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practice

This essay explores how spatial practice can approach the future in critical, imaginative, and projective ways that ethically respond to the climate crisis.

For a World to Come: designing the future amidst climate crisis

Becca Voelcker

What is the relationship between the climate crisis and spatial practices including architecture, and adjacent fields of artistic, activist, and environmental design? The climate crisis demands new ways of thinking, new ways of relating to other human and non-human beings, and therefore new ways of approaching the future of the built environment.¹ Approaches to the future that adequately account for the climate need to be sufficiently far-reaching to avoid quick-fix solutionism, and sufficiently grounded to avoid unbounded flights of visionary fancy. As a spatial practice with far-reaching social implications, architecture and adjacent fields have the potential – and I argue here, the responsibility – to contribute to shaping future spaces and societies around climate justice. The climate crisis cannot be approached through one means alone. If architecture realises its interdisciplinary potential, it could contribute to forming new modes of spatial relation that have profound social and climatic implications.² The reverse is equally true: the social, economic, and environmental shifts required to face the climate crisis demand new spatial formations and practices.

Much design including architecture can be described as hopeful or future-oriented because it inserts its material and immaterial outputs into the present in anticipation that they will improve life for future users – be they more accessible areas for people with prams or wheelchairs, or less biased speech-recognition software.³ Design practices including architecture rely upon imagination and the iterative work of envisioning possible worlds and refining these visions into realities.⁴ But considering what kind of speculation a process of design engenders is paramount for ensuring climate justice. Hopeful designs for another air-conditioned airport in the desert, for example, are hopelessly out of step with the needs of the planet and most of its population.⁵

Airports, 100-mile cities, ski resorts, golf courses, and other ‘gigaprojects’ prove that the architectural discipline has thus far failed to deal fully with the conditions and demands of the climate crisis.⁶ Architecture’s dominant modes of thinking have tended towards technoscientific optimism in accelerated progress, or visionary formal and stylistic play. As Barnabas Calder has so clearly delineated, architecture as we know it also depends on vast amounts of (non-renewable) energy.⁷ Such modes are untenable and intolerable when facing the climate crisis from a globally just perspective. Put simply, the built environment is an environmental problem. Much construction relies upon climate-destabilising practices and processes – not least, the extractive and carbon-intensive production of concrete – that exacerbate unevenly experienced vulnerability to environmental impacts such as heat and flooding. Everyday architectures and infrastructures operating outside celebrated design-led practices (the ‘starchitects’ of design magazines) are also implicated, contributing to emissions at a vast and often overlooked scale.

There is no magic bullet, single solution, or technological fix for the climate crisis. Numerous approaches and scales of operating must instead inform pathways towards ecologically careful futures. At their best, design and architecture could shift culture from a hubristic confidence that humans can manipulate inert material through objective and expert control, to more environmentally responsive and responsible uses of space.⁸

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This is architecture's exciting and urgent opportunity. An architecture fit for the future must be suffused by new forms of social relation – forms that are non-patriarchal and anti-racist, and that centre the well-being of people, more-than-human beings, and the climate, in reparative productions of social and spatial care.⁹ To echo the economist Kate Raworth, these designs must ask: 'What (innovation) is being "born" and how does the design help it to arrive well? What (way of life, status quo) is "dying" and how does the design help it to "leave well"?'¹⁰

This essay explores different kinds of future-oriented design from the past, in architecture and adjacent fields of artistic, activist, and environmental practice. The different examples discussed offer ways of thinking about the future that have spatial consequences in the built environment but reach into wider sociopolitical and ecological realms. What we can take from such diverse practices and projects are lessons in how systemic change must guide design for the future, and how new spatial relations can support this change rather than circumscribe its parameters.

I begin by discussing examples of future-oriented thinking drawn from corporate mining and grassroots environmentalism, selected for their iconic and contrastive nature. Diverse in motivation, these examples illustrate contemporaneous but divergent approaches to thinking about the future of land and its natural resources (oil and grain) in terms of extraction, scarcity, distribution, and profit. Illustrating each end of a polarity with corporate profit on one end and environmental collectivism on the other, the examples provide a framework through which I then consider how spatial practice might envision and enact climate-just futures today. My selection of oil and grain-related projects in the opening section plants seeds for an ecological focus on nature's resources in the essay's latter consideration of more architectural examples. Throughout, my concern is for how spatial practice might contribute to wider systemic change calibrated for climate justice. The definition of climate justice I use here recognises interconnections between environmental and social vulnerabilities and forwards approaches to the climate crisis that not only reduce harmful emissions but also nurture a fairer world. My aim is to explore how spatial practice can contribute to climate justice.¹¹

Divergent approaches to planning for the future

London, England, 1970s

Royal Dutch Shell corporations invite a French oil executive, Pierre Wack, to develop the use of scenario planning, as they face industrial unrest at home and mounting diplomatic tensions abroad. Wack is familiar with quantitative methods for futures thinking, which include trend analysis, data mapping, and time series forecasting. With a global oil crisis on the horizon, Wack thinks he can not only save Shell from financial losses, but even grow its profits.

