

After Comfort

1.

The opposite of comfort is discomfort. The first we seek, the second we try to avoid. Comfort is valued because it promises consistency, normalcy, and predictability, which allow for increased productivity or a good night's sleep. Our collective allegiance to comfort is a form of self-assurance – that we are not threatened and that tomorrow will be like today. Comfort indicates that one has risen above the inconsistencies of the natural world and triumphed, not only over nature and the weather but over chance itself. We can rely on comfort. It will be there when we get back.

Comfort is integral to our designed interiors and to the causal chain that ties together HVAC systems, the fuels that feed them, and the carbon emissions that result. Comfort applies to many aspects of living, from the open space of the suburbs to the luxury upholstery in cars. In this more general sense, it is tightly bound up with consumption. The thermal conditioning of interiors is of specific interest here because it falls under the purview of architects and because it is invisible and especially difficult to disrupt. Design is part of this causal chain, organizing and aestheticizing the connection between comfort and carbon.

Comforts are the rungs on the ladder to luxury. Class distinctions are distinctions of comfort, both broad- and fine-grained. They are also economic and geopolitical distinctions. The West, the Global North, the geography of industrialized capital, the global territory of air-conditioning, politics in the 21st century revolves around access to comfort. The rungs of the ladder to luxury are physical, spatial, architectural, and thermal. First comes sustenance, then shelter and protection from the elements, then heat, and, last, cooling, so as to remain active, healthy, and productive, especially in the soup of humidity. After these come layers of precision: filtered air, sealed membranes, sensors everywhere, all the elements of the comfort-industrial complex that aims to wrap itself around the body like a favorite shirt. To be rich means to never be uncomfortable. The life of the poor is awash in discomfort, striving for relief from hunger, from weather, from being a victim of the unexpected. The struggle for comfort is a struggle for equal opportunity, justice, and conditions amenable to growth and self-actualization.

Comfort, however, is in short supply. Not because the world is running out of it but because, in the face of the climate crisis, we have to collectively adjust to its going away. Or rather, architects have to help make it go away, despite all of the challenges in doing so, despite the lack of real momentum around climate in the field. Interior comfort is specific to architecture, and the scarcity of comfort is something architects will have to produce. It involves a conscious redesign of the built environment. We operate as if comfort in climate-controlled interiors – but also in consumption, food waste, and travel, etc. – is a human right. But the global carbon sink, which is directly related to the provision of comfort, is past full. If we can no longer emit carbon, we cannot be air-conditioned in the same way. Buildings must be conceptualized, designed, and built differently. We have to reconsider and renegotiate the terms of comfort and of productivity, equity, quality, and culture.

Comfort, like capital, is unevenly distributed – not everyone gets to have the same amount. When you have a lot, it is hard to let it go. It is even harder to convince someone to give it up. Comfort feels normal, expected, obvious – deserved. Why not turn on the air conditioner on a stifling, sleepless night? Why ever turn it off? Yet, we need to limit the distribution of comfort, renegotiate it, rather than allow it to proliferate. As the climate crisis renders global asymmetries more extreme, rethinking comfort will force us to critically think through these asymmetries. Who decides who gets to be comfortable? What are the technological, industrial, political, and affective contours of asserting such agency?

2.

It is nearly impossible, at least in the US, to design for discomfort. The cultural-industrial apparatus we frame as architecture does not interrogate comfort. The presence of HVAC is presumed, except in occasional cases of, say, a beach house or a cabin in the woods, where the mild discomfort of living with the elements is temporarily valued. There are exceptions, but in general HVAC is regulated and required. It is invisible, hidden in drop ceilings, shafted behind walls and under floors. The duct and the decorated shed. This epochal aspect of building culture, essential to our near- and long-term future, is not readily available as an element of design or an object of discourse. Comfort considered outside of *architecture*, despite the deep interiority of mechanical systems and the reliance, in so many buildings, on an impenetrable membrane. And yet, architecture's capacity for formal virtuosity relies, ineluctably, on the mechanical provision of comfort. Comfort is not a subject for invention, imagination, and experimentation. Not yet.

