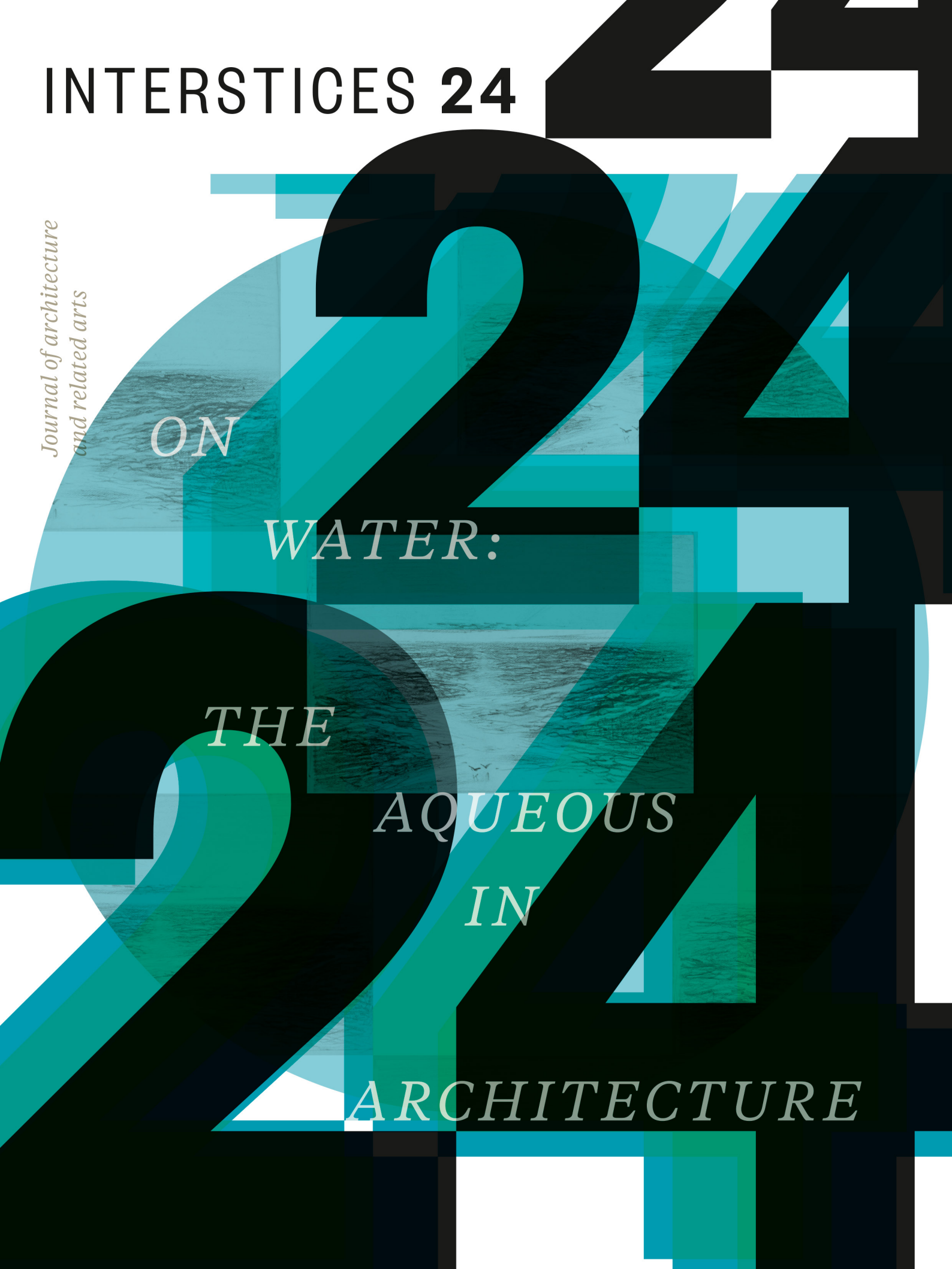
INTERSTICES 24

Journal of architecture and related arts



ON WATER: THE AQUEOUS IN ARCHITECTURE

contents

INTERSTICES **24**
Journal of architecture and related arts

Cover image: John Singer Sargent, *Moonlight On Waves* (circa 1876) [Graphite on off-white paper. Source: Wikimedia Commons, image gifted by Mrs Francis Ormond, 1950]

EDITORIAL / SIMON TWOSE, JEANETTE BUDGETT, AND ANDREW DOUGLAS

On water: The aqueous in architecture

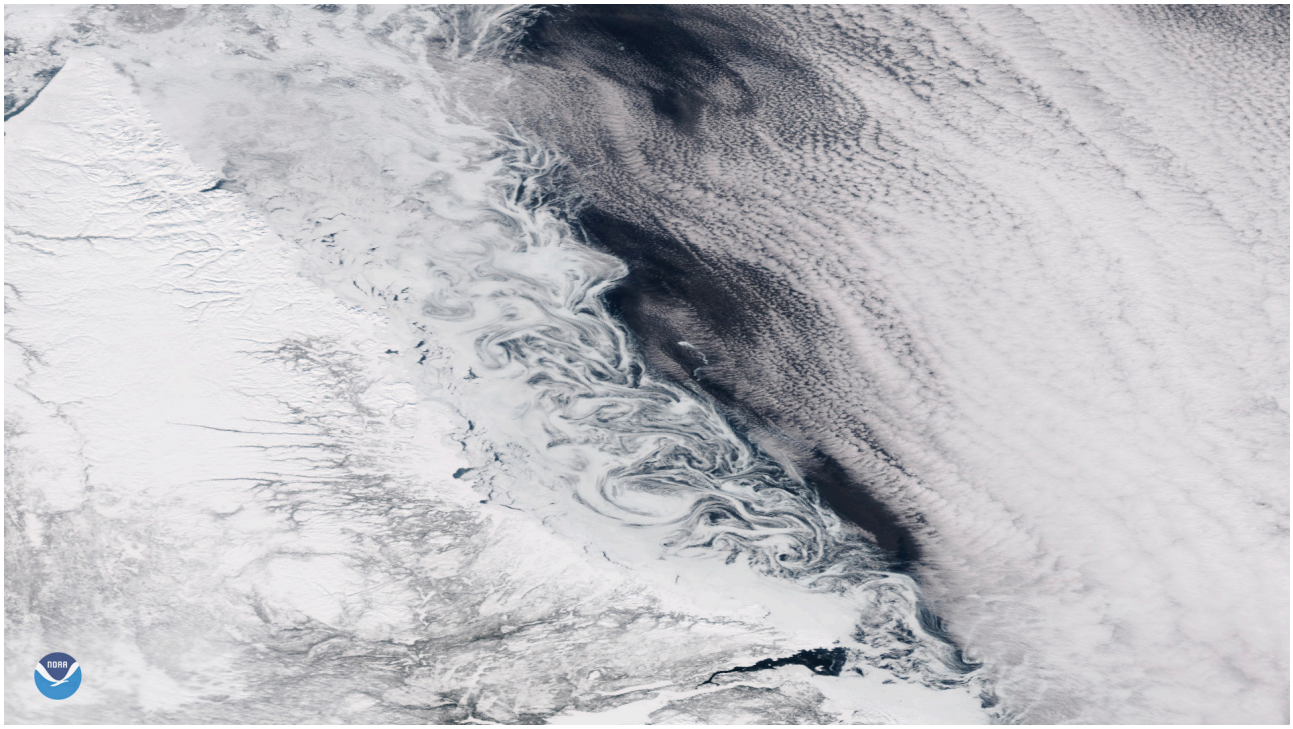


Fig. 1 Swirling ice eddies in the Labrador Sea, 12 March 2018 [National Environmental Satellite, Data, and Information Service]

Water makes its presence felt, and increasingly so. It emerges from our mouths in vaporous clouds, bulges as the moon encircles the earth, inundates cities. Water's actions, and its intelligence, are the focus of this issue, which explores contemporary understandings of the aqueous in architecture. Water's influence crosses a broad range of scales, from infinitesimal waves shimmering in subatomic worlds to vast gravitational ripples in space-time, from the planet to circulating atmospheres, from bodies to their cellular fluid reservoirs. With such an aqueous superabundance underpinning existence, this issue collects thinking on water's imaginative, metaphorical, and material forces, its schlieren-like dynamics, its capacity to unsettle, or to connect culturally. So the issue explores multiple engagements with the aqueous as it surfaces within, about, and as architecture.

Water has had, and continues to hold, a sublime influence on built and inhabited contexts. It can literally sweep buildings from their foundations, threaten to inundate coastal settlements, or insinuate itself within walls through capillary action, and in doing so, bleed away architecture's fiscal worth. And such fluid dynamics are of much contemporary concern in the Anthropocene, where we are both subject to, and actant in, this unsettledness. As Susan Ballard writes, we are

"ecological agents, just like the wind, the tides, the rivers, and volcanoes."[1] This co-authoring of our planetary fate, one imbricated with water's turbulent restlessness, is also intimately tied to our very being, for our bodies are themselves aqueous vectors. As Astrida Neimanis notes, while we may have evolved from the ocean, we have partitioned that ocean off within ourselves: "blood, bile, intracellular fluid [are. . .] a small ocean swallowed, a wild wetland in our gut; rivulets forsaken making their way from our insides to out, from watery womb to watery world: we are bodies of water."[2]

An aqueous interconnectedness within us, and around us, is shared within indigenous knowledge too, with kinship between humans and more-than-human entities and systems forming, as Amanda Monehu Yates writes in the context of te ao Māori, "a living-world-assemblage, where sky, sea, mountains, trees, people are part of a relational *whakapapa*."[3] At the level of the aqueous, one explicit example is the legal personhood of Whanganui awa, with the river itself holding legal status as a person with rights to its own (mediated) voice and personal care. Important in te ao Māori too, is the concept of reciprocity, or mutual care, in the dialogue between natural entities, a notion referred to as utu, in which, as Rob Barnett describes, "is the foundation for the valuation of lives; it accords all beings the same ontological status."[4] Notions of interconnectedness within indigenous epistemologies span people, land, sea, flows of space, time, matter, and culture—in a continuous, dynamic web of relationships. Oceanic water is a particularly significant medium of cultural interconnection and intercourse within the Pacific, tying kinship to planetary scales via atolls, islands, and submerged continents like Zealandia. Water then places many of the distinctions and fixities we value into soluble relation; it permits us to think the transitory and the in-between. So does this issue seek to open architecture to such solubility.

Invited paper

We commence this issue with an invited paper by Martin Schwartz, Associate Professor at Lawrence Technological University in Detroit. The author of numerous books and articles on the role of natural light in Scandinavian architecture, amongst other topics,[5] Schwartz turns his attention in a paper titled "Why Can't Architecture Be More Like Water? Oceans, Lakes, Ponds, Fountains, Pools, Puddles, Droplets, Multiple-Meanings, Complements, Paradoxes, and Metaphors, 1957–1994," to water as an element capable of mobilising sensory and transformative characteristics of architecture. The essay draws on Charles W. Moore's ongoing interest in water and architecture, a focus Schwartz experienced first-hand with Moore, having supervised his Master of Architecture thesis in 1977, asking him to collaborate in the design and drawing of a series of 'water emblems,' intended to illustrate *Water and Architecture*, a book published posthumously after Moore's death in 1993. Moore's interest in water, as Schwartz notes, ran across his entire academic and professional careers with a first version of *Water and Architecture* titling a doctoral thesis completed at Princton University in 1957 under the supervision of Jean Labatut. The thesis imagined through an engagement with water's characteristics and their use historically in architecture, as Jorge Otero-Pailos has written, how its redeployment might then playfully "moisten" an "arid" modernism.[6] The gesture was one amongst a number of moves designed to bring architecture into creative contact with its historical and regional legacies, legacies otherwise tempered by prevailing

international modernist dictates. Backgrounding Schwartz's account of "Why Can't Architecture Be More Like Water?," then, is both an inauguration of the dissolve between history and architecture that came to inform American architectural postmodernism, but also, again as Otero-Pailos has written, a calling up of water as key to an experiential immediacy that fed into phenomenological approaches to analysis and design—a link made by Moore in his introduction into architecture of the work of Gaston Bachelard, specifically *Water and Dreams: An Essay on the Imagination of Matter*.[7] What Schwartz's elegant essay reminds us is the difficult to pin down, the at times paradoxical, attributes of water that compelled Moore to find in it defining "metaphors for architecture" itself.

Peer-reviewed section

Following Schartz's invited paper are seven peer-reviewed essays variously responding to architecture as the carrier of aqueous qualities. These range across cultural and historiographical domains and chart the diverse ways 'architecture' and its broader contexts are in relation with water, pragmatically, poetically, aesthetically, cosmogonically. The essays take us into detailed worlds of concern, collectively providing multiplex accounts of the elemental primacy of the aqueous for human and non-human existence.

The first of these essays, "*Fonua* as *Fakafelavai* (Intersection) of *'Uta* (Land) and *Tahi* (Sea): Material Arts of *Tufunga Langafale* (Land-Architecture or House-Building) and *Fo'uvaka* (Sea-Architecture or Boat-Building)," by Sēmisi Potauaine and Hūfanga -He-Ako-Moe-Lotu, tells of the defining intersection of land and sea in Tongan life and the rich overlap of human habitation and voyaging. Key to defining this intersection for Potauaine and Hūfanga -He-Ako-Moe-Lotu are the philosophies of *fonua* (or nourishing ground), which asserts the holistic intertwining of land and sea, people and places of origin, and *Tāvāism*, which emphasises the indivisible synthesis of *tā* (time) and *vā* (space). Seen through these philosophies defining shared Tongan reality, the essay offers an account of a range of boat-house amalgams and their importance in customary social and spiritual life in this part of Oceania.

Living at Moreton Bay off the coast of Brisbane, Australia, landscape architect Kate Church explores, in the second of the peer-reviewed essays, the nature of "embayment," where saline conditions meet fresh water, the latter a carrier of terrestrial silt born seaward by topography and intense subtropical rainfall. Seeing the bay itself as a 'constructed' waterscape, one which is stressed both naturally and in terms of human modification, Church proposes that greater recognition is needed in this co-constituted ecosystem of dynamical change. Such recognition underpins, she suggests, the need for a specific design sensitivity to flux and uncertainty. Exploring themes of transition, convergence, and variability, Church traces the evolution of a socio-natural "scape" and calls for sensitive and experimental design logics as a means of maintaining a responsive reciprocity alongside, and within, the waters of Moreton Bay.

Where Kate Church might relish swimming in the silty waters of Moreton Bay, Autumn Dsouza, in the third of the peer-reviewed essays, is concerned with floating amongst the waves washing Hikkaduwa. Situated on the southern coast of Sri Lanka, the former village, now a booming surf and tourist destination, Hikkaduwa continues to manifest extractive traces and environmental

degradation arising from its previous colonial appropriation. Against this backdrop, Dsouza proposes a series of entrancing design interventions that employ the "inter-scalar objects" or what scholar of science and technology, Gabrielle Hecht, sees as tools for mediating between diverse scales such as evolutionary deep time and its more immediate human correlate, or between divergently scaled geological and political domains. For Dsouza, inter-scalar objects usefully focalise, and make analysable, the divide between colonial history and contemporary design approaches. Tracing, in one example, the extraction of lime from coral reefs at Hikkaduwa for use in colonial construction, she follows a contemporary redeployment of this material in the production of concrete "reef balls" manufactured by the Tokyo Cement Group. Referring to Anna Tsing's notion of "feralities" (as those escalating entities falling between the wild and the domesticated), Dsouza sees in such material artefacts a reversal of extraction, one that leads to reef reforming. Explored through design projects engaging with eight inter-scalar objects, Dsouza offers a blueprint for regenerative design practices locally responsive to the shifting and patchy conditions of anthropogenic climate change.

While both Dsouza's and Church's essays gauge the ongoing health of marine and human ecosystems relative to shorelines, rich as they are in cultural worldviews, pre-colonial legacies, and colonial inequities, Dimitris Hartonas, in the essay "Flows to Bytes: Digitising Naval Space," leaves specific shores behind in his attendance to the hydrodynamics of naval architecture. Considering flow patterns and aquatic performance of vessels historically via model ships and early digital simulations, he charts the evolving quest to master the protean dynamics of water and its traversing bodies. Looking to aquatic testing places like manoeuvring tanks and lakes, the essay focuses on the British Navy's Admiralty Experiment Works specifically, where, in the 1950s, complex systems for recording and predicting flow patterns were developed. Of note for Hartonas was the superimposition in such testing places of Cartesian coordinate mapping by way of chronophotographic recording and then computation, with water in these spaces succumbing to "a positional system" seeking to master its "liquid intelligence." In this way, "Flows to Bytes" tells the story of an intersecting of architecture, chronophotography, computers, and water, and the quest to capture and profit from aqueous cognition.

Moving inland, Hannah Strothmann, in "Changing Currents: Industrialising Water and Hydrosocial Experiences in Nineteenth-Century Berlin," considers historical accounts of water courses in continental urban places. Attending to changing social relationships accruing with the river Spree in its passage through Berlin across the nineteenth century, she foregrounds how industrialisation brought to the fore the notion of "modern water," an abstraction deployed in the management of, and profiting from, aqueous flows. As Strothmann notes, "modern water" is itself a complexly evolving 'substance,' one that also came to enact a "hydrosocial" demand reconfiguring the river and its edges as leisure zones. The latter, in turn became sites for contesting and reconfiguring class hierarchies, gender norms, and socio-spatial order more broadly. As Strothmann argues, an attendance on "water understandings" and their role in socialisation offers an important nuancing of historical accounts depicting urban development.

Gianluca Drigo, in the sixth peer-reviewed essay, titled "Taming the Leviathan: The Epic of the Domestication of the World and Peter Behrens's Gibraltar Dam,"

explores humanity's will to dominate nature through monumental water infrastructure projects. For Drigo, radical infrastructural visions, such as Herman Sörgel's Atlantropa, in which the Mediterranean Sea was to be partially drained via hydroelectric dams, or Joseph Stalin's schemes to drain vast swamps in the Northern Soviet Union in pursuit of additional arable land, offer monumental expressions of humanity's ambition to master water. As he puts it, what is sought is a "new world" brought about by "the redesign of its hydrography." On the other hand for Drigo, beyond the hubris of such pursuits of world-aquatic-mastery, the challenge remains to reimagine water infrastructures such as dams differently, to see in them perhaps, evolving relationships between human and more-than-human actors. While the essay notes an ongoing perpetuation of modernist ideology in contemporary Anthropocene discourses, it is incumbent on us to ask: "Is the violent subjugation of the Leviathan the only possible destiny for infrastructural form and symbolic content, or can we imagine more nuanced relationships with water as an active agent?"

Turning inland again, though maintaining a convoluted link to the Mediterranean, Jack Wu and Andrew Douglas ask in "Aqueous Place in the Architecture of Luis Barragán: Dark Pink and surface-Other" what role water plays in the Pritzker Prize winner's architecture. Recounting a touristic encounter with two former residences of Barragán, now house museums, in *Ciudad de México*—the *Casa Ortega* (1940–42) and the *Casa-Estudio Luis Barragán* (1947–48)—they construct parallel chronicles seeking to gauge the presence and conditionality of the aqueous manifested there. Each writing from different generational orientations, and retelling tours of each house nominally to the other, the resulting experimental narratives seek to find wellsprings for the aqueous at home for Barragán via touristic and 'outsider' cultural windows, a process at once 'constructed,' yet, they suggest, valid in an elemental manner apposite to these encounters.

Across these essays then, the aqueous is found to be a perhaps unexpectedly useful critical lens for engaging with built and 'natural' environments, with water particularly—that most ubiquitous and mobile of planetary elements—persisting, not as a self-evident given, but as a substance richly reworked and constructed culturally, aesthetically, and imaginatively. How water shows up in diverse phenomena tells how the broader context of such phenomena may in fact be practised, lived, and, as a result, more deeply understood.

Peer-reviewed postgraduate creative design research projects

In each issue, we call for recently completed creative research projects internationally and select projects for publication by anonymous peer review, with no requirement that they correspond with particular issue themes. In this issue we are delighted to showcase three thesis-year projects arising with the Master of Architecture (Professional) degree in Aotearoa New Zealand, two from Te Herenga Waka, Victoria University of Wellington, and one from Waipapa Taumata Rau, the University of Auckland.

In the first of the creative research papers, Hannah Brodie in a project titled *Spatial* Moment*ums*, explores—with supervisory support by Simon Twose—a disruption to the typical trajectory of sketch to design proposal, asking: "What if architecture were to remain a sketch, with the vitality of an open drawing?" Pursued through a method she describes as "performative drawing," and

unfolded across three experimental "acts," the research seeks to capture how thought may become action, and in turn be spatialised. Large-scale, floor-based drawn surfaces permit the experience of inhabiting drawings, themselves abstracted gestures rather than illustrative as routinely demanded of 'architectural drawing.' Reimagined as an urban street site, the drawings, analogous with plans, are in turn inhabited by small-scaled building models, themselves imagined as actors rather than fixed edifices. Through iterative cycles, Brodie seeks, not a 'resolved' architecture, but qualities of irresolution, incompletion, and a bypassing of fixity, qualities critical to the openness of the sketch.

In project research similarly structured according to acts, Beth Williams, in a work titled *The Keeper of My Memories*, attends to the possibilities offered by narrative-based architectural approaches. With supervisory support by Jan Smitheram, and an appeal to the work of Perry Kulper and Andrew Bernheimer, amongst others, Williams offers a fairy tale-like architecture linking domestic inhabitation with the fantastical and densely reimagined. Spanning dollhouse, to house, to film set, the escalating scale of the settings provides the means for embodying each preceding narrative into what follows. As variable acts of remembering and imaginative remaking of such reveries, the result is a series of supersaturated and superabundant images overflowing the normative limits of inhabitation, all in pursuit, as Williams suggests, of "a magical home."

The nature of home is also the subject of the last of the research projects offered in this issue. In a work titled *To the Lighthouse*, Leith Macfarlane gauges more disturbing dimensions of inhabitation—the all too prevalent occurrence of domestic violence. Asking how an architectural lens might give visibility to, and ultimately hope of reprieve from, such violence, Macfarlane—with supervisory support by Andrew Douglas—offers a twofold project, one that initially sought to give expressive form to the affective landscape attending abuse. Paralleling the production of what Macfarlane sees as "dark machines"—artefacts drawing on Elaine Scarry's landmark text, *The Body in Pain: The Making and Unmaking of the World* (1987)—a turn away from "unmaking" towards hope as "world-making" takes the form of neighbourhood resocialisation via street-based communal facilities capable of diffusing the isolated at-home-ness—that condition giving cover to domestic violence. Anticipating a post-carbon, post peak-car vacancy within streets, but also 'street' as protest setting, four luminous edifices—the laundry/garden, the bus stop/waiting tower, the play room, and the caretaker's cottage—take up residence in a fictive roadway compiled from Macfarlane's previously remembered home locations. Foregrounding acts of collective care as antidotes to violence, the resulting lighthouse-like structures—themselves bearers of intricate care—offer one version (of which many variables are possible neighbourhood by neighbourhood) of hopeful world-making.

Non-peer-reviewed articles

The issue culminates with three non-peer-reviewed contributions, each in their way tied to the aqueous. Mark Jackson offers a review of *The Architecture of the Bight of Biafra: Spatial Entanglements*, by Joseph Godlewski. The book offers a history of the coastal bight of Equatorial Guinea in West Africa, a variegated shoreline rich in river deltas, swamps, and creeks that sustained, across many centuries before colonial contact, the proto-democratic governance of the Igbo and Èfik peoples (amongst a range of ethnic groups within the Bight), who

resisted centralised rule, and who favoured instead the governance of village and town republics via counsels of elders. Yet the Bight became, through colonial contact, a key supplier of people within the Atlantic slave trade system, while itself resisting territorial colonisation. Jackson, in his review of Godlewski's incredible charting of these circumstances, offers less a chronicling of the book's content, than an unpacking of the positions from which we read cross-cultural circumstances, temporalities, and histories. Digressing via Jacques Derrida and Michel Foucault, amongst others, Jackson looks to the ontological diagrams at work in such encounters, diagrams that determine what can be seen and accounted for epistemologically. As he asks, what forces "produce our knowing selves," and what blindnesses accompany any form of knowing?

In "Experiencing Water as a Spectator: The Art Practices of Innovative Mid-Century Women from Southern New Zealand," Megan Rule turns to the practice of often overlooked women architects in Aotearoa New Zealand. Focusing on the watercolours of Monica (Ford) Barham (1920–1983), the first female architect in the Otago and Southland regions, she considers how such images tell the story of "water, weather, and/or climate," delving into the techniques Barham used and their broader linkages with artists practising in parallel at this time. Rule in her essay is concerned to see in Barham's attendance on weather and water-ness, a particular sympathy with climatic differences within Aotearoa, but also, via the art historical considerations of Francis Pound, the unique way landscape has been spectacularised and framed in the pursuit of differentiation, identity, and belonging here.

In the last of the non-peer-reviewed contributions Jack Wu reviews the travelling exhibition, *Derek Jarman: Delphinium Days*, which was installed at the Gus Fisher Gallery in Tāmaki Makaurau Auckland in September 2024. The exhibition, which showcases the drawing, painting, writing, and film works of Derek Jarman (1942–1994), and was curated by Lisa Beauchamp, Aaron Lister, and Michael Lett, appeared in the City Gallery Wellington after its run at the Gus Fisher Gallery. In his review, Wu reflects on the shifting circumstances that frame reception of Jarman's work—queer protest contexts of its production across the 1980s and 1990s in the UK, and its appearance here in Auckland and Wellington in less strident terms—noting how its arrival here completes a less known return to the country of his father's birth. For Wu, this somewhat covert interlacing is, in keys ways, indicative of the diverse connections Jarman's work cultivated and continues to generate—the cross-generational uptake of his vision and challenge, at once tied to the HIV crisis and dire political homophobia present in the UK and here, but also the potential of his queer vision for newer generations who did not experience these circumstances in quite the same way. From amongst the justified anger and hurt that fuelled Jarman's work, Wu foregrounds a further political urgency—the need to find grounds for care—a quality beautifully evidenced in his Prospect Cottage, with its seaside garden a living protest against the nuclear power station at Dungeness on the Kent coast. As Wu asks at the conclusion of his review: "How do we sustain practices of care that are generative rather than merely reactive? What does it mean to make art, gardens, or communities in the face of loss?"

Fig. 2 Moon transits the Earth showing the Pacific Ocean below on 16 July 2015. Image taken by NASA's Earth Polychromatic Imaging Camera (EPIC) onboard the Deep Space Climate Observatory (DSCOVR), itself located at the gravitationally neutral, Lagrange point between the Earth and the Sun. [National Environmental Satellite, Data, and Information Service]

And finally

In this issue of *Interstices*, we set out to consider how that most ubiquitous and abundant element on our planet and in our bodies—water (or some variant of it)—might shift thinking about architecture and its materialisation. More often than not, water in its various guises, when not thoroughly channelled or managed, catastrophically erodes built fixity. Still, we wondered how thinking in sympathy with the aqueous might carry thought into new territories. The idea of new territory is, of course, a very old trope, with the ocean long considered capable of drawing thought, beyond the immediacy of the shore, across great distances no less than into vast depths. Michel Foucault borrows this trope when seeking to imagine what might follow the centuries-long engagement of human-knowledge with itself as a subject of inquiry. He concluded *The Order of Things: An Archaeology of the Human Sciences* with an oft-cited image: "humankind, as a figure of and within knowledge, being lost to another locus of inquiry, erased [much. . .] like a face drawn in sand at the edge of the sea."[8] Water, particularly in its oceanic guise, is in that sense an eroder of fixities, of sure footing, of the solid things by which not just architecture and its related arts, but all human life grounds itself. Less a passive matter to be directed, channelled, dammed, evaporated, etc., it is what humbles human agency, but the aqueous is also what enlivens human belonging, what singularly nurtures, involves and evolves us as, ironically, Earthlings.

NOTES

1. Susan Ballard, *Art and Nature in the Anthropocene: Planetary Aesthetics* (Routledge, 2021), 146.

2. Astrida Neimanis, *Bodies of Water: Posthuman Phenomenology* (Bloomsbury, 2017), 1.

3. Amanda Yates, "Mauri-Ora: Architecture, Indigeneity, and Immanence Ethics," *Architectural Theory Review* 21, no. 2 (2016): 261–275.

4. Rob Barnett, "Utu in the Anthropocene," *Places* (August 2021): 1–23, https://placesjournal.org/article/redesigning-colonial-landscapes/.

5. A selected sampling includes: "Light Organising Architecture: Jorn Utzon's Bagsvaerd Church" (2005); *Gunnar Birkerts: Metaphoric Modernist* (2009); "Light from All Around: Asplund's Stockholm Library" (2015); and *Architecture in the Light of Day* (forthcoming); and a book-length study of Charles W. Moore titled *Those Who Love the World Don't Mind Being Reminded of It* (forthcoming).

6. Jorge Otero-Pailos, *Architecture's Historical Turn: Phenomenology and the Rise of the Postmodern* (University of Minnesota Press, 2010), location 2126, Kindle.

7. Otero-Pailos, *Architecture's Historical Turn*, location 2126, Kindle.

8. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences*, trans. Alan Sheridan (Tavistock Publications, 1970), 387.

MARTIN SCHWARTZ

Why can't architecture be more like water? Oceans, lakes, ponds, fountains, pools, puddles, droplets, multiple-meanings, complements, paradoxes, and metaphors, 1957–1994

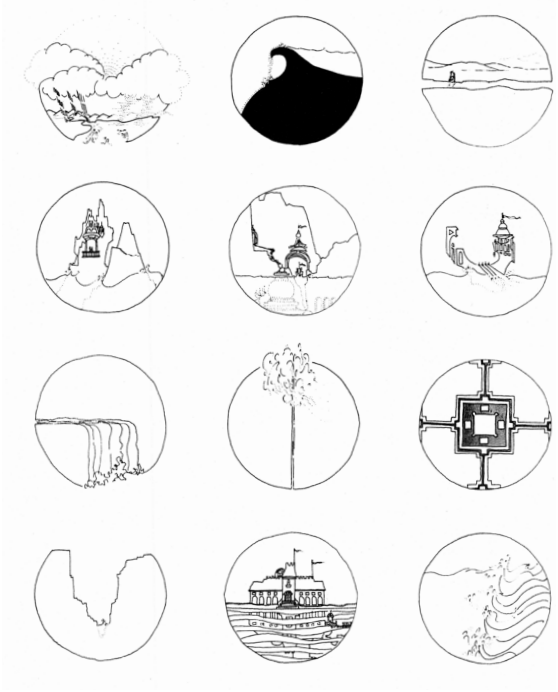


Fig. 1 "The Qualities of Water" designed by Charles W. Moore and Martin Schwartz [Hand drawing by Martin Schwartz]

From 1957 through 1993, the years that span the most productive of his professional life, the noted American architect, Charles W. Moore, taught architecture at several universities, lectured frequently at additional such institutions, and wrote a good number of articles and books. Of Moore's books, all but two are co-authored. These two are not only individually authored but share the same title, *Water and Architecture*. The first of the two volumes was his PhD dissertation, completed at Princeton University in 1957.[1] In the second, he finally turned his thoughts into a book published in 1994, one year after his death.[2]

Aside from the satisfying symmetry of bookending one's professional life, almost literally, with two books of the same name, the fact that Moore authored them himself speaks to the regard he held, over a long period of time, for the subject matter. There was a seriousness of purpose in his understanding of water, with

theoretical consequences that took architecture both back to its essentials and expanded it to encompass a modest but deep humanism, characteristic of Moore, but not of many other modern architects. As was typical of Moore, whose thinking often swerved wide of commonly held beliefs, he had something different to say about the subject of water, something worth recalling and worth better illustrations than the blurred black-and-white images, severely reduced by microfilm and xerography, available in reprints of his dissertation. He continued to think about water and its implications, in practice, in his teaching, in lectures, and ultimately in his 1994 book.

By the time Charles Moore arrived at Princeton University, in 1955, with a PhD as his objective, he already had substantial experience in architectural practice, including works he designed in Korea during a stint with the U.S. Army. Moore recalled that it was at Princeton that he and his classmates were introduced to the idea that architecture could be the source of meanings beyond the fact of even very handsomely crafted construction. Moore recalled, in an oral history conversation conducted with Sally Woodbridge, that from E. Baldwin Smith, the art historian, Princeton architecture students absorbed the idea that:

> [. . .] things can suggest something beyond themselves [. . .] Smith was interested in the symbolic values [. . .] of all kinds of things [. . .] it began to be apparent [. . .] by the time I left there—that all that stuff from the history books had meaning for us.[3]

It was under Smith's influence and, perhaps more specifically, that of Jean Labatut, the director of Princeton's graduate program in architecture who had designed a programmed fountain, music, and fireworks installation at the 1939 New York World's Fair,[4] that Moore determined to write his dissertation on water.[5] Labatut was, Moore recalled:

> [. . .] perceptive at developing nuances [. . .] He pointed out the kinds of things where you see this and then you see that and then they all relate.[6]
>
> In my thesis, *Water and Architecture*, which I started at Princeton in 1956 and got done in late 1957, I saw a chance to deal with communicative and emotional and sensual characteristics of materials, surfaces and shapes and all at a time when a fairly narrow formalism was still current.[7]

In 1977, about halfway between the two water books, Moore attempted what I believe to be one of several attempts to write a book that followed up on his dissertation. I had recently graduated with my MArch, prepared under Moore's supervision at UCLA, and he asked me if I would do some drawings for a book on water and architecture. This required him to explain his expansive thinking about water to me. In conversation, Moore patiently unpacked his ideas about how water and architecture were allies. He offered a series of examples that we discussed. When I suggested that each of the characteristics ought to be accompanied by a "logo" that exemplified that character, he agreed happily. Water, it turns out, is enormously difficult to draw convincingly, but we devised a series of graphic ideas that, not surprisingly, resemble Moore's informal sketches and fantasy drawings. I executed the final drawings, in ink, to depict twelve notions as to how water and architecture are associated with each other. Those ideas and the way I would, admittedly in retrospect, explain them are:

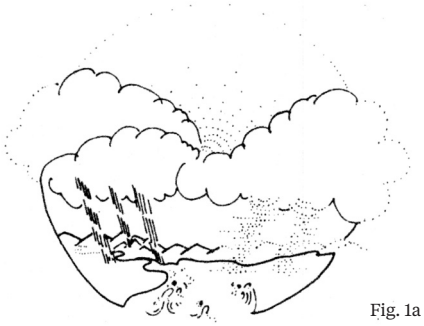
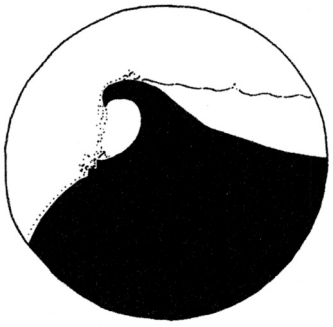


Fig. 1a "Fitting"

Fitting represents the idea that, as the discovery of the hydrologic cycle made evident, all of the water in the world is part of the same, essentially finite, body of water.[8] All water is connected and continually moving through different stages of the cycle.



ig. 1b "Edges"

Edges emphasises that interesting and vital things occur at the edges of bodies of water, and similarly, critically, at architectural boundaries.

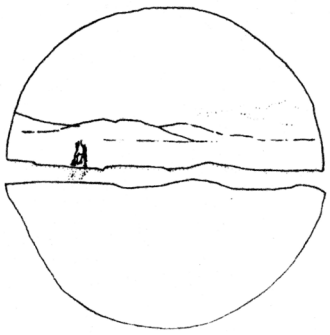


Fig. 1c "Accompanying"

Accompanying suggests that, as we are inclined to follow and explore flowing streams of water, we are similarly inclined to follow alignments, usually in the form of paths, generated in architecture.

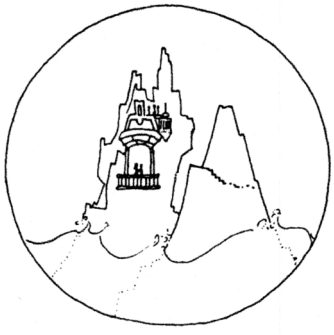


Fig. 1d "Surrounding"

Surrounding is the idea that, just as water may surround and call attention to a place of refuge in its midst, architecture may surround and establish meaningful and important places.

Fig. 1e "Engulfing"

Engulfing, related to *surrounding*, extends that idea to describe how interesting and unfamiliar things become engaged and concealed, below the surface or inside, and only hinted at by what can be seen.

Fig.1a–1e "The Qualities of Water" designed by Charles W. Moore and Martin Schwartz [Hand drawing by Martin Schwartz]

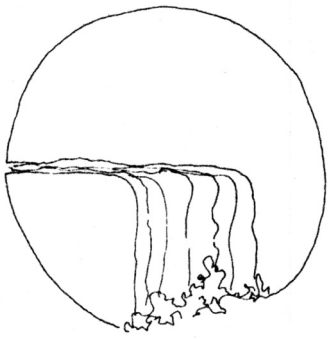


Fig. 1fg "Falling"

Falling reminds us that as water responds to gravity, plunging to create dramatic flowing curtains, gravity also causes water, properly contained, to accede and assume a stillness, in what appears to be a flat surface.

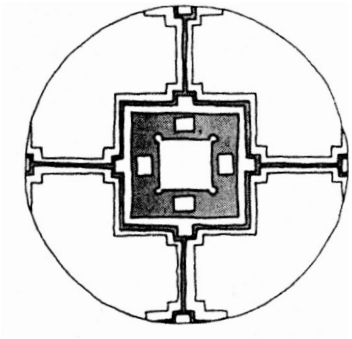


Fig. 1i "Organising"

Organising points to how water may be associated with order, in the guises described here, and in its readiness to assume forms induced upon it, under pressure, when contained, and when it falls. And water generates order around it, as it flows, accompanies, supports, engulfs, and defines edges, frequently in history convincing people to make settlements around it. We likewise rely on architecture to bring order to our lives.

Fig.1f–1j "The Qualities of Water" designed by Charles W. Moore and Martin Schwartz [Hand drawing by Martin Schwartz]

Fig. 1f "Supporting"

Supporting represents the notion that, just as water has the peculiar ability to float things at its surface, architecture, responding to gravity, strives to remain upright, frequently reserving a topmost hierarchical position for light, open, and important elements that hover, poised above all the rest.

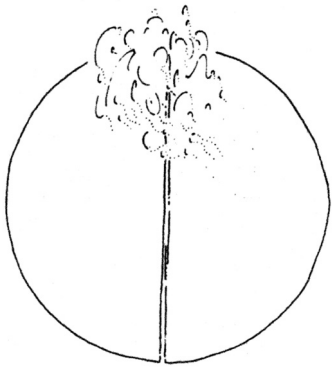


Fig. 1h "Squirting"

Squirting is something that water does considerably better than architecture, but this requires energy and external pressure, as water is induced to assume verticality and defy gravity. It would be a stretch to claim that buildings squirt, but reasonable to point out that they are required to toil against gravity to make habitable spaces.

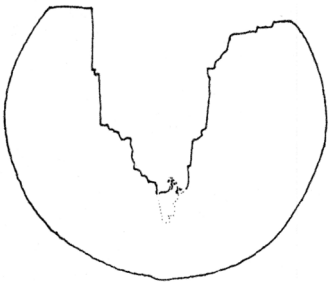


Fig. 1j "Eroding"

Eroding reminds us that water, which we typically encounter in the most helpful, domesticated, rhythmic, or pastoral situations, also possesses enormous power to create form, even as it destroys. When water erodes, it subtracts material and creates space. Space is the essence of architecture and that which distinguishes it from other related arts.