Forecasting, foresight, and futures studies are activities that build knowledge about possible, preferable, or plausible futures.¹² Many such techniques were developed in the 1950s and 1960s, when economic research institutes constructed computer systems capable of producing macroeconomic models for use in financial forecasting.¹³ By the 1970s, data-driven methods of speculation and forecasting were integral to the strategic planning techniques of military agencies who used them to envision future scenarios for warfare and nuclear combat.¹⁴ Such activities worked on the premise that the future is dangerous until it 'becomes plannable'.¹⁵

At Shell, Wack knew that quantitative analysis alone was insufficient to plan for challenges presented by the looming threat of an oil crisis due to political tensions in the Middle East. Altering stakeholders' 'mental models' through activities such as mind-mapping to draw on people's creativity, intuition, and implicit knowledge, became qualitative methods integral to Wack's approach.¹⁶ His techniques in scenario planning are by now legendary in fields of management and business.¹⁷ Wack's biography played into his appeal. Drawing on eclectic readings in psychology, visits to gurus in India, and sabbaticals in Japan where he explored Sufism and Zen Buddhism, Wack saw

many management problems as crises of perception. He simply had to alter Shell leaders' worldview, he decided, to open them to the potential of alternative (and, crucially, lucrative) futures created by uncertainty.

Wack's holistic method caught on, exciting those invested in the hydrocarbon industry in which Shell was a major player. Geared towards increasing financial returns, his innovations contributed to what can now be labelled a violently extractive economy. In some cases, such as Nigeria, political and social instabilities were even seen as desirable for Shell's profiteering.¹⁸ In others, such as South Africa, scenario planning mapped a peaceful transition to a multiracial government – a government capable of more stable and long-lasting gold and mineral production, which safeguarded the profits of companies including De Beers, for whom Wack later worked.¹⁹ Wack's papers are now held at the Pierre Wack Memorial Library at Oxford University, his 'visionary' approaches to future planning taught on MBA courses world over.²⁰

A design might look 'different', but if it perpetuates an underlying status quo premised on economic growth and privatised accumulation, then it cannot intervene or transform more profoundly.

Wack's approach recalls that of the 'Entrepreneur', whom Isabelle Stengers uses to update Marx's figure of the Exploiter who produces wealth. The Entrepreneur, Stengers writes, 'demands the freedom to be able to transform everything into an opportunity – for new profits, including what calls the common future into question.'²¹ Framing Wack as the figure of Entrepreneur helps sketch out a critical interpretation of his work whereby his concept of future is more conservative than radical in its imagination, framed firmly within a remit of financial and corporate interests. Despite his forays into other cultures and spiritualities, and his emphasis on uncertainty and imagination, Wack's work remained bound to a definition of freedom and futurity limited to private financial profit.

In relation to architectural possibilities for designing future spatial and social formations, Wack's case raises an important question: Are some future-oriented models of design so tied to capitalist regimes that they are incapable of forwarding genuine systemic change? A design might look 'different', but if it perpetuates an underlying status quo premised on economic growth and privatised accumulation, then it cannot intervene or transform more profoundly. Put another way, if Stengers's Entrepreneur can only imagine the future in terms of private profit, future possibilities are limited. Imagining the end of extractive capitalism, and a viable alternative beyond it, is impossible for the Entrepreneur.²²

On the other end of the spectrum, far from corporate interests, lies another figure.

Yamagata, Japan, 1970s

A man stands knee-deep in mud, grinning as he points his camera at some leaves, a tape measure, and a weather gauge. This is the documentarian Ogawa Shinsuke. Abandoning consumerist Tokyo, he's moved to the mountains with his filmmaking collective, Ogawa Productions (Ogawa Pro, for short). There, this motley crew of activists and filmmakers learns to grow rice in the traditional method. Members live communally in an empty farmhouse and convert an outhouse into a laboratory for experimenting with plants and photography. Learning the ways of farmers, they say, applying quantitative science, and documenting their efforts on film to educate others, will help cultivate a better future.²³

