



Architecture and the Environment

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FIELD NOTES

Architecture and the Environment

These Field Notes, on the topic of Architecture and the Environment, elucidate how problems raised in the environmental humanities have informed architectural history, and in turn, what architectural history has to contribute to this emerging field. The short essays explore specific ‘positions’ in the overarching debate, identifying a radical return to critical theory and the embrace of the fundamentally transdisciplinary nature of environmental humanities and architectural history. While the positions advocate for a serious investigation of architects’ texts and ideas on environmental issues, the collection also champions a broader engagement with Anthropocene questions and proposes to adopt the environment as an intellectual perspective from which to look upon the world.

Introduction

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During the Fourth European Architectural History Network meeting in Dublin in June 2016, the interest group ‘Architecture and the Environment’ was established. Its members share the ‘environment’ as a central concern of their work, as subject matter, methodological framework, or perspective from which to rethink architectural historiography. The ‘Field Notes’ published here gather fourteen positions that confront the imminent environmental challenges as collective intellectual enquiry, but from varied geographical, historical, and theoretical standpoints.

The motives and potentials for such a group effort may be obvious given the environmental urgencies of the present moment. Today, most people are familiar with the intense discussions concerning climate change, climate chaos, or climate breakdown, as some journalists and activists such as George Monbiot have suggested we call it, so as to adequately reflect the magnitude of what is at stake. Many are also acquainted with debates about the Anthropocene.¹ According to this concept, which is the subject of the natural sciences as well as the social sciences and the arts and humanities, we live in a new geological epoch defined by human activity. In addition to these public and scholarly debates, millions of people around the world have begun to experience man-made climate change and its (after)effects, including human unsettlement and mass displacements. Developing effective strategies to confront this predicament presents a profound challenge, especially in light of ‘the impossibility of enacting the necessary changes within the

parameters of capitalism’ (da Costa Meyer 2016: 1212). While this thought is daunting, it can also be read as a call for action. In fact, we argue that architectural history has as much to learn from the present debate as it has to contribute to it. The positions presented in these Field Notes map out four overarching themes that reflect architectural history’s entanglement with the current environmental debate and its particular disciplinary contribution to that discourse.

Transdisciplinarity

Arguably one of the most relevant developments to confront the imminent environmental challenges as intellectual query for architectural history has been the emergence of the environmental humanities as a transdisciplinary field. The ambition of the environmental humanities is to bridge the divide between science and the humanities by establishing conversations among varied disciplines, including geology, biology, ecology, environmental history, philosophy, cultural geography, anthropology, business, law, media studies, art, and design. Drawing on a unique richness of methods, concepts, and terms from these fields, the environmental humanities have greatly contributed not only to the expansion of knowledge, but also the development of strategies suitable for addressing a problem as vast and complex as the environment. One of its key insights is to understand humanity as merely one agent in a larger network of the earth’s living and non-living things.

Many of the contributing authors — including Isabelle Doucet, Kim Förster, Ross Exo Adams, and Daniel Barber — present positions that draw on ideas from the environmental humanities and mark a departure from concerns intrinsic to the fields of art and architectural history. If we are to take the insights from the environmental humanities seriously, Doucet notes, we must question the categories, methods, and concepts through which architectural historians are accustomed to think, including epochs, canons, and oeuvres. Förster suggests that methods from the environmental humanities further

encourage us to break through the biases that have foregrounded questions of aesthetics or technology in architectural history. Engaging these propositions requires careful labour and changing the language we use in researching, writing, and teaching architectural history as a transdiscipline.

However, as Adams warns, it is also essential for architectural historians to critically reflect on the field's fascination with the environment and to remain wary of its potential pitfalls. Especially in the face of rampant academic capitalism, which has a tangible impact on the built environment (from campus development to fossil fuel investment), the increasing marketization of knowledge predisposes architectural thought to a somewhat narrowly historicized understanding of environment. Especially if we want to regard 'environment' as a perspective, a grasp of its historicity as a concept and social construct is fundamental. According to Barber, such a perspective offers the opportunity to participate in a wide-ranging environmentalization of humanist and scholarly discourses, instead of merely adding 'environment' to a list of sub-issues for the field to engage in.

Environment as Perspective

To consider environment as a perspective means developing a way of seeing – to establish and then to occupy a specific vantage point, from which to look upon the world. This suggests that, like feminism, Marxism, or postcolonial studies before it, the environment is at home in no singular discipline, but enables a broader view that can inform multiple subjects. This does not mean that the environment is equally applicable to all topics of study, but it implies that it has the power to cast almost any theme in a different light.

Aleksandr Bierig, Kenny Cupers, and Jennifer Ferng are among the contributors who dare to think which histories become possible if we were to truly implement environment as a perspective. One of the main propositions these authors share is the need for scrutinizing how the histories of resource extraction, colonialism, and imperialism are inextricably linked. Drawing on economic history, Bierig questions the idea that the realms of the artificial and the natural were ever separate, and argues instead that architecture has always been part of nature. Cupers excavates histories that do not take the environment as given, but that rather recognize its material and conceptual coproduction. Ferng urges us to consider the wider scope of extraction industries, especially in the global south, which date back at least to the establishment of pre-capitalist trade networks.

In unpacking the entangled histories of environment, capital, and extractive economies, these contributors assert that in acknowledging the environment as a perspective, we should pursue 'intersectional' approaches to architectural historiography, to borrow a term from feminist discourse.² Such histories would draw together multiple views and vantage points and would conceive not only of environmental histories of architecture, but would ask what (post)colonial, Marxist, or feminist environmental histories of architecture might look like. In

their commitment to rendering networks and relationships legible – be they human and non-human, material and intellectual, tangible and impermanent, scientific and experienced – the authors echo core intentions of the environmental humanities, of which architectural history is, after all, a part. At the same time, they call for a fundamental critique the universal figure 'Anthropos' by attending to the long history of structural unevenness and inequality that has underpinned both the idea and the actual processes of development.