Fig. 1l "Speaking"

Speaking, Moore meant us to understand, is a reminder that things in the world, water in particular but also architecture, are capable of communicating meanings beyond themselves.

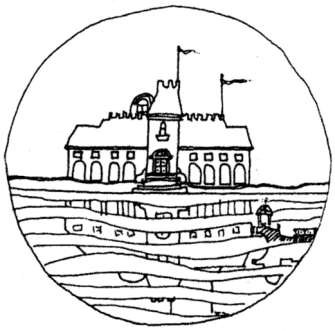


Fig. 1k "Reflecting"

Reflecting—duplicating images, expanding space, and redirecting light—is a characteristic most evident at water's stillest surfaces, but often discernible under other conditions. Architecture, at its best, also reflects its surroundings in the way it cooperates with and complements its landscape and neighbours.

Fig.1k–1l "The Qualities of Water" designed by Charles W. Moore and Martin Schwartz [Hand drawing by Martin Schwartz]

The twelve logos representing these ideas are published here for the first time.

Of these qualities of water, most are obvious and immediately verifiable. A couple of them emerge as having even greater implications for understanding how architecture is, or ought to be, a fundamentally responsive endeavour. Ideas like "organising" and "speaking" are particularly suggestive of what is essential to conjuring order from reality[9] and bringing some significance into a small part of the world.

Moore, I have since realised, was an accomplished categoriser. One supposes that this aptitude may either precede or be an unintended consequence of earning a PhD. In any event, Moore's approach to this tactic was as particular to him as his choice of subject matter. His categories were frequently labelled with verbs appended with an "ing" ending to become present participles as adjectives, active word forms, implying the presence of change or motion. Remember that water is, perhaps above all, in motion continuously, sometimes very slowly, but always adjusting, changing in infinitely small ways even when it appears to be still. It would be difficult to say if Moore's understanding of water inspired his use of language or if the way he spoke and wrote invaded and found a home in his ideas about water. Moore's architecture echoed how he spoke and wrote: all incorporated motion. He was keenly aware of and intentionally made places that seemed to be set in motion as you walked through them. That is, even when still, they incorporate one of the most startling characteristics of water: constant transformation.

Moore's two *Water* books, closely related, if meant for different audiences and separated by more than 35 years, are broadminded and insightful. In his

development of the later book however, he deemphasised the individual qualities of water he had explored a few years earlier, opting instead for a text that is a perceptive, personal journey through water events and distant places. However, something of a gap remains in the broad, embracing message I think he wished to convey, an important point left as implication, a notion that resides in the many visible forms and personae of water: its paradoxes. In his 1957 dissertation, Moore acknowledged that the multiple dual and seemingly competing characteristics of water are extraordinary, meaningful, and delightfully puzzling. He wrote:

> Water [. . .] has a symbolic content as powerful in the twentieth century [. . .] as it had been in the works of Plato and Heraclitus. Its symbolic content is rich to the point of paradox.[10]

The paradoxes, to be specific, refer to the several and distinctly different states that water assumes, all of them familiar to us, but seldom fully considered. These paradoxical qualities of water and its duelling potentials, appear to compete with each other but might be more usefully thought of as complements, which, when experienced together, form a more meaningful whole:

> *Water is both assertive and receptive.*
>
> *Water is creative and destructive.*
>
> *Water may give or receive form.*
>
> *Water is a necessity for life, but may be, at other times, a threat to life.*
>
> *Water both separates and connects.*
>
> *Water may engulf or itself be surrounded: it may define a space or be defined.*
>
> *Water is, concurrently, stable and everchanging.*
>
> *Water is characterised by coherence—the tendency of its molecules to be attracted to each other—yet it flows, as the molecules trade allegiances.*

Although, at a given moment, one of its characteristics may prevail, water typically exhibits its multiple personalities and paradoxical conditions flashing at the same time.

And, water is ubiquitous; it is the most ignored stuff around,[11] except maybe for air. It is usually thought to be "tasteless, odourless, and colourless," and if it's not, we worry about its purity. Yet part of its magic is that it assumes the tastes, aromas, and aspects of other things. One of my favourite superheroes is said to have made water into wine, a neat trick. But, to our great satisfaction, humans have been doing this for centuries: it just takes us a bit more time. Visually, when water appears to lie still, its surface seems absolutely level and, in the manner of a mirror, takes on images of scenes opposite or adjacent to it: the sky, the land, vegetation, the face of anyone who looks straight down into it. Another favourite of mine, in one version of the myth, is said to have been so taken with the beauty of the human face looking back at him on the still surface of a pond, that he attempted to kiss it and, in the process of doing so, drowned.

Because of its paradoxes, watching water is as hypnotic as watching a fire blaze. As it flows, it assumes unprecedented forms. The pull of the moon, 380,000 kilometres away, persuades the ocean to pulse, rhythmically, in evolving, twisting,

whitened curls of waves, susceptible to riding with long, polished, fibreglass planks, which in turn inspire us to song and widely celebrated good vibrations. "Yes," Herman Melville wrote in *Moby-Dick* and anticipating Brian Wilson,[12] "as everyone knows, meditation and water are wedded for ever . . ."[13]

These paradoxes deserve close attention as it is certain that our fascination with water and readiness to attribute meaning to it reside firmly in its astonishing simultaneities. These overlapping relationships, its complementary states, characterise architecture, as well.

Over the course of his career, Moore designed several fountains in which he sought to incorporate the voices he discerned from his observations about water. He collaborated with landscape architect Lawrence Halprin to design the Lovejoy Fountain in Portland, Oregon (1963–65). He designed the notorious Piazza d'Italia fountain in New Orleans, Louisiana (1975–78). And, least known but wonderful in its own way, there was the small, perhaps too economical, fountain in the courtyard of the Faculty Club he designed for the University of California, Santa Barbara. At this building, completed in 1968, Moore's fountain consisted of a common, oscillating lawn sprinkler that sent water upward and side-to-side, allowing the spray to fall lightly onto a multi-coloured, geometric flower pattern painted on a raised, circular, concrete pad. The fountain was excised quickly by an unsympathetic Club management.

Moore's fondness for the irreverent and complementary truths inherent in water drew him to recall this story:

> Four hundred years ago, a wise Japanese Zen master named Sen no Rikyū designed a legendary tea garden on a dramatic cliff site overlooking the Inland Sea. Despite the spectacular view over the broad expanse of murmuring ocean, the tea master carefully planted a high screen of hedges and trees all around the garden and blocked out the vista to the sea. In front of the hedge, Rikyū placed a small stone font for washing the hands, an important prelude to the tea ritual. Just above the bowl, he clipped a tiny opening through the leaves [. . .] As visitors knelt down to the bowl, their eyes would catch a fleeting glimpse of sea through the leaves just at the moment when their hands mingled with the cool water.
>
> [The garden has long since vanished [. . .] but the lesson he leaves us is that, with only a scant amount of water and spirited design, all the water in the world can be called to mind.[14]]

If you have read Moore's writings, if you heard him talk about water, or if you have seen his fountains, you already may know much of this and are certainly familiar with examples of the appearance of water in nature, in architecture, and the founding of great cities. What he never quite comes around to saying is that water and its characteristic qualities are metaphors for architecture, the way it has worked so well for us in the past, and might yet work, if we cared enough. Water vividly illustrates the requisite paradoxical but entirely sensible qualities we need in our lives: assertiveness and receptivity, an inclination towards the expansive and the satisfaction of enclosure. Water realises our creative and destructive impulses, our need for stability and transformation, connection and distinction, coherence and entropy.

Why can't architecture be more like water?

NOTES

1. Charles W. Moore, "Water and Architecture" (PhD diss., Princeton University, September 1957).

2. Charles W. Moore; and Jane Lidz, photographer, *Water and Architecture* (Harry N. Abrams, 1994), 15.

3. Sally Woodbridge, "Oral History Interview With Charles Willard Moore," 28 December 1984, transcript pages 37–38.

4. The display took place at the Lagoon of Nations, New York World's Fair in 1939. School of Architecture Archive, Princeton University School of Architecture, accessed 8 October 2024, https://soa.princeton.edu/content/school-architecture-archive.

5. Woodbridge, "Oral History," 42.

6. C. Ray Smith, *Supermannerism: New Attitudes in Post-Modern Architecture*, (E. P. Dutton, 1977), 79.

7. Woodbridge, "Oral History," 37

8. "The water on our Earth today is the same water that's been here for nearly 5 billion years. So far, we haven't managed to create any new water, and just a tiny fraction of our water has managed to escape out into space. The only thing that changes is the form that water takes as it travels through the water cycle." "Are We Drinking the Same Water As The Dinosaurs?," https://www.castlewater.co.uk/blog/are-we-drinking-the-same-water-as-the-dinosaurs#:~:text=The%20water%20on%20our%20Earth,travels%20through%20the%20water%20cycle.

9. "For it is ultimately the function of art, in imposing a credible order upon ordinary reality, and thereby eliciting some perception of an order *in* reality, to bring us to a condition of serenity, stillness, and reconciliation." T. S. Eliot, "Poetry and Drama," *Atlantic Monthly*, February 1951, https://tseliot.com/essays/poetry-and-drama.

10. Moore, "Water and Architecture."

11. "[E]ventually one [fish] looks over at the other and goes, what the hell is water?" David Foster Wallace, "This is Water," commencement speech delivered at Kenyon College, 21 May 2005, https://www.youtube.com/watch?v=DCbGM4mqEVw.

12. Brian Wilson and Mike Love, "Good Vibrations," Irving Music, Inc., released on Capitol Records, 10 October 1966.

13. Herman Melville, *Moby-Dick, or The Whale* (The Arion Press/University of California Press, 1983), 3.

14. Moore, *Water and Architecture*, 1994, 15.

TAVAKEFAI'ANA, SĒMISI FETOKAI KULĪHA'APAI MOAHEHENGIOVAVA'ULAHI POTAUAINE
HŪFANGA-HE-AKO-MOE-LOTU, 'ŌKUSITINO MĀHINA

Fonua as fakafelavai (intersection) of *'uta* (land) and *tahi* (sea): Material arts of *tufunga langafale* (land-architecture or house-building) and *tufunga fo'uvaka* (sea-architecture or boat-building)

Talaleatefito (Keywords)

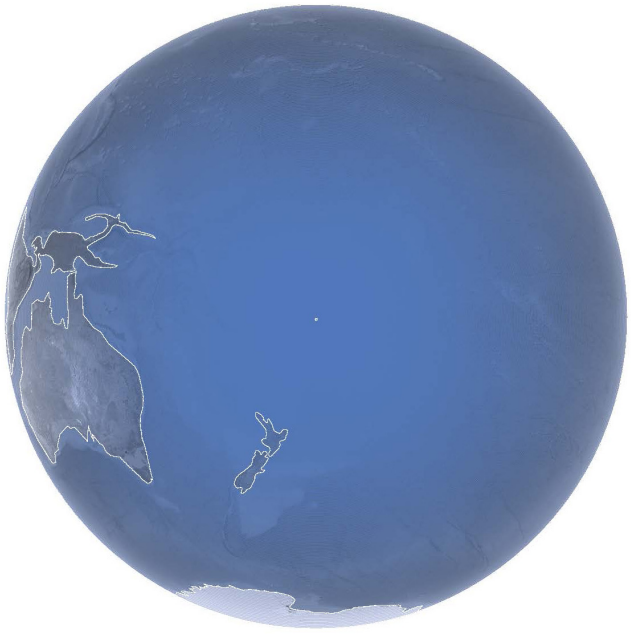
Tāvāism as time-space philosophy of reality; *fonua* (people and place) as *fakafelavai* (intersection) of *'uta* (land) and *tahi* (sea); *talatupu'a* as cosmogony and cosmology; and *tufunga langafale* as material art of land-architecture or house-building and *tufunga fo'uvaka* as material art of sea-architecture or boat-building.

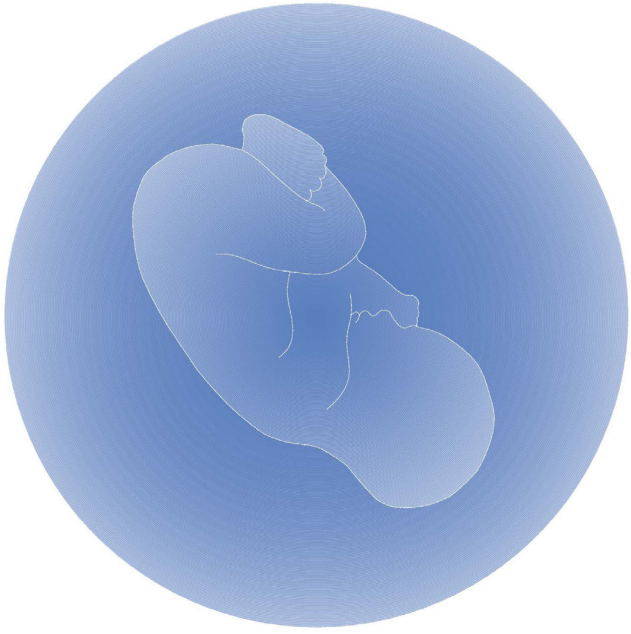
Talakamata (Introduction)

This essay briefly summarises in new ways the Tongan philosophy of *fonua*, itself understood as the *fakafelavai* (intersection), *fakahoko* (connection), and *fakamāvae* (separation) of *'uta* (land) and *tahi* (sea).[1] These natural entities condition the Tongan material arts of *tufunga langafale* (land-architecture or house-building) and *tufunga fo'uvaka* (sea-architecture or boat-building)—themselves understood to intersect architecture and engineering,[2] in addition to other disciplinary and social activities.[3] Combined, these natural entities and social activities comprise Tongan cosmogonical and cosmological accounts, all of which begin with the emergence of *fonua* (i.e., land and sea). The sea movement and land settlement of both the earthly people and godly build on this emergence further permitting the development and refinement of their heroic deeds. Borne from these earthly and godly activities, land-architecture and sea-architecture support other social and religious spheres, as in the land-based and sea-led (and sky-driven) activity of *faiva faifolau*, where, for instance, land-sea(-sky) travelling is portrayed through performance art.[4]

These combined *tā-vā* (temporal-spatial) natural entities, along with accompanying social activities as a 'text,' are viewed and reviewed here in the general 'context' of *TāVāism*, a Tongan time-space philosophy of reality.[5] *TāVāism* recognises, through an inseparable joining of *hoa/soa* (or pairs), a single level of reality in which *tā* (time) is a *fakafuo* (definer) of *vā* (space) and, in turn, *vā* (space) is a *fakauho* (composer) of *tā* (time).[6] We focus here through reflective thinking

and emotive feelings on three Tongan ethnographic groups or clusters: firstly we consider the *vaka* (boat), *fale* (house) and *ouau kava-tō* (kava-sugarcane ceremony); secondly we consider the *falevaka* (boathouse) or *faletahi* (sea-house),[7] and *faleafolau* (houseboat) or *vakaʻuta* (land-boat),[8] i.e., *tohoʻangavaka* (boat-hangar/hanger); and, thirdly we address the *fataʻufi* (yam pyramid structures or platforms) and the *Vaka-ʻa-Hina* (Boat-of-Hina).[9] What these considerations allow us to do is understand the important role of the aqueous in Tonga's material, cultural, and spiritual practices. The latter offer 'texts' for focusing on both architecture and engineering, given, on one hand, their intersecting, connecting, and separating of temporal-spatial, formal-substantial entities, and on the other, their assisting and resisting of forces. More broadly, the arts of architecture and engineering give us a better comprehension and appreciation in the 'context' of the current *fonua* (human-environment, society-ecology) itself in crisis due notably to climate change.





Ata (Fig.) 1a Diagram Map of Tonga as *fonua*, both *motu* (islands) and *tahi* (sea), i.e., "Our Sea of Islands" [Drawing: Authors, 2025]

Ata (Fig.) 1b An embryo: *Fonua*, as both *motu* (islands) and *tahi* (sea), i.e., "Our Sea of Islands" [Drawing: Authors, 2025]

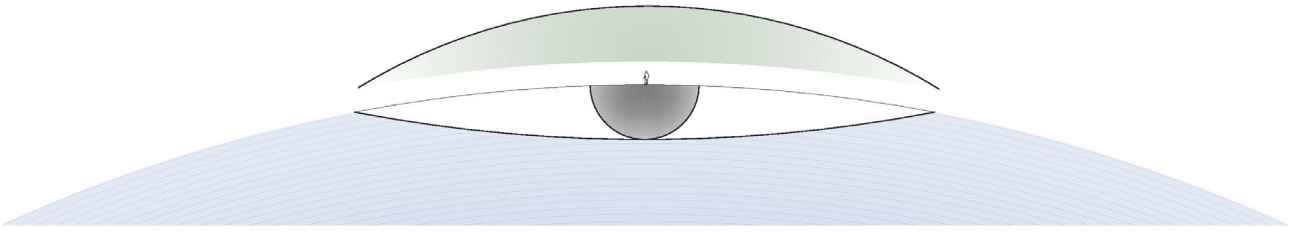
Talatupuʻa (Cosmogony and cosmology)

Tongan *talatupuʻa* (cosmogony and cosmology) account for the *tā-vā* (temporal-spatial) origin, growth, and development of the Tongan people, inclusive of their universe. It begins with the emergence of *fonua*, the *fakafelavai* (intersection) or *fakahoko* (connection), and *fakamāvae* (separation) of land and sea as primary natural entities. The appearance of human and the godly beings they worship build on this primary emergence. Human activities like *tufunga* (material arts) associated with land-architecture or house-building and sea-architecture or boat-building (themselves associated with the performance art of *faiva faifolau*—voyaging—or *faiva toutaivaka*—navigation follow in turn).[10]

For our chief purposes, Māhina and Kaʻili[11] provide a window onto the beginning of Tongan cosmogony and cosmology:

> In the beginning were the *Vahanoa*, the Vast Expanse of *Tahi* (Sea), and *Pulotu*, the Ancestral Homeland and Afterworld, which begat the *Tou'ia'ofutuna*, the *Maka* (Rock), which begat the four *Hoa*/*Soa* (Pairs, Dualities or Binaries) of *ʻUta* (Land) and *Tahi* (Sea) Elements,[12] which begat the four sets of *Tangata* (Male) and *Fefine* (Female) *Māhanga* (Twins), which begat the three *ʻOtua* (Deities), Hikuleʻo, Maui and Tangaloa (and later the fourth Goddess Hina)—respectively residing in *Pulotu* (Ancestral Homeland and Afterworld), *Maama* (Earth), and *Langi* (Sky) (and *Māhina* [Moon]), linked through ongoing tripartite relations of trade and exchange, including knowledge, skills, and technology transfers.[13]

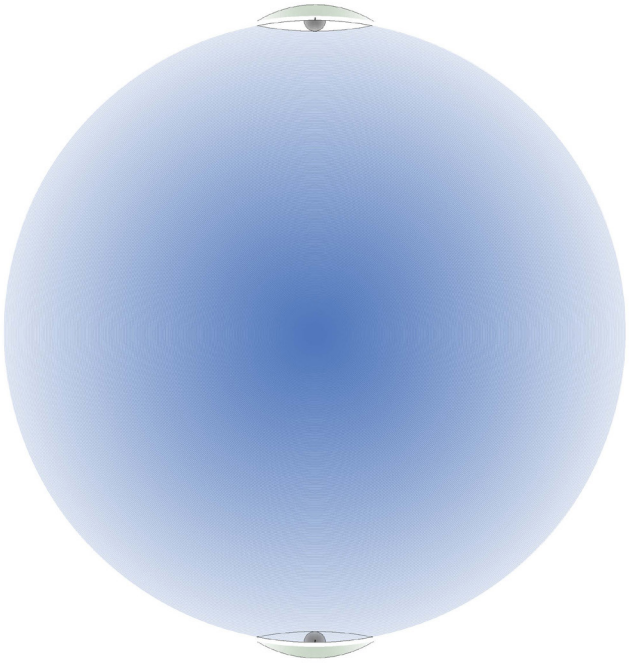
Of immense parallel interest is the biblical account of God's creation of the *ʻuta* (land) and *tahi* (sea) as seen in the following short verses: "And God said, 'Let the water under the sky be gathered to one place, and let dry land appear [. . .] And it was so. God called the dry ground 'land,' and the gathered waters he called 'seas.' And God saw that it was good."[14]



Ata (Fig. 2a) A sectional diagram *falekava-vaka* [Diagram, Authors, 2025]

Fonua **(People and place): The intersection of *ʻuta* (land) and *tahi* (sea)**

The Tongan philosophical notion of *fonua* is constitutive of the land and sea, which from the beginning, cause all entities to be indivisibly placed in time and space. It mirrors the famous dictum by Epeli Hauʻofa: "Our Sea of Islands," which translates into Tongan as "*Hotau Tahi ʻOtumotu*," where Moana Oceania can be generally defined as "lands *fakafelavai* (intersected) (or *fakahoko* [connected] and *fakamāve* [separated]) by *tahi* (sea), *moana* [ocean], or *vai* (water), i.e., *ʻotumotu* (islands)."[15] The word *fonua* also means *kakai* (people) and ʻātakai (environment), along with *ʻuta* (land), *tahi* (sea), and *langi* (sky), i.e., landscape, seascape, and skyscape. *Fonuaism* exists as a philosophical notion across Malay-Moana Oceania (now Austronesia) and wider Moana Oceania as *banua*, *hanua*, *vanua*, *fanua*, *fenua*, and *whenua*, commonly meaning both *kakai* (people) and ʻātakai (environment).



Ata (Fig.) 2b A sectional diagram: three *fonua* as placenta, earth, burial place in a back and forth, cyclical process of past-present-future (house-boat), on spherical earth. [Diagram: Authors, 2025]

There are three types of Tongan *fonua* indicating a cyclically diversified, yet unified, movement from *fāʻele* (birth), through *moʻui* (life), to *mate* (death). The first *fonua* defines *fāʻele* (birth) and is marked by the *valevale* (fetus) and *taungafanau/manava* (mother's placenta/womb) (*Ata* (Fig.) 2). The second *fonua* expresses *moʻui* (life) and is demarcated by the *kakai* (people), and ʻātakai (environment), while the third is marked by the *mate* (dead) and the *tanuʻanga* (burial place). Whereas the fetus, people, and dead are the *fakafuo/fakatā* (temporal/formal definers) of the mother's placenta/womb, environment and burial places, the motherʻs placenta/womb, environment, and burial place are, in turn, *fakauho/fakavā* (spatial/substantial composers) of the fetus, people, and the dead.[16]

'Aati FakaTonga (Tongan arts): *Faiva* (performance arts), *tufunga* (material arts), and *nimamea'a* (fine arts)

Tongan arts are generally divided into three genres: *faiva* (performance arts), *tufunga* (material arts), and *nimamea'a* (fine arts).[17] In old Tonga, *'aati* (arts) were closely aligned to *ako* (education), where they were mutually organised to focus on knowledge and skills, along with beauty and utility. In both cases, knowledge and beauty took precedence over skills and utility. That is, the more knowledgeable and beautiful, the more skillful and useful and, by extension, the more skillful and useful, the more knowledgeable and beautiful. Whereas beauty is aesthetically concerned with *tatatu* (symmetry) and *potupotutatau* (harmony) as a creative process, utility is emotionally linked to *māfana* (warmth) and *vela* (fieriness)[18] as a communicative outcome, in the logical order of precedence.[19]

While the Tongan performance arts are *tefito-he-loto-sino* (body-centred, i.e., inside-the-body), both the Tongan material and fine arts are *tefito-he-tu'a-sino* (non-body-centred, i.e., outside-the-body), with both the performance and material arts seen as largely *tefito-he-tangata* (male-led), and fine arts as mainly *tefito-he-fefine* (female-based). The performance, material, and fine arts of *faiva*, *tufunga*, and *nimamea'a* literally means 'doing-time-in-space,' 'marking-time-in-space,' and 'defining-time-in-space,' respectively, and are themselves expressions of *tā-vā* (time-space), *fuo-uho* (form-content), on both abstract and concrete levels.[20]

Both boat-building and house-building, belonging to the material arts, are considered the material art-form of architecture and engineering.[21] They are commonly concerned with the constant yet consistent *fakatatau* (mediation) of intersecting (or connecting and separating) time-space, form-content and

Ata (Fig. 3) Webber's Cook's Reception, 1777, in concentric circle *mata-ava* (eye-hole) [Source: Auckland Art Gallery Toi o Tāmaki]

opposite *ivi* (energies or forces) each carrying both historical and metaphorical tendencies. The three selected ethnographic examples that will be *tāvāistically* discussed below—like the three arts and *fonua* described above—are *tā-fuo* (time-form)-defined, *vā-uho* (space-content)-composed, with all being expressed through vortex-led, helix-type, spiral-like formations or *kupesi*,[22] including the DNA-like *mata-ava* (eye-hole) formations.[23] This is aligned to the *tāvāist* philosophical belief that it is in the *mata-ava* (eye-hole), vortex-led, helix-type, spiral-like or *kupesi* DNA-like formations[24] that time-space (form-content) configuration of *me'a* (matter) as *ivi* (energy) finds its most *matolutu'u* (dense) and *mālohitu'u* (intense) expression.

Tā-Vā: A Tongan (time-space) philosophy of reality

Tāvāism has a plurality and complexity of general and specific ontological and epistemological tenets[25] which include, inter alia, the following:

1. That *tā* and *vā* (time and space) as ontological entities are the common *vaka* (vessels, vehicles, or mediums) of existence carrying all things within a single reality.[26]

2. That time and space as epistemological identities are differently organised across cultures (and languages), in plural, temporal-spatial, formal-substantial, collectivistic, holistic, and circular ways.

3. That *'ilo* (knowledge) and *poto* (skills) are themselves derived from time and space and *fuo* (form) and *uho* (content), on both the abstract and concrete levels.

4. That knowledge and skills gained in education as a transformation of the human mind and heart from *vale* (ignorance) to knowledge and on to skills, are composed in *fonua/kalatua* (culture) and communicated in *tala/lea* (language) as mere *vaka* (vessels).[27]

5. That the already-taken-place past is put in the front as guidance and the yet-to-take-place future is placed in the back so it is guided by past experiences, with both the illusive past and elusive future being constantly and consistently mediated in the ever-changing present held centre-most.

6. That time and space, as abstract dimensions of form and content which are, in turn, the concrete manifestations of time and space, are themselves *tafa'akifā* (four-dimensional i.e., form, depth/height, length and breadth/width) in nature and not *tafa'akitolu* (three-dimensional i.e., form, depth/height, length and breadth/width only) in character.[28]

7. That time and form are the *fakafuo/fakatā* (definers) of space and content which are, in turn, the *fakauho/fakavā* (composers) of time and form.

8. That all things in a single level of reality stand in eternal relations of exchange, giving rise to *fepaki/felekeu* (conflict) and *fenāpasi/maau* (order).

9. That conflict and order are of the same logical status, where order is an expression of the conflict, when equal and opposite *ivi* (energies/forces) meet at a common point, defined by a state of 0 or *noa* (zero-point).

10. That everywhere in reality is *fakafelavai* (intersection), and there is nothing beyond *fakahoko* (connection) and *fakamāvae* (separation).

11. That everywhere in reality is *hoa/soa* (pair/duality/binary), and there is nothing above *hoakehekehe/hoatamaki* (opposite/dissimilar pairs) and *hoamālie/hoatatau* (equal/similar pairs).

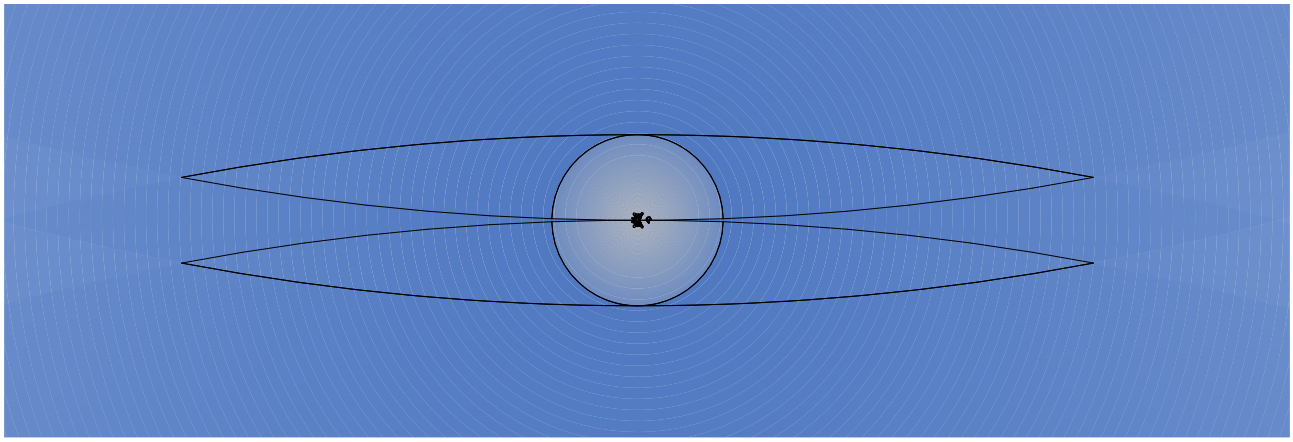
12. That *mata-ava* (eye-hole) is the intersection (or connection and separation) of two *kohi/laini* (or lines); a line is the collection of eyes-holes; and *vā* (space) is the summation of lines.

13. That eye-holes are where *tā-vā* (time-space) as *meʻa* (matter) as *ivi* (energy) is most *matolutuʻu* (dense) and *mālohituʻu* (intense).

Ouau kava-tō (kava-sugarcane ceremony), *vaka* (boat), and *fale* (house)

Oral history tells that, upon the arrival of the first people in Tonga, they initially lived in caves and tree trunks, until it occurred to them to turn their *vaka* (boats) upside-down to form *fale* (houses) by adding four *pou* (posts) as upright support. They celebrated their safe arrival in Tonga by ceremonially *inu kava* (drinking kava) and making *feilaulau* (offerings) to the gods of the *matangi* (winds) and *tahi* (sea), i.e., *peau/ngalu* (waves), Lulu and Lātū, in the space between the *faliki* (floor) below and the *ʻato* (roof) above.[29] So, the kava ceremony was created at the connection and separation (or intersection) between the *vaka* (boat) as a "*fale-fakafoʻohake*" (upside-down house) and *fale* (house) as a "*vaka-fakafoʻohifo*" (downside-up boat). The kava ceremony, like the boat and house, was given *fuololoa* (ovular) (or in some cases *fuopotopoto* [circular]) form, with the key positions named after the boat, for instance, with the presiding chief at the front

Ata (Fig. 4a) Webber's *Pau* drinking /eating *kava /tō* (Vaka [Boat] & Fale [House]) [Source: Auckland Art Gallery Toi o Tāmaki]



Ata (Fig. 4b) *Vaka* [boat] plan diagram [Diagram: Authors, 2025]

as if in the *olovaha* (bow, thereby opposite the back)—and given the role of *touʻa* (kava-maker, anchor). On either side are placed the *ʻalofi* (rowers).[30]

All three constitutive components are respective forms of *tufunga* (material arts) and *faiva* (performance arts), all of which are morphodynamic, hydrodynamic, and aerodynamic in mode of operation.[31] They are forms of protection from the winds, including the *ʻuha* (rain) and the *laʻā* (sun). The winds, waves, and rain are mere *vaka* (vessels) for the movement of *ivi* (energy)[32] as intersecting (or connecting and separating) tendencies. These are further *fakatatau* (mediated) as vehicles for the conduct of such performance arts of *faiva faifolau* (voyaging) (i.e., *faiva toutaivaka* [navigation])—notably their eyes-holes by way of process and outcome. Besides the material arts of land-architecture or house-building, and sea-architecture or boat-building as both architecture and engineering, there is a multiplicity of other associated performance, material, and fine art-forms, notably *faiva milolua* (kava-making), *tufunga lalava* (house-boat-lashing), and *nimameaʻa lālanga* (mat-weaving).[33]

Falevaka (boathouse) and *falealafolau* (houseboat)

The *falevaka* (boathouse) and *faleafolau* (houseboat) are the common derivatives of the *fale* (house) as a "*vaka-fakafoʻohifo*" (down-side-up boat) and *vaka* (boat) as a "*fale-fakafoʻohake*" (upside-down house) and *vaka* (boat) as an "upside-down *fale* house." All these are generally derived from the *fale fakaManuka* (house in the-style-of-Manuka) (*Manuʻa* in Sāmoan) which is commonly *fuololoa* (ovular) (and occasionally *fuopotopoto* [circular]) in form (and content). While the house and boat are constitutive in nature, the boathouse and houseboat are separative in character. Whereas the house and boat are vertically exchanged through inversion, the boathouse and houseboat are horizontally exchanged through substitution.[34]

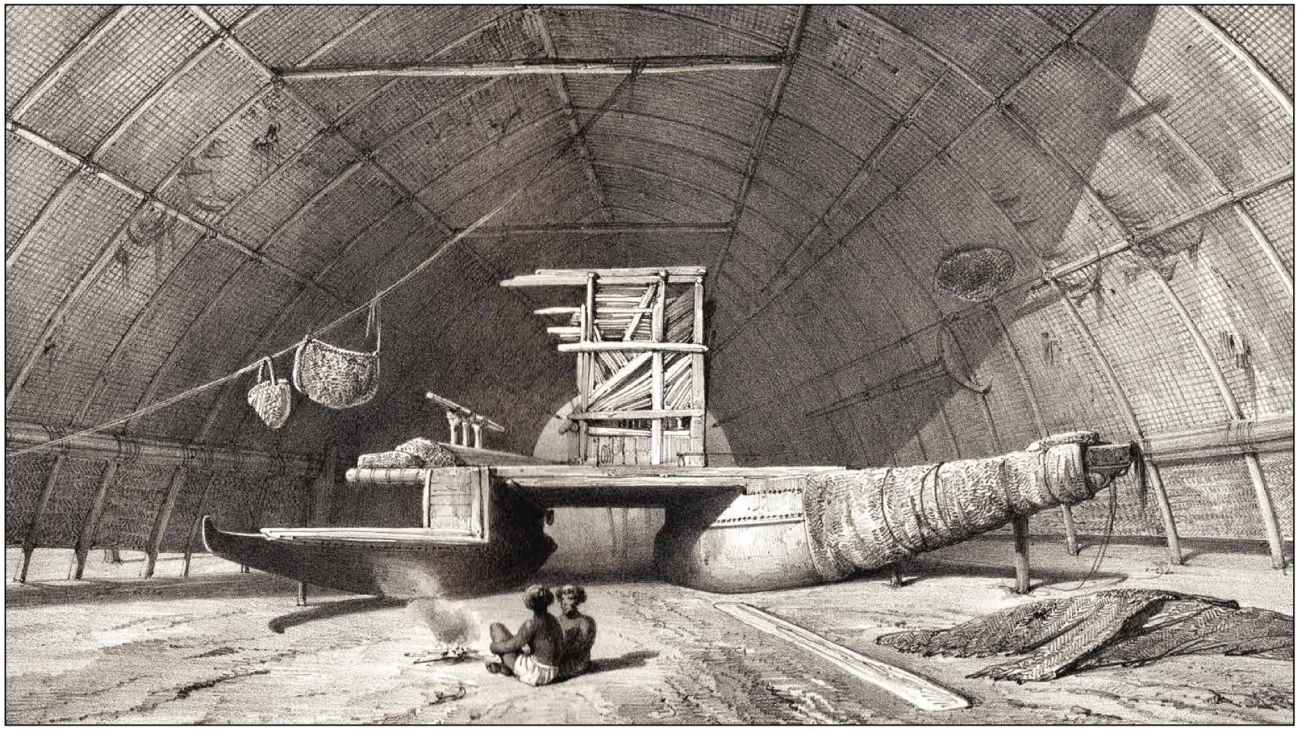
Falevaka (boathouse) is "*fale-i-vaka*" (house-in/on-boat), i.e., now 'on the boat' as "*faletahi*" or "*fale-i-tahi*" (house-in-the-sea) on the boat in the sea. The *faleafolau* (houseboat) is "*vaka-i-fale*" (boat-in-house), i.e., now 'in the fale' as "*vakaʻuta*" or "*vaka-i-ʻuta*" (boat-in-the-house), in the house on land. Both the boathouse and houseboat belong in the material arts, e.g., landscape-architecture or house-building and sea-architecture or boat-building (where the material art of engineering focusing on the mediation of equal and opposite energies or forces). They are respectively concerned with the mediation of intersecting tendencies

between *tā* and *vā* and opposing forms of *ivi* (energy) enacted within and across various processes and outcomes. The boathouse moves away from land to sea as opposed to the houseboat shifting away from sea to land. Their opposite two-way movement between land and sea are morphodynamically mediated at the intersection (or connection and separation) of *matātahi/matāmoana/matavai* (eye-of-the sea/ocean/water) and *matāʻutoʻuta/matāfanga/matātongo* (eyes-of-the-land/anchorage/mangroves).[35]

Besides the 'eating away' of the *matātahi/matāmoana/matavai* (eye-of-the sea/ocean/water) and *matāʻutoʻuta/matāfanga/matātongo* (eyes-of-the-land/anchorage/mangroves) by the winds and waves, morphodynamics is also linked to landscape changes in the formation of distinct topographic features caused by erosional and depositional processes and outcomes due largely to *ʻuha* (rain), winds, and waves. The same also applies to both aerodynamics and hydrodynamics linking winds and waves respectively. These morphodynamic, aerodynamic, and hydrodynamic forces have bearings on the land and sea in the material arts relating to land-architecture or house-building and sea-architecture or boat-building, including the associated performance arts of *faiva faifolau/toutaivaka* (long-distant voyaging/navigation) and *faiva toutaiika* (deep-sea fishing) and the performance art of *faiva fānifo* (surfing).[36]

Of immense interest are the common temporal-formal marking and spatial-substantial composing of the boathouse and houseboat in their angular arrangements, placing their pointed-ends down and wider ends above. By way of comparison, the Sydney Opera House is a collection of boathouses and houseboats, at the intersection (or connection and separation) of land and sea. Like the Tongan boathouses and houseboats, the Sydney Opera House is arranged in angular ways. But, unlike the Tongan boathouses and houseboats, the arrangement of the Sydney Opera House involves placing the wider ends below and the pointed ends above. That is, in that respect, the Tongan boathouses and houseboats are the opposite of Sydney Opera House.[37] The same inversion can be seen in the way sails are oppositely arranged in Tonga and the West, morphodynamically, aerodynamically, and hydrodynamically.

