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The Architecture of Together and Apart

AN INQUIRY INTO APARTMENT BUILDINGS

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Edited by Matīss Groskaufmanis, Evelīna Ozola, Anda Skrējāne

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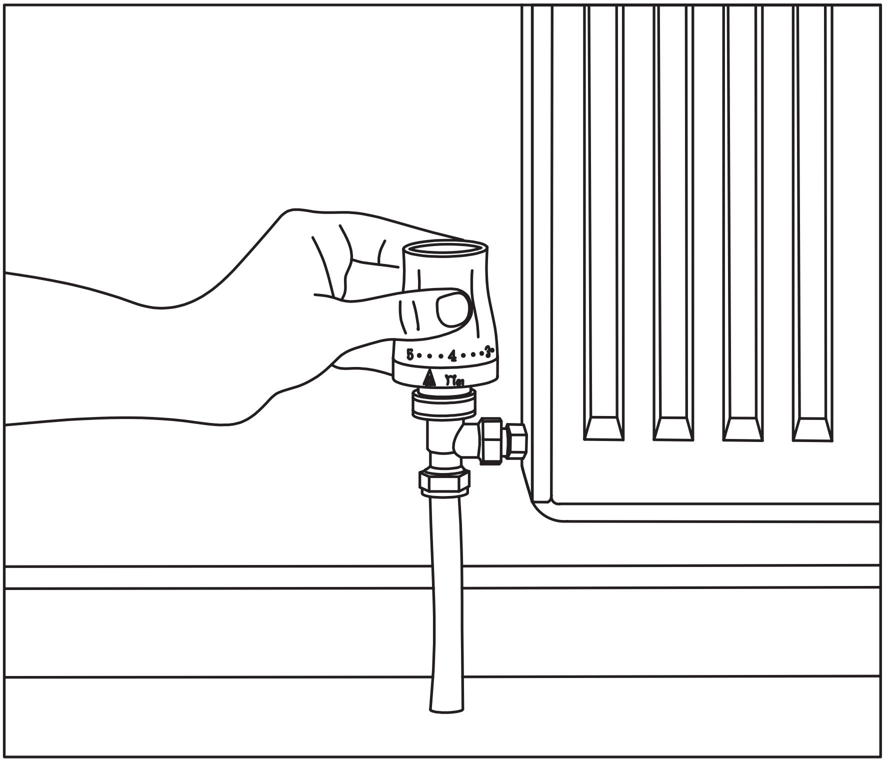
RENATA TYSZCZUK

Thermostat

...to bring in change / Of seasons to each clime; else had the Spring / Perpetual smiled on Earth with vernant flowers / Equal in days and nights...
(Milton, Paradise Lost)

A thermostat is a component that senses a system's temperature so that it can be maintained at a desirable set point. The word thermostat is derived from the Greek words *thermos*, meaning hot, and *statos*, meaning stationary Usually referring to an electrical switch that opens and closes in response to temperature changes, thermostats control many different types of small as well as large domestic appliances. They are found in most homes – in irons, toasters, coffee makers, and hair dryers, also refrigerators, freezers, air conditioners, gas and electric ovens, clothes dryers, radiators, and central heating systems. The earliest feedback-controlled thermostatic device was a mercury bulb invented by a Dutch engineer Cornelis Drebbe in 1620 for use in his chicken incubator. In a later invention by a Scottish chemist Andrew Ure in the 1830s, the bimetallic strip underscored the simple perpetual efficiency of thermostatic devices.



Since that time, thermostats have been thought of as reliable, programmable, and even smart. What they all have in common is the promise of improving, regulating, and controlling an interior climate. The thermostat's capacity to maintain and stabilise temperatures as if by magic chimes with the long held desire, or even nostalgia, for more clement times. These might include an Earth not fallen, which once was in "spring perpetual" – atmospheres perfectly adapted to human needs and comfort, like the globally standardised climates of offices and the shopping malls on a permanent vacation, or the endless suburban sunshine in the designs for space colonies. The artificial maintenance and control of optimum temperatures for the indoor climate of privileged humans is one of the deeply embedded expectations about how our energy systems are meant to work for us. We tend to take for granted the ability to calibrate habitable spaces to personalised temperature target values or ideal set points.