(Re)turn to Theory

One of architecture's profound capacities is to render the management of resources visible – the flow of gold, iron, oil, money and other kinds of capital, goods, or labour. This idea, which has shaped critical architectural historiography in recent years (Scott, 2016), is strongly informed by the theories of Michel Foucault, above all his concept of governmentality (Foucault 2009). It allows us to think of buildings and cities as produced by 'knowledge frameworks and expertise profiles capable of managing populations by regulating their demographics, health, housing, [...] employment, social lives and culture' (Abramson et al. 2012: vii).

The fieldnotes by Ayala Levin, Ginger Nolan and Alla Vronskaya, Torsten Lange, and Maroš Krivý expose architecture's mediating function in the coproduction of territory and populations, humans and their environment. In her contribution, Levin illuminates Laugier's Primitive Hut simultaneously as sheltering the body from its surroundings and as an embodiment of resource extraction. Nolan and Vronskaya invoke Foucault when they introduce the notion of 'environmentality' as a means for understanding the reciprocal relationship between the modern invention of 'humanness' and the production of specific milieus tasked with supporting the optimal development of the human species. Considering an environmental perspective, Lange looks at 'household' as a political technology for the distribution and reproduction of resources, bodies, and social constructs, reminding us of such older but no less relevant theories as those of Max Weber. Finally, Krivý cautions us about the administrative and institutional apparatuses that manage the environment, and their approaches to urbanism such as 'organicism' and 'holism', whose origins lie in the 19th century.

Far beyond an indebtedness to the debate on governmentality, which has recently been revised by the insights of ethnographers and anthropologists (Povinelli 2006), the positions these authors articulate share a renewed commitment to a rigorous and historically grounded but speculative theory. While the authors build on insights from science and technology studies, environmental history, and human geography, they also return to concepts, themes, and even entire fields of enquiry that have been important, and indeed intrinsic, to architectural history. We would even go so far as to say that this particular theoretical approach is something that architectural historians and theorists can contribute to the larger debate.

Architectural Epistemologies of Environment

Certainly, this current moment of opening up the discipline represents but one instance in a much longer history of architecture's engagement with environmental questions. Throughout the 20th century, a great number of architectural actors – designers, builders, critics, and theorists – have sought to make sense of the complex relationship between humans and the environment when they theorized buildings, technology, landscapes, and territory. In fact, we believe that well-known architectural ideas, especially of the 20th century, anticipated many of the themes outlined above, although they pose specific historical and historiographical problems.

Andres Kurg, Sophie Hochhäusl, and Sabine von Fischer reassess architectural writing and built works from an environmental perspective. Kurg asserts that studying environmental debates among practitioners in the Soviet sphere allows us to account for alterity in global modernization processes, and to recognize environment as a horizon of mutual yet different experience. Significantly, environment operates here simultaneously as a theoretical and a historical concept that is socially and politically constructed. Hochhäusl notes the importance of excavating the political motivations behind social constructions of environment; growth metaphors, she argues, especially when it comes to the writing of 20th-century architects, often masked acts of inscribing economic unevenness and racialized imaginaries into the built environment.

In a sense, these positions speak to the call to historicize the concept of environment within architecture in the face of heightened urgency. With a view towards the work of Reyner Banham, von Fischer proposes that, especially in moments that call for action, we should also perhaps remind ourselves of the 'urgency to wait'. 'Suspending urgency' may turn out to be one of the more effective strategies for operating within, and indeed against, the constraints of capitalism.

Structure and Language

Finally, a word on the structure and language of these 'Field Notes'. These texts were never conceived as a final commentary but as a provisional record – a snapshot of a moment in an ongoing conversation that also highlights potential avenues for further research.³ We have thus tried to retain both the heterogeneity and the consensus of the presented ideas. At times, this consensus will appear in the form of repetition, as well as overlapping, parallel, and crossed arguments. Given the rapidly evolving discourse, we have sometimes deliberately resisted the urge to fully synthesize propositions into conclusions. The following texts can be read piece by piece, by theme, across positions, or in full. Needless to say, each one stands on its own merit. Along the way, readers may encounter neologisms, notions of newness, and even buzzwords, all of which point to a shared excitement for the transformational power of the questions at hand. Although there are obvious risks in taking such a position, we believe that there is a beauty in the spirit of 'working something out'. After all, neologisms mean that there is something in the making; repetitions, we hope, imply that something is taking shape.

I. Transdisciplinarity

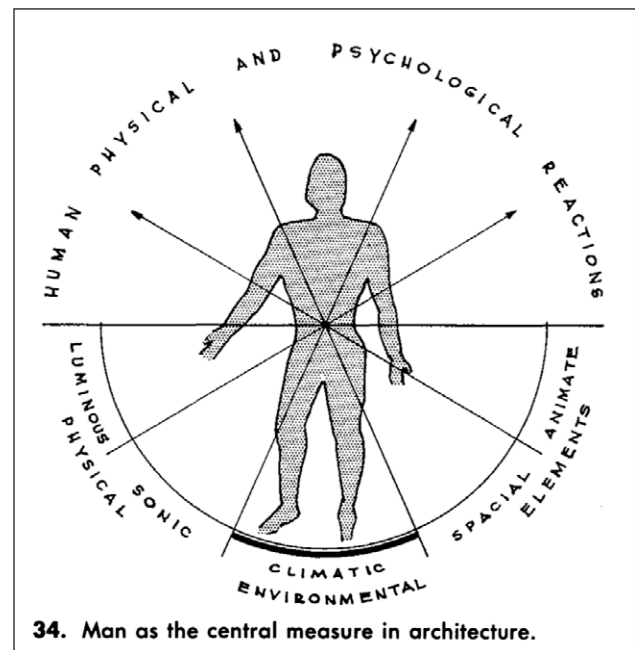


Figure 1: Victor Olgyay, 'Man as the Central Measure', diagram published in the first edition of Olgyay (1963: 14).