Ata (Fig. 5a) *Vavaʻu falevaka* (boathouse) on a sailing double-hulled *kalia* (canoe)/*vaka* (boat) [Source: Museo de America, Madrid]

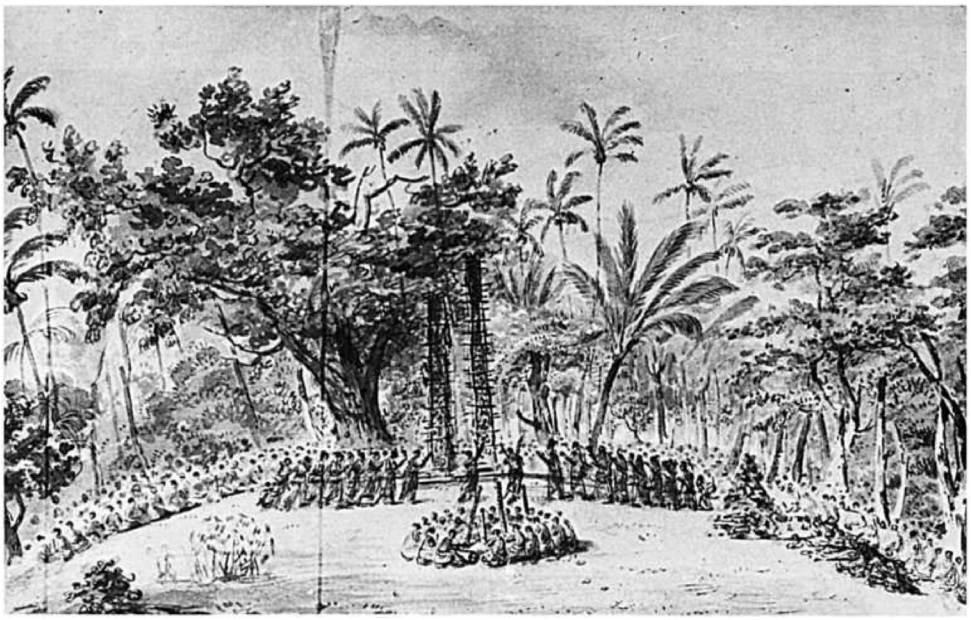


Ata (Fig. 5b) *Tongatapu falealafolau* (houseboat) with *tufunga* (architectural and engineering artists) at work [Source: Dumont d'Urville 1846]

Fataʻufi (yam pyramids, structures or platforms) and *Vaka-ʻa-Hina* (Boat-of-Hina)

Captain James Cook, in his third and last voyage in 1777, observed firsthand the building of *fataʻufi* (yam pyramids, structures or platforms) in progress during the *kātoanga ʻInasi* (ʻInasi festival) in his brief stay on the main island of Tongatapu, in Tonga. This was followed by his earlier equally impressive reception on the island of Lifuka, in Haʻapai, by notable chief and warrior Fīnau ʻUlukālala. The Tuʻi Tonga, Pau, came on board to invite him to be a special guest at a royal reception in his honour the same day. Following breakfast, Cook attended the Tuʻi Tonga ashore and witnessed his people very busy at work, building a square tower defined by four, very long, upright posts, approximately two feet from one another. The space between the posts were then filled up with yams held in place by fixing sticks spanning from post to post at a length of about every four feet. As they reached the top of these posts they fastened others to them as they continued until each pile was some thirty feet or more in height. On the top of one they placed two baked hogs, while on the top of the other was placed a living animal, and further down, about half way, was tied another. Cook was highly impressed and noted the knowledge and skills, creativity and innovativity deployed by the people building these two structures. Comparing these abilities with his own seamen, he determined that they could not achieve the same structures without skillful carpenters and a dozen different types of tools, nor without a hundred weight of nails. Even with these things, it would take the Europeans several days to achieve what the Tongans did in hours. After filling up these two piles, they completed several other heaps of yams and breadfruits on both sides, adding a turtle and a huge quantity of excellent fish. This was all the Tuʻi Tonga's gift to Cook, an offering which far exceeded what he had received in Haʻapai.[38]

Both structures belong to the *tufunga* (material arts), specifically the old *tufunga langafataʻufi* (yam pyramid-building) and the new *tufunga tongiukamea*



Ata (Fig. 6a) Webber's *fataʻufi* (yam pyramids), displayed, Tongatapu, 1777 [Source: National Maritime Museum, Greenwich, London]

(steel-cutting). The yam pyramids and Boat-of-Hina are human-made structures enacted for more than two centuries now (the former in 1777, and the latter in 2019). In comparison, both express the continuity and changes in the intellectual-emotional, practical, material, and technological dimensions of life. A mixture of both land-based and sea-based resources were displayed in Cook's account, with its exhibition of plenty and dignity, beauty and utility—where the two tall upright yam pyramids were filled with excellent *kahokaho* (yams) and *puaka* (pigs) as chiefly food—surrounded by piles of *ʻufi* (yams) and *mei* (breadfruits), including a *fonu* (turtle) and huge quantity of the best *ika* (fish) as chiefly delicacies defining a circular, peripheral enclosure. The *fananga* (legend) goes that goddess Hina regularly travelled on her *vakavavā* (spaceship) between the *Maama* (Earth) and the *Māhina* (Moon), her divine abode, where she practiced her fine art of barkcloth-making workshop.[39]

Both the yam pyramids and the Boat-of-Hina are based on the *kupesi* (geometric design) of *fata*,[40] the internal vertically sharp-ended triangular part of the house on top of the four *pou* (posts) holding together the *ʻato* (roof). In addition, there are other *kupesi* (geometric designs) used by the yam pyramids and the Boat-of-Hina, notably the *fata-ʻo-Tuʻi-Tonga*, *manulua*, *tokelau-Feletoa*, and *veimau* as abstractions of pall-bearers of Tuʻi Tonga, including the royal tombs, two-birds-flying, internal architectural and engineering structures of the fortress of Feletoa and checkerboard or ordered water-flow patterns respectively. Ontologically, yet epistemologically, both material artworks are a collection of connecting and separating (or intersecting) eyes-holes defining temporal-spatial, formal-substantial entities, in vortex, helix, *kupesi* or DNA-like formations, constantly moving in multi-directional and multi-dimensional ways.[41]

Talangata (Conclusion)

We have fused, yet also diffused, our specific text according to Tongan *fonua*, itself defined by land and sea in the Tongan material arts of land-architecture or house-building, and sea-architecture or boat-building. Importantly, these arts have morphodynamic, aerodynamic, and hydrodynamic affects and

Ata (Fig. 6b) *Tavakefaiʻana's Vaka-ʻa-Hina* (Boat-of-Hina), displayed, Christchurch, 2019 [Source: majid2019]

effects consistent with the general 'context' of *Tāvāism*, the Tongan (and Moana Oceanian) time-space philosophy of reality. While there are different ways of knowing and feelings, there is only one single level of reality, with the latter preceding the former. That is, the ontological, with its ways of being, is the only measure of the epistemological with its various ways of knowing, feelings, and doing.

Specifically, these reality-given and society-made ways of being are generally rooted in the *tāvāist* ontological and epistemological tenets. Evident across both process and outcome, these types of 'textualised' natural entities (viz., land and sea), and forms of disciplinary and social identities (viz., material arts of land-architecture or house-building and sea-architecture or boat-building) are *tāvāistically* 'contextualised.' As diverse connecting (or connecting and separating) temporal-spatial, formal-substantial tendencies, both converge and find expression in eye-hole patterns—where *meʻa* (matter) as *ivi* (energy) made dense and intense are shown in vortex-like, helix-type, *kupesi*, DNA-like formations.[42]

Tala'apenitekisi (Appendix) 1

The five *kupu*/*veesi* (verses) below are taken from Lulu and Lātū as an ancient twenty-five-verse long sung and danced poetry[43] addressed as prayers to voyaging/navigation and celebration. They are performed as a *meʻetuʻupaki* dance literally meaning "standing-and-dancing-with-miniature-*paki*-paddles." The poetry is beautifully sung in the *afo faʻahikehe* (minor tune) and gracefully danced with the *paki* (miniature paddles) as an extension of the *sino* (body) as *fakafelavai* (intersecting) or *fakahoko* (connecting) and *fakamāvae* (separating) bodily movements, i.e., in interlinked spiral motions. Further, it undergoes structured *liliu fasikehe-fasikehe* (melody changes), *liliu tāvātuai-tāvāvave* (tempo-spatio changes), *liliu tōmaʻolalo-tōmaʻolunga* (key changes) and *liliu leʻosiʻi-leʻolahi* (volume changes) through sustained *tatau* (symmetry), *potupotutatau* (harmony), and *mālie/fakaʻofoʻofa* (beauty), resulting in energy-like feelings of *māfana* (warmth), *vela* (fieriness), and *tauēlangi* (climactic elation). It surely does so by invoking and evoking a beautiful and useful healing process for the body, mind, and heart, one having enormous therapeutic, psychoanalytic, or hypnotic significance and relevance.

The language used is largely unintelligible to living Tongans, probably proto-Moana Oceania. This sung and danced poetry was a prayer addressed by ancient navigators/voyagers to the gods of the winds and sea or waves, Lulu and Lātū, seeking their divine protection, and asking for pacific conditions in insuring and ensuring a safe voyage (verses 1 and 2). It also talks about sailing and paddling techniques and celestial navigational objects (verses 3 and 4), while telling of a long and arduous voyage from northwest Moana Oceania through many of the islands, recounting perilous and dangerous wind and sea conditions, sea birds, and celestial and terrestrial navigational objects (e.g., Taputea, i.e., Venus; verse 4, line 1). It also recalls key landmarks and ports of call such as Tālava (Tarawa), Kiribati; Funafuti, Tuvalu; ʻUvea; Sāmoa; and Suva, Fiji, all the way to Tonga (verse 5). Upon arrival, it tells of preparing *kava* for drinking, making *feilaulau* (offerings) to Lulu and Lātū, and of feasting, singing, and dancing (verse 5).[44]

Lulu mo Lātū (Lulu and Lātū)

An ancient sung and danced prayer poetry related to navigation and celebration

Poetry, music, and dance by an anonymous master poet

English translation by Kolokesa Uafā Māhina-Tuai; Tavakefai'ana, Sēmisi Fetokai Kulīha'apai Moahehengiovava'ulahi Potauaine and Hūfanga-He-Ako-Moe-Lotu, 'Ōkusitino Māhina

1. Ko Lulu ē! Ko Lulu ē!
Ko Lulu ē! Sua mai matē!
Fakapō! Sua mai sua mai
Fakapō! Sua mai sua mai
'Ī-ī-ā! Tū-ū-ū!

1. Oh dear Lulu! There's Lulu!
Oh dear Lulu! Bring life-saving winds!
Alas! Let there be winds
Alas! Let there be winds
'Ī-ī-ā! Tū-ū-ū!

2. Ko Lātū ē! Lātū ē!
Pe'i tonga mu'a kae tokelau[45]
Pale ki vā tapu i le lā
Kae liua manu o le vaha
Kae tākoi si'ene nga'uta
'Ī-ī-ā! Tū-ū-ū!

2. Oh dear Lātū! There's Lātū!
Blow from south then north
Sacred space, sheltered sail
The seabird returns to land
The sign of a good catch
'Ī-ī-ā! Tū-ū-ū!

3. Laku tā ē! Laku tā ē!
Laku tā, siki poi ē!
Siki poi ē! Siki poi ē!
Siki 'olunga, mata'u fohe
Ma'u ē tātā mālie
Siki poi ē! Siki poi ē

3. Mark your beat! Mark your pace!
On your mark, twist and turn
Turn and twist, twist and turn
Hold up, your right paddle
Grip tight, row in rhythm
Twist and turn! Turn and twist

4. 'Oi Taputea! Taputea mai!
He uia malama i le tai
'Oi suluia lau pengatuia
He uia malama i le uia
'Ī-ī-ā! Tū-ū-ū!

4. Oh Taputea! Shining Taputea!
Let there be light on the sea
Oh knowledge providers of life
Light up the sea, we beseech thee
'Ī-ī-ā! Tū-ū-ū!

5. 'Oi anu mai fai mai!
Tapu lā ē moe i le tai
Velo ē sila Tālava ē
Vaka 'i Suva kite fanua
Afe mai tuli ki Nanumea
Afe ki 'Uvea 'a vakatu
Tonu mo tau 'i tu'ahakau
Fakahakea kiai te vaka
Ki Tapunasili mo Lotevai
Ke fālō mai nai ē
Kā ko Tonga pasipasi mai
Ke puna kotoa ē! 'Io ē ē!

5. Stay afloat, and be safe
Sails down, now sleep
Sails up, there is Tarawa
Boat to Suva, now appears
Turn in haste to Nanumea
Then to 'Uvea, drop anchor
Keep outside the outer reefs
And sail the boat straight
To Tapunasili and Lotevai
To replenish and refurbish
As we safely sail to Tonga
Where we celebrate! Oh yae yae!

Talakolosaliō (Glossary of Tongan words)

ʻAati	Art
Ako	Education
ʻAonga	Utility; also see ʻaonga (useful)
ʻApenitekisi	Appendix
ʻAta	Image, mirror, picture or photo
ʻAta-ki-loto	Abstract
ʻAta-ki-tuʻa	Concrete
ʻAtamai	Mind
Ava	Hole
Faʻahifā	Four dimensions (4D), viz., fuo (form), maʻolunga/loloto (height/depth), loloa (length) and maokupu/fālahi (breadth/width), i.e., time-space, form-content; also see tafaʻakifā (four-sided-dimensionality)
Faʻahitolu	Three dimensions (3D), viz., maʻolunga/loloto (height/depth), loloa (length) and maokupu/fālahi (breadth/width), i.e., timeless/formless; also see tafaʻakitolu (three-sided-dimensionality)
Fāʻele	Birth
Faifolau, faiva	Voyaging, performance art of; also see toutaivaka, faiva (navigation, performance art of)
Faiva	Performance art
Fakafelavai	Intersection
Fakafuo	Formal definer; also see fakatā (temporal definer)
Fakahoko	Connection
Fakamālō	Acknowledgement; also see fakamālō (thank-you)
Fakamāvae	Separation
Fakaʻofoʻofa	Beauty; also see mālie (beauty), old term for fakaʻofoʻofa (beautiful)
Fakatā	Temporal definer; also see fakafuo (formal composer)
Fakatamaki	Crisis
Fakatupu	Create; also see fakatupu (creation)
Fakauho	Substantial composer; also see fakavā (spatial composer)
Fakavā	Spatial definer; also see fakauho (substantial definer)
Fālahi	Width; also see maokupu (width)
Fale	House
Fale fakafoʻohake	Upside-down house, i.e., vaka (boat); also see vaka fakafoʻohifo (downside-up boat), i.e., fale (house)
Faleafolau	Houseboat; also see vakaʻuta (land-boat)
Faletahi	Sea-house; name; also see falevaka (houseboat)
Falevaka	Boathouse; also see faletahi (sea-house)
Fataʻufi	Yam pyramid
Fatu	Heart; also see mafu (heart)
Fefine	Female
Fefusiaki-Fetekeaki	Force
Felekeu	Chaos, conflict; also see fepaki (chaos, conflict)
Fenāpasi	Order; also see maau (order)
Fepaki	Chaos, conflict; also see felekeu (chaos, conflict)
Fonu	Turtle
Fonualoto	Burial place
Fonuaʻuta	Fonua-in-the-land, i.e. people in the land
Fonuatahi	Fonua-in-the-sea, i.e., people in the sea
Fonutahi	Sea turtle
Fonuʻuta	Land turtle
Fonua	Land and sea; land-sea and its people; also see its regional variations banua, vanua, fanua, fenua, hanua, and whenua (land and sea, i.e., land-sea and its people)
Foʻuvaka, tufunga	Sea-architecture or boat-building, material art of
Fuo	Form; also see fuo (time)
Fuo-Uho	Form-Content/Substance

Fuouho	Abstract
Hahake	East
Haka, faiva	Dance, performance art of
Heliaki	Metaphor
Hihifo	West
Hiva, faiva	Music, performance art of
Hoa	Pair, duality or binary; see Sāmoan soa (pair, duality, or binary)
Hotau Tahi ʻOtumotu	Our Sea of Islands
ʻIai	Reality; also see ʻiai (realism)
Ika	Fish
ʻIkonōmiki	Economics
ʻIla	Point; also see mata-ava (eye-hole/point)
ʻIlo	Knowledge; form of maama (lightness; fieriness; redness)
ʻIlo Faʻu (ʻIF)	Artificial Intelligence (AI)
ʻIlo Maʻu (ʻIM)	Real Intelligence (RI)
Ivi	Energy
Kava	Name of plant
Kohi	Line; also see laini/kohi, with kohi (drawing) as the older form of tohi (writing)
Kula	Red
Kupesi	Geometric design
Kupu	Verse; also see veesi (verse)
Lalava, tufunga	House-boat-lashing, material art of
Lalo	Down-under; also see tonga (south)
Langafale, tufunga	Land-architecture or house-building, material art of
Langi	Sky; divine abode of God Tangaloa, symbolic name for Sāmoa; also the royal tombs of most ancient Tuʻi Tonga dynasty were named Langi, designating the divine realm of Tangaloa ʻEitumatupuʻa, God of the Sky, father of ʻAhoʻeitu, the first Tuʻi Tonga.
Liliu fasikehe-fasikehe	Melody change
Liliu leʻosiʻi-leʻolahi	Volume change
Liliu matangi	Climate change; also see fakatamaki (crisis)
Liliu tāvātuai-tāvāvave	Tempo-spatio change
Liliu tōmaʻolalo-tōmaʻolunga	Key change
Loloa	Length
Loloto	Depth; also see maʻolunga (height)
Loto	Heart, inside, desire
Maama	Earth; divine abode of God Maui; symbolic name for Tonga
Maau	Order; also see fenāpasi (order); maau (poem)
Māfana	Warmth; a form of kula (redness); also see vela (fieriness) as a form of kula (redness)
Mafu	Heart; also see fatu (heart)
Māhina	Moon; divine abode of Goddess Hina; month is also named māhina
Mālie	Beauty; also see fakaʻofoʻofa (beauty)
Mālohituʻu	Intense
Māmani	World
Manava	Motherʻs womb; also see taungafanau (motherʻs placenta)
Maokupu	Breadth; also see fālahi (width)
Maʻolunga	Height; also see loloto (depth)
Mata	Eye; also see mata (face)
Mata-Ava	Eye-Hole, i.e., ʻila (point)
Matangi	North wind
Matangi tokelau-hahake	Northeast wind
Matangi tokelau-hihifo	Northwest wind
Matangi tonga	South wind
Matangi tonga-hahake	Southeast wind
Matangi tonga-hihifo	Northwest wind
Mate	Dead; also see mate (death)
Matolutuʻu	Dense
Maʻungatala	Reference
Meʻa	Matter
Mei-loto-ki-tuʻa	From-inside-out
Mei-tuʻa-ki-loto	From-outside-in
Moana	Ocean; also see tahi (sea)
Momoko	Cold; a form of ʻuli (blackness)
Moʻui	Life
Ngalu	Wave; also see peau (wave)
Nimameaʻa	Fine art
ʻOlunga	Up-above; also see tokelau (north)
Ongo	Feeling, hearing, sound
Peau	Wave; also see ngalu (wave)
Peau kula	Red wave; compare with scientific tidal seismic sea waves and tsunami (harbour waves)
Peau tāmate	Killer wave

Peau tangata	Male wave
Politiki	Politics
Poto	Skill; form of maama (lightness; fieriness; redness)
Potupotutatau	Harmony
Puaka	Pig
Pulotu	Ancestral homeland and afterworld; divine abode of Goddess Havea Hikule'o; symbolic name for Fiji, notably the easterly Lau Group
Sino	Body
Tā	Time; also see tā (define, demarcate, beat, hit, mark)
Ta'anga, faiva	Poetry, performance art of
Tatau	Symmetry
Tā-Fuo	Time-Form
Tatau	Symmetry
Tā-Uho	Time-Content
Tā-Vā	Time-Space; also see tā-vā (temporalism-spatialism)
Tahi	Sea; also see moana (ocean)
Tahi-mo-'Uta	Matāpule chiefly orator title, i.e., Sea-and-Land
Tala	Language; also see lea (language)
Talafaletahi	Name of sea-based people and estate
Talafale'uta	Name of land-based people and estate
Talakamata	Introduction
Talakolosaliō	Glossary
Talatuku	Conclusion
Talatupu'a	Cosmogony and cosmology
Tangata	Male
Tatau	Symmetry
Tau Tahi	Sea Warrior; name
Tau 'Uta	Land Warrior; name
Tauēlangi	Climatic elation
Taungafanau	Mother's placenta; also see manava (mother's womb)
Tā-Vā	Time-Space
Tāvāism	Time-space philosophy of reality
Tefito-he-loto-sino	Body-centred, i.e., inside/onside-the-body
Tefito-he-tu'a-sino	Non-body-centred; i.e., outside-the-body
Tō	Name of sugarcane plant
To'a	Warrior
To'a tete'e	Fearless warrior
Toka'anga matangi	Wind direction
Tokelau	North; also see 'olunga (up-above)
Tonga	South; also see lalo (down-under)
Tonga lahi he 'eiki moe tapu	Tonga abounding in both chiefliness and godliness, i.e., Tonga'eiki, Tongatapu, and Tongalahi
Toutaiika, faiva	Fishing, performance art of
Toutaivaka, faiva	Navigation, performance art of; also see faifolau, faiva (voyaging, performance art of)
Tufunga	Material art
Uho	Content/Substance; also see vā (space)
'Uli	Black
Vā	Space; also see uho (content)
Vai	Water
Vaka	Boat; name; also see vaka (vessel, vehicle, medium)
Vaka fakafo'ohifo	Downside-up boat, i.e., fale (house); also see fale fakafo'ohake (upside-down house), i.e., vaka (boat)
Vakatahi	Sea-boat
Vaka'uta	Land-boat; name; also see falealafolau (boathouse)
Vale	Ignorance; a form of 'uli (blackness); also see vale (mental illness)
Valevale	Fetus
Vā-Uho	Space-Content/Substance
Veesi	Verse; also see kupu (verse)
Vela	Fieriness; a form of kula (redness); maama (lightness)

TALAFAKAMĀLŌ
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Tonga's most precious *koloa* treasure is in *fakamālō* (saying thank-you), with sincere appreciation and deep admiration, for the most beautiful and useful exchange on refined *'ilo* (knowledge) (and *poto* [skills]), some of which are duly embedded and embodied in this critical essay. To you all, Professor Maui-TāVā-He-Ako Dr Tēvita O. Ka'ili; Lagi-Maama Academy & Consultancy, Kolokesa Uafā Māhina-Tuai, Toluma'anave, Barbara Makuati-Afitu, and Hikule'o Fe'aomoeako Melaia Māhina; Dr Siosifa Tualau Fifita; Pā'utu-'O-Vava'u-Lahi Dr Adriana Māhanga Lear; Tapu Lolohea amidst many significant others; with mind-heightening and heart-warming we say *mālō lahi* (huge thank-you) to all your good selves, minds, and hearts for the precious koloa of refined 'ilo (knowledge) (and *poto* [skills]) thus freely yet generously rendered. *'Ofa atu fau moe manatu ma'u*.

TALANOUTI'OSI
(NOTES)

1. There is a *matāpule* (chiefly orator title) for Tonga's Royal Army and Navy named Tahi-mo-'Uta (Sea-and-Land). Also, there were the names *Tau 'Uta* (Land Warriors) of Tonga'eiki / Tongatapu /Tongalahi (i.e., Tongatapu for convenience; named due to its association with the first kingly line, Tu'i Tonga, of both earthly and godly origin, i.e., Tonga *lahi he 'eiki moe tapu* (Tonga abounding in both chiefliness and godliness), in the south, and Tautahi (Sea Warriors) of Vava'u and Ha'apai, in the northern groups, during some fifty years of bloody Tongan Civil Wars from the late eighteenth century to the mid-nineteenth century. See 'Ōkusitino Māhina, "The Tongan Traditional History Tala-ē-fonua: A Vernacular Ecology-Centred, Historical-Cultural Concept", PhD thesis, Australian National University, Canberra. 1992.

2. By combining both in Tongan thinking-feelings and doing, architecture engages the mediation of assisting and resisting *tā-vā* (temporal-spatial), *fuo-uho* (formal-substantial) entities, on both the abstract and concrete levels, while engineering involves the mediation of *ivi fefūsiaki-fetēkeaki* (pulling-pushing energies/forces), commonly through sustained beauty and utility.

3. Tangikina Moimoi Steen and Nancy L. Drescher (eds.), *Tonga: Land, Sea and People* (Tonga, Tonga Research Association, 2011). Also see Sēmisi Fetokai Potauaine (Tavakefai'ana), Bruce Sione To`a Moa, Sione Lavenita Vaka, and 'Ōkusition Māhina (Hūfanga-He-Ako-Moe-Lotu), "Loto, Tu'a, moe Fale: Inside, Outside, and House" and "*Vaka, Fale, moe Kava*: Boat, House, and Kava—Mana Structures, Mana Spaces," in *Pacific Studies* 44, no. 1–2 (2021): 163–187 and 188–223 respectively.

4. Tēvita O. Ka'ili (Maui-TāVā-He-Ako), "The Ancestors of the Arts," in *Crafting Aotearoa: A Cultural History of Making in New Zealand and the Wider Moana Oceania*, edited by Karl Chitman, Kolokesa U. Māhina-Tuai, and Damian Skinner (Te Papa Press, 2019); Also see Māhina, "The Tongan Traditional History Tala-ē-fonua"; 'Ōkusition. Māhina (Hūfanga-He-Ako-Moe-Lotu), "*Taha he Kehe*—Unity in Diversity: Towards a New Moana Oceania," in *From the Deep: Pasifiki Voices for a New Story*, edited by James Bhagwan, Elise Huffer, Frances C. Koya-Vaka'uta, and Aisake Casimira, (Suva, Fiji: Pacific Theological College, 2020), 110–123.

5. See Tēvita O. Ka'ili (Maui-TāVā-He-Ako), "*Tāvani*: Intertwining *Tā and Vā* in Tongan Reality and Philology," Special Issue, *Pacific Studies* 40, no. 1–2 (2017): 62–78; Tēvita O. Ka'ili (Maui-TāVā-He-Ako), *Marking Indigeneity: The Tongan Art of Sociospatial Relations* (University of Arizona Press, 2017); T. O. Ka'ili (Maui-TāVā-He-Ako), 'Ōkusitino Māhina (Hufanga-He-Ako-Moe-Lotu), and Pign Ann Addo (Kula-He-Fonua), "Introduction: *Tā-Vā* (Time-Space): The Birth of an Indigenous *Moana* Theory," Special Issue, *Pacific Studies* 40, no. 1–2 (2017); David Harvey, "Between Space and Time. Reflections on the Geographical Imagination," *Annals of the Association of American Geographers* 80, 3 (1990): 418–434; Sigried Giedion, *Space, Time and Architecture: The Growth of the New Tradition* (Harvard University Press, 1967).

6. Adriana Māhanga Lear (Pā'utu-'O-Vava'u-Lahi), Kolokesa Uafā Māhina-Tuai, Sione Lavenita Vaka, Tevita O. Ka'ili, (Maui-TāVā-He-Ako), and 'Ō. Māhina (Hūfanga-He-Ako-Moe-Lotu), "Tongan *Hoa*: Inseparable Yet Indispensable Pairs/Binaries," Special Issue, *Pacific Studies* 44, no. 1–2 (2021b): 5–141.

7. The names *Talafale'uta* (Land-based-*Talafale*) and *Talafaletahi* (Sea-based-*Talafale*) are chiefly estates of Noble Tu'ipelehake in Tongatapu, in the south, and Ha'apai and Vava'u, in the north.

8. There is a name *Vaka'uta* in *'Eua*.

9. See Mele Ha`amoa Māhina 'Alatini and Hikule'o Fe`aomoeako Melaia Māhina, *Fonu 'Iloa ko Sangone: Sangone the Legendary Turtle* (Kula-'Uli Publishing (NZ), 2009).

10. Or *faiva toutaivaka* (long-distant-navigation-voyaging), including *faiva toutaiika* (deep-sea-fishing), as both performance arts.

11. See Ernest Edgar Vyvyan, *Tales and Poems of Tonga*, *B. P. Bishop Museum Bulletin* 46 (1928); 'Ilaisa. Futa Helu, *Critical Essays: Cultural Perspectives from the South Seas*, (Canberra: Journal of Pacific History 1999a); 'Ilaisa Futa Helu, "Aspects of Tongan Material Culture," in *Critical Essays: Cultural Perspectives from the South Seas*, (Canberra: Journal of Pacific History 1999b): 309–331; Ka'ili, "The Ancestors of the Arts"; Māhina, "The Tongan Traditional History Tala-ē-fonua"; 'Ōkusition Māhina (Hūfanga-He-Ako-Moe-Lotu), "Myth and History," in *Voyages and Beaches: Pacific Encounters, 1769–1840*, edited by Alex Calder, Jonathan Lamb, and Bridget Orr (University of Hawaii Press, 1999), 61–68.

12. One of the four *hoa/soa* (pairs, dualities or binaries) of Land and Sea Elements is called *Fonua'uta* (Land-Fonua) and *Fonuatahi* (Sea-Fonua) or *Fonu'uta* (Land Turtle) and *Fonutahi* (Sea Turtle) (see Ka'ili, "The Ancestors of the Arts"; Māhina, "The Tongan Traditional History Tala-ē-fonua").

13. These knowledge, skills, and technology transfers, as were many others, in ancient time-spaces, were conducted at the intersection (or connection and separation) in what is now called *'Ilo Fa'u* ('IF) Artificial Intelligence (AI) and its inseparable *hoa/soa* (pair) *'Ilo Ma'u* ('IM) Real Intelligence (RI). The term 'intelligence,' like the word 'information,' both meaning *'ilo* knowledge and *poto* skills, are more technological than intellectual in orientation (or better still, both indivisibly intellectual and technological, i.e., ontological and epistemological, in modus operandi). See 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), Kolokesa Uafā Māhina-Tuai, Tevita O. Ka'ili (Maui-TāVā-He-Ako), and Sēmisi Fetokai. Kulīhaapai Moahehengi`ovava`ulahi Potauaine (Tavakefai'ana), *Koe Pō Hiva Tu'ufonua Faka Tonga II: A Night of Tongan Classical Music II* (Kula-'Uli Publishing (NZ), 2023); also see Māhina, "*Taha he kehe*—Unity in Diversity"; Sēmisi F.Potauaine (Tavakefai'ana), "The Tectonic of the *Fale*," *Interstices: Journal of Architecture and Related Arts* 6 (2005): 104–109. Also see Tongan tāvāist philosophy of education as the transformation of the human mind and heart from ignorance to knowledge to skills, in that logical order of precedence: 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "From *Vale* (Ignorance) to *'Ilo* (Knowledge) to *Poto* (Skill), the Tongan Theory of *Ako* (Education): Theorising Old Problems Anew," Special Issue,

AlterNative: An International Journal of Indigenous Scholarship 4, no. 1 (2008): 67–96; Māhina, "*Taha he Kehe*—Unity in Diversity"; also see Ka'ili, Māhina, and Addo, "Introduction: *Tā-Vā* (time-space)." Of relevance, too, is the *tāvāist* tenet that errors of thinking and feelings are a problem of mind and heart but not of reality.

14. Genesis 1: 9 and 10. God set out in the creative process and outcome to *fakafuo* ("make *fuo* form"), *fakahoa* ("make *hoa*/*soa* pairs"), and *fakakakato* ("make *kakato* whole"), all things during the day between *pongipongi* (morning) and *efiafi* (evening) for six days, measured by both *faka'ofo'ofa*/*lelei* (beauty) and *'aonga*/*ngāue* (utility).

15. On the one hand, *fonua* can be defined as "lands intersected (or connected and separated) by sea," and on the other, our sea of islands can be defined as "lands intersected (or connected and separated) by sea, *hotau tahi 'otumotu* (our sea of islands)"—where both are reflections of one another, on both the general and specific levels. See Epeli Hau'ofa, "Our Sea of Islands," in *A New Oceania: Rediscovering Our Sea of Islands*, edited by Eric Waddel, Vijay Naidu, and Epeli Hau'ofa (School of Social and Economic Development, University of the South Pacific with Beake House, 1993), 2–16; also see Māhina, "*Taha he Kehe*—Unity in Diversity."

16. Given the current global human-environment, society-ecology crisis, notably *liliu matangi* (climate change), *fonua* firmly stands to affectively and effectively provide a critique of the anthropocentrism, separatism and dualism underpinning the Post Cold War Western-led, UN-driven doctrine of sustainable development, defined as "development that meets the needs of the present generation without compromising the future generations in meeting their needs." See Māhina, "*Taha he Kehe*—Unity in Diversity"; Māhina, Māhina-Tuai, and Potauaine, "*Koe pō hiva tu'ufonua Faka Tonga Il*"; Tim Mulgan, Sam Enright, Marco Crix, Tim O. Jayasuriya, Tevita O. Ka'ili, (Maui-TāVā-He-Ako), Adriana Māhanga Lear (Pā'utu-'O-Vava'u-Lahi), 'Aisea Nau Mathew Māhina, 'Ōkusition Māhina (Hūfanga-He-Ako-Moe-Lotu), John Matthewson, Andrew Moore, Emily C. Parke, Vanessa Schouten, and K.rushil Watene, "Charting Just Futures for Aotearoa New Zealand: Philosophy For and Beyond Covid-19 Pandemic," *Journal of the Royal Society of New Zealand* 51, sup. 1 (2021): 167–178.

17. See Māhina, Māhina-Tuai, Ka'ili, and Potauaine, "*Koe Pō Hiva Tu'ufonua Faka Tonga Il*"; Māhina-Tuai, 'Alatini, and Māhina, "*Koe Pō Hiva Tu'ufonua Faka Tonga Il*"; Adrian M. Lear (Pā'utu-'O-Vava'u-Lahi), Kolokesa Uafā Māhina-Tuai, Sione Lavenita Vaka, Tevita O. Ka'ili, (Maui-TāVā-He Ako), and 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "Sino, 'Ilo, Moe Ongo: Body, Knowing, and Feeling," Special Issue, *Pacific Studies* 44, 1–2 (2021a): 12–94; Adriana. M. Lear (Pā'utu-'O-Vava'u-Lahi), Kolokesa Uafā Māhina-Tuai, Sione Lavenita Vaka, Tēvita O. Ka'ili, (Maui-TāVā-He Ako), and 'Ōkustino Māhina (Hūfanga-He-Ako-Moe-Lotu), "Tongan Hoa: Inseparable Yet Indispensable Pairs/Binaries," Special Issue, *Pacific Studies* 44, no. 1–2 (2021): 5–141.

18. See *tā-vā* (time-space) as *me'a* (matter) as *ivi* (energy).

19. See Aisea Nau Mathew Māhina, "The Transcendence of the Finite in Tragedy and *Lakalaka*. Exploration of Ecstasy and the Sublime Through Metaphysical Comfort and *Tau e Langi*" (MPhil diss., University of Auckland, 2004); 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "Psychoanalysis and Tongan poetry: Reflection on 'the Song of Flowers,'" Special Issue, *Literature and Aesthetics: Journal of the Sydney Society of Literature and Aesthetics* 14, no. 1 (2003): 136–147; 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "The Poetics of Exile: Love and Death in Tongan Poetry," in *Before Pangaea: New Essays in Transcultural Aesthetics Presented in Honour of Professor Grazia Marchiand*, edited by E. Benitez, Special Issue, *Literature and Aesthetics: Journal of the Sydney Society of Literature and Aesthetics* 15, 1 (2005): 136–147; 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "Comedy and Tragedy in Myths, Poems and Proverbs: *Tā-Vā* Time-Space Art and Literary Criticism," in *Tonga: Land, Sea and People*, 140–166; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "*Sino, 'Ilo, Moe Ongo*"; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "Tongan *Hoa*."

20. See Ka'ili, "*Tāvani*: Intertwining *Tā and Vā* in Tongan Reality and Philology"; Ka'ili, *Marking Indigeneity: The Tongan Art of Sociospatial Relations*; Māhina, "The Transcendence of the Finite, in Tragedy and *Lakalaka*; Janet Anderson, Graham Cullum, and Kimon Lycos (eds.), *Art & Reality: John Anderson on Literature and Aesthetics* (Hale & Iremonger, 1982); John Anderson, *Space, Time and the Categories: Lectures on Metaphysics 1949–50* (University of Sydney Press, 2007); Harvey, "Between Space and Time."

21. Whereas architecture deals with *tā-vā* (time-space) and *fuo-uho* (form-content), engineering focuses on *ivi* (energy/force), as inseparable ontological entities, both on the abstract and concrete levels; see Sēmisi F. Potauaine (Tavakefai'ana), "Tectonic of the Fale: Four-Dimensional, Three-Divisional" (MArch thesis, University of Auckland, 2011); Sēmisi Fetokai Kuliha'apai Moahehengi`'ovava'ulahi Potauaine (Tavakefai'ana) and 'Ō. Māhina (Hūfanga-He-Ako-Moe-Lotu), "Oceanic Architectural Routes: The Photographic Archive of Mike Austin Curated by Albert Refiti," *Interstices: Journal of Architecture and Related Arts* 22 (2022): 95–100; Sione To'a Moa, "Langi Royal Tombs: The Beginning of Tu'i Tonga Architecture" (MArch thesis, University of Auckland, 2011); Mōsese. Lisiate Havili Fifita, "Kava at the Intersection of the Fale and Vaka" (MArch(Prof) thesis, University of Auckland, 2016); Walter S. T. Holakeituai, "Ā-tā: It's Not What You Say, It's Where You Sit" (MArch(Prof) thesis, Unitec Institute of Technology, Auckland, 2019); Tēvita Fuataimi Mālohi Vikilani, "Tā ki tahi tā ki 'uta = The One Who Can Perform in Both Land and Ocean is a Well Rounded Person. A Tongan Proverb" (MArch(Prof) thesis, Unitec Institute of Technology, Auckland, 2021); and lastly see Andy J. Anderson, "Tonga: Apt

Housing" (BA thesis, Architecture, University of Auckland, 1983); Kennith Frampton, *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (Harvard University Press, 1995); Giedion, *Space, Time and Architecture*. Also see *tokelaufeletoa kupesi* geometric design as an abstraction of the internal architectural and engineering structures of the most famous early nineteenth-century fortress of Feletoa in the middle northern groups of Vava'u.

22. The Tongan *kupesi* (geometric design) is the equivalent of the scientific DNA—where the former is read *mei-tu'a-ki-loto* (from-outside-in) and the latter *mei-loto-ki-tu'a* (from-inside-out)—*heliaki* metaphorically considered as *toto* (blood)—by way of *hohoko* (genealogy), defined as physio-bodily, psycho-emotional, socio-cultural *fakafelavai* (intersection) (or *fakahoko* [connection] and *fakamāvae* [separation]) through *fakafanau* (procreation)—is read mainly through or on the *mata* (facial features); *fānau* (children) are collectively though metaphorically referred as *mata* (eyes), i.e., *kupesi* (facial features) by virtue of creation and procreation.

23. See Potauaine, "Tectonic of the Fale"; Moa, "Langi Royal Tombs."

24. The Tongan *kupesi* (geometric design) is the equivalent of the scientific DNA—where the former is read *mei-tu'a-ki-loto* (from-outside-in) and the latter *mei-loto-ki-tu'a* (from-inside-out)—*heliaki* metaphorically considered as *toto* (blood)—by way of *hohoko* (genealogy), defined as physio-bodily, psycho-emotional, socio-cultural *fakafelavai* (intersection) (or *fakahoko* [connection] and *fakamāvae* [separation]) through *fakafanau* (procreation)—is read mainly through or on the *mata* (facial features); *fānau* (children) are collectively though metaphorically referred as *mata* (eyes), i.e., *kupesi* (facial features) by virtue of creation and procreation.