The future that Ogawa Pro imagined and attempted to grow was based on ideals of collaborative manual labour, low-impact grain and vegetable production, and a preservation of rural heritage. The future they feared, and detected all around, was an American-allied capitalist system of economic growth and urbanisation. After the Second World War, Japan's rural population had shrunk. Many rice paddy landscapes were concreted over to make way for factories, malls, and office blocks.²⁴ Imported wheat became common. Cases of industrial pollution and chemical poisoning were rife but silenced by corporations allied with the government.²⁵

Wack and Ogawa represent contemporaneous and conflicting ways of approaching late capitalism's extractive reality, the one prioritising economic growth and the other, ecological flourishing. Both were concerned with earth resources – oil for fuel in Wack's case, and rice for sustenance in Ogawa's – but whereas Wack was working within a carbon industry motivated by financial profit, Ogawa aimed to work against it. Considering Wack and Ogawa Pro as contrastive examples of future-oriented thinking sheds light on how divergent understandings of value and motivation can lead to highly different methods and outcomes. The fact that Ogawa's grassroots project could be dismissed as unrealistic or idealist (though not ephemeral – the project lasted eighteen years), illustrates the extent to which carbon industries, and the nexus of corporate and state interests in which they operate, dominate ways of thinking and acting. As Amitav Ghosh writes, this dominance is predicated on the belief that the Modern era has freed humanity from its dependency on the Earth and its sources of energy by conveying us into a boundless technical and economic age.²⁶

Wack's techno-futurism belongs to this continued and pervasive belief in human dominance over nature. The data historian Sun-ha Hong characterises such fantasies as perpetuating a faith that 'impossible and even unimagined technological innovations will arrive, just in time, to cancel out the looming end of destructive climate change'. Hong describes such faith as a 'cultural accounting trick', which finds ways 'to write off debts against future earnings even as bankruptcy approaches'.²⁷ We should understand bankruptcy here as including the depletion of nature's resources for human consumption (and that consumption, unfairly distributed between humans).

Whereas Wack's future is an accelerated version of the present, still bound to capitalist extraction, and in denial of the climate's destruction, Ogawa Pro's resists the extractivist mandate, imaginatively projecting new relations between

humans and earth whereby plants, weathers, and a host of other more-than-human living earth systems coexist in symbiosis, and rice agriculture operates as a low-intensity and collective labour of land cultivation.²⁸

The divergence of Wack and Ogawa Pro's intentions illustrates the fact that similar methods for futures thinking that work by altering people's perceptions of value and motivation, can serve very different ends and understand definitions of 'value' very differently. For both, working with uncertain conditions (be they political or atmospheric) and encouraging flexibility was key to their learning. But, as the philosopher Catherine Malabou has written, consideration of whom and what flexibility serves is paramount in avoiding bending to the spirit of capitalism at the cost of climate justice.²⁹

An architecture for the future that learnt from Ogawa Pro's ecological approach might create spatial and social structures in which existing land, buildings, and local knowledge of materials and processes provided a plausible grounding for future growth. 'Growth', here would be understood as the flourishing of community solidarity, access to greenspace, fresh food, clean air and water, and other non-financialised metrics of wellbeing that economists including J. K. Gibson-Graham present as alternatives to GDP measurements of wealth.³⁰ Which examples of architecture, and artistic, activist, and environmental design have experimented with this approach? How have they succeeded or fallen short in their aims?

Some promising experiments

Agnes Denes and Richard Buckminster Fuller exemplify an artist and designer working on future-oriented projects spanning architecture, design, science, art, and landscaping. Their legacies of iconic experimentation, however, are not straightforward, because their projects seem to intervene in capitalist modernity while sometimes (albeit perhaps inadvertently) bolstering it. Studying this ambivalence reveals how futuristic work can slip into positions of compromise or complicity with the status quo, and hints at challenges facing architects and artists today in terms of audience, sociopolitical impact, and greenwashing.

In 1982 Denes and a team of volunteers planted two acres of wheat in lower Manhattan near Wall Street, titling the summer-long installation *Wheatfield: A Provocation*. The provocation was aimed at New York's financial industry, whose wealth derives from racialised systems of land dispossession and enslaved labour, and the extraction of natural resources for commodities including cereal. By the 1980s, its wealth derived from a less grounded but equally extractive form of financial speculation. What if we could see where our wealth comes from, and where our food is grown? Denes wondered.³¹

Denes was driven by undeniably eco-ethical intentions. But *Wheatfield's* lovely presence on a then-underdeveloped piece of land risked bolstering the very locus of financial power it purported to criticise. Bankers reportedly loved the pastoral installation on their doorstep.³² Had poorer New Yorkers from Harlem, Queens, Brooklyn or further afield wanted to visit *Wheatfield*, meanwhile, they would have faced significant travel time and expenses. *Wheatfield's* iconic juxtaposition of grain and skyscrapers also perpetuated an oppositional narrative of nature-hinterland/ culture-metropolis, at the very time Denes wanted to question this binary. Its combination of spectacle and politics produces a double bind.³³ *Wheatfield* makes a powerful critique ... and a picturesque postcard. The fact that Denes accepted production assistance (a combine harvester) from a pesticide corporation notorious for pollution lawsuits and greenwashing, and *Wheatfield* occupied land once home to the Lenape Nation, add further complications.³⁴