Historical Epistemologies of the Environmental Present

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It is easy to imagine a scenario in which, shifting our attention to the concept of 'environment', we architectural historians will transform our field entirely. Exposed to ontologies of ecological science, systems theory, complexity theory, or thermodynamics, the objects of study inherited from the 20th century will be appraised against a shifting horizon of concerns: cities, neighbourhoods and buildings – environments in themselves – will require new tools and categories of assessment; scale will lose its graduated linearity; time will become indistinguishable from form; and contingency will gain its place as perhaps the only force of history that matters. While epistemologies like these are seductive, I remain sceptical about how they may play out in architectural history – not because of the modernist, liberal imaginaries they abandon, but because they imply that we predispose architectural thought with a somewhat narrowly historicized, techno-positivist, and often apolitical understanding of 'environment'.

Indeed, to historicize a concept like environment, it is crucial to question what it means to our thought in the present since it is the present that gives urgency to any particular concept in the first place. Curiously, the pre-19th century etymology of environment suggests deep relations to militaristic strategies, notions of danger, and forms of protection, particularly in relation to city walls – meanings that may speak more to our contemporary risk

society and the neoliberal fixation on securitized urban 'environments', not to mention contemporary military-strategic thinking, than to the more scientific definition we take as given. While it may be that the 19th century's birth of positive sciences coincided with the onset of industrialization, giving rise to a new human-environment relation, it's certainly not the first time that this relation has been transformed, and it would be a fundamental error to confuse historical interpretation with origination. Instead, we may find that what the 19th century gave visibility to was a conceptual *inflection* of environment whose careful study may open other ways to interrogate this concept in the present.

This is not to deny the methodological and epistemological shifts that have already changed the way architectural history is written vis-à-vis environment. Indeed, these shifts may be registered less in *what* we study than in *how* we frame our research: the fact that not only are we compelled today to write histories examining the forces that produce architecture, but that we also anticipate how these histories contribute to explorations outside our discipline is arguably an outcome of our broader encounter with environment itself and the challenges it poses to 20th-century epistemological frameworks. Given the transdisciplinarity that environmental questions invite, we may do well to see disciplines as intellectual points of departure rather than fixed, bounded realms of 'expert' knowledge. Precisely for this reason, the limitations of building an intellectual edifice around a term understood solely in its relation to modern science may become clear.

The Environmentalization of Architectural History

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The promise of reframing architectural historical knowledge in light of environmental pressures solicits an engagement with a number of epochal shifts. It is self-evident that architecture will look differently now that there is wide recognition of the impact of fossil fuels – including those burned to manage the air-conditioned interiors of modernism – on the planetary climate and on the future of the species. Narratives and methods of architectural history offer a potent window into the environment as a collection of historical agencies, especially insofar as scholarly engagement with methods and intentions evident in the built environment offer compelling evidence of cultural attempts to understand and shape collective relationships to earth systems. In other words, architecture has long been an essential site of conceiving of and enacting social relationships to the biotic sphere; architectural histories open up compelling opportunities in tracing these relationships and their effects.

The two greatest methodological challenges of the emerging field of the environmental history of architecture are a critical engagement with science and technology and a continued, though revised, approach to architecture as media. Broadly speaking, architectural history has yet to assess the impact of the social construction of technology on its methodological frameworks. Technological innovation, especially around sustainability, is too often framed as triumphant and unequivocal, rather than conditioned, complex, and often fraught with unanticipated consequences. Similarly, the shift in media theory toward a framework of cultural techniques allows for more focused analysis of architectural concepts and ideas as formulating material substrates that elaborate on historically and culturally contingent distinctions between interior and exterior, on visual, material, and conceptual terms. Such histories offer a *longue-durée* engagement with buildings as physical, conceptual, and cultural mediators of the environment. The potential here is for architectural history to reframe itself as a site for convening these discussions and exploring their relevance to the ideas, concepts, and figures that drive socio-environmental change.

Environment and sustainability are ciphers for a number of ideas focused on rethinking relationships between political, cultural, and biotic systems. The discourse of architectural history greatly expands and enriches this discussion by recognizing that all architectural activity has registered, or directly engaged, environmental issues both by professional necessity and as an expression of cultural desire. Architectural history helps substantiate the promise of the emerging framework of the environmental humanities: at stake is not the addition to the canon of a new set of objects but, rather, the integration of knowledge about environmental conditions and their relationship to social collectives. Environmental histories of architecture thus address both the material and the symbolic means through which the field has mediated discussions of cultural change over the past few centuries.

Hesitant (Hi)Stories: Whose Environment? Which (Architectural) Imaginations?

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Radical thinkers of the environment call for challenging what Isabelle Stengers refers to as 'first history' (2015: 19), which is defined as thriving on development and mobilization (of people, nature, and resources) fuelled by economic growth. Stengers asks us to inhabit a new, 'second history' based on the recognition of the unsustainable and damaging character of the first. In Donna Haraway's words, such inhabiting is a matter of 'staying with the trouble', which involves becoming 'truly present' (Hara-

way 2016: 1); asking, to paraphrase Stengers, what these ongoing processes oblige us to do (Stengers 2015: 19); and developing other stories than the ones that are promoted through the logic of the 'first history'. The question thus becomes how historians of architecture and the environment can write such (hi)stories that are embodied, responsible, and 'other'. Can historical accounts be 'truly present' at all?

I would argue, albeit tentatively, that architectural historians adopt a privileged position from which they can recall and thus trigger awareness around '(first) histories' of mobilization, justification, and unsustainable decision-making. Historians of architecture – a *projective* discipline and profession – are, moreover, particularly well placed to uncover counter-struggles and counter-narratives that have attempted to challenge the seemingly inevitable course of the 'first history'. They can thus reconnect with (hi)stories and (utopian) imaginations that tell alternative stories of living with Gaia; stories that, because they were considered odd, unrealistic, or inconvenient, went unnoticed, or were silenced. But simply writing accounts of such counter-stories is not enough when these remain themselves locked in historiography's epistemological regimes. Are historians, themselves products of 'first history', not to ask anew: What do we look at? What do we include as actors in the history of the environment?