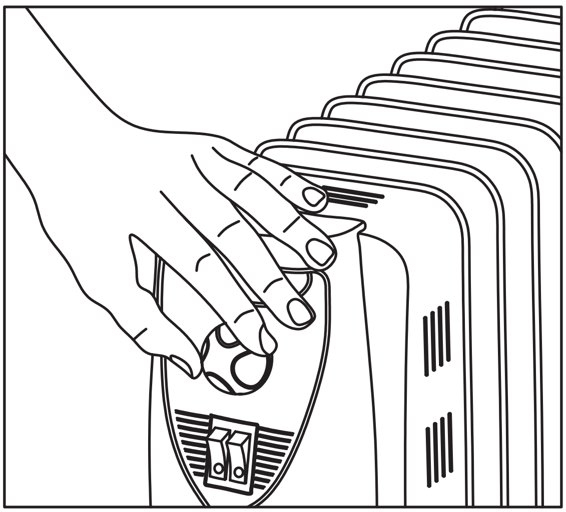
How people live and the adjustments they make at home vary, of course. Thermostat settings are informed by the reliability of the energy supply, showering and bathing practices, clothing, thickness of quilts, insulation, and simply by whether or not someone has remembered to flip the switch. Moreover the relationship to

1 Bruno Latour, "A cautious Prometheus? A few steps toward a philosophy of design (with special attention to Peter Sloterdijk)" in *Networks of Design Proceedings of the 2008 Annual International Conference of the Design History Society* (UK), eds. Jonathan Glynne, Fiona Hackney and Viv Minton (Boca Raton, Florida: Universal- Publishers, 2009).

2 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on an EU Strategy for Heating and Cooling: https://ec.europa.eu/energy/sites/ener/files/documents/1_EN_autre_document_travail_service_part1_v6_0.pdf

climates, both inside and outside, shifts with changes to cultural norms. There is no such thing as an ideal or universally approved climate. There is no way of doing away with the vagaries of weather on Earth, but the proxy experience that is climate control is possible literally at home. If you want to do something to your zone settings, and see what effect your intervention has, playing with the thermostat is all you need to do. "Are you outside?" asks Bruno Latour, in describing Peter Sloterdijk's *Spherology*. He continues: "There is no outside: outside is another inside with another climate control, another thermostat, another air conditioning system."[1]

With the flip of a switch you are also playing a part in building the cumulative effect of domestic thermoregulation on the global climate. "Heating and cooling in buildings, businesses and industry consume around half of the energy produced and used in the European Union," and 45% of this is used in the residential sector.[2] Habitual activities in individual households, neighbourhoods, and cities require enormous amounts of energy and elaborate planet-wide energy infrastructures, all of which rely on vast amounts of fossil fuels and result in dangerous levels of carbon-dioxide emissions. Transitioning to a society and economy that does not use fossil fuels, or uses them dramatically less, is a daunting challenge. All the more so because "climate change augurs as dramatic a shift in society as it does in sea level rise."[3] For it implies a vast process of social transformation, upheaval, and disruption that will revise how many people think about and respond to their relationship with the non-human natural world.



It is now known that humans are changing the global climate, probably for the worse, and on a global scale. The climate in Northern and Central Europe is likely to get warmer, wetter, windier, and far more unpredictable in the future.[4] Other parts of the world are heading for temperature extremes, spectacular drought, rising sea levels, and catastrophic turbulence. It is the geographically and economically vulnerable communities that will struggle to maintain security in their current homes. The disastrous conditions that many of the Earth's inhabitants will experience as a result of climate change can be said to have come about as a result of human manipulation on a global scale: the combined efforts of humans, mostly from the Northern hemisphere, increasing their greenhouse gas emissions year upon year. This hard-won, climate-model-defined insight is in itself an example of what Donna Haraway called the "god-trick,"[5] or Peter Sloterdijk identified as an "inverted astronomy"[6] – that is,