Similar ambivalence emerges from a reading of Buckminster Fuller's provocative, hyperbolic project proposal to build a dome over Manhattan to reduce energy usage in 1960. Planned with architect Shoji Sadao, the dome would have covered Manhattan from the East River to the Hudson River, from 21st to 64th Street. Its architects intended the giant dome to reduce cooling costs in summer and heating costs in winter. Although Buckminster Fuller was a believer in technological solutions, he also understood the importance of speculative projects as critical thought experiments. He encouraged people to think about the limits of their present and how to move towards new frontiers of possibility. What if, the project asked, Manhattan could save energy through insulation?

Horizons of possibility had shifted in very tangible ways during Buckminster Fuller's lifetime. He was born in 1895 when most sources of transport were limited to horses and carts or walking on foot. By the time Buckminster Fuller died in 1983, car travel and aviation were the norm in North America, and humans had travelled to the moon. His life maps onto a series of profound technological breakthroughs – as well as humankind's rising dependency on fossil fuels. And his legacy rests upon his understanding of both the triumph and peril of these developments. His dual approach combined an excitement in technological invention with an environmental concern for fossil fuels, energy wastage, and emissions.

However, as with Denes's *Wheatfield* that provided its banker neighbours with a picturesque reminder of the golden crop upon which America's wealth was once built, Buckminster Fuller's Manhattan project can be read as insulating

(quite literally) New York's locus of economic power, rather than critically engaging with it. The project models a future world but leaves the underlying motor – capitalism – unscathed within a protective dome.

This ambivalent reading of Denes's and Buckminster Fuller's projects sheds light on the way projects labelled 'utopian' for their visionary proposals to transform environments can lack sociopolitical and ecological grounding. The composition of the word utopia anticipates this risk, containing the Greek *ou* (no) and *eu* (good) with *topos* (place), to suggest both a good place and an impossible place. In his work on utopian architecture, Nathaniel Coleman identifies a sociopolitically avoidant tendency that often combines a faith in the good of technoscience and a desire to erase or romanticise selections of the past to make way for unrealisable futures.³⁵ Denes's *Wheatfield* seems to illustrate Coleman's caution – designed as a social and ecological intervention in urban infrastructure, the installation soon became an artworld idyll and later gave way to what became the upscale residential development of Battery Park City, and a series of picturesque images and anecdotes in histories of art and landscape architecture.

Part of the problem for *Wheatfield*, like Buckminster Fuller's *Dome*, is its location within affluent Manhattan, and cultural contexts where visionary and utopian proposals are celebrated as aesthetic genres rather than political interventions. In other words, the underlying conditions that created the need for better food literacy or energy conservation in the metropolis were left undisturbed. The lasting impression is just that – postcard images of the fabled *Wheatfield*, and futuristic renderings of the unbuilt *Dome*.

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Though also unbuilt, a visionary design by Cedric Price in 1966 presents an interesting counterpoint to Denes's and Buckminster Fuller's work due to its attunement to existing social and spatial conditions. Price's *Potteries Thinkbelt* envisioned a network of railway tracks formerly connecting ceramic factories in England's Midlands as a mobile university serving people across this rapidly deindustrialising area.³⁶ *Potteries Thinkbelt* proposed building a shared economy of knowledge in the previous industry's tracks, reducing the need for individuals to drive to universities and making use of otherwise obsolete machinery and infrastructure.

Despite its idiosyncrasy, Price's proposal is more grounded than Buckminster Fuller's because it uses real pieces of the present – a local heritage and an existing infrastructure – to design a spatial transformation with social implications. *Thinkbelt* would no doubt aid local economies if realised as a mobile education unit, but its imaginative criticality pushes for more than financial progress. In Price's proposal, value in the form of education (rather than financialised material or labour) would circulate on a rolling stock of classrooms housed within train carriages. Price did not envision sending *Thinkbelt's* students to Mars but using Staffordshire's disused infrastructure as bedrock for the future. *Thinkbelt* provides a productive critique of post-industrialism and a constructive suggestion of how to sustain and grow communities in industrialism's aftermath.