There is thus a need to question the categories, methods, and concepts through which historians are accustomed to think (such as epochs, canons, oeuvres, geographical relevance, and seminal works), and which are possibly still locked in the first history. One way to do such 'category work', as Haraway aptly called it (Gane 2006), is by slowing down, hesitating, and becoming sensitive to that which we inhabit. For historians, hesitation is essential for gaining access to those 'other' stories, stories of resistance and of difference. Architectural historians, by engaging with a projective discipline, are well equipped to challenge the dominance of the 'first' environmental history. In doing so, they contribute to the imagination of other environmental futures. But it requires a laborious, combined, effort: historiographical category work and the painstaking identification and narration of environmental counter-histories.

Architectural History and the Anthropocene

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In the light of anthropogenic climate change, we might want to reconsider how we narrate (and teach) architectural history as an environmental history. Coming from architectural history, geography, sociology, and cultural studies, I tend to integrate critical concepts

of culture and nature, environment and ecology, with institutional critique and the sociology of the profession, to analyze how architecture and the environment have been coproduced. This idea of coproduction raises questions with regard to architectural history's periodization, its turning points, broader discourses, specific cases, etc.

Disciplines such as history, geography, and sociology have put forth critical historiographic viewpoints to reflect upon present-day consequences of developments since the industrial revolution. They did so by linking earth's history to human life and the capitalist mode of production (Chakrabarty 2009); by analyzing the effects of fossil capitalism on urbanization with the shift of power supply from water power to steam engine (Malm 2016); or by highlighting the dependence of ideologies of growth on the availability of cheap energy, resources, labour, food, etc. (Moore 2015). These takes on the Anthropocene, or Capitalocene, 'understood as a system of power, profit and re/production in the web of life' (Moore 2017), barely map out the role architecture has played. It is in the manifold production of the built environment, e.g. the naturalization of obsolescence (Abramson 2016), that society's complex relation to nature shows itself.

Clearly, the energy question is a critical issue, although not the only one, and by analyzing the socio-spatial nature of the environmental problematic, we would first of all historicize shifts in energy base – from wood to coal, to oil and gas, to nuclear – and their relation to architecture, the metropolis, and national territory, in relation to the invention of modern building typologies, materials, techniques, and technologies. Still, these transformations must be seen in broader terms of political economy and colonialism, population growth and food security, biopolitics and geopolitics, limits and depletion, scarcity and austerity, etc.

Moreover, architectural historians should try to approach unanswered questions by exposing spatially fixed regimes of production and consumption, but also by highlighting the effects of pollution and toxicity; or by analyzing the environmental impact of architecture and urbanism, especially with the Great Acceleration in the West, as in the East, since the 1950s, as witnessed in architectural manifestations of petrocultures (Szeman et al. 2017). Finally, we might investigate new geological stratifications on the basis of technofossils, in terms of the building material industry and its reliance on stable, high-energy, at times toxic materials, such as asbestos, concrete, chemicals, metals, or plastics.

The task for architectural history then is to problematize notions of nature under capitalism at different scales, responding to today's challenges, such as energy transition, sea level rise, and extreme weather events, or even aiming for social and environmental justice, especially in the global south.

II. Environment as Perspective



Figure 2: Fields of Tulips, Lisse, The Netherlands. Source: *Welcome to the Anthropocene: The Earth in Our Hands*, 2014–2016, Deutsches Museum and the Rachel Carson Center for Environment and Society, Munich.

Towards a Natural History of the Artificial

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It seems clear today that the particular eruptions and expansions of modernity are inseparable from the adoption of fossil fuels. Demographic growth and urbanization, among other accelerations, hinged upon a shift from organic energy (wind, water, photosynthesis) to mineral energy (beginning with coal) that gained momentum around the turn of the 19th century (Wrigley 2010). While the drive toward expanding markets as well as class and colonial expropriation preceded this energy transition, those activities, alongside others, were propelled at ever-greater velocities and scales by a new force — that is, fossil fuels at the disposal of certain human societies.

In broad terms, the changing built environment both reflected and captured motivating sources of energy, as buildings and infrastructure came to express and perpetuate these new fuels. These transitions took hold at different times in different places, and distributions of political, economic, and energetic power remain uneven. Nevertheless, studying the built and planned environment with attention to energy, as many have already begun, provides a way to reassess the very idea of an ‘artificial’ built environment — a notion which persists in many of the most thoughtful environmental histories. Artefacts of architecture and infrastructure are perhaps the most pervasive evidence of our supposed separation from nature. Consequently, the re-inscription of this seeming artifice within a natural history allows us to reassess this divide and, with it, a central paradox of our present moment: that we have constructed a natural world in the process of fabricating an artificial one (Purdy 2018; Daston 1998).

The work of early modern historians indicates that establishing where or when capitalism began is a predictably blurry business. For instance, Sheilagh Oglvie shows 17th-century Bohemian serfs behaving as ‘rational’ economic actors (Oglvie 2001) and Fernand Braudel famously locates the promethean spark of commerce and exchange long before the emergence of modern industry (Braudel 1984). In other words, ‘capitalism’ is one thing and fossil fuels are another. If their logics have proved complementary (Malm 2016), we should explicate how and why particular combinations of political economy and motive energy have affected the creation and destruction of buildings and infrastructure. While the political and social analysis of architecture remains vital, the history of energy provides an additional framework that illuminates why certain patterns governing the built environment were able to expand, intensify, and proliferate. A long history of the relationship between spatial structures and changing energy regimes might, in turn, provide examples from the past that point toward new ways of considering the present and future.

The Environment as Material and Intellectual Production

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Despite its ubiquity in contemporary discourse, the notion of the environment has yet to be analyzed as a central category of thought in architectural history. Environmental perspectives of both historical and contemporary architecture are currently being put forward, but what is lacking is an analysis of how environmental thinking underlies the very emergence and development of modern architecture. In the course of the 19th century, the professional and disciplinary field of architecture developed in a constellation of environmental ideas and practices, which ranged from natural philosophy and evolutionary biology to settler colonialism and urban reform. To excavate this constellation requires a historical approach that, instead of taking the environment as a given, recognizes both its material and intellectual production.