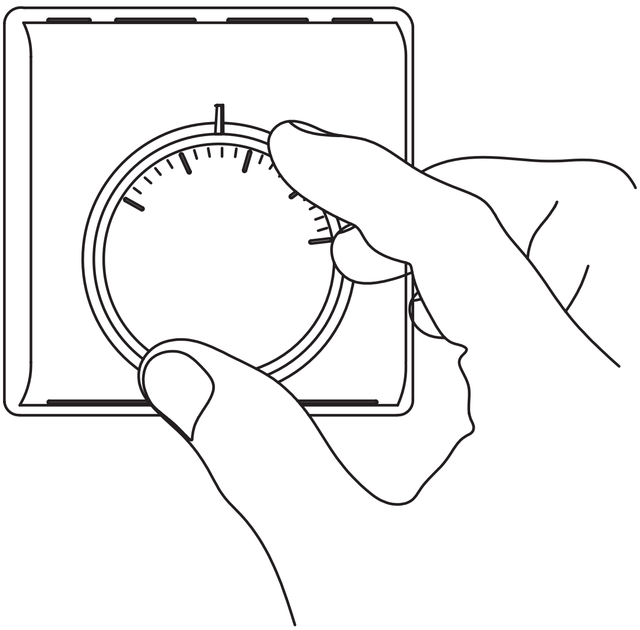
3 Renata Tyszczuk and Joe Smith, "Culture and Climate Change Scenarios: The Role and Potential of the Arts and Humanities in Responding to the '1.5 Degrees Target'" in *Current Opinion in Environmental Sustainability (COSUST)* Vol 31, 2018: 56–64
4 IPCC 5th Assessment Report Working Group II Report, "Climate Change 2014: Impacts, Adaptation, and Vulnerability" Chapter 23: 'Europe'; https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap23_FINAL.pdf.
5 Donna Haraway, "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective" in *Feminist Studies* 1988 14 (3): 575–599.
6 Peter Sloterdijk, 1990; cf. Wolfgang Sachs, *Planet Dialectics: Explorations in Environment and Development* (London: Zed Books, 1999).
7 Joe Smith, "From Truth War to a Game of Risk" in Smith, J., Tyszczuk, R. and Butler, R. (eds.), *Culture and Climate Change: Narratives* (Cambridge: Shed, 2014).

it suggests humans as occupying a privileged vantage point, seeing our Earthly home and its heightened vulnerability from the outside. At the same time the "difficult new knowledge"[7] about climate change might serve to humble or even overwhelm us. For the most part, however, an abstract vision of the Earth has only bolstered our sense of control, underpinned by enduring notions of Spaceship Earth, imagining humanity's home planet as a fragile biospheric artefact in need of careful maintenance. In this view the Earth and our individual domestic environments – both life-sustaining capsules – are perceived as graspable, increasingly monitorable, and (thermally) manageable entities. Earth, however, with the prospect of accelerating climate chaos, is now considered in dire need of assistance, or rather, management.

Re-setting Earth's Thermostat

There is a plan that some call "Plan B," but the stakes are high. As former UN Secretary General Ban Ki-Moon asserted: "there is no Planet B." Geo-engineering rests on the possibility that the artificial and purposeful regulation of the Earth's system processes can avert the onset of climate change. It is commonly referred to as "re-setting Earth's thermostat." The Royal Society defines geo-engineering as "the deliberate large-scale manipulation of the planetary environment in order to counteract anthropogenic climate change."[8] If humans have changed the Earth without even trying, it provokes the question: what would it mean if humanity were to deliberately try to manipulate the Earth's systems? In the last two decades this concept has moved from science fiction and from the fringes of scientific research to the mainstream of science and policy debate. Atmospheric chemist Paul Crutzen, who popularised the term "anthropocene," has been a prominent advocate of geo-engineering research.[9] Others, however, consider geo-engineering as "a bad idea whose time has come."[10] Clive Hamilton expresses concern at such attempts to fix the Earth: "[A]s if we know enough to install and begin to operate a 'global thermostat.' Truly this qualifies as monstrous hubris."[11]

Current geo-engineering options fall into two main categories: solar radiation management (SRM) and carbon dioxide removal (CDR). SRM schemes for reflecting sunlight back into space include releasing sulphate particles into the stratosphere to enhance the Earth's albedo (that is, light-reflecting) effect; "global dimming" by placing millions



8 John Shepherd et al. (Ken Caldeira, Joanna Haigh, David Keith, Brian Launder, Georgina Mace, Gordon MacKerron, John Pyle, Steve Rayner and Catherine Redgwell), "Geo-engineering the Climate. Science, Governance and Uncertainty," in *The Royal Society, RS Policy document* 10/09 Issued: September 2009 RS1636.

9 Crutzen, Paul J., "Albedo Enhancement by Stratospheric Sulfur Injections: A Contribution to Resolve a Policy Dilemma? An Editorial Essay" in *Climatic Change* 2006 77 211–219.

10 Eli Kintisch, *Hack the Planet* (John Wiley & Sons, 2010); see also Robock, Alan, "20 Reasons Why Geo-Engineering May Be a Bad Idea. Carbon Dioxide Emissions Are Rising so Fast That Some Scientists Are Seriously Considering Putting Earth on Life Support as a Last Resort. but Is This Cure Worse Than the Disease?" in *Bulletin of the Atomic Scientists* May/June 2008 Vol. 64 No. 2; pp. 14-18.