25. See 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "Art as *Tā-Vā*, 'Time-Space' Transformation," in *Researching the Pacific and Indigenous Peoples: Issues and Perspectives*, edited by Tupeni Baba, "Ōkusitino Māhina, Nuhisiva Williams, and Unaisi Nabobo-Baba (Centre for Pacific Studies, University of Auckland, 2004), 86–93: 'Ō Māhina (Hūfanga-He-Ako-Moe-Lotu), "*Tā, Vā*, and Moana: Temporality, Spatiality, and Indigeneity," Special Issue, *Pacific Studies* 33, no. 2–3 (2010): 168–202; 'Ōkusitino. Māhina (Hūfanga-He-Ako-Moe-Lotu), "Time, Space, and Culture: A New *Tā-Vā* Theory of *Moana* Anthropology," Special Issue, *Pacific Studies* 40, 1–2 (2017a): 105–132; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "*Sino, 'Ilo, Moe* Ongo"; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "Tongan *Hoa*"; Anderson, "Tonga: Apt Housing"; Harvey, "Between Space and Time"; Mulgan, Enright, Cris, Ka'ili et al., "Charting Just Futures."

26. That is, *tā-vā* (temporality-spatiality), *fuo-uho* (formal-substantial) or *tafa'akifā* (four-sided-dimensionality, i.e., fuo (form) i.e., *tā* (time), and *ma'olunga/loloto* (height/depth), *loloa* (length) and *maokupu/fālahi* (breadth/width), i.e., *vā* (space).

27. Of all three, *'ilo* (knowledge) (and *poto* [skills]) as reality-led are primary while *fonua/kalatua* (culture) and *tala/lea* (language) as society-based or merely as *vaka* (vessels) are secondary. See Māhina, "From *Vale* (Ignorance) to *'Ilo* (Knowledge) to *Poto* (Skill)"; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "*Sino, 'Ilo, Moe Ongo* l"; Potauaine, "Tectonic of the Fale"; Māhina, "The Tongan Traditional History Tala-ē-Fonua"; Māhina, "*Taha he Kehe*—Unity in Diversity."

28. That is, *fuo* (form), *mā'olunga/loloto* (height/depth), *loloa* (length), and *maokupu/fālahi* (breadth/width), with *fuo* (form) as *tā* (temporal), i.e., *fuo* (formal) while *mā'olunga/loloto* (height/depth), *loloa* (length), and *maokupu/fālahi* (breadth/width) are *vā* (spatial), i.e., *uho* (substantial). See Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "*Sino, 'Ilo, Moe Ongo*"; Potauaine, "Tectonic of the Fale"; John Anderson, *Studies in Empirical Philosophy* (Angus and Robertson, 1962); Anderson, *Space, Time and the Categories*.

29. See 'Alatini and Māhina, *Fonu 'Iloa ko Sangone: Sangone the Legendary Turtle* (Kula-'Uli Publishing (NZ), 2009); Hikule'o F. M. Māhina and Mele H. M. 'Alatini, *Ko e Tupu'anga 'o e 'Akau koe Kava mo e Tō: The Origin of the Kava and Sugarcane Plant*s (Kula-'Uli Publishing (NZ), 2009a): Hikule`o F. M. Māhina and Mele H. M. 'Alatini, *Kalia Lahi Koe Lomipeau: Lomipeau the Giant Double-Hulled Canoe* (Kula-'Uli Publishing (NZ), 2009b).

30. See Fifita, *Kava at the Intersection of the Fale and Vaka*; Sēmisi F, Potauaine (Tavakefai'ana), Bruce S. T. Moa, Sione L. Vaka, and 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "*Loto, Tu'a, moe Fale:* Inside, Outside, and House" and "*Vaka, Fale, moe Kava*: Boat, House, and Kava—Mana Structures, Mana Spaces," in *Pacific Studies* 44, no. 1–2 (2021a): 163–187; Walter S. T. Holakeituai, "Ā-tā: It's Not What You Say, It's Where You Sit"; Han Byul Seol, "State of Nirvana: A Spatio-Temporal Condition" (MArch (Prof) thesis, University of Auckland, 2015); Vikilani, "*Tā ki tahi tā ki 'uta*."

31. See Gerd Masserlink and. Roland Gehrels, *Coastal Environment and Global Change* (John Wiley & Sons, 2014); Holakeituai, "Ā-tā: It's Not What You Say, It's Where You Sit"; Potauaine, Moa, Vaka, and Māhina, "*Loto, Tu'a, moe Fale*: Inside, Outside and House"; Potauaine, Moa, Vaka, and Māhina, "*Vaka, Fale, moe Kava*: Boat, House, and Kava."

32. From a Tonga *tāvāist* philosophy, *ivi* (energy) is classified into *ivi kula* (red energy) and *ivi 'uli* (black energy), as in *peau kula* (red waves) (also taken as *peau/ngalu tangata* or *tāmate* [male or killer waves]), Tongan for the scientific tidal and seismic sea waves and Japanese tsunami harbour waves. The *kula* (red) and *'uli* (black) colours are evident in all the three genres, e.g., the use of *vela* (hot) as red and *momoko* (cold) as black in the performance arts of *faiva ta'anga* (poetry), *faiva hiva* (music), and *faiva haka* (dance); *kafa kula* (red *kafa-sinnet*) and *kafa 'uli* (black *kafa-sinnet*), in the material art of *tufunga lalava* (house-boat-lashing); and *koka kula* (red *koka* dye) and *tongo 'uli* (black *tongo*

dye), in the fine art of *koka'anga* (bark-cloth-making). See Sēmisi F Potauaine (Tavakefai'ana) and 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), "*Kula and 'Uli*: Red and Black in Tongan Thinking and Practice," in *Tonga: Land, Sea and People*, edited by Tangikina Moimoi-Steen and Nancy L. Drescher (Tonga: Tonga Research Association, 2011),, 194–216.

33. Of great interest is the eye-hole-like rolled mat called *tatau* (divider) is rolled out, standing on the length of its edge around the *takafalu* (back) of Tu'i Tonga Pau—thereby temporally-spatially marking his sacred person from the rest of his common subjects—where the inner side, including the king, is named *loto tatau* (inside of the divider), and the outer side, including his common subjects, is labelled *tu'a tatau* (outside of the divider) as a symbolic marker of rank and status.

34. See Fifita, "Kava at the Intersection of the Fale and Vaka"; Potauaine, Moa, Vaka, and Māhina, "*Loto, Tu'a, moe Fale*: Inside, Outside, and House" and "*Vaka, Fale, moe Kava*: Boat, House, and Kava"; Potauaine, "Tectonic of the Fale."

35. Anderson, "Tonga: Apt Housing"; Frampton, "Studies in Tectonic Culture"; Giedion, *Space, Time and Architecture*; Charmaine M. 'Ilaiū, "Persistence of the Fale Tonga" (MArch thesis, University of Auckland, 2007); Tōmui Kaloni, "The architecture of Tonga," in *Cross Section: NZIA News* (2005): 11–15; Albert Refiti (Lealiʻifano), "The Forked Centre: Duality and Privacy in Polynesian Spaces and Architecture," Special Issue, *AlterNative: An International Journal of Indigenous Peoples* 4, no. 1 (2008): 97–106; Solomone Tuita, "Towards a Tongan Architecture. A Commentary From a Tongan Perspective" (BA thesis, University of Auckland, 1988); Micah Van der Ryn (Fepulea'i), "The Difference Walls Make': Cultural Dynamics and Implications in Samoan Architectural Traditions and Socio-Spatial Practices" (PhD thesis, University of Auckland, 2012).

36. See Masserlink and Gehrels, *Coastal Environment and Global Change*; Potauaine, Moa, Vaka, and Māhina, "*Loto, Tu'a, moe Fale*: Inside, Outside, and House" and "*Vaka, Fale, moe Kava*: Boat, House, and Kava"; Potauaine, "Tectonic of the Fale."

37. See Potauaine and Māhina, "Oceanic Architectural Routes"; Moa, "Langi Royal Tombs"; and Potauaine, "Tectonic of the Fale."

38. J. C. Beaglehole (ed.), *The Journals of Captain James Cook: Edited from Original Manuscripts* (Cambridge University Press, 1969).

39. See Helu, "Critical Essays: Cultural Perspectives from the South Seas," *Journal of Pacific History* (1999); Ka'ili, "The Ancestors of the Arts"; Māhina, "The Tongan Traditional History Tala-ē-Fonua."

40. See the *kupesi* (geometric designs) *fata-o-Tu'i-Tonga* (pall-bearer-of-Tu'i-Tonga) as the abstractions of the *'otulangi* (royal tombs) and the *falefata/falefataki* (house-of-fata), like the *fata `ufi* yam pyramids and Boat-of-Hina, are derivatives of the *kupesi* (geometric design) *veimau* (checkerboard or ordered-water-flow) and more.

41. That is, a constant motion from *loto-ki-tu'a*, *tu'a-ki-loto* (inside-out, outside-in), *lalo-ki-'olunga*, *'olunga-ki-lalo* (bottom-up, top-down). See Moa, "Langi Royal Tombs"; Potauaine, "Tectonic of the Fale"; Lear, Māhina-Tuai, Vaka, Ka'ili, and Māhina, "*Sino, 'Ilo, Moe Ongo*."

42. That is, by modelling the ways of society, i.e., epistemology, on the ways of reality, i.e., ontology—as in the *tāvāist* philosophical tenet, that time and space, like form and content, are socially organised in plural, temporal-spatial, formal-substantial, collectivistic, holistic, and linear ways (as opposed to their organisation in singular, techno-teleological, individualistic, atomistic, and linear ways in the West).

43. The performance art of poetry makes affective and effective use of the artistic and literary of *heliaki* as "metaphorically saying one thing but historically meaning another," as in the utilising of knowledge of the fishing birds (*kupu/veesi* verse 2, *kohi/laini* lines 5 and 6) and celestial stars (*kupu/veesi* verse 3, *kohi/laini* lines 1 and 2) as natural entities for voyaging and navigation as disciplinary and social activities.

44. See Māhina, Māhina-Tuai, Ka'ili, and Potauaine, "*Koe pō hiva tu'ufonua Faka Tonga II*"; K. U. Māhina-Tuai, M. H. M. 'Alatini, and 'Ōkusitino Māhina (Hūfanga-He-Ako-Moe-Lotu), *Koe Pō Hiva Tu'ufonua Faka Tonga: A Night of Tongan Classical Music* (Kula-'Uli Publishing (NZ), 2022); 'Ōkusitino Māhina, (Hūfanga-He-Ako-Moe-Lotu), Kolokesa Uafā Māhina-Tuai, and Sēmisi. Fetokai Kuliha'apai Moahehengi'ovava'ulahi Potauaine (Tavakefai'ana), "Nanamu as Tongan Sense of Smelling: A *Tāvāist* Philosophical Critique," *Garland Magazine: The Stories Behind What We Make* (1 September 2023): 1–34.

45. By dividing the Tongan *māmani* universe into four parts, viz., *hahake* (east), *hihifo* (west), *tokelau* or '*olunga* (north or up-above) and *tonga* or *lalo* (south or down-under), there exists six Tongan *toka'anga matangi* (wind directions), viz., *matangi tonga* (south winds); *matangi tonga-hahake* (southeast winds); *matangi tonga-hihifo* (southwest winds); *matangi tokelau* (north winds); *matangi tokelau-hahake* (northeast winds); *matangi tokelau-hihifo* (northwest winds). There seems not to be *matangi hahake* (east winds) nor *matangi hihifo* (west winds).oat-building)—themselves understood to intersect architecture and engineering,[2] in addition to other disciplinary and social activities.[3] Combined, these natural entities and social activities comprise Tongan cosmogonical and cosmological accounts, all of which begin with the emergence of *fonua* (i.e., land and sea). The sea movement and land settlement of both the earthly people and godly build on this emergence further permitting the development and refinement of their heroic deeds. Borne from these earthly and godly activities, land-architecture and sea-architecture support other social and religious spheres, as in the land-based and sea-led (and sky-driven) activity of *faiva faifolau*, where, for instance, land-sea(-sky) travelling is portrayed through performance art.[4]

KATE CHURCH

Convergence, transition, and variability in a co-produced waterscape

Moreton Bay is not (just) a bay. Framed in Western cartographic and scientific terms as a partially enclosed coastal waterbody, it is often reduced to a bounded geographic feature—a discrete object of management, development, or ecological concern. This paper resists such reductive framings. Instead, it argues that Moreton Bay—known as Quandamooka to Aboriginal people, its traditional custodians—is a dynamic and co-produced waterscape: a relational space shaped by the entanglement of cultural histories, ecological processes, hydrological systems, and colonial infrastructures. As such, the bay must be understood not as a passive backdrop for human action, but as an active and evolving socio-natural formation. This reframing invites a reconsideration of how landscape architects, designers, and researchers engage with watery places, attending not only to their ecological fragility or utility, but also to their ongoing, interdependent, and evolving cultural-hydrologies.

As the sole author of this paper, I write from the position of a non-Indigenous landscape architecture scholar and practitioner working on unceded Quandamooka Country. My engagement with Moreton Bay is informed by my disciplinary training, but equally by an evolving responsibility to attune to Country as a living, sovereign presence. Living aboard a boat on Moreton Bay's waters over several years has shaped an embodied understanding of its shifting spatio-temporalities and materialities—informing how I relate to the bay as a site of entangled knowledge and practice.

The methodology underpinning this research emerges from that relational positioning. It adopts a field-based and critically reflexive approach that weaves together lived experience, pedagogy, and research. Residing on the bay, teaching its ecological processes to undergraduate students, and drawing on scientific literature, design theory, and archival histories, the method cultivates a situated knowledge of Moreton Bay as a dynamic landscape. While I acknowledge the limits of my perspective in comprehending the full cultural and spiritual significance of this place, this work is offered in the spirit of attentive, respectful, and responsive engagement with water, people, and Country.

In the context of landscape architecture, "waterscape" offers a critical lens through which to reimagine coastal and aquatic environments, such as Moreton

Bay. Both "landscape" and "waterscape" share the suffix "-scape," which confers the expression of human activity on the material conditions of the environment.[1] Traditionally privileging terrestrial perspectives, "landscape" often overlooks the agentive and dynamic qualities of water. In contrast, "waterscape" reorients attention to watery environments as fluid systems shaped by entangled human and nonhuman actors, ecological processes, cultural practices, and infrastructural interventions. This conceptual shift invites more situated, responsive design approaches that attend to the dynamism, precarity, and potentiality of hydrological systems. As a waterscape, Moreton Bay functions as a site through which the interconnected logics of hydrological transformation, colonial legacy, capitalist extraction, and infrastructural intensification are rendered visible offering a rich example of just such a co-constituted "-scape."

Conceptualising waterscape

As a concept, waterscape carries varied meanings across disparate disciplines. In landscape architecture, it often refers to designed water features—fountains, reflective pools, water play areas, or constructed wetlands—that shape spatial experience, regulate microclimate, and invite sensory engagement. These waterscapes foreground water not only as infrastructure or ecology, but as a malleable and expressive design medium.

In this paper, however, waterscape is understood through a different lens: as a dynamic socio-natural formation in which water is both materially and symbolically produced through the entanglement of ecological processes, political structures, cultural imaginaries, and infrastructural systems. Rather than treating water as a neutral resource or "natural" element, the waterscape perspective foregrounds its inherently fluid, hybrid character emerging through the ongoing and contested co-constitution of natural and social domains.

This understanding of waterscape draws from contributions by new materialists, political ecologists, and environmental historians, who have foregrounded the need to rethink water beyond narrow disciplinary or functionalist framings.[2] In resisting closure by dominant epistemologies—particularly those rooted in hydrological science—the concept creates space for alternative ways of knowing and relating to water. Research into waterscapes has therefore provided a critical anchor for reshaping debates around water, highlighting its spatial, material, cultural, and political dimensions as interconnected and mutually constitutive.

Erik Swyngedouw's seminal work formulates waterscapes as inherently fluid, positioning them as resisting stable categorisation.[3] He argues that water cannot be fully understood through the deterministic logics of natural science, nor can it be reduced to a purely social construct. Instead, it exists in a constant state of transformation—flowing across physical geographies while simultaneously moving through cultural imaginaries and social systems. Rooted in political ecology, this perspective recognises that nature and society do not exist as separate spheres. Rather, they are intertwined in the production of hybrid socio-natures.[4] Swyngedouw's work in framing the Spanish waterscape exemplifies this through examining the intricate ways in which they are "fused . . . inseparable," producing water as a "restless hybrid."[5]

This conceptualisation of Moreton Bay as a waterscape foregrounds the dynamic co-production of socio-natural systems.[6] Here, "co-production" refers to

the entangled processes through which human activities (such as urban development, agriculture, and conservation) and natural forces (like tides, sediment flows, and ecological succession) collectively shape the bay. Crucially, these entanglements are not symmetrical in scale, intensity, or intentionality. Colonial infrastructure and capitalist extraction do not merely entangle with ecological-cultural rhythms; they often overwhelm, displace, or redirect them. Moreton Bay's socio-natural formation emerges through uneven and historically charged interactions between human and nonhuman forces. This contested co-production highlights the asymmetries embedded within these multi-scalar interrelationships, challenging reductive binaries such as resilience versus degradation. For landscape architecture, this perspective demands a rethinking of the -scape suffix—not simply as a sign of human intervention, but as a marker of ongoing, uneven, and contested co-production across multiple scales.

Moreton Bay exemplifies these complex, entangled dynamics across catchment, regional, and local scales. As a waterscape, it has been reshaped by human intervention from Indigenous stewardship to post-colonial damming and dredging—all of which have altered the bay's chemistry, ecological function, and spatial character. At the same time, the bay's hydrodynamic forces—sediment flows, tidal rhythm, and currents—have conditioned patterns of settlement, land use, cultural practice, and environmental governance. These reciprocal processes foreground the co-production of the -scape, where human agency and ecological systems are mutually (though not equally nor benignly) constitutive.

The following analysis focuses on three aquatic zones within the bay, tracing how natural variability and human activity co-produce its distinctive spatial, cultural, and ecological contours. These zones—marginal reefs, intertidal edges, and a river mouth—form a transect through which the waterscape of Moreton Bay can be read. Each reveals how resilience and variability are emergent from ongoing and co-constituted processes.

***Convergence*: The waters of Moreton Bay** draws from landscape architectural, environmental humanities, and marine science perspectives to examine how convergence—of oceanic flows, riverine loads, and anthropogenic inputs—produces a uniquely dynamic waterscape. The bay's converging temperate and tropical waters offers a valuable case for understanding how "natural stressors" and human interventions can unintentionally or deliberately support adaptive processes.

***Transition*: Intertidal edges and creeping limits** positions the shoreline as a socio-ecological threshold—where sediment flows, tidal rhythms, and engineered structures interact to constantly redraw the land-sea boundary. Changing sea levels, infrastructural intervention, and the phenomenon of "mangrove creep" reveal uneven shifts in adaptive responses of this vulnerable ecosystem.

***Variability and control*: River mouth as a manufactured interface** examines the interplay of freshwater and tidal forces at the river mouth and the extent to which it is mediated by human engineering. Damming, dredging, and flood control have rendered this liminal zone a "made" condition, where the variability of subtropical hydrology meets the force of urban design.

An evolving entanglement: Subtropical flux, deep-time adaptation, and cultural reshaping

As a catchment, Moreton Bay, located in the Australian subtropics, occupies one of the most hydrologically volatile regions on the continent.[7] Defined by pronounced climatic variability—manifest in unpredictable rainfall, fluctuating river flows, and shifts in humidity—this heightened dynamism continues to exert a formative influence on coastal morphology, settlement patterns, and hydrological systems. Large-scale climatic oscillations such as the El Niño Southern Oscillation and the Pacific Decadal Oscillation also modulate these environmental conditions,[8] amplifying the inherent unpredictability and dynamism of the subtropical regime.

This dynamism is evident in the ancient history of the bay's catchment formation, which occurred approximately 6,000 years ago when rising sea levels inundated the coastal lowlands,[9] drowning an extensive river valley. Upstream, the original river still flows—its meandering, serpentine course is a signal of its age (and its ongoing propensity to flood). Now called Brisbane River, it flows through a shallow bedrock gorge,[10] that has been shaped and reshaped over deep time. Just beyond the river mouth, the bay's boundaries have also continued to shift and evolve. Historical sea-level rise and changes in the pattern of riverine input over a geological time scale, displaced Indigenous groups who had inhabited the fertile coastal floodplains—now the seafloor of Moreton Bay—for at least 25,000 years, but who subsequently had to move further inland.[11]

These forces collectively generate hydrological rhythms that are neither stable nor linear, shaping natural systems that are broadly attuned to unpredictable-but-recurring environmental pressures. Emerging from the intrinsic volatility of the subtropical climate, these dynamic natural stressors have long influenced the adaptive trajectories of native species and ecosystems.[12] These stressors are understood not as ecological disturbances per se, but as evolutionary forces.[13] Thus, the bay is situated within a long-term condition of natural stress, where ongoing climatic variability forms the ecological baseline.

Alongside this ecological dynamism, the bay has been shaped over millennia by sustained Indigenous management practices, particularly by Quandamooka clan groups. These practices worked in concert with the region's climatic and hydrological variability, forming an enduring socio-natural system. Far from passive occupants of a "primeval wilderness," the Quandamooka actively modified the catchment and waterways through techniques such as: cultural burning to manage vegetation and reduce fuel loads; the construction of stone fish traps and tidal weirs to regulate and harvest aquatic species; and the strategic location of camps and freshwater wells attuned to seasonal availability and tidal flows.[14] These interventions were deeply relational—embedded within cultural protocols, seasonal calendars, and knowledge systems that recognised and respected natural variability as part of life on Country.[15]

This form of landscape modification contrasts starkly with the extractive and industrial transformations that followed non-Indigenous colonisation in the 1820s. Whereas Indigenous practices operated through a logic of reciprocity and responsiveness to ecological rhythms, colonial and later industrial systems imposed fixed infrastructures—ports, levees, and dredged channels—that sought to control or override natural processes. These interventions restructured the bay's

hydrology, disrupted sediment transport, and degraded ecological functions, generating cumulative and often irreversible impacts.

Recognising these differing modes of co-production underscores that not all landscape modification is equal in intent or effect. Indigenous shaping of this waterscape was—and continues to be—adaptive, small-scale, and deeply embedded in cultural responsibility; colonial-industrial interventions have been large-scale, extractive, and driven by economic imperatives. For landscape architecture and environmental governance today, this comparison foregrounds the importance of engaging with Indigenous knowledge not as heritage, but as an ongoing and vital mode of environmental stewardship.

Understanding waterscape as an active formation means recognising that these entangled socio-natural forces shaping the bay do not create a fixed or harmonious state, but a shifting condition marked by contestation and change. In Moreton Bay, the entanglement of human and nonhuman processes does not guarantee stability or balance; rather, it generates complex feedback loops, adaptive pressures, and emergent vulnerabilities. Framing these complex reciprocities in this way moves beyond metaphors of mutual shaping to consider how power, history, and intention actively structure these interrelationships.

In this context, Moreton Bay emerges as inherently hybridised: a waterscape simultaneously engineered and ecological, shaped by the interaction of human interventions and nonhuman forces. This hybridity is not simply the overlay of culture upon nature, but rather a system in which built and biophysical processes are mutually constitutive. It is through this entangled and ongoing negotiation that the bay may be understood as a socio-natural waterscape—a term that underscores the inseparability of social and ecological dynamics in shaping form, function, and resilience. These are not merely environmental impacts; they are active, cultural, historical, and spatial processes through which the waterscape continues to be made and remade.

The following sections examine how socio-natural hybridity manifests across three interconnected aquatic zones of Moreton Bay. Through the lenses of convergence, transition, and variability, each zone reveals spatial and ecological configurations shaped by environmental processes and human agency—underscoring the imperative to rethink dominant design paradigms in response to the complex dynamics of this evolving waterscape.

Convergence: The waters of Moreton Bay

Shallow, semi-enclosed and protected by a string of massive sand islands, Moreton Bay spans over 21,000 km^2. Its geographic typology is defined by the partial enclosure of bay water alongside its direct connection to a larger body of water such as an ocean.[16] A bay's underlying hydrology is thereby deeply relational: its character and water quality shaped by oceanic, riverine, groundwater, and other land-based percolation processes occurring across its catchment.

Hydrologically, a characteristic convergence occurs in most bays—where freshwater from river systems meets and mingles with saltwater from the sea. Moreton Bay receives the discharge of multiple rivers including the highly urbanised Brisbane River. The bay's salinity, water clarity, and chemical composition are governed not only by tidal flows and oceanic currents, but also by its

semi-enclosed morphology, which renders it a repository for concentrations of urban discharges and terrestrial flows.

The second type of convergence relates to the bay's subtropical location whereby the tropical water from the north flows towards the southern regions of the continent, carried by the East Australian Current. This water is warmer than the surrounding ocean and regular tidal exchange in the bay sees warm tropical waters mix with colder temperate waters to produce a distinctive aquatic convergence zone—a dynamic marine entanglement that emerges from this confluence of climate, currents, and urban systems.

These convergences produce a uniquely hybrid hydrology emerging from this underlying natural variability which is further amplified by human activity and urban systems. An example of this occurs at various points along the foreshore where industrial recycled water management sees treated wastewater discharged into the bay. This water is typically warmer than the surrounding ocean water, contributing to localised temperature increases.[17] Additionally climate change-induced intensification and increased frequency of storm events result in significant volumes of urban stormwater runoff piped and rapidly discharged into the bay.[18] This, in conjunction with the documented post-colonial increases in riverine sediment loads, results in newly hybridised hydrologic confluences.[19] Collectively, these influxes of runoff and treated water contribute to specific convergence conditions where warmer water temperatures and increased nutrient inputs interact in complex and sometimes unpredictable ways.

Across multiple scales, these convergence conditions are evidenced in the complex and novel specificities of the bay's high-latitude reef ecologies and how we understand the relationship between adaptation and resilience. The continuity of marine assemblages from the Holocene to the present suggests that ecological marginality in parts of the bay is not a recent condition, but a long-standing feature of its dynamic history.[20] Yet, rather than operating as a model of episodic adaptation, these marginal assemblages offer a situated example of continuous dynamic change, where reef communities adapt variably to persistent and episodic environmental stressors without reaching long-term equilibrium.[21] This reflects a broader shift in ecological thought: contemporary ecological discourse increasingly emphasises dynamic adaptation and system-level resilience, departing from earlier paradigms that presumed ecosystems tend toward a stable, equilibrium state.[22] While biodiversity fluctuates in these marginal ecosystems, it does so within a relatively constrained range, and resilience in this context appears to derive from functional persistence under marginal conditions, rather than from increasing taxonomic diversity. Additionally, though biodiversity is generally considered a foundation of ecological resilience, in certain conditions of existing low biodiversity, resilience can persist through traits and responses such as functional redundancy, response diversity, or dominance of highly adaptable species.[23] Thus, the normative assumption that increased diversity equates to increased resilience may not apply in naturally variable, marginal systems—where endurance and adaptability under stress are key ecological strategies.[24]

For corals and other sensitive marine organisms, Moreton Bay's variable hydrology—shaped by long-standing subtropical volatility and exacerbated by anthropogenic warming—has selected for stress-tolerant species. Recent studies suggest that coral communities in high-latitude convergence zones like Moreton

Bay may persist under conditions of temperature fluctuation and acidification.[25] However, this persistence reflects tolerance rather than benefit; these reefs remain highly vulnerable. The bay's mixed environment may continue to support certain coral taxa and temperate species, particularly near oceanic inlets, but only if anthropogenic stressors are actively reduced. In such conditions, the normative binary of resilience versus degradation becomes increasingly unstable. The bay's waterscape invites a rethinking of ecological agency that recognises how systems adapt, reorganise, or persist through disturbance, rather than returning to stable states. Understanding this relational dynamism is critical for design approaches which too often rely on fixed baselines and restoration ideals.

The reef system in Moreton Bay also contains different approaches and models of artificial reefs composed of scuttled ships, engineered substrates, and other built structures which now coexist with natural reef systems, providing habitat complexity and refugia for diverse temperate and tropical marine species. The Living Shorelines oyster project in Moreton Bay contributes to this hybrid reef system and exemplifies a different restorative paradigm. In response to the functional extinction of shellfish reefs in most Australian estuarine systems,[26] the Robust Oyster Basket (ROB) was developed. Rather than aiming to return ecosystems to a pre-disturbance state, this design response exemplifies a logic of adaptive resilience. Strategically deployed in Moreton Bay, the ROBs leverage material cycles (recycled oyster shells), species behaviour (the clumping tendency of rock oysters), and biodegradable scaffolding (steel mesh) to facilitate the gradual re-formation of reef habitats. These structures are not imposed restorations but designed catalysts—interventions that recognise and amplify the agency of more-than-human actors in shaping habitat over time.

The ROB exemplifies relational waterscape infrastructure: a modular, degradable form that transforms over time through interaction with tides, sediment, and multispecies occupation. As the mesh corrodes and the oysters grow, the structure transitions from human-made scaffold to ecological substrate. This approach reframes resilience as a temporally open, materially entangled process, in which design seeds ecological possibility rather than enforcing control. In Moreton Bay's shifting aquatic terrain—where sedimentation, thermal stress, and urban runoff shape ecologically uncertain futures—the ROB demonstrates how design logics rooted in co-evolution and ecological symbiosis can support more-than-human flourishing within damaged environments.

In this light, adaptation is not a passive biological response, but an ongoing process that gives rise to hybridised ecological conditions. The waterscape of Moreton Bay does not neatly conform to dominant narratives of either degradation or resilience. Rather, it complicates this binary by revealing how ecological systems can persist, recalibrate, or even reorganise under stress, without necessarily returning to a prior or optimal state.

While some indicators—such as coral persistence in marginal zones—may suggest adaptive capacity, these must be read alongside profound and ongoing ecological disruptions, including sedimentation, warming, and nutrient loading. Resilience, in this context, does not signal recovery or stability, but a form of conditional persistence shaped by constant negotiation with disturbance. The bay is not resilient despite human impact, nor wholly degraded because of it. It is both—and more—a socio-natural formation where multispecies adaptation occurs amid ongoing transformation, uncertainty, and constraint.

For design practice, this recognition matters. Too often, ecological resilience is operationalised through metrics that seek to restore systems to a previous condition or maintain them in a stable state. Yet in places like Moreton Bay, where disturbance is ongoing and embedded, design must engage with resilience as an open-ended, negotiated process, not a destination or idealised equilibrium. This requires moving beyond reductive templates of restoration or control and embracing strategies that work with volatility, acknowledge layered histories, and support multispecies cohabitation.

In this context, waterscape becomes not only a descriptor of spatial dynamics, but a conceptual tool for rethinking landscape intervention. It foregrounds relationality, flux, and co-production as central design logics. Designing for such a waterscape means cultivating responsiveness over mastery, allowing for ecological improvisation, and attending to the overlapping agencies—tidal, climatic, cultural—that shape coastal conditions. Rather than treating resilience and degradation as opposites, this approach sees them as co-present forces that must be held in tension. It is in designing with, rather than against, this tension that more ethical, situated, and enduring practices might emerge.

Transition: Intertidal edges and creeping limits

Moreton Bay's intertidal edge is defined by a long, shallow incline that is cyclically submerged and exposed by the tides. At low tide, the water recedes over 100 metres in places, revealing saltmarshes, rock shelves, and mudflats—alongside stormwater pipes, seawalls, concrete jetties, groynes, and piers. These built interventions contribute to the shaping of the shoreline and mudflats through creating artificial deposition zones. This intertidal zone is not only shaped by tidal rhythms but also by erosion, sedimentation, and wind—processes increasingly entangled with anthropogenic pressures. Urban development and engineered interventions choreograph water flows, often intensifying or interrupting natural cycles.

The bay's designed esplanades and foreshore public spaces, often assumed to sit beyond tidal influence, are occasionally inundated during king tides and onshore winds, leaving behind seagrass debris and saltwater residue. This challenges conventional urban delineations of land and sea and situates the intertidal edge as a hybrid and contested space; a liminal zone where foreshore infrastructures and ecological systems coexist in uneasy proximity.

Alongside their vulnerability, intertidal ecosystems have remarkable adaptive capacities. For example, many keystone plant species tolerate alternating periods of inundation and desiccation, thriving in dynamic, saturated environments. These naturally stressed systems are also under increasing pressure from urbanisation whereby nutrient imbalances, pollution, habitat fragmentation, and sedimentation loads all contribute to the ecological character of the shoreline.

Paradoxically, these changing coastal conditions and the impacts of increased sedimentation are creating opportunities for certain species to thrive, inadvertently privileging some over others.[27] Mangrove forests, for instance—key constituents of the intertidal edge—are expanding inland in response to rising sea levels and altered sediment regimes.[28] This process, dubbed "mangrove creep,"[29] reveals the capacity of some ecosystems to respond to changing conditions with resilience and agency, exemplifying the dual nature of human-environment entanglement: whereby rapid, multi-scalar shifts in

climate, sea level, and development disrupt ecological balance, they can also provoke adaptive responses in nonhuman systems.

Mangroves, with their aerial roots and salt tolerance, stabilise shorelines, filter pollutants, and provide critical habitats. Their landward expansion into saltmarshes and upland zones reflects not only environmental stress but also ecological agency—a reoccupation of space facilitated by anthropogenic transformation. The reshaping of Moreton Bay's intertidal edge—marked by muddying seafloors, shifting vegetative boundaries, and hardening shoreline infrastructure—signals a broader shift: one in which natural systems are not merely reacting to human change, but actively adapting, reorganising, and, in some cases, flourishing in unexpected ways.

However, this adaptation comes at a cost. Mangrove and saltmarsh habitats often coexist, and mangrove creep can displace existing saltmarsh habitats[30]—ecosystems that support distinct assemblages of species, including migratory shorebirds, crustaceans, and salt-tolerant vegetation. As saltmarsh areas contract, species reliant on them face habitat loss and potential population decline. Mangrove expansion into new areas may alter the composition of intertidal habitats and reshape the intertidal landscape.[31] Thus, mangrove creep is not simply evidence of ecological thriving but also of ecological reorganisation—where gains for some species coincide with losses for others.

Understanding this dynamic change highlights the complexity of these socio-natural interrelationships. Anthropogenic activity may provoke adaptive ecological shifts, but these shifts are uneven in their impacts. Recognising this allows us to approach intertidal transformations not only as zones of loss or resilience, but as evolving terrains of negotiation between human actions and the differentiated capacities of ecological systems to respond, persist, or transform.

Contemporary design practice plays a critical role in engaging with these complex transitional zones in a manner that goes beyond seeking to control them or create hyper-stable edges but rather creates frameworks that acknowledge the ongoing co-production of this "scape," enabling ecological negotiation, and supporting multi-species habitation over time. The City of Moreton Bay's recent pilot project *Living Coast Plan* exemplifies how contemporary design can engage with socio-natural systems. Rather than imposing fixed boundaries, these interventions work with the continual interplay of tidal flows, sediment movement, and built infrastructure—demonstrating that shoreline resilience emerges not from separation, but from the co-constituted interactions of built and living systems.[32] By integrating mangrove planting, biodegradable materials, and soft engineering techniques, the project reflects a design ethos grounded in reciprocity and an understanding that resilience and adaptation are co-produced through socio-natural relations. These efforts do not seek to halt transition, but to scaffold it—to create space for ecological processes to continue adapting under the pressures of rapid urbanisation and climate change.

In this context, design becomes a means of mediating transition—facilitating negotiation between human and nonhuman agency, between infrastructure and ecological succession. Adaptive strategies such as soft shorelines, amphibious infrastructure, and dynamic zoning offer frameworks for living with uncertainty, rather than seeking to control it. As Moreton Bay's intertidal edges continue to shift, these approaches allow us to reimagine transitional landscapes not as

zones of loss or risk alone, but as shared, evolving spaces—sites of encounter and co-constituted futures.

Variability and control: River mouth as a manufactured interface

The mouth of the Brisbane River is a critical interface between the urbanised catchment and the waters of Moreton Bay. It exemplifies the complex, co-produced conditions of this waterscape—where a dynamic subtropical hydrology is continually shaped and reshaped by anthropogenic activities. For millennia, the river's natural flow regime has been governed by highly variable rainfall patterns. Since colonisation, however, this variability has been increasingly managed through dredging, levees, and flood-control infrastructure. These technocratic efforts seek to control the river's inherent unpredictability but remain embedded within the volatile climatic and hydrological forces of the subtropics. As historian Margaret Cook observes, this altered river mouth and its floodplains represent a space where "the competing interests of the river and humans are most exposed."[33]

Brisbane's hydrology—characterised by cycles of heavy rainfall, frequent flooding, and episodic drought—is central to understanding its contemporary socio-natural condition. Extreme events punctuate the river's history: the catastrophic floods of 1841, 1893, 1974, 2011, and 2022 reveal the ongoing tension between human settlement and a climate marked by high variability.[34] Despite successive investments in flood mitigation, including dams and levees, floods persist, and their impacts intensify due to expanding urban development across the river's floodplains.[35]

These hydrological extremes of interspersed floods and droughts produce cascading effects throughout the catchment. Floodwaters deliver heavy sediment loads and nutrient-rich runoff into the river and bay, reducing water clarity and threatening seagrass meadows reliant on high light penetration for photosynthesis.[36] Conversely, prolonged droughts decrease freshwater flows, heighten salinity, and disrupt sediment dynamics. Reduced flow also allows pollutants and nutrients to accumulate, stressing aquatic ecosystems. These oscillating conditions are emblematic of the variability intrinsic to both subtropical climates and rapidly shifting urban conditions, challenging the adaptive capacities of both human infrastructure and ecological systems.

As previously discussed, subtropical ecosystems have evolved to accommodate many of these fluctuations. Species such as the ancient lungfish illustrate this adaptability in a riverine context—able to breathe through both gills and a lung, they survive in stagnant, oxygen-poor water during floods and persist through dry spells without surface water.[37] Such species embody unique ecological resilience in the face of ongoing and extreme climatic fluctuations.

Even within the broader Australian context, the Brisbane River exhibits a particularly volatile hydrological regime.[38] South-east Queensland's hot, humid summers and erratic rainfall patterns have shaped a river system that blends tropical and temperate fluvial characteristics. Subtropical rivers display seasonal extremes: high sediment yields, large flood ranges, and drought-induced ponding.[39] This hybridity—oscillating between contraction and inundation—has historically defined the Brisbane River, whose geomorphology was formed by dramatic fluctuations in annual rainfall long before colonisation. Despite land

clearing, urban expansion, and significant floods recorded since European settlement, the river's channel morphology has remained strikingly resilient, likely due to its adaptation to its characteristic high-magnitude flood events on decadal timescales.[40]

Prior to extensive dredging, the river alternated between deep waterholes and shallow crossings, reflecting its dynamic fluvial behaviour.[41] Today, though artificially deepened, the river retains a serpentine form, with surrounding topography bearing the imprint of centuries of flooding and sediment deposition. These processes created nutrient-rich floodplains that were desirable to early European settlers who were drawn to the fertility of the estuarine lowlands. In seeking to manage the river's unpredictability, settlers introduced a range of flood mitigation techniques including levees, dams, channelisation, and especially dredging that have profoundly reshaped the lower reaches and mouth of the river.

At the river's mouth, where freshwater meets saltwater, sediment-laden flows slow and deposit their load onto the estuarine floor. Empirical data suggests that sediment transport has increased dramatically—by up to fourteen times[42]—since colonisation. These interventions have altered water quality and disrupted ecological functions, contributing to seagrass decline and harmful algal blooms.[43]

This engineered environment constitutes the manufactured condition of the river mouth and reveals the paradox of control. While intended to safeguard human settlement, such interventions remain vulnerable to the broader climatic forces that continue to define the region. Infrastructure may buffer some effects, but it cannot eliminate the hydrological volatility that defines the Brisbane River. Thus, the mouth of the Brisbane River is not merely a site of water exchange, but a zone of intense and ongoing negotiation between ecological processes and human attempts at control. As a subtropical waterscape, it is shaped by a deeply variable climate and its socio-natural character lies in this very entanglement: a co-constituted condition where control is always provisional, and variability remains the defining force.