Our current — North Atlantic — definition of environment, which entered dictionaries in the mid-19th century, emerged at the intersections of modern sciences, such as biology, geography, and anthropology. Yet it was also based on older, deterministic convictions — such as that climate determines race, or miasma bring disease. New science and old conviction were in turn reshaped by practice in at least two different ways: through the practices of colonial expansion, governance, and resistance, and through planning and reform efforts in the rapidly transforming cities and countrysides of the metropole. Such intersections suggest a close relationship between what are usually considered to be separate intellectual traditions: a romantic strand of philosophy focused on the experience of nature and a much more rigorous, instrumental

belief in the determining influence of the environment on human culture and behaviour.

In light of this relationship, the rise of modernism at the turn of the 20th century might be understood as the reversal of the deterministic relationship between humans and their environment, a reversal in which the environment becomes recognized as being constructed architecturally and humanity itself is increasingly understood as a geographical factor. Such an argument might contribute to our understanding of one of the central paradoxes of modernity, namely that the modern violence towards nature and humanity that pervades much of 20th-century history, including the history of architecture, can be seen as integral to a vitalist worldview that understands humanity as an intrinsic part of nature.

(More) Global South, Pre-Capitalist Anthropocenic Milestones

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The Deutsches Museum and the Rachel Carson Centre for Environment and Society's exhibition *Welcome to the Anthropocene: The Earth in Our Hands* (2014–2016) recently documented what the curators called 'significant milestones', or revolutionary innovations, that have transformed how mankind has altered the natural environment. Their curatorial strategy, which follows Paul Crutzen's definition of the Anthropocene, 'a new geological epoch in which human beings have altered the planet', is organized into the categories of urbanization, mobility, machines, nature, food, and evolution.

The Anthropocene is often either exalted for its technocratic character or condemned as another theoretical trend that has rehearsed the age-old perils of climate change. Drawn in comic-strip form, the coal bucket wheel excavator dating from 1880 shown in the exhibition, for example, is rendered as a glorified mechanical version of a shovel (Möllers 2014; Hamann et al. 2014). The shaft drill, crucial for open-pit mining, is similarly depicted with retractable pneumatic pistons, topped by a poppet head that creates cavities underground. That mankind has been depleting natural resources since the time of the Altamira Cave is not new. If we are to address architecture's engagement with the Anthropocene, I view this exhibition as a pressing call for further critical studies that articulate earlier modes of natural resource extraction that emerged outside of Europe and well before the 19th century.

Originating from Australia, Chile, India, Peru, and South Africa, some of these other environmental histories remain equally pertinent for European precedents and likewise demonstrate how the extraction of mineral resources leads to detrimental effects. The ecological footprint triggered by mining practices has incorporated everything from town settlements, regional churches, roadways, and underground tunnels for transportation. Contemporary mining

camps in Australia are even better known as fly-in, fly-out establishments (FIFO) that form temporary housing centres for off-site workers, but they often leave behind permanent infrastructure that goes unused for several decades. In light of projects that identify global practices of mining in Canada and other countries, we must be more cognizant that these exemplars encompass a broader chronological and geographical scope that extends across our shared international empire (Bélanger 2016; Ponte 2016). Thus, the Deutsches Museum's exhibition intimates that there are even more anthropocenic milestones that could be integrated into our collective chronicle about the Earth and its future fate. These objects of the Anthropocene, in fact, represent essential architectural questions that position human interventions as an extension of design and technology. Against ever-expanding global narratives that touch upon colonial and imperial undertakings, the environmental histories from the so-called periphery are no longer limited by access or geography, but only by the self-imposed shortcomings of historiographic interpretation.

III. (Re)turn to Theory



Figure 3: 'The Primitive Hut', frontispiece of the second edition of Marc-Antoine Laugier's *Essai sur l'architecture*, 1755. Designed by Charles Eisen.

Urbanism, Organicism, and the History of Environments as Dispositifs

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What are the pre-histories and conditions of the resurgent neo-organicism of contemporary urbanism? The notion of the built environment, salient to the development of urban planning in the late 19th century, highlighted the irreducibility of the city to architecture. It also anticipated the non-built environment exceeding the merely physical aspect to the urban realm, as testified by ways in which disciplines such as sociology, psychology, ecology, semiotics, and systems theory informed how urbanism was theorized and practised throughout the 20th century. Casting cities as biological organisms was a common thread in these otherwise distinct bodies of knowledge.

Politically, 20th-century urban organicism oscillated between liberal-humanist, fascist, and social democratic positions, informing such typologies as public parks, summer camps, and housing estates, and sanctioning distinct class, national, and racial alliances under the metaphoric guise of the organism. That organic metaphor's history has been replete with disparate meanings: the city as rationally planned and romantically irrational, a cybernetic brain and a calculated (and computed) uncertainty. It has informed a plethora of projects, such as Walter Gropius's 'integrated planning', Bruno Zevi's 'humanist anti-classicism', Jane Jacobs's 'liveable urbanism', Ian McHarg's 'designing with nature', Christopher Alexander's 'timeless way of building', or Michael Batty's digital 'breeding' of urban forms.

We might interrogate tensions between these holistic organicisms and approaches to the urban that are dialectical or otherwise attentive to power, inequalities, and contradictions, such as those of Henri Lefebvre, Manfredo Tafuri, and, more recently, Felicity Scott. Moreover, we might ask what the organicist visions of good, healthy, and well-tempered environments suppressed and concealed. Urbanism can be studied historically as an environmental dispositif, foregrounding physical, institutional, and epistemic aspects of how power operates through environments. While value judgements are inherent to the discourse on environment, the disparate criteria (efficiency, ethics, aesthetics) that underpin those judgements are rarely explicated as such. Urbanism practised as environmental improvement routinely obfuscates its broader socio-political contexts and ramifications. Where environmental critique registers contradictions of human action (urbanization, and more recently the Anthropocene), those contradictions are routinely resolved at an imaginary level (moralizing discourses that lead to aestheticized enclaves), thus further intensifying rather than restraining capitalist development.