11 Clive Hamilton, *Earth Masters: The Dawn of the Age of Climate Engineering* (New Haven and London: Yale University Press, 2013).

of tiny mirrors into orbit near the Earth; whitening marine layer clouds by spraying seawater into them; brightening water through the creation of hydrosols (inside-out clouds of tiny air bubbles); painting dark urban infrastructures, such as roads, car parks and rooftops, white. Plans in the related category of glacial geo-engineering include shoring up glaciers to slow sea level rise by freezing water at their base, or building barriers. CDR schemes to remove carbon dioxide from the atmosphere include: dumping pulverised limestone into oceans to neutralise acidification; fertilising oceans to promote algae growth; floating vertical pipes in the ocean to aid carbon fixation; burying charred biomass to achieve carbon sequestration. SRM, or “albedo modification,” schemes have received most attention from the business community; a fact reflected in the numerous patents issued.

Such schemes involve implementing experiments hitherto confined to laboratories and computer models to a global scale to actually transform the oceans, whiten the clouds, shield the Sun, and fix the Earth. While such projects shift between the sublime and the ridiculous, the feasible and the fantastic, depending on one’s point of view, they “typically involve mundane technologies such as mirrors, iron dust, sulphate particles or crumbled rock.”[12] Moved around Earth, like in a sandbox, these mundane earthly materials could bring about massive changes, but would they save us, or destroy us? And is there any way to test this accurately before we lock ourselves into a planet-wide experiment with no off-switch? Naomi Klein has expressed horror at the prospect of a Monster Earth – a toxic mix of geo-engineering projects gone awry: “A grim picture emerges. Nothing on Earth would be outside the reach of humanity’s fallible machines, or even fully outside at all. We would have a roof, not a sky – a milky, geoengineered ceiling gazing down on a dying acidifying sea.”[13] There would be no “outside.” We could not lock the door of laboratory Earth and walk away – we would be the experiment.

Ungovernable Technology

The eruption of Mount Pinatubo in the Philippines in 1991 threw up an enormous cloud of ash, dust, and gas, estimated to have injected ten million tons of sulphur into the stratosphere. Scientific studies of the event concluded that the albedo effect of the sulphate particles caused a drop of 0.5°C in the average global surface air temperature. This suggested that volcanoes might function as accidental planetary thermostats. For atmospheric scientist Ken Caldeira, volcanic events exemplified that geo-engineering concepts hitherto only tested on climate models had, in fact, already been “tested by nature.”[14] But the stratospheric sulphate aerosols were not just proven to scatter sunlight; they also changed atmospheric chemistry. A year after the eruption, the ozone hole over Antarctica was showing signs of excessive thinning because of an ozone-depleting reaction. Pinatubo’s changing of the climate occurred against the backdrop of high-level political alarm about climate change – the year that

12 Phil Macnaghten and Bronislaw Szerszynski, “Living the Global Social Experiment: An Analysis of Public Discourse on Solar Radiation Management and its Implications for Governance” in *Global Environmental Change* 23, (2013): 465–474.

13 Naomi Klein, *This Changes Everything: Capitalism vs. the Climate* (London: Allen Lane, 2014).

14 Ken Caldeira, “We Need Some Symptomatic Relief” in *Earth Island Journal* Spring 2013; http://www.earthisland.org/journal/index.php/eij/article/caldeira/

15 Oliver Morton, *The Planet Remade: How Geo-engineering Could Change the World* (London: Granta, 2015).

16 IPCC, “2013: Summary for Policymakers” in *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. (Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA). http://www.climatechange2013.org/images/report/WG1AR5_SPM_FINAL.pdf; p.29.

A photograph from postcard set Riga in winter, published in 1971.

Pinatubo cooled the Earth was also the year that the UNFCCC was signed at the Rio Earth summit, 1992. Oliver Morton observes that "[i]t's hardly surprising that some people wondered whether Pinatubo could be more than an experiment – whether it could, instead, be a prototype."[15]

Over twenty years later, the 2014 IPCC 5th Assessment Report presented more than a 100 modelled scenarios that might keep global warming below 2°C; most relying on negative emissions technologies that remain economically unviable, untested to scale, and potentially devastating to ecosystems. The report's "Summary for Policymakers" concluded with a terse warning about geo-engineering schemes.[16] While it is argued that geo-engineering may be the only way to avert a climate emergency, there remains unease, misapprehension, and downright fear when it comes to its implementation. There is suspicion that societies may come to depend on these methods rather than taking much-needed action to curb carbon emissions. There is also doubt that the proposals could work at all and concern that if any of the schemes are implemented, a series