How do we design for discomfort and reveal these implicit structures (of ventilation, of decarbonization)? How do we frame livability, lifestyle, and life itself in the context of the geophysical and the geopolitical implications of comfort? What is the limit of livability? Could it feel better to be uncomfortable? Perhaps there would be a pleasant sense of participation in a changed global-thermal regime. The affective contours of uncomfortable living are a growth industry. Being discomforted can become a value for spatial innovation.

Every little click and hum of the air conditioner kicking in, every creak of the radiator, is a slow, extended, collective symphonic lament accompanying the decline of civilization. Comfort is destroying the future, one click and hum at a time. Comfort relies on its invisibility: you don't see it, you pretend not to hear it. It's just there. Touch the buttons or the screen. Tell your smart speaker to adjust the temperature. Not only is the HVAC system hidden, so is the boiler, the fuel, the network of extraction, the labor exploitation, the carbon cost of

distribution, the toll of pollution and the toxification of the air. Comfort is normal, the epitome of normative; regulated and rationalized, embedded in construction systems and industrial supply chains. ASHRAE has long since taken command.

Comfort is very difficult to disrupt. Designing for comfort has produced stranded assets: buildings conceived and built for HVAC, with sealed curtain walls and robust mechanical systems, have little chance of surviving in a world after comfort. Most of the icons of 20th-century architecture were poorly conceived relative to the thermal interiors and exteriors of the present; they are, relative to carbon, uninhabitable, unrecoverable, unredeemable. Our histories will be rewritten, our principles of preservation and claims of building integrity will be adjusted. We are witnessing the beginning of a slow (too slow) but persistent decline for the hermetic built environments to which we are accustomed. Architects are not trained to design for discomfort. Not yet.

3.

We are no longer protected from the elements. The elements are assailing us, determining our collective future. The experience of comfort *inside* is predicated on the global acceleration of climatic instability *outside*. Interior comfort produces unpredictability. Despite all the claims of the Anthropocene, the geologic “age of man,” we are helpless to transform the atmosphere back to a predictable state. Or, so far, to conceptualize a human future resilient to the unpredictability that we, and even more so our children, are facing. Heating, cooling, and humidity control systems make us comfortable while simultaneously making us vulnerable. We are, in fact, exposing ourselves to the elements by virtue of these sealed, conditioned spaces.

We live in the Comfortocene, an era defined by a global order predicated on manufactured interior consistency. This era will be short – or rather, human capacity to witness it is limited. Are we really killing ourselves through a demand for comfort? Yes, or at least threatening to. Air-conditioning is a primary medium of this existential threat; conditioning interiors is the carbon-intensive imperative that architects can approach, resist, and reconfigure.

The challenges of climate change are both political and physiological. How many will be discomforted? And to what extent? Changing personal and social expectations is one important element of this challenge – not the personal virtues of reduced carbon living but the collective reframing of cultural values. Can we imagine, articulate, and proliferate a culture of discomfort? What does it look like, literally? What is its form? How does it feel? And how do we get there? It is a magnificent challenge for architects who, as a profession, are so inextricably entangled in capital, yet licensed to imagine. The challenge now is how not to grow, to facilitate an economy of exchange and redistribution. Discomfort is an opportunity. The imperative for transition structures the prospect of discomfort. But if transition is not toward growth, what is the goal? How do we produce buildings while reducing carbon emissions?

The recent global wave of populism in electoral politics also reflects a collective, anxious grip on comfort, thermal and otherwise – a holding on to what is known in the face of increasingly wild uncertainty. Energy, coal, and climate have structured political shifts, in American and Australian elections in particular. There is nothing more traditionalist, more conservative, than comfort. Conditioned spaces form the infrastructure of global capital, from offices and museums to airports and refrigerated shipping containers.