A history of the uneasy relationship between urban 'environmentalism' and capitalism could extend beyond Michel Foucault's well-known investigation of

neoliberalism as an environmental intervention (Foucault 2008). The late 19th-century argument that poor sanitary environments determined working class vice justified slum-clearance as well as the social democratic compromise around urban planning. Sustainability, born out of the critique of Fordism, informed the 'greenwashed' architecture of LEED certificates. And in the recent resilient urbanism, the very notion of politics has been 'environmentalized': the spectre of organicism has returned under the amorphous, emergent, and viridescent guises of parametricism, data-behaviourism, and smart cities. The history of environments-as-dispositifs would illuminate social contradictions and political conflicts intrinsic to (neo)organicism's many faces.

Other Home Stories: Troubling the Anthropocenic Household

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'Environmental behaviour and change begin at home', we are frequently told. It might be easy to dismiss such statements as mere platitudes, as modern-day mantras so characteristic of neoliberalism's obsession with the individual rather than the structural. Yet what does the imperative for living sustainable and ethical lives, for maintaining both one's own and, by extension, our global household mean when approached from the perspective of architectural history and the environmental humanities? How can historical work help to politicize, again, the home? What conceptual and material practices of dwelling underpin contemporary ways of living in the global north? What are the specific disciplinary as well as broader cultural histories, and what the corresponding geographies, of 'being at home' in the Anthropocene? And what kind of subject dwells there: *Anthropos*, the exceptionalist human being?

Home and the concept of dwelling have traditionally been cast in opposition to capitalist modernity and the world of production characterized by instrumental rationality and calculative thinking. Rejecting this 19th-century split between private and public spheres, material feminists in particular have argued that the home, rather than being separated from the outside world, is in fact entangled with it through a dense web of social, economic, political, and other relations. Moreover, industrial and technological developments as well as new social structures have reshaped the modern home over the course of the past one hundred and fifty or so years.

To take seriously the questions above, it is necessary to 'trouble' (Haraway 2016) taken-for-granted understandings of home as they persist in our current era of environmental crisis, and to take a fresh look at the thick materialities and entangled practices of living across different historic periods and geographies. This would foster a reading of ecology that recognizes its etymological meaning as comprised of *oikos* (household), *logos* (discourse), and *nomos*

(management) (Williams 1983: 110–11). Building on the work of Max Weber (Weber 1978), we might not only want to interrogate the politics of managing such households communally and bureaucratically. But we might also want to reactivate the notion of dwelling as ‘to cherish and protect, to preserve and care for’ (Heidegger 1997: 96), beyond romantic contempt for worldly things. In addition, we should critically engage science and technology as well as political and economic concerns.

Man, Nature, and the Question of Resources

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Like the sub-discipline of human geography, architecture operates at the intersection of, for example, economy, culture, landscape, and climate. Architecture, however, is unique in its capacity to physically intervene in these interrelationships. If architecture can be narrated in terms of its mediating role between man and nature, what are the specific forms this mediation took in different historical periods? What notions of man and nature underlay this mediation? And how, in turn, has this mediation redefined both man and nature reciprocally? This interrogation lies at the heart of the debates over humanism and posthumanism, or in other words, the question of human agency in the age of the Anthropocene. The visualization techniques – drawings and diagrams – employed in architectural design can offer a lens through which to probe the epistemological frameworks at work in the construction of built environments, and their respective human subjects, in various historical moments and at different scales.

In the modern Western imagination, as exemplified in Marc-Antoine Laugier's ‘Primitive Hut’, architecture's basic function is to provide shelter from the elements. First, this foundational hypothesis calls for a comparative analysis of the different ‘sheltering’ functions architecture provided in various historical moments and in different regions, Western and non-Western. Such an analysis will include questions about the identity of the subjects or things in need of (or having the right to) shelter; what or whom they need sheltering from; and to what ends. Second, the preventive charge of the term ‘shelter’ obscures architecture's role in the conquest of nature via the exploitation of its resources. In Laugier's tale, the environment is a hazard (sun and storms) that humans need protecting from and that at the same time provides the resources (trees) to do so. It is the act of architectural design that defines one as a problem and the other as the solution. I therefore suggest that in order to fully account for architecture's mediating role in the construction of the environment – i.e., its role in defining natural elements as hazards or resources – we need to study it as a political-aesthetic apparatus for the identification, ordering, and management of resources.

Building the Ineffable: Human-ness and the Reification of Environmentality

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Seemingly apparent and palpable, the category of the environment is nevertheless elusive. While the environment could be said to comprise everything under the sun, it does not exist as a precise, definable object of enquiry delimited by either spatial or categorical boundaries. Although the environment has long been invoked in the interests of architecture's own disciplinary self-legitimization, most notably in discourses of climate and sustainability, what remains less examined is how architecture has mediated between the omnipresence and non-existence of the environment. In translating abstractions into built form, architecture performs the work of reification. It thus works toward concretizing and circumscribing a complexity – the environment – that would otherwise remain ineffable. It does so through recourse to another ineffable complexity: ‘the human’.

The epistemic emergence of environmentality – that is, the emergence of the environment as a *rubric* through which the world is comprehended – is inseparable from the emergence of humanness (and vice versa). Both derive largely from Darwinist discourse, which postulates that biological species evolve in response to their natural milieu. As humanity was reconceptualized as a species within the animal kingdom, the question arose: What sort of environment would best suit particular social groups, races, and genders of human beings, encouraging their optimal performance, survival, and even evolution? The environment was thus conceived as a climatic, biological, psychological, and perceptory milieu, whether at the scale of natural ecosystems or at the scale of such man-made environments as architectural enclosures, laboratories, and the virtual spaces of audio-visual media. Reciprocally, the human appeared as the semiotic and psychological subject requiring the existence of such a thing as the environment. The entwined constructs of the human and the environment thus appeared at the nexus of scientific objectivity and cognitive subjectivity.