17 A. Atiq Rahman, Paulo Artaxo, Asfawossen Asrat and Andy Parker, "Developing Countries Must Lead on Solar Geo-engineering Research" Comment, in *Nature* 556 22-24 (2018).

of negative and unintended consequences might follow, reconfiguring and destabilising regional and local climates in unanticipated and unprecedented ways. It is countries in the global South that have most to gain or lose in the matter.[17] There is concern that rather than diffusing "climate emergencies," geo-engineering technologies might in fact create new political and security emergencies. No one knows if the risks of geo-engineering are greater than the risks of not limiting global warming to the 1.5°C target. The difficulties of reaching any agreement through the multilateral United Nations process of the UNFCCC – notably the Kyoto Protocol or the Paris Agreement – with regard to more conventional climate mitigation suggests that governing the geo-engineering schemes will be even more difficult. Mike Hulme argues that "[t]he technology is ungovernable... I find it hard to envisage any scenario in which the world's nations will agree to a thermostat in the sky."[18]

Take Care

The planet is not a machine. Earth's systems cannot be controlled as if a maintenance engineer were to simply adjust a planetary thermostat, shifting between optimum and maximum levels of 1.5 or 2 degrees of average warming. Living on this fractious planet requires involvement, not only through physical and material interventions, but also through urgent consideration of the implications of everyday practices in relation to the Earth's systems dynamics and, hence, climate politics. Many responses are being proposed to stem the threat of disastrous climate change resulting from an insatiable appetite for energy. These include energy rationing, carbon taxation, sumptuary laws, investment in renewable energy infrastructures, and the design of higher density and carbon neutral buildings. While it may seem ludicrously optimistic to anticipate rapid and radical de-carbonisation, it is also dangerous to depend on world-wide geo-engineering technofixes. There is understandable caution when it comes to claims that humans can take control of the planet's thermostat and "re-set the Earth." Time pressure and the worryingly intransigent habits of carbon consumption might seem to be driving humans towards a drastic high-tech intervention. But there are many obvious advantages for opting instead – and as soon as possible – for a humbler approach, rooted in the practices of care and repair. Combining the meddling with inherently unpredictable Earth systems with troublesome politics and fragile forms of environmental governance makes a particularly turbulent mix.

In the most economically secure parts of the world, technologies conspire in the creation and maintenance of highly individualised cellular units of habitation. These climate enclosures, now equipped with improved residential thermostatic controllers online and on smartphones, promise increased occupant engagement in determining energy efficiency. But there are other technologies that need nurturing in the face of the intractable politics and shared dilemmas of climate change. As Kim Stanley Robinson argues: "Justice is a climate-change technology of great power."[19] While we attempt to maintain the impossible dream of achieving "perpetual spring" by means of our control or our adjustments, it actually leads to a warming planet; to a world where many are destabilised, dehydrated, starved, weakened, and displaced. As Margaret Atwood opines, climate change is rather an "everything change," or what Mike Hulme calls "an aggregated manifestation of changes which are at one and the same time environmental, economic, technological social and cultural."[20] Being on planet Earth, or behind the front door of our own home, calls instead for the kinds of improvised adjustments and accommodations that recognise that Earth's system processes will always escape human efforts to control, stabilise or secure them. For what is at stake is not how we adjust our domestic or global thermostats in order to resist change, but rather how humanity collectively should live on its earthly home in response to the changing climate and unsettled times. The domestic setting – home – is still the medium through which different sensibilities and perspectives can be explored, methods of adaptation tested, burdens of responsibility negotiated, and modes of hospitality practiced. Home is, among other very important things, the most common source of examples as to how we might best take care of ourselves, each other, and the Earth.

This essay draws on "Monster Earth" Chapter 6 from Tyszczuk's *Provisional Cities: Cautionary Tales for the Anthropocene*, published by Routledge.

18 David Keith and Mike Hulme, "Climate Science: Can Geo-engineering Save the World? Climate Professors Mike Hulme and David Keith go Head to Head over Whether Climate Engineering Could Provide a Solution to Climate Change" from The Guardian, 29 November 2013; http://www.theguardian.com/sustainable-business/blog/cli

19 Kim Stanley Robinson, "Toward an Ecologically Based Post-Capitalism: Interview With Novelist Kim Stanley Robinson" from *Truthout*, 17 March 2018; http://www.truth-out.org/opinion/item/43864-toward-an-ecologically-based-post-capitalism-interview-with-novelist-kim-stanley-robinson.

20 See Mike Hulme, *Weathered: Cultures of Climate* (London: Sage, 2017).

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