There is nothing to stop Price's ideas for a railway infrastructure for education growing again, in other contexts, as in the way Soviet Agitprop trains were replicated forty years later for educational and cultural programmes transported around Socialist Chile on trains.³⁷ Ideas guiding *Thinkbelt's* investment in local infrastructure, materials, and people are like seeds that could grow in different soils – that is, in different contexts and conditions. With each iteration, such ideas could engage, politicise, and transform.

Seeds of ideas from Denes's *Wheatfield* have also taken root elsewhere since its initial installation. One iteration grew in a disused railway curve in London's Dalston (2009) and another in an empty lot in central Milan (2015). While both iterations contributed to urban regeneration, coinciding with funding opportunities in the prelude to the 2012 London Olympics and Milan's 2015 Expo, the Milanese *Wheatfield* lasted only months during a period of redevelopment in which a vast business district was constructed with Qatari and American funds. The London version, meanwhile, has become Dalston Curve Garden, a greenspace and social hub much loved by the area's diverse community.³⁸

Ethical and ecological considerations

Dalston Curve Garden fulfils simultaneous social and spatial needs in a way that is vital for climate justice. If we are to 'stay with the trouble' of climate crisis, as Donna Haraway recommends, and face its challenges in just and sustainable ways, the Curve Garden is instructive in its commitment to locality and the re-use of available materials and infrastructure.³⁹ Cultivating a community garden in a disused railway curve is neither particularly novel nor remarkable – rather, it belongs to a rich tradition of spatial and social design that values the health of communities

and more-than-human ecosystems within an interconnected web of life. An important figure in raising awareness of this tradition is the sociologist Robert Gutman.

Fascinated by the relationship between buildings and their users, Gutman brought a sociological approach to architecture, his many books and articles describing the need for long-term, affordable, and more ecological buildings.⁴⁰ Gutman embedded architecture within society and in a web of relations with inhabitants and the wider environment, his emphasis on the long-term value of buildings' social functions resonating with Stewart Brand's approach in *How Buildings Learn* (1994). Despite Brand's dubious affiliations with ecomodernist groups in recent years, his earlier sensibility for the long term offers an important alternative to quick-fix solutionism and futuristic hubris, proposing that buildings function best when constantly adapted and refined by their occupants.⁴¹

Architectural projects for adaptive reuse and recycled and regenerative materials resist cycles of obsolescence and new construction, demonstrating a growing acceptance that the climate is the condition of our living, and no technological breakthrough can alter our dependency on the planet – despite recent claims by self-styled ecomodernists whose research, we must not forget, is funded by natural gas, nuclear, and GMO agriculture industries.⁴²

Ecomodernists at the Breakthrough Institute, a Californian research centre 'that identifies and promotes technological solutions' to climate crisis, place hyperbolic faith in invention and innovation without due recognition that most technology builds on existing technology, and serves conventional ends, albeit in accelerated ways.⁴³ The recent craze for artificial intelligence (AI) is exemplary here. The trading of NFT artwork maintains highly conventional auction house-style value systems. AI face recognition software perpetuates age-old biases of race and gender. Virtual reality cannot bypass or solve real problems merely by being virtual. Neither can cryptocurrency by not being currency, or transhumanism by transcending humanity. Such futurity, taking existing conditions (a currency system, the World Wide Web) and applying an apparently novel element, often in the form of a new technology (block chain, AI), continues age-old systems of labour exploitation, resource extraction, and profiteering.⁴⁴ As Hong puts it, futures thinking that invests faith in high-tech innovation is appealing to many because 'there is less need to worry so much about concrete, existing patterns of inequality or inefficiency [...] since technological breakthroughs will soon render them irrelevant.'⁴⁵

Futurity that fixates on novelty manufactures obsolescence. In architectural contexts, this results in the constant demolition and construction of ever-more technologically smart buildings, no matter the carbon emissions involved in the swapping of old and new. As Daniel Abramson explores in his book on obsolescence in architecture, the logic by which buildings lose their value is entirely congruent with capitalist mandates of consumption and expendability.⁴⁶

Futurity that fixates on novelty also risks driving aesthetic innovation at the cost of real sociopolitical change. Projects can look radical or futuristic and adopt promising terms (who hasn't seen an art or design exhibition recently that advertises itself as *a speculative exploration of worldmaking possibilities*, or *an invitation to imagine alternative futures?*). The Barbican's 2022 exhibition *Our Time on Earth* was themed around climate but displayed more technical gadgetry than considered eco-political thought. Liam Young's 2021 project *Planet City* was a case in point. Combining film, text, and images, Young proposed a 'solution' to climate change in the form of rewinding the planet and compressing its human populations into one techno-scientific city. Such a proposal is wildly at odds with social and ecological reality, and uninterested in exploring the underlying conditions that have created climate crisis.