For much of the 20th century, architects' interest in the environment was directed not so much toward analyzing the environment *per se*, but rather toward defining the human: its ambit, biological structures, proclivities, cognitive aptitudes, and how these could be better governed by environmental design. An assessment of this history helps not only to understand the heuristics used by architecture in reifying the environment, but also to expose the epistemic underpinnings tacitly supporting ‘the environment’ that are constantly produced by architecture and architectural discourse. It was through the alembic of architectural thought that the environment could be distilled into something recognizable as *the human*, while the human could be rendered as environmental.

IV. Architectural Epistemologies of Environment

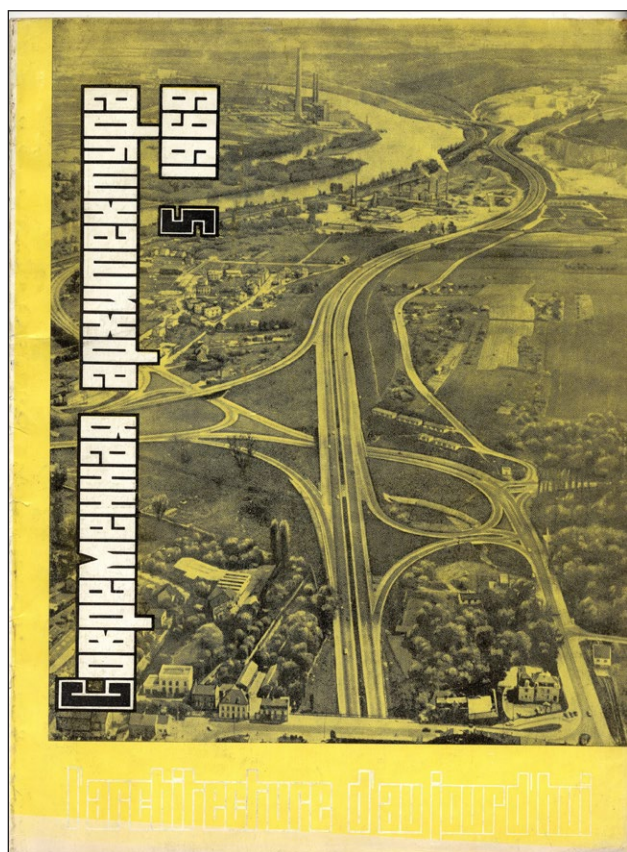


Figure 4: 'The New Surrounding Environment'. Cover of *L'Architecture d'aujourd'hui/Sovremennaya Arhitektura*, of 1969, when the French journal was published in both French and Russian.

The Environment Is Social, Is Political: About Core Houses and Envirotechnical Regimes

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In his 1930 essay 'Was ist Modern?' the Austrian designer Josef Frank posited that modern life was characterized by diversity, heterogeneity, and above all change over time, and that architecture, too, had to account for these qualities (1930: 133–35). In the 1920s, in a related effort to plan for change, a group of architects set out to design modern houses that would grow into their surroundings over the years. The proposed architecture aimed at adapting human habitation to the environment, and designers referred to their ideas as *core houses*, *growing houses*, or even *natural architecture*.

I came to the study of the environment through these architectural projects and, later, through the texts of scholars in science and technology studies (STS). While these two fields of enquiry seem to be distinct, they also share important concerns and insights that are relevant to the present discussion on the environment. Among major

concepts in contemporary STS scholarship, the idea of *envirotechnical landscapes* seems critical for architectural discourse, since it theorizes designers' long-held fascination with 'physical hybrids of ecological and technological systems' (Pritchard 2010: 13). Highlighting the fact that such landscapes are socially constructed and therefore political, STS scholar Sara Pritchard reminds us that *envirotechnical regimes* – bureaucratic and civic forms of power – administer, alter, and potentially resist the expansion and shaping of envirotechnical landscapes.

As architectural historians turn to the environment, this concept of *envirotechnical regimes* is critical, so as not to overlook the exclusionary and racialized histories that underpin some of the writings and projects of 20th-century architects about discussions of land, landscape, and particularly the ground. While the idea of constructing homes as core houses, for example, allowed residents to build homes in phases over time, thus expanding the scope of their material and economic possibilities, natural architecture – while based on a similar premise – aimed at connecting inhabitants through common agricultural labour to the ground. While the former tried to account for change and multiplicity in modern life, the latter, diametrically opposed to it, advanced racialized biological narratives through the construction of housing landscapes.

In embracing 'environment' as a perspective, therefore, more histories that elucidate *regimes of power* are needed. Such an endeavour would necessitate taking to heart the STS mandate of further uncovering how social inequalities are historically produced through the construction of buildings, cities, and landscapes. It might imply a political re-interrogation of our discipline's tropes and terms, allowing us to address unresolved themes, such as processes of marginalization and how they become material through design and construction. But it could also shed light on more hopeful narratives, such as those envisioned by Frank, that illuminate the heterogeneous multiplicities and agencies that also characterize modernity.

Environment and Modernization under State Socialism

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The recent study of the history and culture of the late Soviet period has been characterized by a move away from the previously perceived exceptionality of the communist bloc towards both analyzing the connections between the Cold War adversaries and viewing the Soviet Union as equally 'complicit' in the modernization processes of the post-war decades. Environment is one of the terms that allows us to study the unfolding of these modernization processes in a more nuanced way, against the previously dominant approach, while at the same time acting as a historical and theoretical concept.

From a historical perspective, we can follow the ways in which the professional and public discourse about environment became 'visible' in the Soviet Union from the 1960s onward.

In architecture, the parallel French and Russian edition of *l'Architecture d'aujourd'hui/Sovremennaya arhitektura* devoted its 1969 issue to the 'New Environment'. In striking photographs, the issue demonstrated vast changes modernization had left on the landscape; it thus introduced environment's relevance for predominantly object-centred architectural discourse. Official Soviet doctrine, however, saw these criticisms as the work of pessimistic bourgeois theorists who denied socialist control over all spheres of life, including the biosphere, which involved the adaptation of nature to satisfy man's needs. In other fields, discourse about the environment was fuelled by translations of critical Western authors, such as the 1974 translation of *The Closing Circle: Nature, Man and Technology*, by Barry Commoner. This book introduced the concept of the ecosphere to the Soviet public and analyzed the environment as a system where 'everything is connected to everything else', which consequently spurred active polemics in environmental psychology (Commoner 1974). According to the Soviet view, the task of architecture and design was to provide a 'harmonious objective world', leading to the formation of the 'objective environment in the interests of the creative needs of the human being' (RGAE f. 9480/9/2026). The official answer to environmental deterioration thus lay in comprehensive planning, in controlling not only production, but also consumption and human needs.