Conditioning is everywhere. It is not affected by the changes going on outside. Architects are not even adjusting the presets. Rather, as with many other professions, we are relying on

politicians and engineers to figure this problem out, naively maintaining the imperative of comfort while ignoring the inevitability of increased instability.

4.

Comfort, like capital, is a proxy for racial inequity, a spatial and mechanical form of implicit bias. It is the structural imposition of a norm; materially, atmospherically, and globally. Climate determinists in the 1920s mapped the world according to race and climate, arguing that the Euro-American temperate zones allowed for more social interaction and productivity. They correlated economic opportunity with solar patterns, rationalized through pseudoscience. Their imposed notion of productivity wrought surplus – culture, comfort – on the backs of others.

Comfort was an important colonial distinction: who was comfortable and who was not? Can we begin to speak of comfort reparations, to develop design methods that intensify northern discomfort in order to better manage life in the Southern Hemisphere? This would involve a massive transfer of thermal wealth while reducing overall comfort. Designing northern discomfort to its limit, refocusing energy resources on the interiors of the Global South: decarbonization as decolonization.

Comfort and development are inextricably intertwined. Comfort scarcity is the signal that development is not available to everyone and that this unevenness needs to be forced across political and geographic divides lest it proliferate along historically familiar lines. Northern discomfort will be imposed, not welcomed. The asymmetry of thermal wealth can be inverted; the lives led in the North and the South transformed by the transfer of thermal wealth. Architecture is the medium for this comfort distinction; through design, thermal difference can be articulated and negotiated. Architecture is both the material from which the comfort-climate nexus is produced and the screen on which the comfort imaginary is displayed.

How can design for discomfort attain the status of quality, of value? Designing for discomfort involves treasuring the global collective over the local and emphasizing the capacity of architecture to integrate the geophysical with the geopolitical: to value cities, buildings, spaces, and practices as if carbon mattered. In terms of carbon, in addition to terms of form, theory, and novelty, architects can explore the experience of discomfort.

5.

The spaces of formal experimentation we gather as “modern architecture” were also spaces of energy intensification. The seminal Seagram tower is one of the worst performing buildings in Manhattan. With its thin curtain wall and luminous ceiling, it aspired to use as much energy as possible. This was not a failing or an oversight: after the war, as the global oil regime was in formation, the ambition of corporate buildings in particular was to use more energy in order to generate more economic activity. An office building was a celebration of the inevitability of economic growth, and of the possibility of comfort, in New York, Hong Kong, Sydney, Delhi, Macao, London, Beijing, Madrid, and on and on. Comfort was everywhere, and yet absent in so many places. Many cherished buildings are now monuments to a sociotechnical mechanism receding rapidly into the past: stranded assets. In terms of carbon emissions, architecture as we know it is unsalvageable. So, what is architecture after comfort?

Form is of interest if and when it facilitates the capacity to reduce carbon emissions and design for discomfort. To overcome carbon form is to resist its preeminence. Does it really matter what the unpredictable future looks like? Yes, clearly. Design articulates new

expressions of collective will. Form is what we will hold on to until the end, an insistence that cultural expressions matter.

The built world is contingent. It was built according to specific socioeconomic conditions, collective desires, and cultural interests; it can be unbuilt and rebuilt according to new conditions, new desires, and new frameworks for cultural elaboration. Such reconstructions also reimagine relationships to resources, economy, exchange, and equity. Architecture's new ambition should be to condition humans to be uncomfortable.

The architecture of discomfort will be multifaceted – the glory of architecture is that it reveals in its own creativity, in the pleasant unfamiliarity of affective space. It provides something new; yet, over the past few decades the terms of this novelty have been too tightly proscribed. Unleashing architects to design for discomfort will produce spaces, materials, and systems wholly unimaginable in the present. We anxiously await this explosion of carbon creativity.

6.