In the face of this extreme variability, design—particularly within landscape architecture, architecture, environmental design, and urban planning—often occupies an ambivalent position, caught between the impulse to impose control and the imperative to adapt. Historically, these disciplines have often operated on assumptions of environmental stability, producing spatial solutions aimed at resisting or containing ecological variability through fixed forms, hard infrastructure, and risk-averse planning. In subtropical waterscapes like the Brisbane River and Moreton Bay, however, where climatic volatility and hydrological extremes are endemic, such approaches are increasingly inadequate. These design and planning disciplines are now being challenged to engage with variability not as a problem to be solved, but as a defining condition of place. This shift calls for adaptive, process-oriented, and temporally aware practices that work with flood, drought, sedimentation, and ecological succession rather than against them. In this context, design becomes a medium of negotiation rather than domination—foregrounding flexibility, resilience, and the co-evolution of human and nonhuman systems—and attuned stewards of this dynamic socio-natural environment.

Convergence, transition, variability, and the design of socio-natural futures

According to marine scientists, "little of the Moreton Bay catchment, apart from isolated areas [. . .] remains unaltered,"[44] highlighting the co-produced nature of the bay, where even remote biophysical processes are shaped by human activity. Framing Moreton Bay as a waterscape—a spatial and temporal assemblage shaped by hydrological, ecological, and sociopolitical forces—foregrounds its deeply altered yet dynamically responsive state in the Anthropocene. Understood as a waterscape, Moreton Bay's significance lies in both its layered histories of Indigenous stewardship and colonial restructuring, alongside its "naturally stressed" ecological baseline that has been shaped by long-term climatic variability. This context highlights both ongoing and continual change within this co-constituted socio-natural environment.

The interrelated conditions of convergence, transition, and variability offer useful vantages for framing the complex particularities of Moreton Bay's shifting character of adaptation and habitat transformation. "Convergence" shifts focus from purely hydrological or spatial aspects to highlight evolving thresholds of ecosystem resilience and fragility, that is continually reshaped by underlying hydrothermal variability, biotic adaptations, and infrastructural discharges. These entangled processes in turn create the socio-natural character of Moreton Bay's waters and are made visible in the adaptive behaviours of coral species and other marine life, which respond to complex stressors in ways that signal both vulnerability and resilience. For designers, working in this context demands a paradigm shift—from reactive mitigation to the deliberate co-production of adaptive waterscapes. In this context anthropogenic inputs may be leveraged as deliberate materials for crafting adaptive, more-than-human assemblages.

The phenomenon of "mangrove creep" shows that anthropogenic disturbance can catalyse transitions, fostering complex re-territorialisations in which some species thrive while others recede. The co-produced intertidal edge represents a liminal zone, where socio-natural agency creates a choreography of both loss and resilience, underscoring the need for design frameworks that support transition rather than halt it. Resilience is reframed as an ongoing practice of design-mediated reciprocity, with human and more-than-human actors continually reshaping the waterscape.

The Brisbane River mouth exemplifies hydrological variability, complicating the view of natural flow versus engineered control. Variability, as an embedded, cyclical force, structures the catchment's hydrodynamics, driving flooding, drought, and sedimentation. As a condition, variability reveals the limits of infrastructural control, prompting a shift from control-based strategies to adaptive, processual approaches that engage flux, sediment, and flood as co-authors of spatial form.

Collectively, this reorientation also opens new imaginaries for human habitation—not as a fixed, autonomous domain, but as flexible assemblages within dynamic socio-natural systems. In this framing, habitation becomes a responsive and participatory act, shaped through convergence, transition, and variability. Whereby convergence reveals the interweaving of urban and ecological systems; transition highlights the mutable character of liminal habitats; and variability calls attention to the temporal fluctuations—tides, floods, sedimentation—as a key consideration to be negotiated rather than controlled in planning

and developing for future habitation "zones."

Thus, future approaches to inhabiting this waterscape must embrace permeability, adaptation, and new types of reciprocity as generative design logics. A waterscape is not only a register of past socio-natural entanglements but also an experimental site for developing forms of life and living that are attuned to flux. From amphibious architectures and floating infrastructures to sediment-responsive and seasonally shifting morphologies, the waterscape invites speculative approaches to co-living that foreground reciprocity over resilience and transformation over stasis.

By integrating human habitat into the socio-natural dynamics of Moreton Bay, many new possibilities emerge; and convergence, transition, and variability evolve beyond ecological descriptors to offer critical design provocations for inhabiting the Anthropocene. As a waterscape, Moreton Bay demands design practices that are not only responsive but also speculative—capable of engaging the uncertainties and instabilities that define its socio-natural condition.

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AUTUMN CHELSEA DSOUZA

Sympoietic shores—An interscalar architecture for Sri Lanka's coastal futures

Fig. 1 Autumn Dsouza (2024). Sri Lanka coastal actors collage [Digital drawing]

Introduction

Coastlines, home to nearly half the world's population, have long served as dynamic zones of human habitation, cultural exchange, and agriculture. Along the shores of the planet, stories, cultures, and commodities flow. It is estimated that oceans contribute 60 per cent of the total economic value of the biosphere, making them crucial to human activity and welfare.[1]

Shorelines are arenas of creation, transition, destruction, and rebirth—where the ever-changing boundary between land and sea presents spiritual and existential significance for many cultures. These liminal spaces challenge humanity's perceived dominion over nature, revealing the forces of Earth's systems that exist beyond human control. The constant ebb and flow of tides and the reshaping of the shoreline by storms and rising seas highlight the tension between human ambition and the ancient rhythms of the planet and its inhabitants.[2]

More recently in the planet's lifetime, coastal towns and ports have served as conduits for colonisation, leading to lasting legacies of inequality and vulnerability.[3] Today, coastal regions are among the most susceptible to the devastating impacts of climate change. Rising sea levels, plastic-choked oceans, coastal erosion, and extreme weather events pose growing risks to coastal communities, infrastructure, and ecosystems.

Sri Lanka's coastlines present evolving landscapes shaped by myriad multiscalar entanglements of natural and human forces. Hikkaduwa, a coastal town in the Galle District of southwest Sri Lanka, has been subject to centuries of settler–colonial interference and is now a highly popular tourist destination. Hikkaduwa's coastal environment, significantly changed by urbanisation favouring capital-intensive tourism development, now coexists precariously with increasingly pressured natural systems.[4]

This article presents two architectural proposals for coastal rehabilitation embedded within Hikkaduwa's specific contexts and developed through a critical investigation of eight "interscalar objects." These objects serve as lenses through which to examine the layered multiplicities that constitute Hikkaduwa and to articulate a place-based intervention that supports new relational modes of living.

My relationship with coastal geographies was shaped long before I had the language to articulate it. Growing up along the shores of southwestern India, the sea shaped daily rhythms and instilled an understanding of reciprocity between land, water, ecology, and people. Over time, I've witnessed these coastlines shift—not through sudden events, but through the slow erosion of place, agency, and ecology driven by climate change and capital-led development. These personal experiences echo broader conditions of the Anthropocene, where global crises manifest through local ruptures. Yet what endures is the quiet resilience of coastal communities and the vitality of the ecosystems they inhabit. My early encounters with Hikkaduwa, through visits to family, were shaped partially from my viewpoint as a tourist. Returning as a researcher has required a more accountable stance—one that recognises both my distance and my affinity, and that understands design not simply as a tool for adaptation, but as a form of resistance and care. It is a way of returning to the shore with something to offer.

In what follows, I draw on my graduate thesis research at Carnegie Mellon University, which examines how the built environment has historically intersected with processes of colonisation, shaped coastal landscapes, and contributed to a web of multiscalar narratives involving contamination, extraction, and proliferation along the southwestern shores of Sri Lanka. I explore these themes through several key theoretical concepts, outlined below.

Many current coastal rehabilitation strategies reinforce capitalist frameworks, favour high-tech solutions, and lead to the dispossession of local communities from their land and resources. These technocratic, carbon-intensive approaches—modern extensions of the colonial systems that shaped the country's economic and ecological landscapes—continue to marginalise subaltern voices. A stark example is Colombo's Port City, a large-scale land reclamation project in Sri Lanka's capital, where the government, in partnership with the Chinese company CCCC is expanding port infrastructure, intending to attract foreign investment and multinational corporations.[5] These strategies exemplify what environmental critic Rob Nixon describes as "slow violence"—a form of "attritional catastrophes that overspill clear boundaries in time and space [and are] marked above all by displacements—temporal, geographical, rhetorical, and technological displacements that simplify violence and underestimate, in advance and in retrospect, the human and environmental costs."[6] The unprecedented sea mining associated with this development has caused devastating effects such as coastal erosion, intensified storm surges, and depleted fish stocks—ecological disruptions that frontline coastal communities are forced to contend with daily.

These human interventions in natural and built environments often catalyse what Anna Tsing describes as "feralities"[7]—the unpredictable, emergent outcomes of human impact on landscapes. These feralities materialise as layered traces of infrastructural change—ecological, economic, and social—that unfold across multiple scales. This research examines such feralities through a methodology informed by Gabrielle Hecht's concept of interscalar vehicles.[8] Hecht positions these vehicles as analytical tools for unpacking the Anthropocene as a crisis of scale—entities or phenomena that traverse and connect the local with the planetary, the intimate with the systemic. To understand their often-violent consequences, Hecht urges us to "refract history through new prisms,"[9] enabling more nuanced understandings of how landscapes are continuously transformed and entangled within the complex systems they inhabit.

A place on the planet—A Sri Lankan Anthropocene

Hikkaduwa, like many coastal areas in South Asia, has a complex and painful history of colonisation, beginning with the Portuguese in 1505, followed by the Dutch in 1638, and later the British, who extended their control over the entire island in 1798.[10] European global expansion relied on coastal towns and ports as primary sites for extraction, exploitation, and strategic control within the settler–colonial enterprise.

The colonisation by the Portuguese in 1505 and the Dutch in 1638 marked a turning point in Sri Lanka's agricultural landscape. Driven by the lucrative cinnamon trade, vast tracts of arable land were transformed into cinnamon plantations. This shift profoundly impacted traditional farming communities, who were gradually dispossessed of their land and coerced into labour on the plantations.

Before the colonial era, the use of lime in construction was largely restricted to royal palaces and monumental structures. This exclusivity gave way during the Dutch period, when lime became more widely adopted, prompting the emergence of a coral mining and lime production industry along the southwest coast.

The transition from Dutch to British rule in 1798 marked yet another significant shift in Sri Lanka's landscape, as coconut cultivation supplanted cinnamon as the dominant economic activity. This change brought about a substantial reduction in labour demand, leaving many individuals unemployed.

By the late nineteenth century, the lime industry had firmly established itself. In 1895, a railway platform was constructed in Hikkaduwa to facilitate the loading of coral—then a crucial raw material for lime production.

After Sri Lanka gained independence in 1948, the town experienced rapid growth. In 1966, the Sri Lankan government introduced policies to promote private investment in tourism, with a focus on the south coast. Offering fiscal incentives to attract developers, these initiatives transformed Hikkaduwa into a premier tourist destination, celebrated for its vibrant coral reefs, pristine beaches, and scenic marine landscapes.

In this geographical area, the unchecked exploitation of natural resources has become the prevailing norm rather than the exception. Currently, Hikkaduwa stands as one of the most popular coastal destinations in Sri Lanka and serves as a stark example of unplanned development.[11] Tourists, typically visiting for short durations, are largely insulated from the consequences of this degradation, which

local communities experience daily. The mounting pressure on ecosystems and wildlife continues to escalate, exacerbated by the slow pace of top-down strategies that often lack proper enforcement. As fishing practices have expanded unsustainably, fish yields in the region have reached critical lows[12]—a situation further aggravated by the damage inflicted upon the coral reefs by rising ocean temperatures.

The coastal environment is not solely inhabited by humans, be they transient tourists or long-term residents, but also by a remarkable assemblage of marine life. Five species of sea turtles—green, loggerhead, olive ridley, hawksbill, and leatherback—frequent the shores to nest, contributing not only to their survival but also to the health of the beach ecosystem.[13] Turtles control the population of sea sponges and crustaceans, which help regulate the balance of life in the reefs. The coral reefs—vital yet increasingly vulnerable ecosystems—serve as critical habitats for many marine species, including over three hundred species of fish, molluscs, and crustaceans.[14] Marine mammals, such as dolphins and whale sharks, rely on these environments for migration and feeding, while coastal and migratory birds contribute to the ecosystem by controlling pest populations and dispersing seeds. The preservation of these animals and their habitats is vital, not only for biodiversity but also for the cultural and economic practices of local communities that depend on these natural resources.

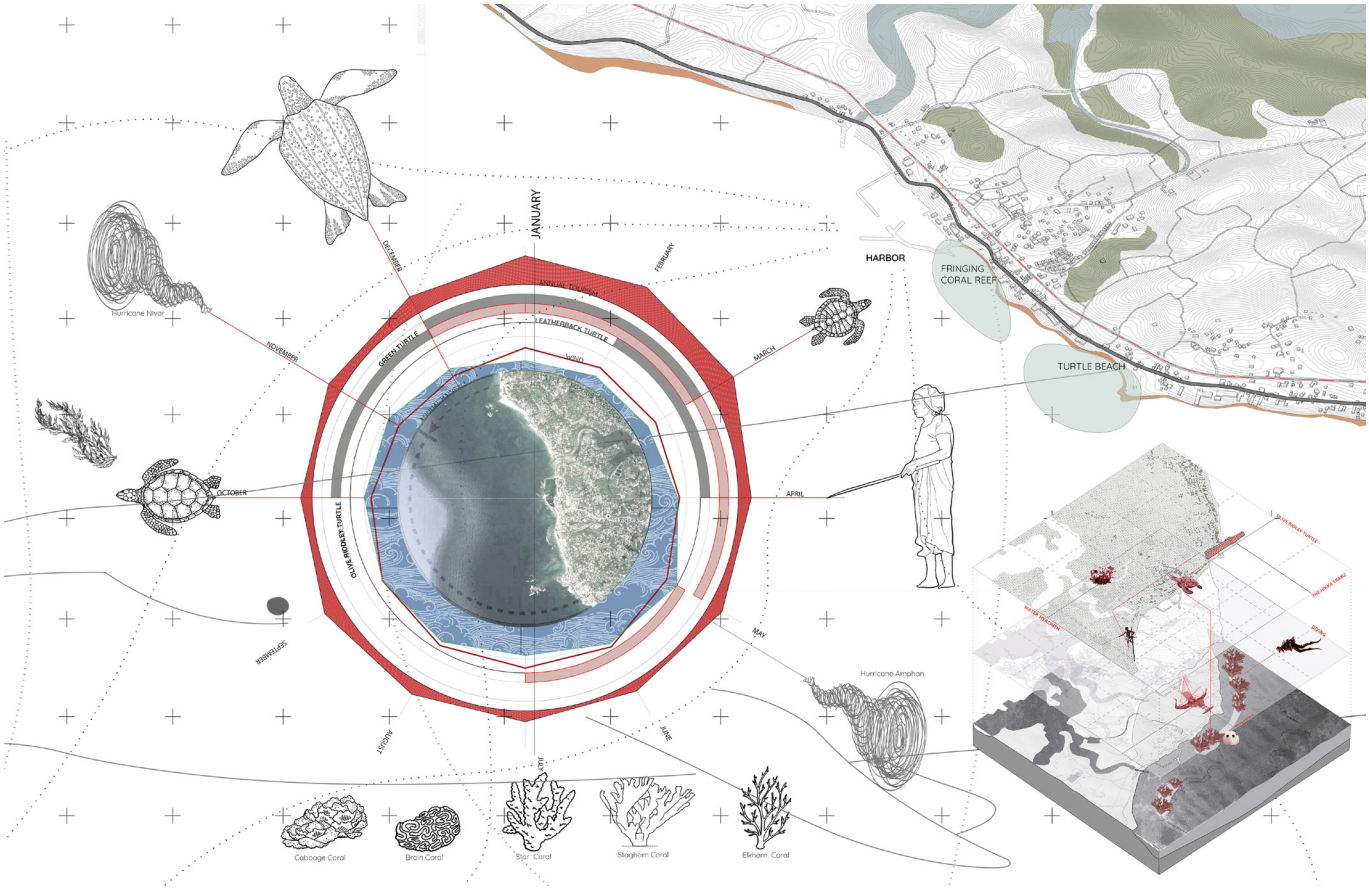

Fig. 2 Autumn Dsouza (2024). Coastal actors and annual wheel [Digital drawing]

Coral reefs are integral to managing the earth's atmosphere and maintaining the balance of life. Having existed for over sixty million years, these remarkable ecosystems are responsible for producing a significant portion of the world's oxygen and act as vital carbon sinks. They also serve as natural buffers against the adverse effects of climate change, protecting coastlines from the destructive forces of the Earth's oceans.

The situation in Sri Lanka is, however, dire. According to the Marine Environment Protection Authority, 90 per cent of the country's corals are already dead, with projections suggesting that the remaining 10 per cent will be lost within the next decade.[15] The historical interplay of colonialism and architecture has significantly contributed to the destruction of this vital natural habitat. Coral mining for lime extraction—introduced as part of the colonial export economy—was widely practiced and continues to have lasting impacts. This history of extraction calls for an urgent shift towards regenerative, place-based architectural practices that prioritise ecological preservation alongside human activity.

Interscalar objects

In the aftermath of the 2004 tsunami, local communities and organisations in Hikkaduwa took proactive steps to address the degradation of coral reef ecosystems. Among them, the Foundation of Goodness—a community-based organisation in Seenigama, six kilometres from Hikkaduwa—worked with local divers, offered training in coral propagation, facilitated beach clean-ups, and promoted material recycling.[16]

These efforts partly arose from the lived recognition that coral reefs are crucial protective infrastructures. Prior to their degradation, Hikkaduwa's reefs helped buffer coastal settlements from the force of waves and storm surges, softening the impact of tsunamis in some areas. The reefs' decline has since rendered these communities more vulnerable to future disasters. These community efforts signal an ontological shift—one that resists framing nature as a passive backdrop to human activity and instead affirms its role as an active participant in shared lifeworlds. Such a reorientation foregrounds the entanglement of human and more-than-human communities in ongoing processes of care, restoration, and transformation.

In partnership with the Sri Lanka Navy, Blue Resources Trust, and local organisations including the Foundation of Goodness, the Tokyo Cement Group has introduced reef balls—hollow structures fabricated from recycled concrete waste—into nearshore waters.[17] These reef balls serve as substrates for marine life and new corals to grow on, while also functioning as storm barriers. Yet an irony persists: the very material used to construct them—cement—has historically depended on lime extraction, a practice that contributed to the destruction of the reefs they now seek to restore. These repurposed structures, viewed through a reparative lens, raise critical questions about the limits and possibilities of regenerative action in landscapes marked by extractive pasts.

Reef balls—and the coral substrates they aim to support—constitute the first of this project's "interscalar objects."[18] These objects are not simply physical artefacts; they operate as symbolic condensations of layered interactions across ecological, cultural, and economic domains. As analytical devices, they reveal

Fig. 3 Autumn Dsouza (2024). Interscalar objects [Digital drawing]

entanglements with colonial extractive histories, tourism economies, and shifting local livelihoods. Anna Tsing's observation that "as contamination changes world-making projects, mutual worlds—and new directions—may emerge" extends this reading. Here, contamination is not merely a disruption but a generative condition: an entanglement of disparate and often contradictory forces that continuously reshape landscapes and unsettle fixed notions of ecological or cultural purity. Rather than seek a return to an idealised past or project utopian futures, these objects invite us to dwell in ambiguity, tracing the messy and co-constituted futures that unfold through interscalar entanglements.

The project is particularly focused on the "second lives" of these objects, exploring the unexpected ways they are repurposed and imbued with new meaning. Through this lens, the story of Hikkaduwa unfolds, examining the interscalar objects such as coconut stumps, ghost nets, coral bricks, oruwa boats, stilt fishing, water hyacinths, and Tokyo reef balls.

Architectural imaginings

In "Stirring the Anthropological Imagination: Ontological Design in Spaces of Transition," Arturo Escobar elaborates on the impetus placed on designers to rethink how we design cities and spaces. He notes that "the development of new modes of earthly habitation has become an imperative, which means changing the practices that account for contemporary forms of dwelling in ways that enable us to act futurally instead of insisting on strategies of adaptation to defuturing (future-destroying) conditions."[19]

Arturo Escobar's idea of ontological design starts from a simple but radical claim: "We design the world, and the world designs us back."[20] Architecture and design are seen as ongoing, reciprocal practices that co-create ways of being—ontologies—for humans and non-humans alike. In Escobar's framing, the task is to move from a dominant, modern ontology that treats the earth as inert matter for extraction and accumulation, towards pluriversal ontologies that recognise many worlds, many lifeways, and many ways of knowing. Architecture and design are thus considered key tools in shifting perspectives and stirring the collective imagination, offering a unique opportunity for catalysing positive transformation.

The project's narrative approach in presenting Hikkaduwa's story and its unique "world-making" scenario is inspired by *The Feral Atlas*,[21] a work by Anna Tsing, Feifei Zhou, and collaborators. This text approaches the Anthropocene as a complex, layered landscape defined by patchiness, unpredictability, and feral-ity—qualities shaped by varied and often conflicting forces. These landscapes reveal underlying social inequalities, presenting a vision of the Anthropocene not as a cohesive era but as a fragmented reality woven through with both human

Fig. 4 Autumn Dsouza (2024). Original 8" x 12" mural [Digital drawing]

and non-human influences. The project's own mural becomes a methodological template for tracing the emergent and contested world-making practices unfolding along Hikkaduwa's shorelines.

The project's eight-by-twelve-foot mural draws from *Feral Atlas*'s approach of collapsing traditional categories and timelines to illustrate Hikkaduwa's entangled systems. It highlights seven interscalar objects—cultural, economic, and ecological knots that converge in the design. Rejecting linear chronologies, the mural uses a visual web to convey the interconnectedness of these systems, underscoring the complexity and hybridity that characterise contemporary world-making projects. It encourages a perception of Hikkaduwa's landscape as a pluriversal reality, shaped by overlapping histories, practices, and indigenous knowledge. Through architectural annotations, the seven interscalar objects are translated into an architectural imagining aiming to dismantle the single growth-oriented "development" narrative and replace it with relational, emergent, and situated possibilities.

Fig. 5 Autumn Dsouza (2024). Zoomed interscalar object cards [Digital drawing]

Two architectural propositions emerge from this framework: The Amphibious Commons, a floating reef restoration system that entangles architecture with multispecies cohabitation; and The Port Cooperative, a reimagined coastal market space that supports fish processing, plastic recycling, and community education through a fisherwomen-led cooperative model. By operationalising design strategies rooted in pluriversal ontologies, these interventions rehearse new ways of living, where coastal residents, marine species, and geomorphic processes co-author space. This project offers one framework for reimagining radical coastal futures in Sri Lanka.

The materials and construction techniques proposed in the architecture are grounded in a critical tracing of local skills and wisdom, knowledge that has been adapted and transformed in some ways through the colonisation of the land. One example is the now defunct oruwa (outrigger canoe), a significant piece of Sinhalese maritime ethnotechnology.[22] Another material is the invasive water hyacinth, originally native to the Amazon basin and introduced to Sri Lanka in 1905 as an ornamental species.[23] The plant quickly became a prevalent invasive species in water bodies across the country. In this case, the hyacinth is a "ferality"—a species co-opted by local communities. Water hyacinths excel at phytoremediation and currently function within Hikkaduwa's existing waste stabilisation ponds. The stalks of the plants are woven into various products, ranging from interior screens to baskets and clothing, a craft predominantly carried out by Sinhalese women.

Traditionally, architecture's dependence on coral lime extraction has left lasting damage on the fringing reefs, which, due to their slow growth, struggle to recover. Recent advancements in coral science, however, have introduced techniques to stimulate coral reproduction, including the replication of coral polyps' sexual reproduction vital for sustaining reef genetic diversity and methods for cultivating mature coral fragments.

Building on local material knowledge and broader scientific innovations, the first intervention, The Amphibious Commons, proposes an architectural response to regenerate the fringing coral reef along Hikkaduwa's shoreline through the deployment of mobile floating platforms. These interconnected platforms form a hybrid structure that merges architecture and reef ecosystems, advancing a vision of amphibious architecture tailored to a just ecological regeneration. This design approach reframes the "interscalar objects" featured in the mural, repurposing their histories into a living architectural fabric that engages directly with multispecies lives.

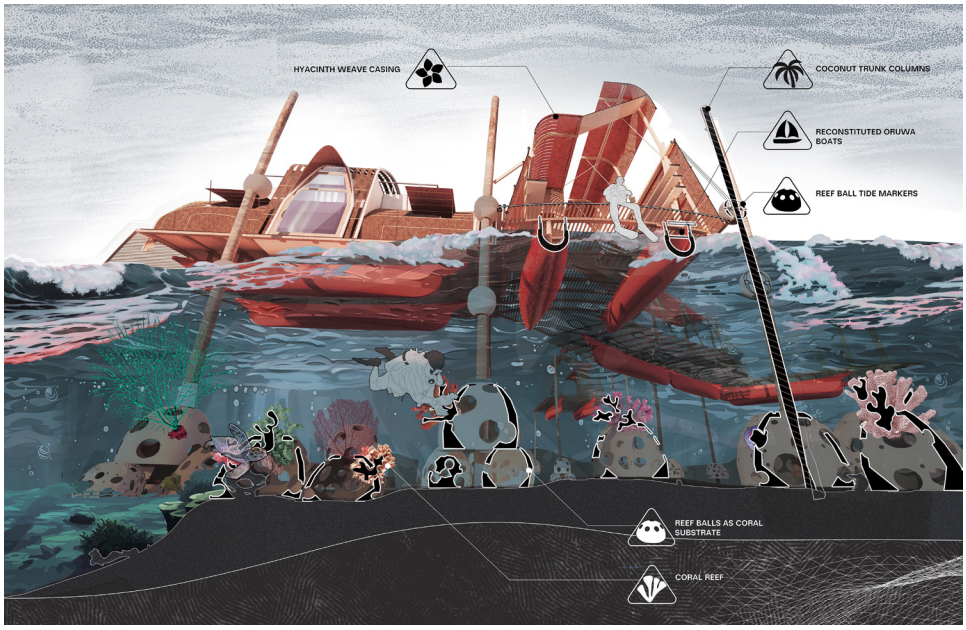

Fig. 6 Autumn Dsouza (2024). Zoomed-in coral eye perspective section of reef restoration platforms [Digital drawing]

Fig. 7 Autumn Dsouza (2024). Zoomed-in section of reef restoration platforms [Digital drawing]

The mobile platforms—floating on oruwa hulls and constructed from timber, bamboo, and water hyacinth—integrate essential functions for coral reef propagation and are anchored by recycled reef balls. These reef balls serve as a substrate for coral nubs that have been untangled from fishing nets above the water. This intervention aids in regenerating the fringing coral reefs and acts as a storm barrier, providing essential protection for the coastline. Additionally, the reef restoration assemblages provide spaces for fisherfolk to gather, rest, and play. The structures are designed for disassembly and relocation and can be detached from the columns once the reef is healthy, then moved along the assemblage to new locations. These "sympoietic"[24] systems highlight the entangled agencies of humans and non-humans that collectively produce and sustain one another. The reefs, once destroyed to facilitate architectural construction, are now being regenerated through a reparative architectural vision.

Fig. 8 Autumn Dsouza (2024). Perspective of reef restoration platforms [Digital drawing]

The second intervention, The Port Cooperative, addresses intertwined socio-ecological pressures confronting coastal communities, including the marginalisation of women, the precarity of traditional fishing practices, and the proliferation of plastic pollution. The Hikkaduwa Restoration Task Force[25] underscores fishing as the second-highest economic driver in the region. Yet, depleting fish stocks—exacerbated by the burgeoning tourism industry and pressures from industrial fishing—cast a shadow over the future of local fisherfolk.

Stilt fishing, which emerged out of necessity during World War II when British troops escalated demand, epitomises this struggle. Perched atop tall wooden poles in shallow coastal waters, fishermen cast lines into the sea, but diminishing returns have increasingly steered them towards tourist photography as a source of income. This adaptation reveals how local customs are commodified for tourism, leaving communities grappling with shifting livelihoods amid the climate crisis. Furthermore, the overlooked role of women in Sri Lanka's fishing industry emerges starkly. Despite their pivotal contributions—spanning fish processing, net mending, and essential support for fishing endeavours—women remain marginalised, their efforts often absent from official records and policy dialogues.

Plastic pollution further compounds these challenges, with ghost nets as visible symbols of how human activity damages marine ecosystems. These abandoned or discarded fishing nets ensnare marine life, damage coral reefs, break down into harmful microplastics, and worsen the ocean plastics crisis. Ironically, ghost nets also attract fish, functioning as makeshift fish aggregation devices, and many fishing communities have developed informal methods to haul in and recycle this waste—a grassroots response to the broader environmental crisis.

Fig. 9 Autumn Dsouza (2024). Zoomed-in section of fisherwoman cooperative [Digital drawing]

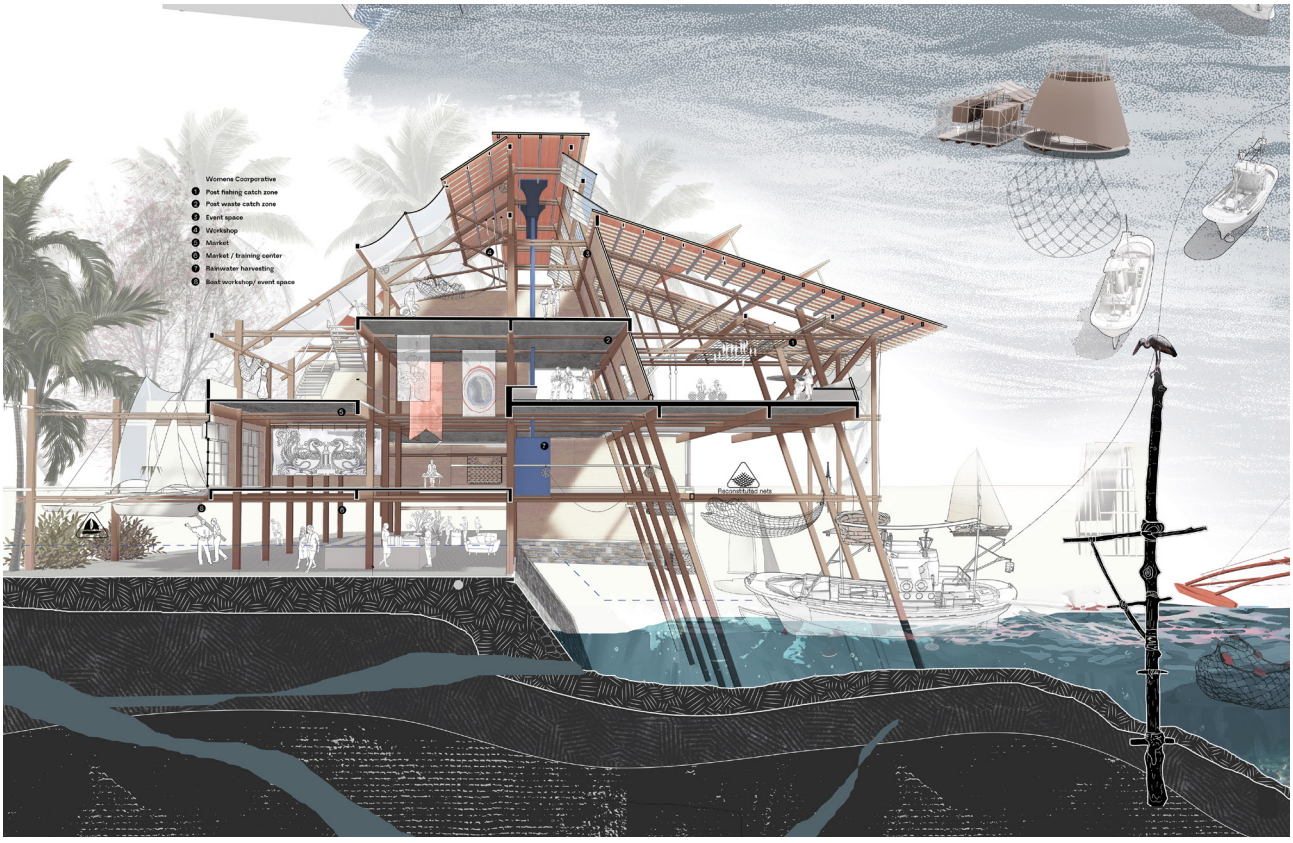

Fig. 10 Autumn Dsouza (2024). Perspective of fisherwoman cooperative processing space [Digital drawing]

Inspired by this research, the project proposes that the existing market space along the Hikkaduwa port be reimagined as a fisherwoman cooperative. Here, fish and plastic waste would be processed, sorted, and recycled. During the tourist season, workshops would educate visitors about coral reefs and involve them in reef protection efforts, such as making reef balls from recycled concrete. In the off-season, the space would transform into a training centre for local artisans. This "port-infrastructure-architecture" supports the cooperative's activities and buttresses functions like fish drying, hauling, and launching the floating restoration platforms.

Fig. 11 Autumn Dsouza (2024). Perspective of fisherwoman cooperative workshop space [Digital drawing]

Conclusion

While the architectural proposals presented in this paper manifest as spatial interventions, their primary intent is not to prescribe a fixed built solution but to provoke re-examination of the systems that govern coastal inhabitation. The project treats architecture as a lever to expose, question, and reimagine institutional logics that organise these environments.

Sri Lanka's coastal zones are shaped not only by physical processes but also by layered regimes of planning, zoning, land tenure, and environmental governance, many of which are holdovers from colonial systems. These frameworks often marginalise informal economies and coastal dwellers, prioritising economic growth through tourism and technocratic infrastructure over long-term community resilience.

The speculative proposals engage these realities not by circumventing regulation but by making its limitations visible and proposing counter-logics. For instance, rethinking the harbour as a space of ecological co-authorship and community stewardship implicitly challenges the commodification of coastal access and state-sanctioned hierarchies of land use. The architectural forms—porous, multi-use, seasonal—are instruments for policy imagination, rehearsing futures where zoning might account for seasonal livelihoods, more-than-human agency, and decentralised governance. By embedding care into the very structure of the port, the architecture gestures towards alternative governance models rooted in justice, autonomy, and ecological well-being.

The project contends that architecture can function as a critical mediator—a practice capable of surfacing contradictions in current planning paradigms and working transversally with law, policy, and activism. By foregrounding epistemological pluralism and ontological experimentation, the work extends architectural expertise into the political realm, not through mastery of regulation, but by actively imagining and enacting alternatives to it.

As Donna Haraway articulates: "One way to live and die well as mortal critters in the Chthulucene is to join forces to reconstitute refuges, to make possible partial and robust biological-cultural-political-technological recuperation and recomposition, which must include mourning irreversible losses."[26] This project unveils the intricate entanglements that have shaped—and continue to shape—the coastal ecologies and cultures of Sri Lanka. Within this framework, the proposed architectures not only make these connections visible but also reimagine our intertwined existence, advancing a vision of resilience founded on collective care and kinship with the Earth and each other. The design proposals foreground plural epistemologies, drawing on indigenous knowledge systems, vernacular material cultures, and situated ecological practices. In doing so, they position architecture as a site for ontological experimentation. Rooted in shared stewardship, the project gestures towards a transformative model for living in reciprocity with our environments, acknowledging both the losses we face and the enduring potential for regeneration.

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DIMITRIS HARTONAS

Flows to bytes: Digitising naval space

Introduction

Whether testing climate projections, chemical compounds, economic theories, or engineering solutions, computer models are ubiquitous in simulating dynamic environments.[1] Yet, despite computers in the twenty-first century proving remarkably adept at translating model-based simulation practices to digital signals, computation and the physical environments they simulate are far from being in simple alignment with one another. The use of models in experimental simulation practices has a long and epistemologically diverse history[2] spanning post-war explorations in computation to contemporary practices. How digital technologies are embedded in dynamic and complex systems, such as a ship in relation to water, is, however, anything but clear.

In September 1959, this inconclusiveness was captured in black and white when the superintendent of the British Navy's Admiralty Experiment Works (AEW), A. J. Vosper, outlined the "facilities" and "ship-model instrumentation" at the agency's disposal. His report was presented at the annual conference of test tank superintendents—the Symposium on Towing Tank Facilities, Instrumentation and Measuring Technique.[3] It was thus prepared for and presented to a specialised audience with a keen interest in the experimental apparatus of the British Navy's first research establishment. This interest was particularly well placed, since this apparatus's entanglements with digital computation were being allowed for the first time to be publicly, if only partially, displayed. When the Manoeuvring Tank installation was commenced in 1953, Vosper's report declared: "[. . .]it was decided to install a digital computer as part of the initial equipment with the primary function of experiment data reduction." The report expanded upon the computation's benefits:

> Its use not only saves a considerable amount of effort on normal routine calculations [. . .] but also can be brought to bear on calculations which *could not previously have been attempted* [because], if carried by computing staff, [they would] take such a long time that the chance of an error would increase prohibitively.[4]

Vosper's tone throughout the report manifests that his account (like most communications coming out of military establishments) aspired to be

straightforwardly descriptive. Still, perhaps unintentionally, his language in the report reveals an ambivalence, as he wavers, framing the role of computers at the AEW in incommensurable terms. On the one hand, he portrays electronic computers as mere accelerators of established computational practices, enabling calculations previously envisioned but never attempted, on the other, as critical infrastructure for an altogether new type of experiment. His account, otherwise direct and unambiguous, becomes strikingly blurry when assessing digital computation's impact on the AEW's operations.

This peculiar oscillation, between computation's obvious usefulness in calculation and its capacity to support prediction, as part of an experimental infrastructure, begs the question: What was the impact of digital computers on environments of experimental simulation, such as in post-war ships' movement through water, and how might this spatialise contemporary understandings of computation's relation to water? Reaching for answers, I suggest, may entail telling a history of early computing from a watery site, the Manoeuvring Tank of the Admiralty Experiment Works. Centring on water can lead to potent, if peripheral, sites of computing history where the minutiae of digital computers' transition, from calculators to simulators, becomes most pronounced. But more importantly, in a historiographic reorientation of simulation histories away from atmospheric—whether air defence, air travel, or air conditioning—and towards liquid domains, water's materiality is not incidental.[5] That the specificities of matter were central to simulation practices will, of course, not be surprising to the reader of simulation histories. After all, already in the nineteenth century, long before the term "computer" signified a machine, the transition towards simulation relied on expressing material behaviour mathematically.[6] Rather than resolving dynamics solely in mathematical formulations, however, in the case of the AEW, water's flow—its twists, swirls, ripples, and vortices, as well as the ensuing roll, pitch, heave, and acceleration of bodies immersed in it—were observed through physical simulations in three-dimensional space. In particular, water furnished these spaces with a positional system that constituted a "liquid intelligence" in many ways irreconcilable with the dry, grounded linearity of the Cartesian grid that transcribed the experiments into computable information. In fact, what watery sites like the Manoeuvring Tank suggest, I argue, is that the translation of in-water simulated behaviour into flat computable data was mediated by a series of documentation techniques whose agency was redefined by the introduction of digital computers; it was compound photographic, and other practices, which arbitrated the transcription of aqueous space, and its dynamics, into bytes.[7]

Bringing to the fore the media landscape in which the computerisation of simulation practices occurred, at the time of the Manoeuvring Tank experiments, this essay recontextualises these "dead" media objects to articulate ways in which they shaped the subsequent emergence of computer simulations.[8] Through such water-related media objects, this essay redirects attention away from long-lived undercurrents of architectural discourse, such as form or style, and towards how a multivalent array of media, including water and buildings, relate to one another. Rather than trust that interrogating a building's plan, materiality, or precedents is essential to writing architectural history, this essay asks how architecture can operate as part of a larger technological apparatus.[9] It contends that the scope of architectural history can extend beyond the building to other related

arts, artefacts and media, such as those so central to the AEW. Specifically, centring on water-contingent techniques or technologies, the essay traces the shifts, evolutions and transformations in the AEW's documentation methods to argue that they made simulation "thinkable" by at once facilitating and limiting its development. And crucially, this essay engages in an excavation of simulation documentation media without wishing to make an argument for, or against, computer-induced historical discontinuities in scientific practice. Rather, through the AEW's built environments of aqueous simulation, it demonstrates a dialectical relationship between new technologies like digital computation and dynamic experimental practices.