New research on the theories of the environment in the Soviet context could, however, attempt a leap beyond the analysis of the official rhetoric or of the transfer from West to East. Taking such an approach would be a way of accounting for the different global modernization processes in the socialist bloc. These differences were mediated, among other things, by the collective ownership of land and organization of production, collective and state farming, the particular version of the consumer society – the 'underproduction of use-value', to use the words of Ernest Mandel (Mandel 1962) – and the domination of the military-industrial complex. Critical histories of this kind, which go beyond the exoticization of the socialist environment as either shabby or cool, or beyond declarations of this environment's abnormality or extraordinariness, would be highly welcome.

Suspending Urgency

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With green policy, energy research, and sustainable design topping the charts of funded research in architecture and engineering, the urgency of environmental issues is hardly in question. For architectural historians, the challenge

reaches further than green-washing formerly environmentally oblivious narratives. Designating the environment as an object of study does not mean that we must react to the eco-frenzy of the present. On the contrary, it allows us to slow down. If we conceive of architectural history as a history of the built environment (rather than as just a history of buildings as objects), then we can more easily see that we must look deeper, rather than plunging in to frantic problem-solving at the risk of causing new problems. 'Il est urgent d'attendre' – it is urgent to wait – a Red Cross associate with decades of experience in disaster relief told me in 2005, when teaching our group of potential future water and sanitation engineers.

Not every historian's life, however, was timed for waiting. The most tragic fate in this sense afflicted Reyner Banham, who in 1984 revised and amended his 1969 *The Architecture of the Well-Tempered Environment*. After the oil crisis of the 1970s, he anticipated that his new thirteenth chapter on passive solar gain would rescue his technologically driven logic and bring it into a third industrial age. In his revised portrayal of the well-tempered environment, solar energy would eventually replace fossil fuels, the abundance of which he previously had taken for granted. This attempt to revise his perception of modern architecture as based on the management, and to a lesser degree the consumption, of energy coincided in the 1970s with the growth in society of an environmental conscience. Had he lived and waited until the 1990s, he could have written a post-oil-crisis narrative of solar gain that would not only incorporate the window as a solar device but would also involve other procedures and processes in society at large. Despite his hapless timing, Banham nevertheless provides a role model for any historian making an effort to formulate possible solutions because of his enthusiasm for new technologies and, even more importantly, by his engagement with the everyday world.

Methodologically, disaster relief and architectural history share the challenge of operating on varying scales. Large problems are tackled with small tools: pipes, tents, and water tanks that need to be installed; essays and ideas with words and images that need to be contextualized. Both fields are confronted with vast questions of long-lasting consequence, while the range of momentary action is limited. Both must go beyond formal appearances and address real problems in terms of processes, systems, and scenarios. This involves methods other than the monographic study of distinct buildings – methods that can encompass larger geographic regions and timeframes. The specificity of our present-day engagement with the environment seems to lie in the unprecedented tensions of scale. In the midst of resolutions to act, we can remind scholars of the urgent need to wait.

Notes

- ¹ The etymological and conceptual origins of the term 'Anthropocene' remain a matter of dispute. Nevertheless, the Dutch atmospheric scientist Paul J. Crutzen, alongside biologist Eugene F. Stoermer, is usually credited with having formally coined the term, despite himself pointing to a longer history of ideas that stretches

back to the late 19th century, e.g., to Italian geologist Antonio Stoppani's 'anthropozoic era' (Crutzen 2002: 23). While scientific approaches continue to dominate discourse on the Anthropocene, there has been increasing engagement with the concept beyond the scientific community, and within the arts and humanities in particular (Davies & Turpin 2014; Turpin 2014). Not only has the term come under scrutiny from contemporary theorists such as Donna Haraway, for whom the concept of 'Anthropos' as chief agent is both inappropriate, due to its universalizing tendency, and unhelpful for conceiving ways out of the current predicament. Instead, she and others advocate rigorous, critical, as well as creative speculative modes of thinking beyond the traditional humanist paradigm to account for complex multi-species and non-human entanglements (Haraway 2016; Stengers 2015). There have also been calls for appropriating the term as a common, transdisciplinary 'project' that might challenge us to think and act differently in the world, as for example in 'The Anthropocene Project' at Berlin's Haus der Kulturen der Welt, initiated in 2013 (Renn & Scherer 2015).

² The term 'intersectionality' was coined in the late 1980s by the American critical race scholar and activist Kimberlé Williams Crenshaw (Crenshaw 1989).

³ It is important here to mention the many other initiatives that have emerged in recent years, parallel and in relation to our own: Jennifer Ferng organized 'Mining the Environment: History and Aftermath' for the Society of Architectural Historians Australia and New Zealand (SAHANZ) in 2016, and, together with Lauren Jacobi, is co-chair of the forthcoming session 'Land, Air, Sea: Environment in the Early Modern Period' at the Annual Meeting of the Society of Architectural Historians in 2019. In 2017, Maroš Krivý organized the symposium 'Architectures, Natures and Data: The Politics of Environments' at the Estonian Academy of Arts in Tallinn. Daniel Barber conducts an ongoing project called 'Environmental Histories of Architecture', and he organized the symposium 'Structural Instabilities' at the University of Pennsylvania in 2018. And Kim Förster is curator of the Multidisciplinary Research Project 'Architecture and/or the Environment', funded by The Andrew W. Mellon Foundation at the Canadian Centre for Architecture (CCA) in Montreal, 2017–2019, to which Daniel Barber, Aleksandr Bierig, and Isabelle Doucet have contributed, among others.

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The authors have no competing interests to declare.

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