A first step: retrofit. “*Resolved: (E)*. upgrading all existing buildings in the United States . . . to achieve maximum energy efficiency”; the Green New Deal reaches out toward disciplinary transformation. It hurts, though, to think of architecture's role as simply upgrading. It reveals burning questions: What new construction can be justified? If it really is all about carbon, what is left for architects to do? How much discomfort can we take in our homes, offices, schools, and institutions? How uncomfortable can we be? Architecture has the opportunity, if not the obligation, to define and explore this new limit – to design to the edge of comfort. The last 100 years have been defined by manufactured comfort; the carbon released will condition the planet for centuries to come. Yet, one lesson from this period of luxury and technological elaboration is that it demonstrates a capacity for designers to encounter complex challenges with creativity and optimism; it demonstrates the capacity of a collective to overcome.

7.

The savvy design collective of the near-future sees opportunity in designing for discomfort, in moving past the computational production of novel form and toward engaging with the limits of comfort. Through collaborations with physiologists, engineers, artists, and others, we can ask: How can a building help regulate a planetary sense of comfort, according to the intersection of cultural desire and carbon emissions, rather than according to ASHRAE standards?

The imperative to design for discomfort is real, tangible. As a site for design exploration and elaboration in the coming decades, discomfort is the goal: only by changing our expectations of the interior (relying less on air-conditioning) will we have a future. Design tools can not only reduce reliance on mechanical conditioning, they can also be compensatory, creative, and instructive: the experience of a room or a city that can encourage and reward the lifestyle, habits, clothing, and activities that reduce comfort.

Of course, for centuries architecture was built without HVAC; until the 1960s most buildings were developed in some relationship to their climatic surroundings. As a discipline we have a long history of tools, of material knowledge, of attention to orientation and induced ventilation. We can draw on many historical examples. Current digital capacities have increased the field's ability to understand and design for the specifics of a given climatic opportunity.

Designing for discomfort suggests that such performance software is not enough – that meeting LEED standards is not enough. The transformation is profoundly cultural and resists

sustainability metrics: as a global society, we need to adjust the contours of our desires and our values. This is the role for architecture: architects can design for discomfort *in order to make discomfort desirable* – to find pleasure in a new causal chain, one that starts with the less-conditioned interior, extends to the less carbon-filled atmosphere, and resolves itself by tempering the inequity, exploitation, and destruction that increase with climate instability. Discomfort is not a bad thing if it is designed, managed, and made desirable. We will be discomforted either by design or by default, as the terrors of an uninhabitable Earth make themselves increasingly felt. Why not start now?

8.

Architecture is not to be blamed, though it is nonetheless partly responsible. We lack a language, formal and textual, to examine our position in this struggle. A spotlight is shining on the field as legislators, scholars, scientists, and the public scan biennials, museum renovations, blockbuster exhibitions, the celebration of new airports, searching for evidence of attention to the climate-changed future. It is rarely found. We are counting on architecture to transform; to produce new forms. To overcome its past. This socioenergetic transformation elicits an architecture that reveals, rather than ignores, the determinant presence of HVAC in most of the developed world. This transformation requires dramatically changing the terms by which we value a building, landscape, or public space. “How does this project interrogate comfort, work toward discomfort, make carbon reduction appealing?” will soon ring out in studio juries and client meetings. Architects lack a language to discuss comfort, and discomfort, or to interrogate the relationship between HVAC and civilization.

A strength of the field today, its potential prominence in cultural discourse, is as a space of intensification in the changing balance of comfort and carbon. The challenges to architecture clarify a broader trend, as every other sociopolitical practice also grapples with climate instability. Architecture is essential: it is needed to modulate interior comfort; to organize with precision the details of carbon emissions; to imagine and build zero-carbon environments; to value retrofit and renovation. Architects are skilled in producing a future distinct from the past.

9.

We are, all of us, architects and everyone, complicit. Despite all of the alarm bells, we are emitting more carbon than ever. Every professional and cultural practice faces an imperative for radical transformation. Architects are on the front lines – finally the avant-garde! – building a world at the edge of discomfort. This is, or soon will be, the cultural prominence of the field: to express and build noncarbon possibilities, to explore life after comfort.

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