Computational (dis)continuities

Vosper's ambivalence between the calculation and prediction capacities of computers, recounted above, tracks a historiographical schism, a vignette of which is offered by the literature on digital computation's imprint on mid-twentieth-century microphysics. Scholars, most notably Peter Galison, positioned digital computation at the centre of scientific developments.[10] Whether operating as *a substitute for human labour* or as *a substitute for nature*, the computer, Galison's story goes, undergirded the very possibility of certain scientific activities. As a replacement for labour, it displaced the scientist in mid-twentieth-century microphysics. Operating either as a standalone tool or as part of a "system [produced through] the thorough integration of 'scanning girl,' physicist, and electronic computer," digital computation performed functions previously conducted manually while confining human intervention in data extraction to preparatory work.[11] Adopted for its speed and accuracy across the "logic" and "image" traditions in microphysics, the digital computer, so Galison claimed, catalysed the 1960s reorganisation of computational methods and the ensuing merging of the two traditions. "Bit by bit," Galison evocatively writes, "the two cultures came together."[12] By the end of this process, the digital computer had drastically altered the landscape of high-energy physics research. Digital computers went beyond standing in for tools, they effectively stood in for nature itself. Case in point is the Monte Carlo, a mid-century computational method employing approximation via random sampling to simulate the outcome of physical experiments deemed either too dangerous to test or too complex to calculate. If born out of the material and mathematical realities of nuclear research, the Monte Carlo stood between experiment and theory, heralding nothing short of "a new mode of producing scientific knowledge."[13]

The vector of early digital computers driving paradigmatic change has also been drawn in the inverse direction.[14] Proceeding with suspicion towards accounts of discontinuity, historians like Jon Agar have argued that the computational methods employed by microphysicists and X-ray crystallographers remained constant. Any noticeable shift in computing practices was quantitative, not qualitative. Rather than the promise of new epistemic frontiers, what prompted microphysicists to adopt digital computation was the possibility of conducting *familiar* operations faster and more accurately. Monte Carlo did not introduce new modalities of scientific inquiry, so this story goes, as "Monte Carlo-style methods" predated digital computers and can be traced back to techniques of manual calculation.[15] That is to say, its digital operation was a direct analogue of familiar processes, only faster and translated into code. An Agar-fashioned view

of this history, then, not only rejects the idea that digital computation ushered in new modes of scientific knowledge-production, but also asserts that electronic computers were only introduced "in settings where there *already existed* material and theoretical computational practices and technologies."[16]

Situating itself at the nexus of these compelling, if competing, accounts of electronic computation's impact on science, this essay seeks to articulate a framework for thinking through the operations of digital computers in dynamic simulation environments, where water, architecture, and documentation media form a continuous apparatus. It proceeds by maintaining that assigning primacy to either new technologies or existing practices can obscure what is argued to be a dialectic relationship between the two—a cyclical process of redefining each other's role, which allowed new experimental practices, like digital simulation, to emerge out of environments with pre-electronic traditions of physical simulation.

The AEW was precisely such an environment. Its nineteenth-century engineering inquiries positioned themselves in a similarly ambiguous territory—between theory and experiment—by modelling vessels and seas alike. Established in the aftermath of the catastrophic foundering of HMS *Captain* in 1870 as a recourse to the knowledge vacuum produced by naval architecture's transition from wood to iron, and from air to steam, the AEW's experimentation programme introduced an era of sustained hydrodynamic simulations in controlled environments.[17] The AEW's inaugural simulation facility, built in Torquay in 1871, comprised a

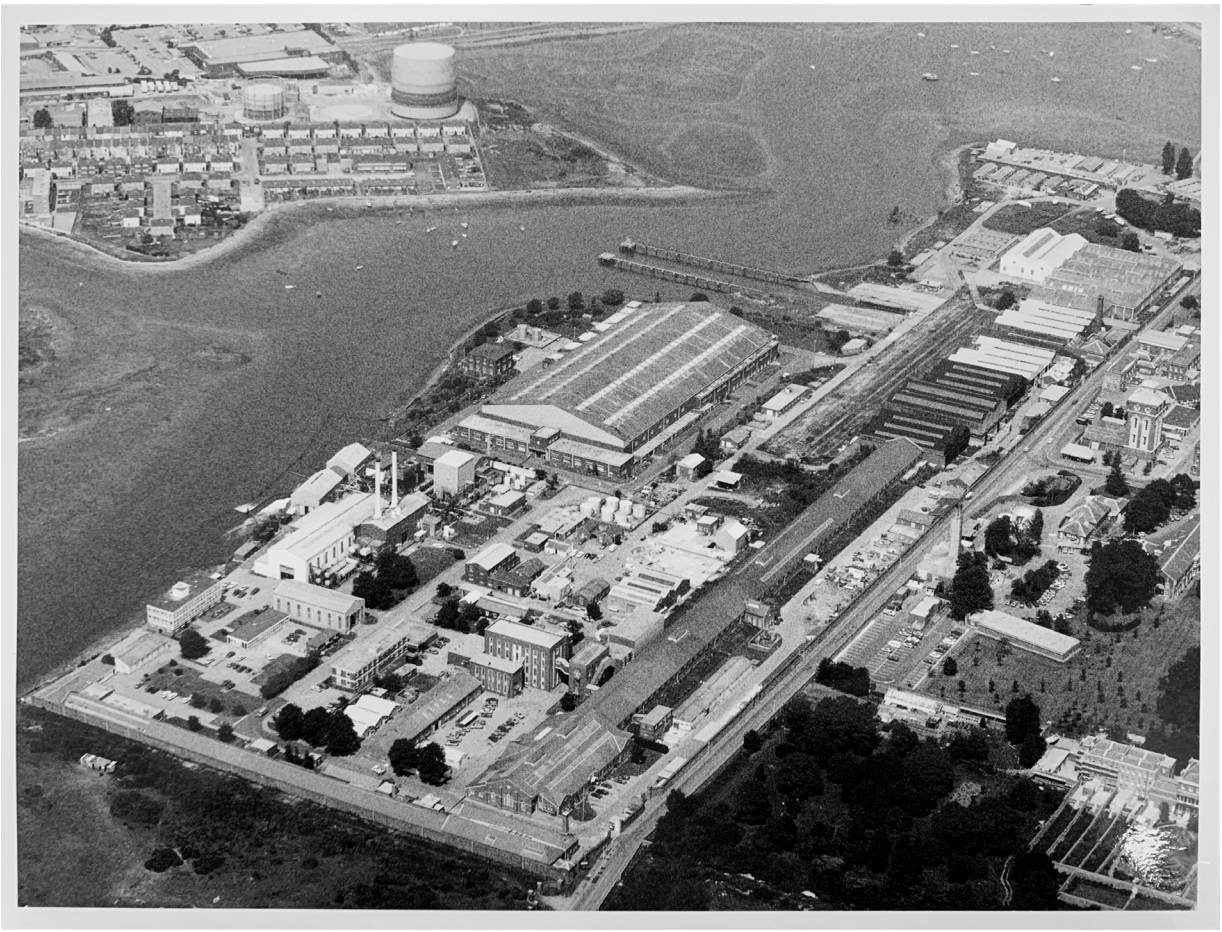


Fig. 1 Anonymous (ca. 1989). Aerial view of the Gunboat Yard site of the Manoeuvring Tank [Photograph, Science and Innovation Park Library, Wroughton]

rail carriage configuration moving six-foot-long wax models through water and recording, by means of a self-registering dynamometer, the experienced resistance. The apparatus also consisted of an architecture enclosing a linear test tank measuring two hundred and fifty by twenty feet and producing physically and materially what may anachronistically be called a space of naval simulation. The architectural articulation of this space reverberated to the new premises of the AEW, in the Gunboat Yard at Haslar, Portsmouth, where a facility replacing the Torquay basin was constructed in 1886 and a second, longer and more capacious tank, was completed in 1930.

The Manoeuvring Tank was erected on this site in 1959. Like its predecessors in Torquay and at Haslar, it produced a controlled, interiorised space, albeit this time for a type of inquiry newly emerging in the aftermath of World War II naval warfare.[18] Specifically, it was designed to accommodate physical simulations of vessels' seaworthiness, steering, and manoeuvring, to replicate those undertaken in the 1950s on the nearby non-tidal waterway of the Horsea Lake. An architectural response to newfangled experimental inquiries, the Manoeuvring Tank configured a waterscape that resembled little the linear waterways of its predecessors. It comprised a gargantuan steel roof housing a four-hundred-foot-long by two-hundred-foot-wide basin which was divided in two sections designed to emulate two different oceanic conditions.

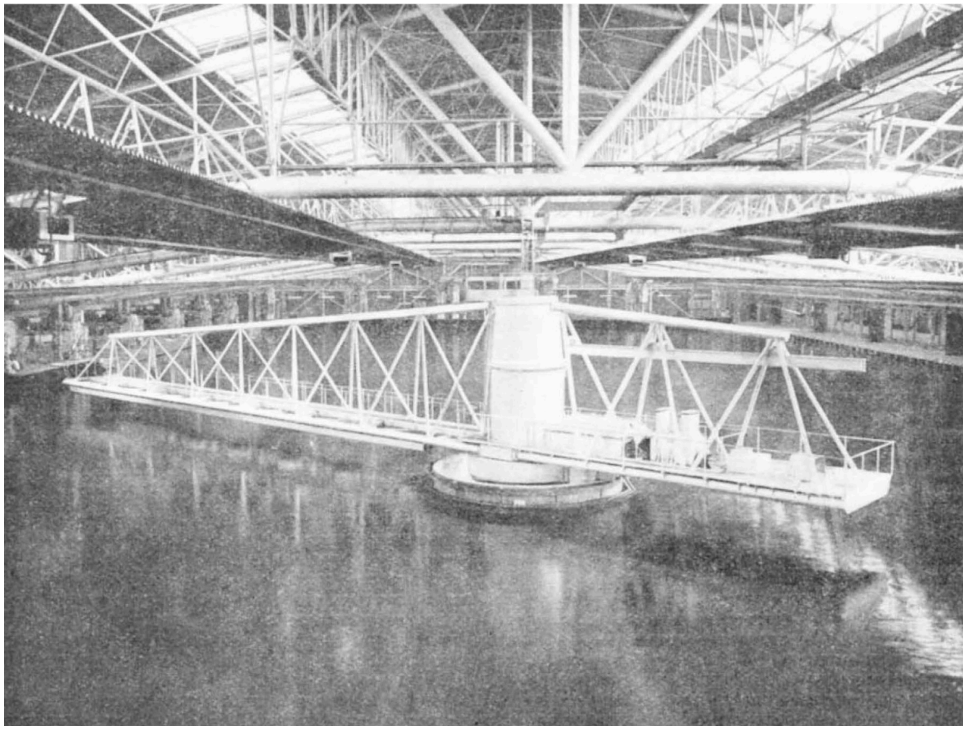


Fig. 2 Anonymous (1962). Plan of the experimental configuration of the Manoeuvring Tank [Drawing, Nature Publishing Group]

The was devoted to a mechanically rotating arm, which propelled models during manoeuvring tests while recording the resistance they experienced and the wave patterns they produced. The second section featured two sets of wavemakers and a stepped "beach" suppressing unsolicited or recoiling waves. It thereby articulated a contained, defined, and stable water space which, when animated by waves forming along two axes, could generate indoors the complex wave forms required for seaworthiness trials, and allow for an intramural simulation of conditions at sea.[19] As the intricacy of this artificial waterscape suggests, this

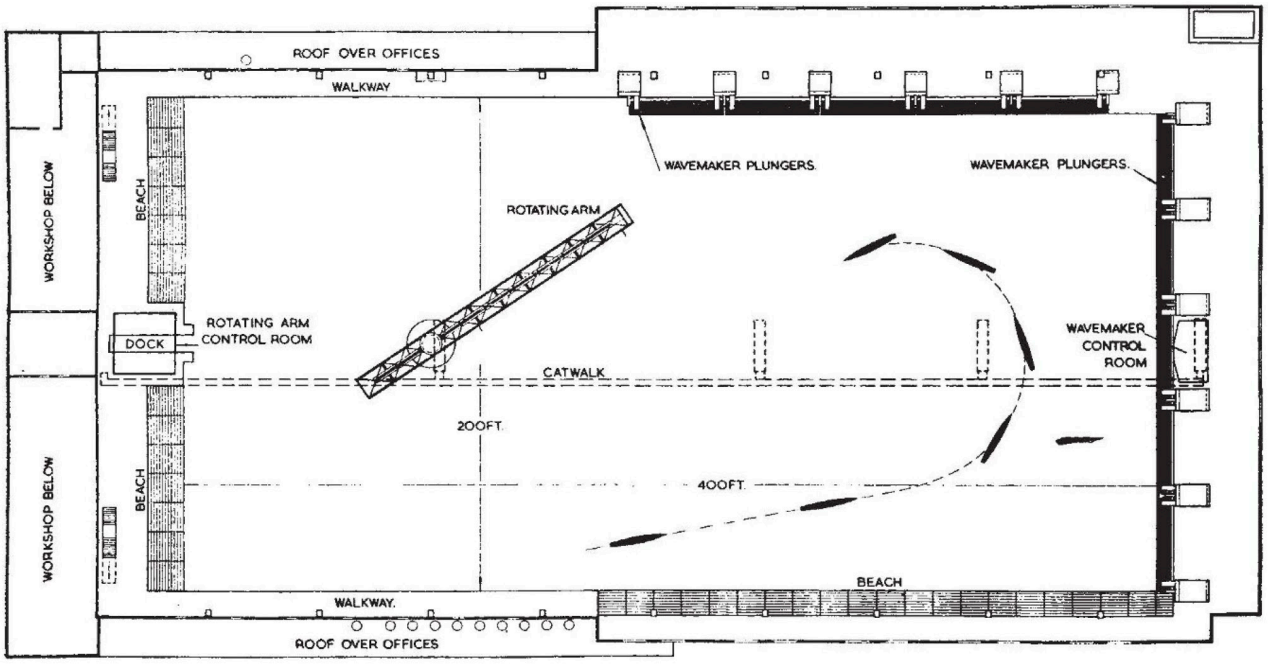


Fig. 3 Anonymous (1962). The water space of simulation in the Manoeuvring Tank with the rotating arm in the foreground [Photograph, Nature Publishing Group]

architecture did not merely interiorise unaltered pre-existing experimental practices. Rather, by inscribing the latter in a controlled architectural space, it reformulated the parameters of the inquiry in ways that exceeded the AEW's computational means, effectively necessitating additional computing resources. As Vosper made clear:

> When the Manoeuvring Tank installation was commenced in 1953, it was foreseen that the analysis of records from the rotating arm and seaworthiness basin would be a prodigious task which would have placed an onerous burden on the relatively small staff and also would have resulted in unacceptably long delays between experiments.[20]

In other words, digital computation was introduced as a recourse to this unattainable "burden" of analysis. It was introduced in tandem with architecture, warranted by the new articulation of architecture's interface with water, that an indoors, non-linear, artificially animated seascape was produced. Although physical simulation—and the architectural configuration of simulation spaces—had been central to the AEW's experimental practices from its very inception, the Manoeuvring Tank recodified experimental simulation parameters, ushering in a new era of electronic computation whose capacities and limitations—whether in replacing human labour or serving as a substitute for entire simulation environments—would come to the fore.

Recording aqueous space

In his refashioning of Monte Carlo's computational dependence, Agar gestures towards digital computation's impact on representational practices. "The practices of computation were already in place," he writes, "only the final stage—representation of the object—was transferred to a new medium."[21] If the introduction of electronic computers did not reconfigure scientific experiments by instituting computation, but only occurred where manual computing

methods were already an established practice, computers were nevertheless implied to have transformed graphical methods. Indeed, through the representation practices' friction with digital computation, I suggest, it became possible for computers to assume roles beyond performing pre-existing computational procedures: through a dialectic relationship between computational and representational techniques, computer simulations became thinkable. Thus, to trace how the AEW's techniques of simulating ship behaviour in architecturally modelled environments were transcribed to the digital space of computer simulations, we may turn to the graphical tools and methods through which the experimental records were produced.

The codification of physical simulation results as information, through graphical means, had been part of the AEW's experimental procedures since its nineteenth-century origins.[22] Already in its inaugural facility, the experimental apparatus included a dynamometer recording the resistance experienced by models on a rotating drum.[23] If in the 1870s documenting trials meant assigning numerical values to phenomena like hydrodynamic friction through graphical means, after World War II, this practice included the position of models in space, with turning trials being the primary field of application. In 1950, for example, during the full-scale manoeuvring tests of HMCS *Magnificent*, the ship's paths at sea were documented by two "autographic bearing records" and subsequently transferred on a two-dimensional graph.[24] The latter represented the nautical space of the trials by virtue of curved lines on a grid, which rendered the local coordinates of the ship continually recuperable. This practice was echoed in model turning trials conducted—in the absence of a manoeuvring tank—on Horsea Lake. The graphs reproduced in the 1951 report of the HMS *Eagle* tests, for example, captured the model's path, turning, and lateral movement spatially.[25]

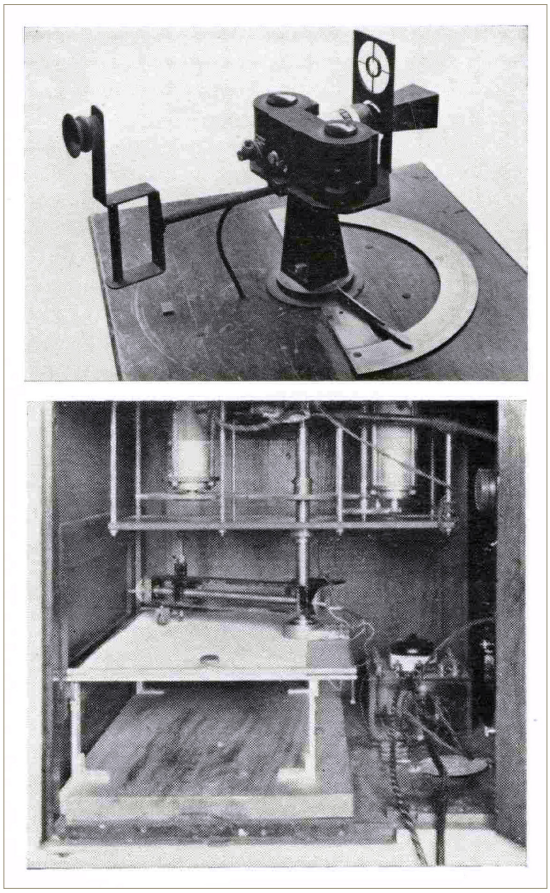


Fig. 4 Admiralty Experiment Works (1960). Automatic bearing recorders used by the Admiralty Experiment Works [Photograph, Nationaal Archief]

Whereas graphical practices captured physical simulations by representing a ship's course numerically, photography was called upon to overcome this abstraction. At its simplest, its application included photographic documentation of natural growths on a ship's hull.[26] But beyond producing records of static conditions, photography with high-speed cameras was employed, beginning in the 1930s, to document the movement of models, ships, or mechanical parts under trial. High-speed photography was, of course, not a new technology in the 1930s, and neither was its application to moving subjects. Eadweard Muybridge's canonical motion pictures and Étienne-Jules Marey's famous chronophotographic movement-capture in composite images had established the practice nearly half a century earlier. Although an old technique, chronophotography was nevertheless particularly well positioned to meet the 1930s demands of naval research, as studies of mechanical parts proliferated rapidly under the impetus to improve propulsion and thrust systems.

The widespread adoption of chronophotography by the AEW was facilitated by the 1920s development of the stroboscope. A lighting technology for high-speed photography, it was devised by Harold Eugene Edgerton at MIT in the mid-1920s to

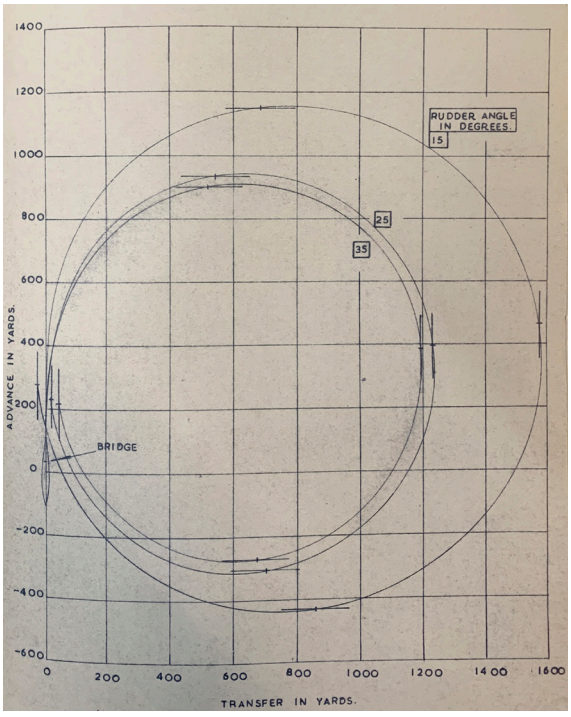
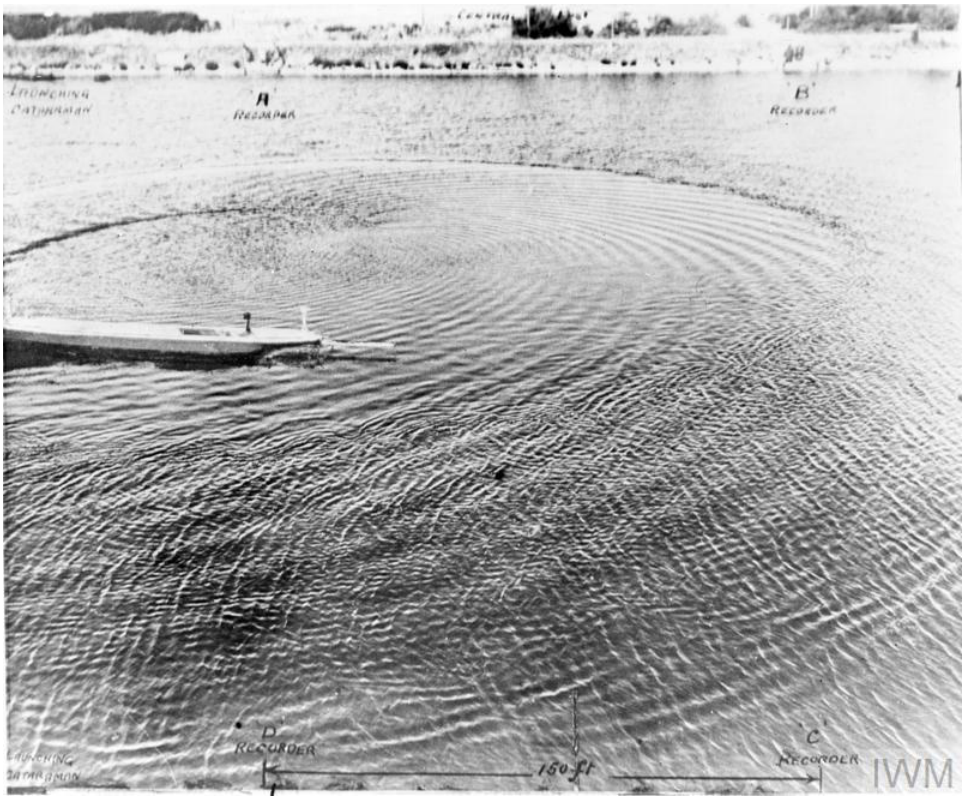


Fig. 5 Admiralty Experiment Works (1950). Graph recording a ship's path and bearing during turning trials at sea [Drawing, National Archives]

Fig. 6 Admiralty Experiment Works (undated). Photographic recording of model in Horsea Lake steering trial [Photograph, Imperial War Museum]

make cyclically moving objects like motor parts appear stationary when captured on a photographic surface. Edgerton's method relied on matching the frequency of the strobe's flashes to the speed of a part's rotation and capturing it on film. As Vosper's report indicates, this type of high-speed photography became central to the AEW's propeller experiments conducted in cavitation tunnels during and after World War II. In his words, "an ultra-high speed camera, working up to a rate of 200,000 exposures per second [was] acquired [. . .] for this purpose" and used in tandem with a "portable wheeled console [. . .] permit[ing] fine control [. . .] of the stroboscopic lighting."[27] This assembly allowed the AEW staff to produce still photographic records of both the rotating model propellers and the circulation patterns of air and bubbles, effectively enabling the study of propulsion systems' hydrodynamic behaviour.[28]

Yet, scaled propellers were not the only models whose trials were recorded by a camera. Turning trials with models might have been numerically transcribed in graph form, as seen in the tracking of the *Magnificent*, but their manoeuvring paths on the surface of the artificial Horsea Lake were also documented photographically by a spatial apparatus. This consisted, as recounted in a 1948 inventory of facilities and equipment, of "a tower approximately 6 feet square and permitting a camera height of 23 feet" so as to allow overhead views.[29] The photographs produced and developed on site emulated



aerial views—rendered popular by aviation—all the while seeking to insert such views in a quantifiable plane of reference. To that effect, the tower's position was aligned with a white post located at the mid-length between two concrete blocks. Four such blocks were installed in total, raised above water level to define a rectangular sector of the lake within which trials were conducted. With all its reference points "accurately surveyed," the experimental infrastructure around the photographic tower pertained not to the experiments themselves but to their documentation; the apparatus was tasked with aligning photographic records of turning simulations with the physical space of Horsea Lake. That is to say, upon its introduction to the AEW, digital computation entered a landscape of graphic documentation techniques that mobilised penned ink or photography to inscribe movement through aqueous spaces into an analogue informational system, comprising concrete blocks in lakes and grids on paper, creating waterscapes of computing.

Waterscapes of computing

In the early 2000s, digitally simulated environments fused "image" with "logic," all the while blurring any distinction between physical and mathematical modelling.[30] Yet the watery sites of the AEW suggest that this blurring was already underway in the 1950s. "Propeller photography," "digital computation," and "recording by photographic methods," intertwined in Vosper's report, were also entangled in practice. The AEW's experimental practices were not merely housed by architecture but rather articulated an interface between architecture and water. Indeed, the 1959 facility codified the mediation of photographic (or composite) documentation techniques architecturally by consolidating their operation into a photographic laboratory,[31] all the while producing an aqueous space of simulation which made the acquisition of a digital computer imperative.

The machine acquired in response was a British-manufactured and Dutch-designed Stantec Zebra.[32] The Zebra was a mainframe digital computer selected, Vosper reported, because of its speed, "modest price," and simplicity of programming.[33] Being simple and fast, the Zebra was put to the task of performing calculations that were familiar, if sometimes too onerous to be attempted through manual or mechanical means.[34] Fittingly, water permeated the Zebra's operational terminology, with its speed being predicated on a mechanical technique termed "underwater programming." The implied submersion was, of course, not physical but informational insofar as it referred to minimising drum access, not a literal plunge.[35] A technique specific to Zebra machines, this informational submersion amounted to operating in bursts of autonomy by incorporating and modifying instructions (typically retrieved from the drum at every step) into data registers. That is to say, the Zebra was designed to function in conditions of communication scarcity, which, albeit artificially produced, emulated naval realities particularly acute in submarine domains. Even if strictly metaphorical, the Zebra's "underwater" operation highlights that water's materiality did not merely host the experiments whose records were analysed digitally but also posed very material limitations to the information system. As will be shown below, this attentiveness to water's affordances was inscribed on AEW documentation practices that negotiated the nexus between water, architecture, and information; it permeated the techniques through which a digitally simulated aqueous space became thinkable.

By the 1960s, AEW reports register a shift in terminology. Documents pertaining to computation practices had begun to adopt a language of *simulation* with references to "calculation," for example, giving way to "mathematical simulation."[36] Nomenclature shifts notwithstanding, little had changed in terms of what was being computed. Resolving manually the complex integrodifferential equations of motion (on which "mathematical simulations" relied) might have been unattainable at the rate required, but the equations themselves remained familiar mathematical formulations—by no means novel epistemic objects. What this new discourse did introduce, however, was an emphasis on the link between *simulation* and *information*. In the language of the 1962 *Porpoise* report:

> It cannot be emphasised too strongly that very little *information* for the *simulation* of H.M. S/M PROPOISE [*sic*] is available. [. . .] While this technique is ideally suited to this type of problem, it is impossible to ascribe quantitative accuracy to the results if accurate hydrodynamic *data* are not available for use in the equations of motion. *Experiments and full scale* [*sic*] *trials must be designed* to produce more of the coefficients for the simulation necessary for these studies.[37]

Computers might have indeed merely accelerated the computational practices already present in experimental environments like the AEW. But in doing so, they catalysed a process of translating simulations, using physical models, into quantifiable information. And they did so by virtue of the need for "accurate data," a process mediated by the AEW's documentation apparatus, as Vosper reported: "in the past, a number of trials have been carried out in which ship motions have been recorded in amplitude form on photographic film or with pen and ink recorders."[38] Here too, speed and the availability of (human) resources limited the efficiency of these practices. But this could be overcome through "automatic analysis." The automatic analysis of "pen and ink" records relied on "digital recording" techniques, which necessitated the use of either digitisers connected at the back of pen-recorders or an electronic analogue-to-digital converter—both tools that allowed experiment results to be captured in the form of punched tape. Such equipment was complex, costly, and prone to breaking down. Still, Vosper conceded that this form of digital recording was particularly valuable. And his reasoning had a computational bottom line: this practice permitted results to be entered "directly into the digital computer for analysis."[39]

Much like the datafication of experimental recordings, digital means also facilitated the "automatic analysis of film records."[40] This process, too, was contingent upon digital computation. Firstly, the practice itself was developed for seaworthiness tests conducted in the Manoeuvring Tank. These were precisely the kind of experiments enabled by this new architecture, the complexity of which had dictated the acquisition of a digital computer. Secondly, the self-propelled models tested in the Manoeuvring Tank, detached from any mechanical arm or railway carriage, could not accommodate recording apparatuses without inadvertently changing the parameters of their buoyancy. Therefore, trial data had to be acquired from a distance. "Passing the results ashore," as Vosper put it, was achieved through an Admiralty-developed ten-channel film recorder capturing the models' "roll, pitch, heave, acceleration, shaft revolutions, course and wave height."[41] These were "automatically converted [. . .] into *digital information*" by a second piece of specially developed equipment: an automatic analyser.[42] Beyond being applied alongside photographic recording, the newly introduced digital

technologies reorganised the AEW's processes and instituted new practices of documentation. While digital computation was employed in an experimental setting where both computational and photographic practices pre-existed, it metabolised previous practices resulting in new, composite techniques and experimental infrastructures—including the architecture of the Manoeuvring Tank—aligned with the possibility of digital information.

The AEW's composite photographic practice of documenting turning trials in the Manoeuvring Tank encapsulates a dialectic relationship of cyclical redefinition in which the technique of photographic recording originally developed for manoeuvrability tests on Horsea Lake was adapted to align with the input requirements of digital computers, enabling the controlled intramural naval space of the tank to be understood as digitisable. The recording configuration consisted of a camera capturing:

> The path of the model during the run up and during the turn [. . .] by a multiple exposure on a single plate. The single camera used look[ed] down on the turning area so that the resulting circle show[ed] the position [of the model] at various points.[43]

Singular lights were mounted on the bow and the stern of the model. Placed at pre-defined heights, they allowed the model's position to be registered on a horizontal plane, even after the model's vertical position relative to water (sinkage) and roll along the lateral axis (trim) took effect. Once the model's movement was recorded chronophotographically, the two lights allowed the reduction of its position to two points on this plane, which was itself represented graphically in the form of a "specially constructed [perspectival] grid."[44] As with the language of simulation, the practice of retouching photographs was not novel to the AEW. As a 1950 inventory documents, besides Leica cameras and Watson microfilm viewers, tools such as "aerograph brush[es]" were part of the photographic studio equipment well before the Manoeuvring Tank was constructed.[45] But if editing photographs in post-production had been well established, following the introduction of (non-human) computers at the AEW, it was put to new use—inscribing experimental results into digital information. By virtue of overlaying a

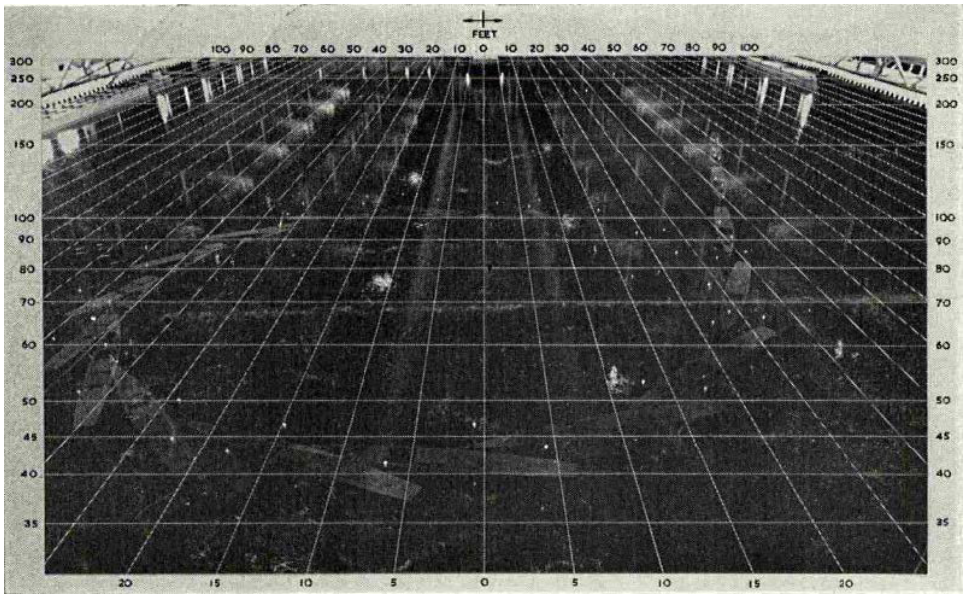


Fig. 7 Admiralty Experiment Works (ca. 1960). Chronophotographic recording of model in Manoeuvring Tank steering trial [Photograph, Nationaal Archief]

two-dimensional grid on multiple-exposure photographs, this composite technique allowed analysing the perspective distortion and unfixed datum of the water space. It enabled translation of the lights' positions into two-dimensional Cartesian coordinates, from which the values of relevant experimental parameters (tactical diameter, transfer, advance, and drift angle) could be extracted. In mediating between a positional system inflected by water and a reference plane defined by the architecture, it transcribed models' movements in space into data, codifiable as bytes.

While decades away from model trials being conducted in digitally simulated environments, such composite techniques, at the water's interface with architecture, made the possibility of tests in a digitally parametricised space conceivable. Digital practices of automatic recording, analyses of film records and the chronophotographic method of documenting turning trials were informed by digital computation. Shaped by its incorporation into the AEW's practices, they were developed in step with the new architectural infrastructure that produced the imperative for electronic computation and, in turn, these techniques produced the conditions of possibility for a new mode of scientific experimentation. They allowed a different role of the electronic computer to become thinkable. They made the conceiving of digital simulation possible.

Conclusions

That simulations have come to define the terms in which most complex systems are modelled and studied is a veritable truism. The lack of consensus on the epistemological status of digital simulation models has hindered neither their adoption nor their diversification.[46] Occupying the hazy space between the empirical and the theoretical, they produce results by "re-producing" phenomena and use an endlessly varying combination of theoretical models, empirical data, and "semi-empirical" heuristic principles derived from observation.[47] With questions on the significance of "theory-model-data" to experimental purity and control persisting, watery sites like the AEW Manoeuvring Tank suggest that asking *how* such environments came to be can lead to understanding the unstable interface of water and architecture, in concert with documentation techniques tasked to stabilise water, by transcribing its aleatory dynamics into digital information. In other words, whereas translating movement through spaces of experimentation into numerical quantities via graphical means predated digital computation, in the aftermath of computation's adoption, the relationship between physical and digital space became increasingly mediated by composite photographic practices. But while digital computation catalysed the development of the AEW's composite photographic documentation practices, these practices allowed for the role of digital computers to be redefined.

Tracing the story of digital computation at the AEW, then, complicates the historiographically consolidated assessment of pre-1960s computers as machines built merely for the procedural calculation of numerical data. It illustrates that the 1970s operationalisation of the image through computer graphics has an analogue prehistory, with image recordings "made to compute and perform actions, to take up and simulate space."[48] And crucially, it suggests that crediting computers with paradigmatic change in experimental environments or, inversely, relegating them solely to facilitators of epistemically familiar processes obscures

the intertwinement of digital computation and recording practices that took place in intramural aqueous modelled environments: such stories of digital computation fail to recognise the agency of water and architecture acquired through their interface.

Within the history of the 1950s Admiralty Experiment Works, digital computation was one more inscription technology entering a multifarious landscape of media. It relied on having operational value—computation's survival was contingent on its ability to integrate with the agency's multiple media recordings of experimental processes. Electronic computers were incorporated into a broader technological apparatus comprising an aqueous site of simulation with its physical space defined, produced, and stabilised by architecture, and transcribed into data through composite documentation techniques. That is to say, the introduction of digital computation at the AEW offers a tale of simulation, computation, and documentation enmeshed in a process of dialectic redefinition. But it also reorients concerns with architectural specificity—be it through genealogies of form, technique, or matter—towards an attentiveness to buildings' relational operation within a landscape of technologies: it tells a story of architecture, computers, and water as a layered system of media.

Acknowledgements

With much gratitude to Professor Matthew L. Jones for his guidance at the earliest stages of this paper, as well as to the staff of the National Archives in London for facilitating this work. Special thanks are also due to the anonymous reviewers and the editors for their rigorous and attentive insights.

NOTES

1. Paul N. Edwards, *A Vast Machine: Computer Models, Climate Data, and the Politics of Global Warming* (MIT Press, 2010); Johannes Lenhard, Günter Küppers, and Terry Shinn, "Computer Simulation: Practice, Epistemology, and Social Dynamics," in *Simulation: Pragmatic Construction of Reality*, edited by Johannes Lenhard, Günter Küppers, and Terry Shinn (Springer Netherlands, 2006); Eric B. Winsberg, *Science in the Age of Computer Simulation* (University of Chicago Press, 2010); Mary S. Morgan and Margaret Morrison, *Models as Mediators: Perspectives on Natural and Social Science*, Ideas in Context, 52 (Cambridge University Press, 1999).