In exhibitions such as these, promises of alternative, radical, and speculative futures become readymade slogans and marketable 'looks'. People who may have aimed for greater impact find themselves limited to aestheticised domains in which imagination only realises its ideas in pacified, depoliticised outcomes, or as Caroline Levine puts it, as rhetorical flourishes that leave audiences disempowered to enact systemic change.⁴⁷ Manfredo Tafuri detected a similar impasse in the 1970s. Writing a critical analysis of futuring ambitions of the early and mid-twentieth century, Tafuri recognised that architects envisioning futuristic and utopian designs often remained constrained by capitalist tenets of development and growth.⁴⁸ With the climate crisis worsening, such tenets impinge on planetary boundaries with catastrophic consequences.

The question remains as to how artists, architects, and other spatial practitioners might design critical and imaginative futures in a manner that avoids both fantastical invention and replicating the status quo via technical tweaks. The challenge is one of balancing intentionality (a commitment to a value-based set of scenarios or goals for the future) and openness (so that scenarios remain available for change, contingency, and collaboration). Spatial practices appropriate for facing the climate's crisis therefore require substantial social and political content; sufficient grounding in details of what is proposed to transform social relations and spatial conditions in tandem; and a sensitive understanding of history that enables a productive critique of the present. As Daniel Aldana Cohen argues, architects and planners today can design climate-friendly urban spaces fit for a radical 'no-carbon' future (and

antithetical to 'eco-modernist utopias [and] dazzling green technological dreamworlds') by simultaneously studying contemporary climate science and historical design precedents for 'measured and critical' urban provision.⁴⁹

Like Gutman and Tafuri before him, Cohen stresses the connection between spatial and social provision, whereby a city's social, political, economic, and cultural aspects exist in interdependent relation with its architectural infrastructure and environmental ecosystem. Such an approach frees architecture of idealistic goals of individual authorship, solutionism, and finality so often yoked to the idea of the architectural 'project', acknowledging that architecture depends on a host of other disciplines and

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contexts that work in spatial, social, and ecological relation.⁵⁰ This multi-faceted orientation is vital for facing climate crisis. When utopian design projects are associated with idealism, they are also hampered by perfectionism and therefore impossibility and failure.⁵¹ A drive for perfection and finality tethers architecture to a Modernist, anthropocentric arrogance at odds with facing climate crisis as an ongoing, multi-species, and multi-generational challenge.

Designing the future from pieces of the present

Many sectors and disciplines concerned with climate crisis and issues of social inequity are proposing scenarios for the future that serve people and the planet more fairly.⁵² Within fields of spatial practice, projects geared towards providing safer and more habitable spaces have sought to expand definitions of value, progress, and growth beyond financial parameters. Such projects take an eco-intersectional approach to understand social, economic, and environmental relations, which then play out in spatial relations. Central to this approach is a reckoning with the legacies of colonialism evidenced in continued projects for extractive capitalism, and chronic cases of environmental racism.⁵³

A key example of this sensitive approach to capitalist and colonialist violence is evidenced in the work of the Heritage Foundation of Pakistan, an initiative founded in 2005 by the architect Yasmeen Lari. It seems paradoxical to cite a heritage foundation as a bastion of futuring, but this is the point: Lari builds a future upon a foundation of the past – including Pakistan's local materials, construction techniques, and cultural heritage.

As the climate crisis worsens, environmental disasters threaten to exacerbate gender and socioeconomic inequity. Nowhere has this become more apparent than in Pakistan, a country devastated by flooding during the writing of this essay. Aside from heavy and early monsoon storms worsened by climate change, Pakistan faces the challenge of sitting on tectonic fault lines. Earthquakes have killed and displaced vast swaths of its population, harming poorest people the most – many of whom are women and denied access to education and healthcare. Post-disaster reconstruction projects, meanwhile, tend to lack both social and material understanding of the region. Engineered cement structures are promoted as 'safe' and hygienic by international aid agencies, in a construction pattern that fosters international dependency, ignores indigenous knowledge, and robs local people of self-esteem. Lari established the Foundation to curb these patronising procedures. She also wanted to atone.

In Pakistan, architecture is often considered to be the domain of the rich, and therefore tends to emulate the Modern project's futuristic, carbon-intensive, and elitist tendencies. Prior to 2005, Lari led a career designing financial centres, hotels, and company headquarters in precisely this vein. With architecture considered inaccessible on the one hand, and paternalistic international aid failing at cultural sensitivity on the other, Lari saw an opportunity to meet a holistic challenge of taking anti-racist, pro-feminist, and environmentalist action in the built environment, with the aim of constructing a better future.⁵⁴

The foundation employs poor people to build community-serving structures from natural and low-carbon materials, including locally sourced low-energy lime, unfired clay, mud, and bamboo. The foundation also supports projects that provide housing, fund local enterprises, and educate women. Through such grassroots initiatives, Lari aims to shift people's mindsets and boost their confidence in using local, traditional materials such as mud and clay – materials that have sometimes been⁵⁵ associated with poverty due to international perceptions. Likewise, Lari hopes to change popular conceptions of women's work, highlighting the importance of domestic spaces and labour to the entire community.