2. For a condensed overview of scientific model use see Joshua Nall and Liba Taub, "Three-Dimensional Models," in *A Companion to the History of Science*, edited by Bernard Lightman (John Wiley & Sons, 2016); Soraya de Chadarevian and Nick Hopwood, "Dimensions of Modelling," in *Models: The Third Dimension of Science*, edited by Soraya de Chadarevian and Nick Hopwood, Writing Science (Stanford University Press, 2004). For a broader introduction on the epistemological impact of modelling practices see Graham M. Burnett, "Masters of the Universe," in *Models*, edited by Emily Abruzzo, Eric Ellingsen, and Jonathan D. Solomon (306090 Books, 2007).

3. A. J. Vosper, "A Review of Facilities and Ship-Model Instrumentation at the Admiralty Experiment Works, Haslar," Symposium on Towing Tank Facilities, Instrumentation and Measuring Technique, Zagreb, Brodarski Institute, Paper No. 3 (1959).

4. Vosper, "A Review of Facilities;" my emphasis.

5. That is not to suggest that the primacy attributed by historians of computation to all things air is an unjustified bias. On the contrary, in a 1950s historical inversion, even naval research itself was shaped by the fast advancing and much better funded domain of aeronautical engineering. For examples of post-war entanglements of digital computing with air see Paul N. Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America*, Inside Technology (MIT Press, 1996); Clark A. Miller and Paul N. Edwards (eds), *Changing the Atmosphere: Expert Knowledge and Environmental Governance*, Politics, Science, and the Environment (MIT Press, 2001); Yuriko Furuhata, *Climatic Media: Transpacific Experiments in Atmospheric Control*, Elements (Duke University Press, 2022).

6. In Naomi Oreskes's words, "if one could calculate the required properties of materials in a scale model, . . . then there was actually no need to build the model itself." Naomi Oreskes, "From Scaling to Simulation: Changing Meanings and Ambitions of Models in Geology," in *Science Without Laws: Model Systems, Cases, Exemplary Narratives*, edited by Angela N. H. Creager, M. Norton Wise, and Elizabeth Lubneck (Duke University Press, 2007), 113.

7. Oreskes sees the propelling of this mathematisation occurring in two phases: first, by the Victorian interest in geological time, and second, by the Cold War preoccupation with nuclear waste. Oreskes, "From Scaling to Simulation," 113.

8. For a thorough account of dead media objects in computing histories see Jacob Gaboury, *Image Objects: An Archaeology of Computer Graphics* (MIT Press, 2021).

9. For in-depth discussions of complex mediatic operations' pertinence to architecture, architectural discourse, and architectural history see John Harwood, *The Interface: IBM and the Transformation of Corporate Design, 1945–1976* (University of Minnesota Press, 2011); Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (MIT Press, 2003). For architecture's friction with a language of "flows" developed for conceptualising computational processes see Matthew Allen, *Flowcharting: From Abstractionism to Algorithmics in Art and Architecture* (gta Verlag, 2023).

10. Peter Galison, *Image and Logic: A Material Culture of Microphysics* (University of Chicago Press, 1997).

11. Galison, *Image and Logic*, 371–385.

12. Galison, *Image and Logic*, 532.

13. Galison, *Image and Logic*, 119.

14. Jon Agar, "What Difference Did Computers Make?," *Social Studies of Science* 36, no. 6 (2006): 869–907.

15. In fact, Agar argues that whether digital computers were the optimal solution for performing Monte Carlo calculations remained an open question. Alternatives, including manual and mechanical methods, were tried and compared. Allocating resources to this exploration would be unjustifiable, he points out, if it had been certain that Monte Carlo methods were only feasible through the use of stored-program computers. Agar, "What Difference Did Computers Make?"

16. Agar, "What Difference Did Computers Make?," 872.

17. For more on William Froude and the early days of the Admiralty Experiment Works see David K. Brown, *The Way of a Ship in the Midst of the Sea: The Life and Work of William Froude* (Periscope Publishing Ltd., 2006); Larrie D. Ferreiro, *Bridging the Seas: The Rise of Naval Architecture in the Industrial Age, 1800–2000* (MIT Press, 2020). For more on earlier model ship trials under the objective of improving the sailing qualities of warships by testing hulls' resistance, stability, buoyancy, trim, and leeward drift see Simon Schaffer, "Fish and Ships: Models in the Age of Reason," in *Models: The Third Dimension of Science*, edited by Soraya de Chadarevian and Nick Hopwood (Stanford University Press, 2004); Bernhard Siegert, "Waterlines: Striated and Smooth Spaces as Techniques of Ship Design," in *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real*, Meaning Systems, First edition (Fordham University Press, 2015); David McGee, "From Craftsmanship to Draftsmanship: Naval Architecture and the Three Traditions of Early Modern Design," *Technology and Culture* 40, no. 2 (1999): 209–236.

18. "New Manœuvring Tank at Admiralty Experimental Works," *Nature* 193 (1962): 817–819.

19. Vosper, "A Review of Facilities."

20. Vosper, "A Review of Facilities," 49.

21. Agar, "What Difference Did Computers Make?," 872.

22. For more on "digitisation" or the codification of objects as digital information see Chris Wiggins and Matthew L. Jones, *How Data Happened: A History from the Age of Reason to the Age of Algorithms* (W. W. Norton & Company, 2023); Harry M. Collins, *Artificial Experts: Social Knowledge and Intelligent Machines* (MIT Press, 1990); Simon Schaffer, "Accurate Measurement Is an English Science," in *The Values of Precision*, edited by M. Norton Wise (Princeton University Press, 1995).

23. This arrangement deviated little from the established configuration of nineteenth-century self-registering instruments. For more on the AEW apparatus see Brown, *The Way of a Ship in the Midst of the Sea*.

24. "H.M.C.S. MAGNIFICENT Turning Trials," 26 January 1950, ADM 226/68, The National Archives, London.

25. "H.M.S. EAGLE Turning and Manoeuvring Trials," 21 December 1951, ADM 226/72/71, The National Archives, London.

26. "Inventory of Experiment Facilities and Equipment at Admiralty Experiment Works, Haslar," 1948, ADM 226/66, The National Archives, London.

27. Vosper, "A Review of Facilities," 43–49.

28. See, for example, "H.M. Submarine OTTER Propeller Photography Trial," June 1964, ADM 226/458, The National Archives, London.

29. "Inventory of Experiment Facilities and Equipment at Admiralty Experiment Works, Haslar," 361.

30. Chadarevian and Hopwood, "Dimensions of Modelling," 8.

31. The 1959 facility saw the consolidation of film-processing small dark rooms, previously incorporated within the vibration and electronics laboratories, into a photographic laboratory, constructed on site as a separate building. For photography in the new facility see Matthew Bristow, *The Admiralty Experiment Works Haslar, Gosport* (Historic England, 2016), 60.

32. Standard Telephones and Cables Limited, "Stantec Zebra: Electronic Digital Computer," 1957.

33. Vosper, "A Review of Facilities," 51.

34. Vosper, "A Review of Facilities," 49.

35. Willem Louis van der Poel, "The Logical Principles of Some Simple Computers" (PhD thesis, University of Amsterdam, 1956); Willem Louis van der Poel, "Micro-Programming and Trickology," in *Digitale Informationswandler/ Digital Information Processors/ Dispositifs Traitant Des Informations Numériques*, edited by Walter Hoffmann (Springer, 1962).

36. "Analogue Computer Investigations of Emergency Manoeuvres on H.M.S/M Porpoise," November 1962, ADM 226/793, The National Archives, London.

37. "Analogue Computer Investigations;" my emphasis.

38. Vosper, "A Review of Facilities," 53.

39. Vosper, "A Review of Facilities," 53–55.

40. Vosper, "A Review of Facilities," 55.

41. Vosper, "A Review of Facilities," 55–56.

42. The importance of this digitisation was such that the AEW underwent a process of deliberation on the means to achieve it. Before the development of the specialised equipment human labour was considered but was deemed too prone to error. Vosper, "A Review of Facilities," 55; my emphasis.

43. Vosper, "A Review of Facilities," 58.

44. Vosper, "A Review of Facilities," 58.

45. "Inventory of Experiment Facilities and Equipment at Admiralty Experiment Works, Haslar," 31 January 1950, ADM 226/68/3, The National Archives, London.

46. Matthew L. Jones, "Calculating Devices and Computers," in *A Companion to the History of Science*, Wiley Blackwell Companions to World History (Wiley-Blackwell, 2016), 476–477.

47. Paul N. Edwards, *A Vast Machine*.

48. Jacob Gaboury, *Image Objects*, 7.

HANNAH STROTHMANN

Changing currents: Industrialising water and hydrosocial experiences in nineteenth-century Berlin

Water remains chaos until a creative story interprets its seeming equivocation as being the quivering ambiguity of life.

—Ivan Illich

Water is in everything, and waters are many. Water fills metaphors, rivers, oceans, policy papers, and books alike. Despite the proliferation of discourses on water and the extensive research conducted across disciplines, the topic of water remains ambiguous. As the philosopher Ivan Illich observed, "water is a shifting mirror. What it says reflects the fashions of the age; what it seems to reveal and betray hides the stuff that lies beneath."[1] Geographer Jamie Linton adds another layer to this discourse by emphasising the often-overlooked bio-physical nature of water in favour of its social dynamics. Linton's concept of the "social nature" of water posits that every significant instance of water is imbued with human ideas, meanings, values, and potentials.[2] This paper delves into the evolving social nature of water and its effects on urban spaces, focusing particularly on Berlin in the nineteenth century—a period of profound transformation in urban water environments due to industrialisation and urban growth.

In the nineteenth century, Berlin experienced a significant shift in its socio-natural relations and urban water environments. Industrial production and the capitalist political economy demanded new uses and volumes of water, thus conceptualising water as an industrial resource. Water, which had always been integral to city-building, faced unprecedented demands that necessitated the creation of large-scale infrastructures and a reorganisation of water management as a facet of urban governance. Flowing rivers were engineered for efficiency, embodying what historian Eva Jakobsson describes as the "industrialization of rivers,"[3] a process that commodified water flows for industrial purposes. Jakobsson's framework is useful in exploring how the concept of "modern water" emerged in tandem with industrial and urban processes. Expanding this concept to the "industrialization of water" allows for a comprehensive understanding of the multifaceted effects of industrialisation on various bodies of water, such as rivers, canals, and new water infrastructures.

This paper examines the emergence of "modern water" and how this abstraction facilitated the industrialisation of urban waters. These industrialised waters, in turn, transformed urban spaces and societies, giving rise to new urban

"hydrosocial" experiences. The term "hydrosocial" encapsulates the complex interplay between water and social forces, highlighting their mutual constitution rather than treating them as separate entities.[4] Nineteenth-century Berlin serves as a lens to illuminate how the social nature of water and its associated meanings evolved alongside urban development and industrialisation processes. The focus is on the river Spree, particularly its eastern stretch known as the Oberspree, which by the late nineteenth century had become both an industrial hub and a site for urban leisure and recreation centred around water. Anchored in long-standing fishing traditions and increasingly integrated through railway connections, the Oberspree emerged as a key site of Berlin's hydrosocial transformation—home to the city's industrial core, its first waterworks, and a burgeoning culture of water-based sports and recreation.

Modern water and its industrialisation

Water was conceived as "a clear liquid, without colour or taste"[5] by nineteenth-century Western thought. For centuries, the understanding of water was not that of a homogeneous chemical entity; instead, it encompassed a multiplicity of forms—"waters"—each characterised by unique local traits and cultural meanings. For example, Roman aqueducts, emblematic of imperial power, transported waters from diverse sources across vast distances, yet they were referred to "in terms of the different waters they carried, not in terms of the structures that carried them."[6] Similarly, springs and wells were often imbued with sacred significance, reflecting the cultural and spiritual beliefs of their communities. Thus, "premodern" waters were articulated in the plural, signifying their heterogeneity shaped by geographical, cultural, and spiritual contexts, as Linton argues.[7]

Social conflicts about the management or control of these waters—particularly regarding access rights and the construction of distribution networks—had always existed. In this context, reframing the social natures of waters to assert ownership has historically served as a means to consolidate power and accumulate capital. The commodification of water, therefore, was not a modern invention. As such, the discursive shift from "holy waters" to "mineral springs" in sixteenth-century Europe was initiated by spring owners who began to compete in a growing market for an increasing number of paying clients.[8] As the eighteenth century progressed, the scientific examination of water intensified, leading to drastic changes in its valorisation. Chemists began to articulate water in terms of an H_2O molecule, while hydrologists produced diagrams that depicted its circulatory nature. Waters were intellectually abstracted from their cultural contexts to become one: waters became water, a deterritorialised, dematerialised chemical substance that Linton calls "modern water."[9] This epistemological reconception of waters into water enabled the perception of a seemingly homogeneous resource, and, as such, took part in intellectual efforts to separate the natural and the social worlds.[10]

However, the emergence of modern water was not solely a product of scientification; it was also intertwined with the processes of urbanisation and industrialisation. As architect and geographer Maria Kaika notes, these transformations were characterised by practices of "domestication and commodification."[11] In the nineteenth century, rapid industrial production and urban growth imposed new demands on water, which helped to create the

idea of water as a resource that could be "industrialized." While water had long been a fundamental element in the formation of cities, the scale of demand generated by industrialisation was unprecedented, necessitating large-scale infrastructure and a reorganisation of water management within the framework of urban governance. Rivers, once natural entities, were altered and subordinated to principles of efficiency.

Eva Jakobsson captures this transformation in her concept of the "industrialization of rivers,"[12] describing it as the process by which river flows were commodified for economic gain. Although Jakobsson's analysis focuses primarily on the hydropower developments in Sweden—highlighting extensive infrastructures such as dams—her framework is useful for examining the broader implications of industrialisation on water. Expanding the concept of the "industrialization of rivers" to encompass the "industrialization of water" allows for a more comprehensive understanding of how various water bodies—rivers, lakes, canals, fountains, and infrastructures—were affected by these transformative processes. This expanded perspective elucidates the multifaceted effects of industrialisation, revealing how water, once seen as a diverse resource, became increasingly homogenised and instrumentalised within the growing urban landscape.[13]

Nineteenth-century Berlin and its industrialising river

In nineteenth-century Berlin, the city's slowly meandering rivers could not be exploited for large-scale hydropower projects. Yet, they had long served other economic functions already. The Spree and Havel rivers integrated Berlin into a trans-European trade network, linking the city to the Baltic Sea through the river Oder and Stettin to the east, and to the North Sea via the river Elbe and Hamburg to the west. For a short period of time, Berlin even became a member of the Binnenhanse, the Hanse network.[14] As industrial production and trade networks expanded, Berlin's role as a hub for ship traffic and commerce grew significantly, leading to the industrialisation of its rivers, particularly the Spree.

With Berlin becoming the capital of the German Empire in 1871, industrial production along the Spree's shores surged. By 1901, forty-two industrial production sites had settled on the shores of the Oberspree, the eastern segment of the river.[15] Industrial settlements were favoured in the east to reduce air pollution, since the prevailing winds came from the west. Furthermore, the region's existing infrastructure, affordable land, and low population density made it an attractive location for the textile, chemical, metal, and electrical industries.

As a consequence, the lands in front of the Stralauer Tor were turned into construction sites for the growing metropolis. The Stralau peninsula, with its long shoreline, became home to various factories, such as breweries, shipyards, a bottle factory, a palm kernel- and carbon disulfide industry, and a carpet manufacturer.[16] This carpet manufacturing business was part of the growing textile industry which had settled along the Oberspree and employed around 400 workers in the production processes of washing, dyeing, spinning, and reeling raw wool.[17] Thus, the river provided for the livelihood of industrial workers. The processes of dyeing and washing required substantial volumes of water, necessitating high-quality, clean water sourced directly from the Spree. However, the residual wastewater was heavily polluted when discharged back into the river, exacerbating environmental degradation.

Historically, the Spree had functioned as a sewage outlet for centuries, but the increased volume and intensity of industrial waste significantly strained the aquatic ecosystem.[18] Besides the devastating effects of water pollution, the lives of fish were increasingly disturbed by the ship traffic, making it impossible for fish to spawn.[19] Thus, only a few fish survived the Spree's industrialisation, and their gradual extinction reciprocally affected human lives on Stralau's shores. For centuries, Stralau had been a fishers' village whose livelihood was built on the Spree's nourishing water as a habitat of freshwater fish, such as pike, tench, zander, catfish, bass, carp, bleak, and eel.[20] The annual festival, Stralauer Fischzug, expressed the close relation between Stralauers, the Oberspree, and the fish, celebrating the villagers' fishing tradition.[21] As fish populations dwindled, professional fishing ceased to exist too.[22] Industrial water pollution, however, also became a public health concern. Berliners bathed in the Spree's numerous river baths, many of which were located downstream of Stralau and its industries and thus exposed to wastewater flows. Similarly vulnerable to water pollution was Berlin's drinking water supply, which was until 1892 provided by the city's first waterworks built right next to the Oberbaumbrücke, close to Stralau's industries.[23]

By 1901, municipal authorities initiated annual chemical analyses of the wastewater from the industrial plants to monitor the effects of industrial production on the river.[24] This regular chemical analysis was part of an increasing regulation of the Spree's waters, which intensified from the 1890s onwards and also included the adjustment of the riverbed. Due to increasing ship traffic, the width and depth of the river's bed was broadened to accommodate bigger ships and their voluminous hulls.[25]

Water as a governance tool

Berlin's industrialisation of water also entailed the construction of new waterways. These were planned not only as industrial transportation routes but also as means to structure urban growth. In the early nineteenth century, Prussian architect and superintendent of public works Karl Friedrich Schinkel devised plans to regulate Berlin's urban development through the design of the city's waterways. After travelling to England in 1826 to study its industrial and residential architecture, Schinkel was determined to prevent Prussia's capital from growing as "disorganized."[26] He imagined that with the help of its waters, Berlin could be put in order, kept clean and ventilated, preconceiving the idea of modern water.

In the mid-nineteenth century, landscape architect Peter Joseph Lenné continued Schinkel's trajectory but concentrated his plans for Berlin on the building of new canals. In less than fifteen years, Landwehrkanal (1845–50), Luisenstädtischer Kanal (1848–52) (Fig. 1), and Spandauer Schifffahrtskanal (1848–59) were constructed, each designed with different intentions. While the Landwehrkanal was perceived as a way to bring building materials such as bricks into the city, the design of the Luisenstädtischer Kanal followed primarily aesthetic and not functional principles, which rather hindered than enabled ship traffic.[27] The Spandauer Schifffahrtskanal was built to connect industrial production sites and adhered to economic principles. Decades later, the Teltowkanal (1900–06) was designed in a similar vein as a circumvention route of the inner city, relieving the Spree and the Havel from ship traffic. The mentioned canals were only some of the major construction projects in Berlin's inner city;

Fig. 1 Luisenstädtischer Kanal (1926): Engelbecken (Angels' Basin) [Landesarchiv Berlin, F Rep. 290 (09) Nr. II925 / Foto: k. A. / übernommener Bestand]

in addition, one-way canals were built to provide access to industrial areas, and other canal projects in the region expanded the infrastructural water network. Thus, the industrialisation of Berlin's waters took on many forms, and interests in reconceiving waters as modern water were manifold.

These canal projects were emblematic of the "engineering era" which, as Kaika notes, "heralded a new relationship between human beings and nature" that reconfigured waters and societies "for the benefit of capitalist expansion."[28] As preconceived by Schinkel, the design of waterways and new water infrastructures was increasingly employed as a governance strategy to create a spatial and social order in the urban sphere. In nineteenth-century cities, deteriorating living conditions and recurring outbreaks of infectious disease "posed a complicated set of dilemmas for the scope and effectiveness of modern government,"[29] according to geographer and urbanist Matthew Gandy. As a reaction, public health policies were implemented that built on the reconfiguration of urban water flows to enforce sanitation and hygiene measures. The introduction of water infrastructures relegated polluted waters as causes of illnesses to sewer systems, while freshwater was separately piped to clean both urbanites and urban spaces. These water infrastructures relied on the idea of modern water as a clean and homogeneous liquid that could be employed to erase smells, dirt, and dust and thereby also regulate social lives.[30]

Berlin, however, lagged behind cities like Paris and London in separating and manipulating water flows. While those cities had established water supply networks for decades, Berlin's mid-nineteenth-century demand for both raw and drinking water was still covered by various fountains on private and public grounds.[31] Water access was dispersed across urban spaces and the quality of the pumped waters varied accordingly, depending on the grounds they were being extracted from.

> Many houses have their own wells and every 200 steps you can find such wells in all streets [. . .] The quality of this water is very different. In some areas it is pure, bright, fresh and tasteless. The water from the fountains in the castle courtyards, for example, is of excellent quality. In others, it is hard, yellowish, and has an unpleasantly pungent taste that comes from the ground where the wells are dug.[32]

This excerpt from Johann Formey's *Versuch einer medicinischen Topographie von Berlin* published in 1796 demonstrates an astonishing sensitivity to the city's diverse waters. It also highlights that the access to 'good' water depended on class and socio-economic affluence, as the best water quality was registered in the "courtyards of castles."

Thus, before the implementation of centralised water infrastructure, people were attuned to the idea of different waters and had gained knowledge of Berlin's varying water qualities, relating to Linton's idea of premodern waters. Social relations with water were influenced by class, yet remained intimate and somewhat self-determined. Urban residents devised their own water management solutions such as backyard tanks for rainwater collection and gas-fuelled water towers in residential attics.[33] As agents of their water, it was therefore not the people which demanded a change in urban water management. Instead, governing authorities saw an opportunity to establish urban order.[34]

In the nineteenth century, the police had been assigned the responsibility to monitor and govern Berlin's streets and squares. This included the management of public fountains as well as street cleaning and firefighting responsibilities. It was the authoritarian police commissioner Karl von Hinckeldey who implemented Berlin's first centralised water supply system: the regulation of urban waters aimed to establish social order and secure political power.[35] The primary goal of the city's first water supply system was not to ensure access to clean water for residents, but to solve curbstone cleaning issues by eliminating excrements from public spaces. Berlin's first water supply system therefore aimed at establishing the city's hygiene, and not the hygiene of citizens, and was, in fact, a precursor to the later introduced sewage system.[36] After decades of discussions and several proposals for a sewage system, Berlin's magistrate appointed urban planner James Hobrecht to develop a new sewage plan in 1869.[37] The immense growth in population and urban density made it seem urgent to eliminate pollution of urban waters in order to combat diseases and establish hygiene. Hobrecht had already left a distinctive mark on Berlin's development with his 1862 Extension Plan for Berlin, which became the main regulative framework for the city's future growth. Now, he was to bring order to the city's water flows. Hobrecht's approach to Berlin's sewage system was novel in that he introduced the so-called "radial system," which proposed draining the city's wastewater onto fields outside of the urban area—fields that were also used as fruit plantations: wastewater thus became a nourishing liquid.[38]

Gendered spaces for water interaction

Earlier in the nineteenth century, Berlin's water infrastructure was built on the idea of modern water as a homogeneous cleansing liquid. This led to the creation of urban spaces that further manifested this imagination. Invisible to the public eye, new underground pipe networks now linked neighbourhoods, unifying

the city as a cohesive force for city administration.[39] Waterworks, like Berlin's first plant built along Stralau's Oberspree, pumped and purified water to supply the growing city (Fig. 2). Sociologist Elisabeth Heidenreich refers to these infrastructures as "technical *flowing* spaces" to emphasise their spatiality, defining them as a synthesis of nature and "modern everyday life."[40] To access these controlled "*flowing* spaces," new "spaces of transition," such as bathrooms, emerged. These spaces redefined the relationship between public and private spheres, impacting social roles and domestic dynamics. Public fountains, formerly sites

Fig. 2 Waterworks in Alt-Stralau, Stralauer Chaussee / Warschauerstraße (1888) [Landesarchiv Berlin, F Rep. 290-09-01 Nr. 61-5077 / Foto: k. A.]

of communal water access, were succeeded by new private "wet rooms"[41] within homes, shifting the responsibilities and experiences of water interaction.

In a gendered reallocation of responsibilities, household water management, traditionally seen as women's work, became confined to the bourgeois home's interior, as Kaika notes.[42] Meanwhile, the industrialised water flows feeding these wet rooms were public and controlled by male engineers and municipal administrators. Thus, water management responsibilities were separated according to the contemporary logic of gender characteristics:[43] The economisation of public water flows was the responsibility of 'rational' men, whereas women 'passively received water from the tap within the home. Anthropologist Veronica Strang concludes that women were the first to be "disenfranchised from the control of water,"[44] as men took over water's technical and administrative aspects.

Indeed, water had "always been perceived as the feminine element of nature,"[45] as Illich underlines. Fluidity and wetness were understood as physical characteristics not only of water but also of female bodies. Thus, water flows undergirded gendered and sexualised imaginations. Philosopher Astrida Neimanis points out that the inherent wetness of female bodies and their capacity to gestate life in "intrauterine space" remains withdrawn from male control.[46] Therefore, she sees in female bodies a nexus of notions of fluidity and power. Transferring this idea to an urban

scale, strategies to control and contain water flows as part of the industrialisation of water were related to strategies of managing and disciplining biologically and figuratively fluid feminine bodies.[47] Moreover, in the nineteenth century, physis and morals were understood to be inherently related, which helped to proliferate ideas of untamed water flows as a morally bad influence, according to sociologist Susanne Frank. Disorderly urban spaces reflected characteristics of the open sea as an uncontrollable and endless water body. And the sea was in turn a symbol for the devouring and destructive aspects of female sexuality.[48]

In contrast, designed and controlled urban water flows such as fountains symbolised the successful taming of wild female natures. Designed by male planners and engineers, such controlling strategies expressed the nineteenth-century bourgeois male angst of urban disorder. Frank contends that these urban water-control measures reflected a deeper anxiety within the nineteenth-century bourgeois male psyche, triggered by the city's growth and transformation.[49] The demolition of city walls to accommodate expansion symbolised not only physical but also social disintegration; boundaries that once defined and maintained a male-centric social order were eroding. These (symbolic) ruins became a ground for the bourgeoisie to cultivate their unease and anxiety about the industrialising city, with its growing working-class neighbourhoods, raging epidemics, decaying morals, and eroding bourgeois gender roles.

The crisis of the modern city, therefore, was a gender crisis.[50] Yet, it was as much a class conflict and a struggle to deal with the fluidity of urban natures, which played out in domesticating and disciplining urban waters and human natures alike. The underlying fear that men dominating nature could suddenly shift to nature dominating men informed both strategies of taming urban waters and female bodies.[51] Fluids and mushy substances, such as swamps, marshes, mud, or slime, and their capacities to absorb and swallow everything without a trace were feared by the militaristic Prussian morale, according to sociologist Klaus Theweleit. In congruence with Neimanis, Theweleit sees a relation between this fear of fluids and wetness to the masculine (military) disgust of women.[52] Thus, the containment of water flows into hidden infrastructural spaces and the industrialisation of water as a means to exploit and control urban water, both reconfigured the urban sphere and manifested social imaginaries.

This spatial reallocation of water access and interaction thereby affected and reaffirmed gender roles as well as bodily ideals. Illich points out that water, now flowing through pipes directly into the home, also became central to new ideals of domestic intimacy and privacy: "Water became that stuff that circulates through indoor plumbing, and the nude became the symbol of a new fantasy of sexual intimacy defined by the newly created domestic sphere."[53] From fountains to pipes, from backyard water collection to simply turning on the tap—new urban water infrastructures altered everyday lives tremendously. And they did not do so equally for all, not only in terms of gender. While water access had potentially become as "easy and simple as turning a tap inside the private space of one's home,"[54] it remained unevenly distributed. High costs of plumbing and construction required capital and socio-economic affluence; only wealthier households could afford these amenities. Thus, water access at the turn of the twentieth century was limited to middle-class households.[55] Nevertheless, industrialised water and its new infrastructures influenced everyday interactions with water not just in the bourgeois home.

New urban hydrosocial experiences

As water management was no longer dependent on collective labour but instead a task for the hydrological engineers of the hidden "*flowing* spaces," shared knowledge about different water qualities was increasingly lost. Yet, it can also be argued that as water infrastructures now provided for everyday needs of water, urbanites were freed from a purely functional relation to water access. Instead, they were able to discover new interactions and aspects of urban waters, inventing new "hydrosocial" experiences. When environmental historian Stéphane Castonguay widens Jakobsson's idea of the "industrialization of water" to encapsulate the "formation of an economic system based on the integration of different industrial systems," he explicitly includes recreational activities, such as swimming, rowing, or sailing, that were linked to the "industrialization of water."[56] These new hydrosocial activities emerged in tandem with industrialisation and reconfigured urban spaces and water landscapes.

Thus, the transformation of the river Spree extended beyond its waters and aquatic life; it altered the river's atmosphere and social dynamics. Industrialisation redefined work schedules and traffic patterns, influencing the temporal rhythms of urban life as well as the river's physiognomy. A newspaper article from 1896 noted that the Spree now had a "weekday and a Sunday-physiognomy":

> Berlin is a busy city, and on weekdays one therefore rarely sees a pleasure boat on the water; [. . .] hardly a few hours of the night are left in which the appallingly tuned steam whistles of the tugboats do not frighten the residents out of their sleep. The water idyll on the Spree is over. The weekday physiognomy of the river is decidedly prosaic [. . .] and the rowers' boathouses are closed. The situation is different on Sundays and holidays, when the Spree shows a festive physiognomy early in the morning. Rowers and sailors hurry upstream with their flagged boats, and steamers with music lead companies to locales of the Upper Spree.[57]

The river's atmosphere changed depending on the day of the week. On weekdays, the Spree appeared "decidedly prosaic," populated by ship traffic which supplied Berlin and filled the atmosphere with particles and noise of steam pipes, leaving only a "few hours of the night" to the riverine inhabitants. Thus, Otto Hellmann talks of the "noisy age of technology" to which the "idyllic fishing village" Stralau surrendered, having become a "factory village" instead.[58] The morphology and the soundscape of the city changed in unison. Yet, it was also this clocked-in rhythm of production processes and working hours which created spare time for leisure and new ways of engaging with the urban water landscape. Thus, on weekends, the Spree showed "a cheerful physiognomy" already early in the morning, when rowers and sailors "hurried in their boats upstream."[59]

August Trinius humorously noted in 1885 that a "Sportbacillus"[60] had spread among Berlin's population, and it had "infected" the river and its shores, transforming Stralau into a centre for water sports. The area had already been a popular destination for Berliners seeking respite from urban life on summer weekends.[61] Here, the village's century-old fishing tradition, which had established a close (social) relation to the surrounding waters, might have helped to quickly integrate the Oberspree into this growing leisurely environment. As urban growth eventually consolidated infrastructural connections, the peninsula became accessible for an increasingly diverse public, and on weekends people

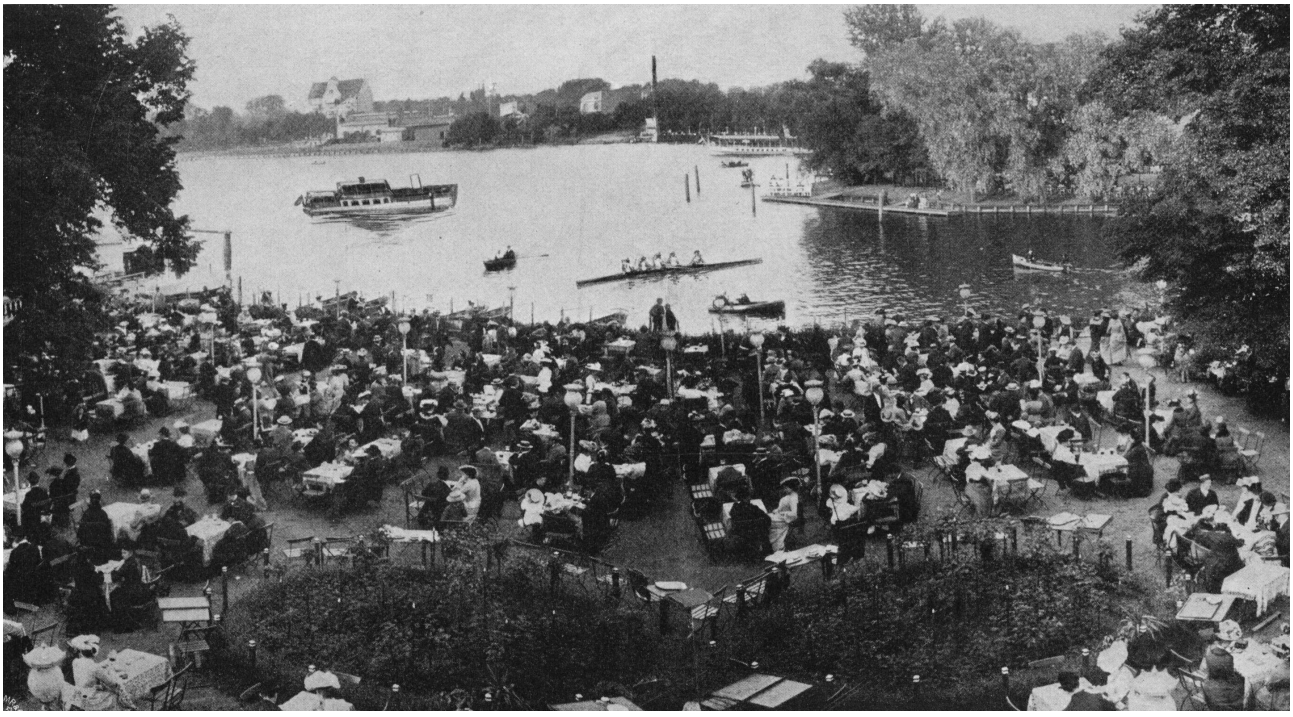


Fig. 3 Zenners Gartenrestaurant [Fedor Zobeltitz, *Berlin und die Mark Brandenburg* (Verlag von Velhagen und Klasing, 1902), 75]

from all social classes came to seek rest from Berlin's densifying and loud urban environment.[62]

The industrialisation of the Spree, therefore, took on many forms, which impacted not only the river, its water, and environment but also the lives within as well as ashore. Industrial processes extracted water, produced wastewater, polluted aquatic environments, and created increasing ship traffic, disrupting the river's ecological balance. Conversely, these same industrial processes facilitated the discovery of the river as a public space, enhancing living conditions and creating opportunities for leisure on and along the water. Moreover, infrastructures such as waterworks provided for everyday needs of water, creating opportunities to engage with water beyond purely utilitarian concerns. In that sense the Spree not only had become a "weekday and a weekend physiognomy," but instead many different faces, according to the diversifying uses and perceptions of its water.

The intellectual abstraction of waters into modern water had imagined water as a homogeneous liquid that could be industrialised. This industrialisation of water took on multiple forms and reconfigured both city spaces and urban societies in complex ways. One consequence was that urbanites were freed from a purely functional, individual relation to water. Open waters were newly discovered as spaces of leisure and rest, transforming Berlin's rivers into public spaces—yet ones still shaped by power relations. As such, Berlin's rivers and canals also became sites of social negotiation, where ideas about gender and class were articulated and contested. Built by male engineers, various water infrastructures helped (re)affirm dominant gender roles and class privileges. Yet, while these power relations continued to shape industrialised urban water flows, water itself remained fluid, blurring boundaries as well as social norms. Contradictions were inherent. The Oberspree, one of the most polluted river segments, simultaneously served as a leisure playground for the bourgeoisie, who rowed and sailed on this part of the river. Still, as a flowing river, the Spree could not be entirely

controlled or governed. In the late nineteenth century, for example, female workers rowed alongside upper-class men on the Oberspree—disrupting the social order inscribed onto the city's waterscape.[63] Attending to such contradictory microhistories reveals the shifting currents of urban water flows—currents that continue to shape the city today.

NOTES

1. Ivan Illich, *H20 and the Waters of Forgetfulness* (Dallas Institute of Humanities and Culture, 1985), 25.

2. Jamie Linton, *What Is Water?: The History of a Modern Abstraction* (University of British Columbia Press, 2010), 4f.

3. Eva Jakobsson, "Industrialization of Rivers: A Water System Approach to Hydropower Development," *Knowledge, Technology & Policy* 14 (2002): 41–46.

4. Linton, *What is Water?*, 105f; Erik Swyngedouw, *Liquid Power: Contested Hydro-Modernities in Twentieth-Century Spain* (MIT Press, 2015).

5. The Cambridge Dictionary defines water as "a clear liquid, without colour or taste, that falls from the sky as rain and is necessary for animal and plant life." "Water," Cambridge Dictionary, accessed 30 October 2024, *https://dictionary.cambridge.org/dictionary/english/water*.

6. Linton, *What is Water?*, 83.

7. While Linton's notion of "modern water" is helpful to delineate shifting social natures of water, his idea of "premodern waters" remains problematic, and Western-centric. Sacred waters never ceased to exist and framing cultural practices celebrating sacred waters as "premodern" remains problematic. There were never such clear shifts between "modern" and "premodern," instead these processes remain ambiguous.

8. Linton, *What is Water?*, 94f.

9. For a more detailed definition on "modern water", cf. Linton, *What is Water?*, 13–19.

10. Linton, *What is Water?*, 80f.

11. Maria Kaika, *City of Flows: Modernity, Nature, and the City* (Routledge, 2005), 53; Linton, *What is Water?*, 97.

12. Jakobsson, "Industrialization of Rivers," 44.

13. Broadening Jakobsson's concept is inspired by Stéphane Castonguay, "Rivers, Industrial Cities, and Hinterland Production in Quebec in the Nineteenth and Twentieth Centuries," in *Rivers Lost, Rivers Regained*, edited by Martin Knoll, Uwe Lübken, and Dieter Schott (University of Pittsburgh Press, 2017).

14. Laurenz Demps, "Berlin am Wasser: Ein historischer Ausflug," in *Wasser in der Stadt: Perspektiven einer neuen Urbanität*, edited by Uli Hellweg and Jörg Olmanns (Transit, 2000), 13–55; 19.

15. Karin Winklhöfer, "Die Wasserqualität der Berliner Spree zwischen Reichsgründung und Erstem Weltkrieg" (PhD diss., Freie Universität Berlin, 2015), 27. This dissertation is a biological analysis of the Spree's shifting waters. With regards to the industries on the Oberspree's shores, see Karin Winklhöfer, Marc Leszinski, and Christian Steinberg, "Industriebetriebe an der Oberspree und ihre Auswirkungen auf die biotische Beschaffenheit des Flusses im frühen, 20. Jahrhundert," in *Hydropolis: Wasser und die Stadt der Moderne*, edited by Susanne Frank and Matthew Gandy (Campus Verlag, 2006), 199f.

16. Otto Hellmann, "Stralau und seine Geschichte," *Mitteilungen des Vereins für die Geschichte Berlins* 46 (1929): 97.

17. Winklhöfer, Leszinski, and Steinberg, "Industriebetriebe an der Oberspree," 123.

18. Until regulations limited discharges of wastewater in 1842, all sewage water was directed into the Spree, see Winklhöfer, "Die Wasserqualität der Berliner Spree," 31.

19. "[. . .] the ever-increasing steamboat traffic and other vessels, such as the many rowing and sailing boats, do not allow the fish to spawn quietly," "Lokales," Berliner Börsen-Zeitung 385, 19 August 1909, 1; translation by the author.