The foundation's holistic approach to buildings' functions, designs, materials, and methods of construction offers a model for collaborative, community-led and community-serving building practices, economies, and educational programmes world over. The foundation's work illustrates the ethical and environmental importance of using technology appropriate to a local climate and culture to drive design and living practices. Using appropriate technology helps displace fashions for importing materials and designs, such as glass, steel, and concrete, which undermine local economies and ecosystems.

Living with the past, rather than demolishing it, is also key to an association in Japan that provides future homes and training in construction and conservation skills. In many parts of the world, Japan included, low-cost housing built in cheap (imported, carbon-intensive) materials undercuts more expensive housing and repair options that use traditional materials and practices. Japan's vast and predominantly urban population requires housing in abundance, and developers with few qualms in using unsustainable materials are quick to meet the need. New housing in rural and urban areas of Japan now tends to favour mass-produced concrete, timber, and plastic construction, and lasts neither centuries nor decades, but only a few years.

Dotted around the countryside, meanwhile, lie small clusters of wooden farmhouses that were once home to large families who grew rice and vegetables, and used their steep attics for sericulture and drying persimmons (it was communities like these that Ogawa Pro championed). With cottage industries less common, these communities' houses (*minka*, in Japanese – literally meaning, folk house) are left empty. Family structures have atomised, younger generations have sought urban employment, and birth rates continue to decline.⁵⁶

In the face of the Japanese building industry's demolition-prone norms, some people are approaching the future with a philosophy and ethics for passing dwellings and their embedded knowledges to the next generation. The Japan Minka Reuse and Recycle Association (JMRA) began in 1997 with this aim. JMRA is a non-profit organisation that promotes the careful upkeep of *minka* across Japan. With its promotion of reuse and recycling comes the preservation of local knowledge for future generations.

Local knowledge is very localized in Japan and so *minka* vary from region to region, reflecting situated building techniques appropriate to the microclimate. Steep roofs deflect precipitation in rainy Toyama, for instance; bamboo grows in abundance in Shizuoka, so *minka* there feature lots of it; straw is more common in Gifu, meanwhile; *minka* in Shirakawa have steeply pitched roofs to shed heavy snowfall and channel smoke from centrally placed fireplaces into their eaves where it dries the thatch and deters insects. These houses are ecologically future proof in their design.

Minka are also socially geared for the future. Their organisational patterns in clusters, and their requirement to be rethatched or otherwise repaired by teams of skilled people, means that *minka*'s spatial presence requires a social presence, again safeguarding communal principles of solidarity and mutual aid for future generations. Social infrastructure is deep-rooted in Japan. Some of the earliest existing *minka* date to the eleventh century, and a feudal agrarian context in which close-knit communities of multi-generational families lived in clusters and supported each other in mutual aid (*sougo-fujo*), repairing their homes, harvesting together, or patrolling villages as fire brigades. The fact that such practices continue today in villages including Shirakawa and Gokayama is testament to their sustaining social value.

Echoing this historical social provision, JMRA's promotion of repair and recycling includes a Minka Bank that helps owners transfer their *minka* to people who want them, and a network to circulate old wooden building materials among house owners. Specialists work with JMRA to advise owners on conservation practices and how to source local materials, including bamboo, wood, straw, and clay. Traditional construction techniques, such as the twining of roof structures to allow for movement during high winds or earthquakes, continue to provide the best solutions for the local climate, and make use of local knowledges and skills. In these numerous ways, *minka* should be seen as futuristic in the sense that their technology, perfected over centuries, is designed to resist obsolescence, and survive climatic changes.

Minka provide an exemplary model for thinking about architectural practice in the face of climate crisis. As well as being constructed from materials that carry a very small ecological footprint because they are found nearby and can biodegrade, *minka*'s size offers potential use for co-housing, making them viable options for reducing household emissions by pooling resources under one roof. *Minka*, like Lari's Heritage Foundation, serve as important reminders that the future is already planted in the present.

Similar ideas of using existing materials, infrastructures, and knowledges to nurture social and ecologically careful futures guide a recent community project in Sharjah, United Arab Emirates. *Becoming Xerophile* was initiated by Daniel Fernández Pascual and Alon Schwabe, who practice under the collaborative name Cooking Sections. The pair are known for combining research, performance, installation, and design in projects that intervene in local

infrastructures such as supply chains or reframe cultural perceptions of climate care and related issues of (neo) colonial justice.

Becoming Xerophile began in 2019 as part of the Sharjah Biennale. Arriving in the arid city, Fernández Pascual and Schwabe were struck by the UAE's complicated relationship with resources including water. Sharjah is in a desert, but a wealthy one. An oil-rich state dependent on fossil fuels for its power, the UAE has developed a liking for freshly watered lawns. Its cities depend on water sprinklers. Many people in the UAE, including those in Sharjah, consider cacti and other indigenous plants to be dull reminders of their dry climate. Consequently, imported plants are popular indicators of wealth. But, as Fernández Pascual and Schwabe noted, imported plants are thirsty.⁵⁷

After identifying Sharjah's cultural reliance on imported plants and water as untenable for the future, Cooking Sections began imagining how to transform public gardens into climatically viable spaces. Ancient methods of agriculture still practised in parts of North Africa provided a model for how to plant a climate-suitable garden. Collaborating with engineers, botanists, and residents, Cooking Sections planted a selection of indigenous species on the site of a demolished school, using construction rubble to create bowl-like indentations and craters designed to capture humidity and provide plants with water without using sprinklers. Cooking Sections named the project *Becoming Xerophile* (from the Greek terms *xēros*, meaning 'dry', and *philos*, meaning 'loving') in the hope of encouraging appreciation of ancient technologies and plants indigenous to arid areas.

Like Pakistan's Heritage Foundation and *minka* in Japan, *Becoming Xerophile* emphasises continuity between humans and the environment. Such projects are not utopian because they work from existing material (the rubble of an old school, local knowledge of water systems) to help them grow. Crucial to *Becoming Xerophile*'s success is that it both provides a catalyst for ecological and social thought and offers a community a built space and social infrastructure that can be used immediately and cultivated collectively in years to come. No less hopeful, and no less political than other future-oriented projects, *Becoming Xerophile* is intentionally bounded, and grounded.

Futures thinking that finds gaps and possible seeds in the present requires a spirit of curiosity, generosity, and collaboration, not an age-old idolisation of the isolated architectural genius

The examples described in this section illuminate the fact that scenarios suitable for imagining the future need to be constructed from pieces of the present, grounded and credible, at the same time as being capable of reform and reconfiguration. With this balance, scenarios could uncover inconsistencies or gaps existing within current structures and disrupt established relations in a productive manner. This kind of thinking requires us to see the future as being here already, all around us, if we only look for it. The search cannot be a solitary one. Futures thinking that finds gaps and possible seeds in the present requires a spirit of curiosity, generosity, and collaboration, not an age-old idolisation of the isolated architectural genius.⁵⁸ And, as Sarah Ichioka and Michael Pawlyn argue in their work on regenerative design, this collaborative spirit must extend beyond the human to engage carefully with animals, habitats, and the climate, in ways that help all living beings flourish.⁵⁹

Conclusion

Today, most humans are locked into an economy founded on carbon. We urgently need to face this dependency and the climate crisis it entails, especially by attending to the ways in which neoliberal policies of the past fifty years have exacerbated it, and by considering how the built environment has housed such activity.⁶⁰ This essay has argued that spatial practitioners should think and work towards kinds of futures that have real-world implications and applications, but that are imaginative enough to reach beyond business-as-usual restrictions on climate justice. These futures might be plural, cultivating a world where many worlds fit, in what Arturo Escobar describes as a 'pluriverse'.⁶¹ Any understanding of future-oriented spatial practice that begins and ends with form (with the design of a 'look') confines itself to spatial representation to its detriment. As the various practitioners I have described demonstrate, intervening in systems for positive transformation is not only possible, but necessary. Our human capacity for imagination makes us flexible thinkers – our challenge and responsibility are to decide what we should do with that power.

Notes

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11. This research has been produced as part of the project 'Architecture after Architecture: Spatial Practice in the Face of the Climate Emergency'. I have benefited from conversations with, and feedback from, colleagues Tatjana Schneider, Jeremy Till, Anthony Powis, and Christina Serifi, 'Architecture after Architecture: Spatial Practice in the Face of the Climate Emergency' is funded by the AHRC (AH/V003283/1) and DFG (448472648) For further information, see: mould.earth
12. In contexts of financial accumulation, speculation tends to predict unknown short-term futures – the value of stocks, for example – while forecasting looks to longer-term changes occurring over several decades.
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56. See also Tsing, *The Mushroom at the End of the World*.
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Competing interests

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