20. Hellmann, "Stralau und seine Geschichte," 76.

21. In 1841, the century-old Stralauer Fischzug attracted as many as 50,000 visitors, including the king and royal court, see Hellmann, "Stralau und seine Geschichte," 91f. The increasingly excessive character was countered by Prussian authorities with severe police and military presence, until the festival was repeatedly banned in the late nineteenth century. It continued in decentred form in various restaurants, yet as Baedeker notes in 1891, the visitors are only from "the lower ranks" of urban society—see Karl Baedeker, *Berlin und Umgebungen. Handbuch* für *Reisende* (Verlag von Karl Baedeker, 1891), 167.

22. Still in 1929, the fishing territory existed and Stralau's fishers celebrated the Stralauer Fischzug, yet bought the fish on Berlin's markets. After the bought fish was released into the Spree, it was immediately caught again: a legal ritual for the fisher to retain their still existing fishing rights; Hellmann, "Stralau und seine Geschichte," 90.

23. In 1877, the second waterworks opened at the Tegeler See; Winklhöfer, "Die Wasserqualität der Berliner Spree," 31.

24. Winklhöfer, Leszinski, and Steinberg, "Industriebetriebe an der Oberspree," 129.

25. Between 1875 and 1908, Berlin's locks registered a drastic increase of freight volume which rose from 787,404 to 2,769,300 tons, with a simultaneous decrease of lock operations due to bigger ships—see Winklhöfer, "Die Wasserqualität der Berliner Spree," 31.

26. Demps, "Berlin am Wasser," 44.

27. The bridges crossing the Luisenstädtischer Kanal were of extremely low height to not alter the city's appearance from ashore. As the bridges were concealed from the streetscape, they became obstacles for the canal's traffic, and ships could not pass underneath, but had to wait for them to be opened—see Demps, "Berlin am Wasser," 45.

28. Kaika, *City of Flow*s, 107.

29. Matthew Gandy, "The Bacteriological City and Its Discontents," *Historical Geography* 34 (2006): 15.

30. The social effects of this "de-sensualization" of cities are analyzed by Tim Edensor, "The Social Life of the Senses: Ordering and Disordering the Modern Sensorium," in *A Cultural History of the Senses in the Modern Age*, edited by David Howes (Bloomsbury Publishing, 2014), 31–53. Research in Urban Political Ecology traced the effects of the separation of water into 'good' and 'bad' flows, consistent with Kaika, *City of Flows*.

31. Water supply infrastructures were introduced to Paris in 1802 and to London in 1808, cf. Gandy, *The Bacteriological City*, 17. Hilmar Bärthel provides a thorough history of the development of Berlin's water infrastructures, with detailed figures of Berlin's fountains and inhabitants at the beginning of the nineteenth century: Hilmar Bärthel, *Wasser für Berlin: Die Geschichte der Wasserversorgung* (Berliner Wasserbetriebe, 1997), 32.

32. Johann Ludwig Formey, *Versuch einer medicinischen Topographie von Berlin* (Berlin, 1796), 18; translation by the author: "Viele Häuser haben eigene Brunnen und ohngefehr alle 200 Schritte findet man dergleichen in allen Straßen. [. . .] Die Güte dieses Wassers ist aber sehr verschieden. In einigen Gegenden ist es rein, hell, frisch und ohne Geschmack. Von vorzüglicher Güte ist z.B. das Brunnenwaßser auf den Schloßhöfen. In andern ist es hart, gelblich und hat einen unangenehm mohrigen Geschmack, das dasselbe von dem Grund und Boden, wo die Brunnen gegraben sind erhält."

33. The latter inspired an 1806-contemporary to remark: "jedes Haus sein eigener

Wasserturm" [each building its own water tower], Bärthel, *Wasser für Berlin*, 42.

34. Demps, "Berlin am Wasser," 53.

35. Bärthel, *Wasser für Berlin*, 33; Demps, "Berlin am Wasser," 53.

36. Bärthel, *Wasser für Berlin*, 38. The ontological difference between 'clean' and 'dirty' water flows in separate water infrastructure systems (water supply versus sewage) was a socio-cultural ascription, and not a functional reality.

37. Oliver Krzywanek, "Die Entstehung der Berliner Kanalisation: Ein Kraftakt," *Wissenschaftsmagazin fundiert* 2 (2004), https://www.fu-berlin.de/presse/publikationen/fundiert/archiv/2004_02/04_02_krzywanek/index.html.

38. Laila Seewang provides a detailed analysis on the effects of Hobrecht's radial system and its "*Rieselfelder*" [draining fields] on the urban fabric and urban governance in her dissertation: Laila Seewang, "The Scale of Water: Networked Infrastructure and the Making of Municipal Berlin 1872–1900" (PhD diss., ETH Zürich, 2019), https://doi.org/10.3929/ethz-b-000381384, especially cf. pp. 84–105.

39. As an example serves a commission convened by the magistrate in 1902 to negotiate the "*Einverleibung*" [annexation] of Treptow, Stralau-Rummelsburg, Lichtenberg and Friedrichsberg in Berlin. This was deemed necessary by the city's administration as these eastern towns were to be connected to the sewage water system; "Aus Berlin," *Norddeutsche Allgemeine Zeitung* 64, 16 March 1902.

40. Elisabeth Heidenreich defines "*technische Fließ*räume" [technical *flowing* spaces] as infrastructural systems consisting of the nexus of the medium's source, the connective thread and the overall technical infrastructure; taken together, they form a continuous and dynamic space as an integral part of everyday (urban) life: Elisabeth Heidenreich, "Natur und Kultur heute: verwickelt in technische Fließräume" in *Hydropolis*, 60.

41. Kaika, *City of Flows*, 58.

42. The bourgeois home itself played a key role in establishing and inscribing the social division of labour in space in many regards, as it also allocated labour responsibilities according to gendered roles—see Kaika, *City of Flows*, 58.

43. Emerging in eighteenth-century Germany, "gender characteristics" defined men as rational and active, whereas women were ascribed to be passive and emotional, reflecting the idea of women as 'natural' and men as 'cultural' beings. By the end of the nineteenth century, gender characteristics had become an accepted ideology and a dominant political instrument that declared a 'natural' world order. Karin Hausen, "Die Polarisierung der 'Geschlechtscharaktere'—Eine Spiegelung der Dissoziation von Erwerbs- und Familienleben," in *Dis/Kontinuitäten: Feministische Theorie*, edited by Sabine Hark (Springer, 2007), 162–185.

44. Veronica Strang, *The Meaning of Water* (Routledge, 2004), 24.

45. Illich, *H20 and the Waters of Forgetfulness*, 1.

46. Astrida Neimanis, *Bodies of Water: Posthuman Feminist Phenomenology* (Bloomsbury Publishing, 2016), 79.

47. According to Neimanis, who refers to the psychoanalyst Luce Irigaray, feminine bodies are both biologically fluid, in their "genital mucosity, their placental interchanges, and their amniotic flows" and figuratively fluid "in their non-subsumability into a masculine paradigm," Neimanis, *Bodies of Water*, 78.

48. Susanne Frank, "'Schmutziges Wasser' und 'schmutzige Frauen'. Zur Verbindung von Wasser- und Weiblichkeitsbildern in der Stadtentwicklung des 19. Jahrhunderts," in *Hydropolis*, 159.

49. Frank, "'Schmutziges Wasser' und 'schmutzige Frauen,'" in *Hydropolis*, 147.

50. Frank, "'Schmutziges Wasser' und 'schmutzige Frauen,'" in *Hydropolis*, 147.

51. Frank, "'Schmutziges Wasser' und 'schmutzige Frauen,'" in *Hydropolis*, 149.

52. Kirsty Bell refers to Theweleit's influential study "Männerphantasien," which traced fascist continuities in male fantasies and sexualities after WWII: Kirsty Bell, *Gezeiten der Stadt: Eine Geschichte Berlins* (Kanon Verlag, 2021), 72.

53. Illich, *H20 and the Waters of Forgetfulness*, 1.

54. Kaika, *City of Flows*, 53. Kaika traces the multiple relations between the commodification of water and social formations, especially in her chapter "Nature as the Urban Uncanny" (pp. 51–75), focusing on the effects on the 'modern home.'

55. Gandy, *The Bacteriological City*, 20. This would only change with "wider diffusion of prosperity during the twentieth century." Kaika highlights that as the bourgeois household turned into the home and a signifier for "freely flowing good water," urban public spaces were increasingly perceived as "the place where 'bad' water dwells (together with other urban anomies)"—see Kaika, *City of Flows*, 57.

56. Castonguay, "Rivers, Industrial Cities, and Hinterland Production in Quebec," 29: "[. . .] for the production of hydropower, pulp and paper, and aluminium, as well as log driving and touristic and recreational activities."

57. "Berlin ist eine arbeitsame Stadt, und an Wochentagen sieht man deshalb selten ein Vergnügungsboot auf dem Wasser; [. . .] kaum ein paar Nachtstunden sind noch übrig, in welchen die entsetzlich gestimmten Dampfspfeifen der Schleppdampfer nicht die Anwohner aus dem Schlafe schrecken. Mit dem Wasseridyll an der Spree ist es vorbei. Die Wochentagsphysiognomie des Flusses ist entschieden prosaisch [. . .] und die Bootshäuser der Ruderer sind geschlossen—Anders sieht es an Sonn- und Festtagen aus, da zeigt die Spree schon in aller Frühe eine festliche Physiognomie. Ruderer und Segler eilen mit ihren beflaggten Booten stromauf, und Dampfer mit Musik führen Gesellschaften nach Lokalen der Oberspree.": "Lokal-Nachrichten und Vermischtes: Erstes Beiblatt," *Berliner Tageblatt und Handels-Zeitung* 485, 23 September 1896; translation by the author.

58. Hellmann, "Stralau und seine Geschichte," 97: "Das idyllische Fischerdorf war dem geräuschvollen Zeitalter der Technik zum Opfer gefallen. Es war ein großes Fabrikdorf in unmittelbarer Nähe Berlins geworden."

59. "Lokal-Nachrichten und Vermischtes."

60. August Trinius, *Vom Grünen Strand Der Spree: Berliner Skizzenbuch* (J. C. C. Bruns Verlag, 1885), 40f: At that time, watersports in Berlin were concentrated on the Oberspree, the only other hotspot of water sports was in Köpenick, on the other, eastern 'end' of the Oberspree.

61. Located on the outskirts of the city (gates), yet within easy reach, Stralau came alive in the warm season and fell silent in the winter—see Hellmann, "Stralau und seine Geschichte," 96f.

62. The inauguration of new train lines, such as the Ringbahn (1877) and the Stadtbahn (1881), drew Stralau closer to Berlin, while the construction of the Tunnelbahn (1899) consolidated the Spree's shores, connecting Stralau with Treptow; Hellmann, "Stralau und seine Geschichte," 97.

63. Hannah Strothmann, "Unter dem Radar? Rudernde Arbeiterinnen oder die vergessenen Wegbereiterinnen des Frauen-Rudersports in Berlin (1892–1914)," in *Arbeit Bewegung Geschichte* III (2023), 75–97.

GIANLUCA DRIGO

Taming the Leviathan: The epic of the domestication of the world and Peter Behrens's Gibraltar Dam

This paper examines the symbolic and monumental significance of water infrastructure as an expression of humanity's ambition to dominate nature. By exploring cases such as Peter Behrens's Gibraltar Dam and Soviet hydrological projects, it considers how water infrastructure has transcended its functional purpose, embodying the "domestication of the world" by asserting control over water, a force both essential and potentially destructive. As hallmarks of the Anthropocene, these structures represent modernity's rationalising spirit, showcasing both technical prowess and a cultural ideology of human supremacy over natural forces. However, in the context of escalating environmental crises, this article questions whether the subjugation of water remains the only viable approach in contemporary design.

> *Until the last ton of fossil fuel is burned out, capitalism and bureaucracy force humanity into an 'iron cage' of dependency, ushering in the ' domestication of the world.'*[1]
>
> **—H. Spode**

Introduction: Water infrastructure—beyond functionalism

Diverting rivers, draining lakes, and dredging oceans—the transformation of bodies of water into forms and configurations suited to human development, beneath its evident utility, reveals a complex and layered design philosophy. Interrogating the symbolic meanings of these practices offers a powerful lens through which to grasp the Promethean tension that characterises design in the Anthropocene era. Through case studies—from Atlantropa and Soviet hydrological projects to contemporary "green" initiatives—this paper examines how water infrastructure, particularly from modernity to the present, embodies the enduring human ambition to control and rationalise the wild forces of nature. The current environmental crisis is a powerful challenge to this paradigm, and raises a critical question: Can water have powerful agency in contemporary design?

To address this question, this paper explores the meanings and symbolic power associated with the subjugation of the aquatic element in infrastructural design. Investigating the underlying design codes of infrastructure means challenging some of the most deeply rooted assumptions within contemporary

design practice. As Marco Biraghi states: "Like the most representative monuments and public buildings of a civilisation, infrastructures are also a direct expression of the dominant ideology of a given era."[2] Through its role in governing and rationalising natural forces, infrastructure exposes the conflict and drive for domination that characterises the human–nature relationship in the Anthropocene.[3] The domestication of nature enacted by the infrastructural object can be seen as a salient expression of a broader cultural process set in motion by modernity, one that finds a meaningful echo in a passage by Karl Marx:

> For the first time, nature becomes purely an object for humankind, purely a matter of utility; it ceases to be recognized as a force in its own right; and the theoretical discovery of its autonomous laws appears merely as a ruse to subjugate it to human needs, whether as an object of consumption or as a means of production.[4]

From modernity onward, nature has been perceived as an entity entirely tameable by human agency. This paper interprets infrastructure as the symbolic and material apex of this tension, affirming and crystallising the domestication of the natural world through human intervention. By spatialising this Faustian ambition, infrastructure emerges as a monument to the Promethean ethos underpinning design in the Anthropocene. This elevation of infrastructure's role becomes particularly significant when considered in light of Alois Riegl's definition of the monument: "A monument is a work of man erected for the specific purpose of keeping particular human deeds or destinies alive and present in the consciousness of future generations."[5]

In this sense, infrastructure becomes a true monument, capable of materialising and fixing in time the act of hybris[6] against the forces of nature—a gesture that lies at the very core of the design logics of the Anthropocene. This reading becomes even more relevant when applied to a resource as vital—and as potentially destructive—as water. The process of interaction between humans and the aquatic element becomes one of the most radical manifestations of the anthropocentric paradigms that continues to shape—and at times destabilise—contemporary design.

Domestication of the world: Designing the geography of rationalisation

Before undertaking a thorough analysis of the role of infrastructure, it is essential to reflect on the theoretical and cultural frameworks through which the design codes of the Anthropocene observe, measure, and represent nature. It is crucial, in fact, to clarify a radical shift in modes of interpreting the natural world—one that stands in sharp discontinuity with the "nature idolatry" which, as Marx observed, defined premodern culture.[7] This transformation, both epistemological and operational, introduced new logics of control and interpretation of nature, finding one of its most emblematic expressions in the infrastructural project. This profound shift in European modernity continues to shape contemporary Western conceptions of the natural world, grounded in the belief that nature is inherently interpretable and measurable. This appears to be closely linked to one of the foundational principles of modernity: rationalisation as both a theoretical and operational framework. In this regard, Hasso Spode's reflection on what he defines as the "grammar of rationalization" is particularly illuminating:

> This grammar is based on the idea of decontextualization and of disassembling and recombining: isolating complex processes from their context, breaking them down into their individual components, then combining them again to form a new structure. That which is superficial can be discarded; that which is mixed can be separated. Processes laden with significance, meaning, morality, traditions, and arbitrariness can be melted down to the pure scaffolding of relations as translucent as crystal and as unsurprising as double-entry bookkeeping. This grammar, as everybody knows, provided for the victory of capitalism, step by step conquering science, technology, economy, judicial systems, management, the arts, and philosophy.[8]

This fundamental modernist theoretical tool had a decisive influence on design cultures and, more broadly, on the perspective of natural-human relations as a whole. Using Max Weber's words, the "iron cage"[9] of rationalisation's grammar imposed a rigid framework for interpreting natural elements. Modernity not only transformed chaotic premodern cities into efficient and orderly urban systems, it also placed environmental control as a cornerstone of its ideology. This process of ordering can thus be viewed as connected to interpretations of reality —and especially of nature—that inform the perspective of the Anthropocene era. James C. Scott's analysis of how modernity conceptualises natural territories identifies a key characteristic of this domestication and control. Scott highlights modernism's relentless drive to render the world legible through the imposition of simplified, abstract models. A paradigmatic example of this "high-modernist" logic, he argues, is found in the environmental policies of late eighteenth-century Saxony and Prussia, where scientific forestry emerged. In response to timber shortages, German foresters began to conceive of the forest as a calculable grid of uniform, economically valuable trees. Once adopted by the state, this schematic vision became prescriptive rather than merely descriptive—imposed upon real forests at the expense of ecological complexity and local knowledge, all in the name of administrative efficiency.[10] Thus, the "iron cage" of modernity subjugated not only productive principles and human societal structures but also applied the same principles to forests, deserts, and oceans. The application of this abstract model to natural systems reflects a particular conception of natural entities: a chaotic system to be corrected and simplified through human rationalisation. Therefore, the world could be interpreted and governed through the lens of Spode's "grammar of rationalization." This process, defined by Max Weber as the "domestication of the world," represents the foundational theoretical core of this thought and assigns a structurally important role to a specific design instrument: infrastructure.

Infrastructure, as artefact, becomes a material tool to physically implement the process of domesticating the world, its aleatory dynamics controlled and designed to serve humanity. A particularly significant example of this is found in the pre-war USSR, vividly illustrated in the words of Soviet geographer Nikolai Mikhailov:

> Western scientists lament: 'The landscape is our irrevocable fate.' 'No!' we say. 'With our hands, using well-considered projects, we are building our country; we are creating a new landscape.' Bourgeois scientists say: 'Geography is not created but emerges on its own.' 'No!' we say. 'By building communism, we are reshaping the country with rational calculation, changing its geography.'[11]

Mikhailov accompanied these words with concrete proposals for redesigning Soviet territory. This statement of intent was followed by a series of maps illustrating a radical vision for transforming Russian geography through titanic geoengineering and infrastructural interventions. Nature was seen as an element entirely controllable and subject to human will. Following these publications, the regime funded vast projects: immense funds were allocated by Stalin to redesign Russia's vast territory. By the 1930s, the Soviet state aimed to reclaim swampy lands in the north and make the desert regions in the south arable through water infrastructure, thereby expanding the nation's arable land. These grand operations were accompanied by propaganda publications that sought to monumentalise these extensive territorial design projects. In this context, the mastery of water took on a fundamental role: to construct a new world through the redesign of its hydrography. Locks, canals, and dams became essential components of the "domestication of the world" process. It is important to emphasise that the governance and control of hydrography was not conceived merely as an engineering undertaking, but as a symbol of the power of the Stalinist regime. An example of this can be seen in Aleksandr Rodchenko's photomontage of the construction of the canal between the White Sea and the Baltic Sea (known as the Belomor Canal), published in 1933 in the magazine *USSR in Construction*. On the first page, the magazine explicitly displays this celebration of power: a photomontage of Stalin looms over a continuous water background with the caption: "[. . .] 'Belomorstroy,' the White Sea canal construction scheme, was a child of the will of the Communist Party, at the initiative of its leader, the leader of all workers, Comrade Stalin."[12] Later in the publication, monumental representations of locks and dams appear, depicted as colossal architectures, the transformation of land and water ascending to the status of a monument. Water infrastructures transcended their purely functional role, becoming symbols of humanity's ability to design a world entirely shaped by its own will. They became heroic monuments to overturning and manipulating natural laws, through humans' absolute power, a way of subduing the power of water through a Faustian desire to domesticate the world.

The Leviathan and the Dam: The cult of hybris and the confrontation with water

It is worth noting how the "grammar of modern rationalization" generates a symbolic logic and a design-driven tension that goes beyond its apparent techno-functionalist framework. The world's domestication, through modernist logics of rationalisation and control of natural resources, has crucial symbolic and mythopoeic dimensions. If, as we have observed, modernity rationalised nature through infrastructures capable of transforming the environment—reducing nature's complexity to a legible and manageable system—it is important to recognise that this transformation does not end with a mere technical gesture. It entails a profound redefinition of the symbolic mission of design. Infrastructure, in this sense, is not merely the result of a will to organise territory; it embodies a radical shift in the relationship between design and nature—one that, as Martin Heidegger suggests, is rooted in the modern technological disclosure of nature as a resource to be exploited. Heidegger argues that this process fundamentally alters how we relate to the natural world.[13] It is precisely through this radical transformation in our relationship with natural entities that modern culture

enacts one of its most profound symbolic revolutions. The domination of nature—achieved through the rationalisation of territory—does not end with a technical operation; rather, it emerges as one of the cornerstones of the modern design imaginary. This symbolic drive, to sublimate, symbolise, and domesticate the world, has Promethean heroism as its core. Within this framework, infrastructure sheds its apparent technical neutrality and assumes a mythopoeic and symbolic centrality: it becomes one of the privileged instruments through which modern design affirms its authority over the world. The elevation of infrastructure to the status of monument was driven not only by a new way of perceiving the material world, but also by a reconfiguration of the symbolic order that had long underpinned premodern thought. As Walter Benjamin argues, every shift in historical epoch also entails a transformation—often a radical one—of the symbolic order that had structured the worldview of the Ancien Régime.[14] From this perspective, the elevation of infrastructure can be read not merely as the material execution of the will to transform territory—central to the "domestication of the world"—but also as the embodiment and symbolic expression of its Faustian ambition. Hybris defines the aesthetic core of modernity's poetic imaginary, where the Promethean defiance of natural order—framed as an act of human liberation—emerges as a central motif in the project of world-domestication.

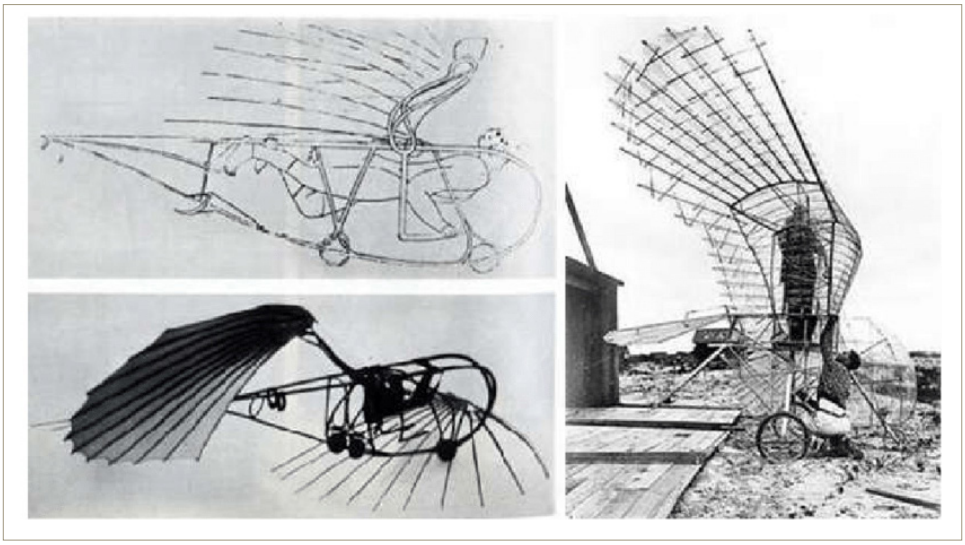


Fig. 1 Vladimir Tatlin (1929–32). More than an experimental flying apparatus, *Letatlin* symbolises the avant-garde's mythopoeic challenge to gravity and natural law—an icon of modernism's heroic imagination and its cult of *hybris*. [Wikimedia Commons]

This fascination with such acts of hybris is clearly visible in the experiments of the twentieth-century avant-garde. A particularly emblematic case is Russian Constructivism, which found in the defiance of gravity fertile ground for experimentation—as evidenced by Georgy Krutikov's *Flying Cities* (1923), and, above all, Vladimir Tatlin's *Letatlin*. Tatlin's flying machine, a work that embodies the utopian, Promethean, and mythopoeic momentum of Constructivism, represents perhaps the most literal projective manifestation of the modern cult of *hybris*. The Icarian fascination that marked the Constructivist experience reveals a radical mythopoeic component within avant-garde design practice, which, rather than being an isolated feature of Constructivism, is central to the poetics of the avant-garde. At times veiled behind a cold functionalism, at others openly proclaimed—as in the rhetorical musings of Le Corbusier—the Promethean *tension* emerges as a foundational and structuring theme of modern design thought: an intense and creative aesthetic tension, capable of breaking through the limits of rationality.

Viewed retrospectively, the heroic ethos of modernism manifests most radically in its encounter with infrastructure and the elemental force of water. Whereas Constructivism found poetic momentum in its defiance of gravity, hydraulic infrastructure discovered its symbolic mission in confronting the power of water. To oppose and subdue the force of seas and rivers became a poetic act of asserting the power of design itself. Water infrastructure emerges as the privileged object of this process: not merely a technical device, but a means of exerting both symbolic and material control over a resource that is at once essential and unpredictable. A mythopoeic reading of the domination of the aquatic element—one intrinsically tied to the logic of "world-domestication"—invites a retrospective revaluation of modernist hydraulic infrastructure. Dams, canals, and locks transcend their operational function and are inscribed into the symbolic pantheon of modernity. In this sense, one may extract from the symbolic imaginary of the modern a fundamental dyad: the Leviathan and the Dam. The Leviathan—understood in its most archaic form—represents the archetype of a natural (and aquatic) force that is chaotic, overwhelming, and uncontainable.[15] This power, as described in the book of Job, is, by definition, beyond human reach:

> The sword that reaches him has no effect [. . .] Iron he treats like straw [. . .] He makes the depths churn like a boiling cauldron and stirs up the sea like a pot of ointment. Behind him he leaves a glistening wake; one would think the deep had white hair.[16]

A symbol of boundless and violent aquatic energy, irreducible to human control, the Leviathan embodies the ideal adversary of the poetics of *hybris*. And it is within this symbolic framework that the figure of the Dam emerges. More than a mere technical object, the Dam becomes the emblem of the heroic power of modern design: the instrument that bends the unbendable, rewrites geography, and transgresses the limits imposed by nature. Aquatic infrastructure thus becomes one of the paradigmatic projective forms through which the limits of the natural world are overcome and a new order, grounded in human supremacy, is asserted. This rhetoric finds explicit expression in the monumentalisation of infrastructural form, most notably in one of the most radical infrastructural visions ever conceived: *Atlantropa*. The analysis of Herman Sörgel's "realizable utopia" stands not only as one of the clearest and most recognisable manifestations of this phenomenon, but also serves as a valuable lens through which to trace the enduring presence of modernity's Promethean poetic unrest within the contemporary imaginary.

Messianic infrastructure: Atlantropa and Peter Behrens's Gibraltar Dam

Atlantropa, conceived by German architect Herman Sörgel in 1927, is one of the most radical expressions of modernity's messianic vision of infrastructure—an extreme assertion of control over the dynamics of water. Sörgel's "realizable utopia" stands as the ultimate example of world-domestication and human dominion over the Leviathan. Sörgel's plan, conceived as a response to Europe's twentieth-century decline, aimed to create a macro-continent uniting Europe and Africa by enclosing the Mediterranean with a series of massive dams, generating new landmasses and connecting the continents with rail and road bridges. Despite its visionary nature, Atlantropa can hardly be dismissed as mere fantasy.

Sörgel's idea became central to contemporary political and artistic debates, engaging leading intellectuals and even inspiring political parties. The vision of the German architect became a pivotal topic in early twentieth-century Europe, attracting not only strategic considerations but also intense spatial focus: many architectural giants, including Peter Behrens, Erich Mendelsohn, and Hans Poelzig, collaborated on this project, underscoring its cultural significance.

Atlantropa represents the most radical expression of rationalisation's power, reaching an almost messianic dimension. The project arose from the geopolitical emergency that affected Europe in the early twentieth century: How could Europe compete with the Pan-Asian and American power blocs? Faced with overpopulation, unemployment, resource shortages, and an insufficient energy supply,[17] European states found themselves in a weakened position relative to rival powers (notably the USA and USSR). Sörgel proposed a radical solution: draining the Mediterranean through the construction of a massive hydroelectric dam at the Strait of Gibraltar, making the exposed land arable, reclaiming the Sahara Desert, and physically uniting the African and European continents, thus creating a new geopolitical entity capable of competing with the USSR and the United States. Sörgel saw the supercontinent's creation as a sincere means of ensuring world peace, reflecting his blind faith in technology's power. This belief is captured in his verses from the *Atlantropa Symphony*: "Not with cannons, but with turbines, not with deceit or murder: with dams and machines technology will prevail and finally bring peace to all with its liberating word."[18] The German architect, therefore, saw himself on a dual mission: to save Europe and secure world peace through Atlantropa's construction. This titanic (and ultimately unattainable) endeavour centred on a singular principle: to create a new world by fully mastering nature. This view is evident in Sörgel's thoughts:

> The vast energy supply network across all of Europe and North Africa, made possible by the hydroelectric plant at Gibraltar, will only reveal its true value after the next war—a war instigated by ideology but determined by fuel—when we are forced to replace the combustion engine with electric cars, when 'white coal' finally replaces black coal. Then, we will need energy sources—hydroelectricity—at any price! Only then will we remember that the power of twelve Niagara Falls has lain dormant in the Strait of Gibraltar for thousands of years, while people slaughter each other over a few oil wells, that 240 million horsepower lie unused in the Congo, thoughtlessly wasted while humankind's technical ambitions focus solely on self-destruction.[19]

Sörgel's vision represents perhaps the clearest and most radical manifestation of world-domestication principles. A distinctly high-modernist approach, as previously described by Scott, clearly emerges: the Mediterranean is reduced to a system to be optimised and rationalised, its complexity diminished to a mere resource. What matters most is harnessing its energy potential and creating new arable land. The taming of the Leviathan becomes the primal act of a total rationalisation process. The Mediterranean's recession renders obsolete the settlement structures that once governed the development of cities like Marseille and Genoa. For example, to replace Marseille's port (which, in this new scenario, would become an inland city), the radical redesign of Port du Rhône was proposed, fundamentally disrupting centuries-old settlement patterns that shaped southern France. An even more radical proposal was made for New Genoa by Ferber and

Fig. 2 Diagram of land gain from the Atlantropa project, Hermann Sörgel (1932). This hand-coloured map illustrates the territories that would emerge from the partial drainage of the Mediterranean Sea, as envisioned by Sörgel. The project projected a land gain of 576,000 km² and 200 million horsepower from hydroelectric energy. A striking visualisation of modernity's ambition to redesign geography at a continental scale. [Wikimedia Commons]

Appel.[20] The old town of the Ligurian city was relegated to a mere tourist hub, connected only by a narrow saltwater canal to the new city, whose morphology and settlement patterns became detached from the historical configurations that had defined Ligurian spatial development for centuries. Atlantropa thus embodies a totalising ambition: reshaping the Mediterranean basin becomes an operation that not only reconfigures geopolitical balances and everyday life but also allows for a complete subjugation of nature through extreme spatial rationalisation and simplification.

In Sörgel's "realizable utopia", a symbolic centre stands out: the Gibraltar Dam. By sealing the Strait of Gibraltar, the monumental dam enacts the heroic gesture at the heart of Atlantropa's messianic vision: the draining of the Mediterranean as an act of total design over nature. This exemplified Sörgel's proposed new world order and its foundational act in the subjugation of the Leviathan. This pushes the veneration of water infrastructure to its ultimate limits: taming the Leviathan's force transcends mere system optimisation, becoming the primal origin of an almost messianic mission. This mythic dimension finds significant spatialisation in Peter Behrens's Gibraltar Dam design. Behrens's project, beyond its technical role, aimed to symbolise the power of the new supercontinent, intentionally making it a monument to the dominating ethos of the endeavour. The dam rises from the ocean like a mighty, cyclopean stepped pyramid, with a sharp skyscraper rising from its façade. These forms convey nothing less than the poeticisation of the worldview underlying this spatial vision: a world in which humanity dominates nature, overturning its fundamental laws. The celebration of the Leviathan's defeat thus becomes an essential component of the dam's symbolic aura. The cyclopean dam thus becomes, both functionally and symbolically, the generative act in Atlantropa's messianic geography: the new macro-continent emerges from a fundamental act of hybris—the complete subjugation of the aquatic element. The Gibraltar Dam represents the elevation of water infrastructure to be the ultimate monument of Promethean unrest

underlying world-domestication. Behrens's dam thus encapsulates perhaps the most important spatial and poetic feature of this domesticating design ideology: an artefact gains symbolic authority through its capacity to subjugate the fury of the elements, liberating humanity from the chains imposed by natural laws. Viewed from a contemporary perspective, the analysis of this experience raises a pressing question: is the Faustian hybris of Behrens's dam merely a historical relic, or can it be an active force in our time?

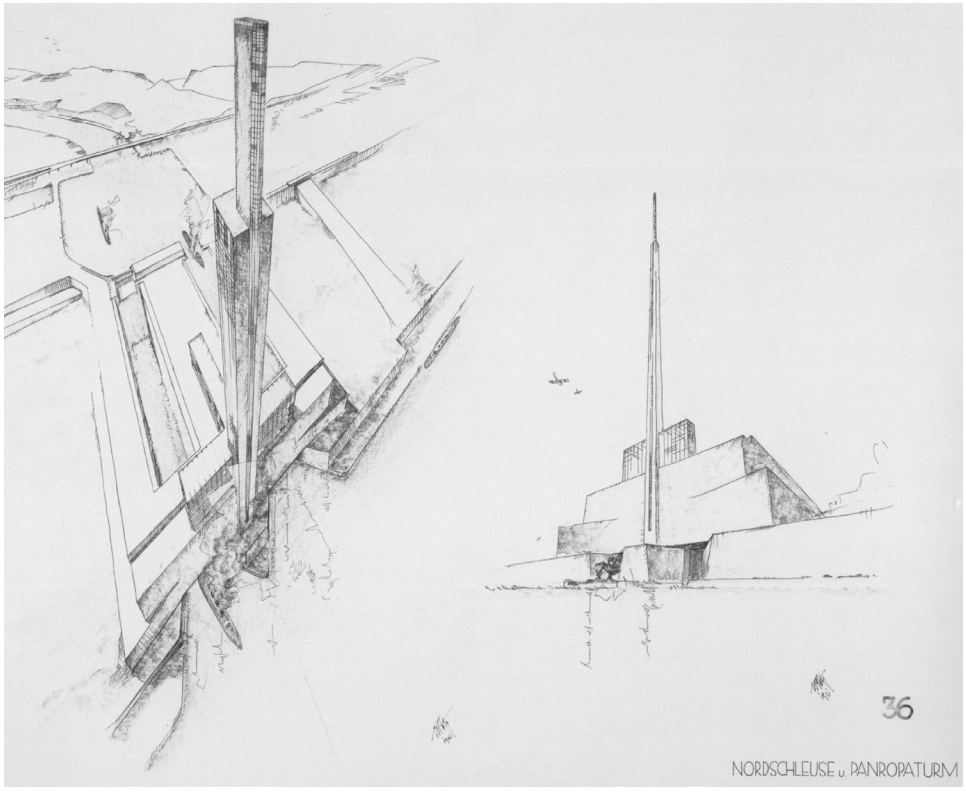


Fig. 3 Peter Behrens (1931). Northern Lock with Skyscraper at the Gibraltardam, bird's view (left) and from the perspective of the lowered Mediterranean Sea (right) [Wikimedia Commons]

Beyond domination: Rethinking water infrastructure's role in contemporary design

The examination of Atlantropa prompts a rethinking of water's agency, its symbolic influence on infrastructure monuments, and contemporary design theory and practice. Sörgel's Promethean spirit seems to remain an active design force in contemporary design: since the post-war era, numerous projects have emerged that echo the mission evident in Atlantropa. An example of this is the Snowy Mountains Hydroelectric Scheme. This was a colossal project aimed at providing irrigation water and energy in New South Wales, Australia, developed between 1949 and 1979, covering over 3,200 square kilometres and including sixteen dams, seven power plants, 80 kilometres of aqueducts, 145 kilometres of tunnels, and 2,000 kilometres of roads.[21] Another example is Muammar Gaddafi's unfinished Great Man-Made River project in Libya, started in 1983.[22] Perhaps the most explicit example of this continuity between mid-twentieth-century and contemporary perspectives, however, is the South-North Water Transfer Project in China, still under construction. As of 2014, the People's Republic of China invested over $79 billion, making it one of the most expensive undertakings in

human history. The project aims to transport water from southern China to the arid north, constructing three major aqueducts to convey 44.8 billion cubic metres of fresh water annually.[23] The most paradoxical aspect of this continuity in world-redesigning approaches appears in so-called green infrastructure projects. While the environmental crisis is intimately linked to the high-modernist worldview and its spatial manifestation, contemporary green water infrastructure solutions often stem from the same spatial conceptions. Benno Albrecht's insights on this point are useful:

> [. . .] an axiom of contemporary environmentalism is understanding large-scale problems in order to address them on a smaller, local scale. 'Think Globally, Act Locally,' the popular slogan attributed by some to René Dubos, by others to Patrick Geddes, and later revived by Jackie Tyrwhitt—secretary of CIAM and collaborator of Siegfried Giedion, who went on to edit *Ekistics*, the journal of Doxiadis. But it is also clear that the reverse is true today, 'Act Globally, Think Locally,' and that addressing immediate problems now requires large- and mega-scale intervention strategies.[24]

Albrecht's words suggest that even in the twenty-first century, architects, even those working in ecological fields, tend to adopt a worldview in which nature is fully mouldable and controllable by human intervention. Indeed, contemporary design emphasises infrastructure's role as even more decisive: today, these structures seem to be the only plausible way to attempt control over the planet's environmental collapse. Modernist ideology is therefore still integral to contemporary design. This recognition reveals a profound underlying contradiction. To address environmental upheaval caused by human exploitation, contemporary design culture proposes yet another artificial infrastructural intervention. This suggests that, despite formal declarations, nature is still viewed as a set of forces to be dominated by humankind: human rationalisation can not only disrupt the world's spaces but is assumed able to re-stabilise them through its actions. One might even argue that, given the environmental disasters caused by sea level rise or floods, the subjugation of the Leviathan has become even more imperative for contemporary design practice. This principle materialises in projects like the MOSE system in the Venetian Lagoon. Operating since 2020, this network of barriers is crucial for protecting Venice from sea level rise-induced flooding, an act of domestication appearing to prove that taming of the Leviathan is central to contemporary design thinking. While the persistence, and in many cases the necessity, of practices that subjugate the aquatic element is evident, it is increasingly urgent to question the paradigm that sustains them. Is the violent subjugation of the Leviathan the only possible destiny for infrastructural form and symbolic content, or can we imagine more nuanced relationships with water as an active agent? In light of growing ecological awareness, there is a pressing need to complement existing strategies of control with more sophisticated approaches—ones that recognise and engage with the agencies of the aquatic element. The notion of water as a purely chaotic and antagonistic force is becoming increasingly difficult to sustain, both ethically and materially. And yet, contemporary culture still struggles to produce a symbolic and operative vision capable of rivalling the modernist paradigm of world-domestication.

The present moment appears ripe for a redefinition of the relationship between water infrastructure and aquatic power—one that exceeds the aesthetic and ideological bounds of the modernist cult of *hybris*. A promising first step in this

Fig. 4, Sea Dam Between Gibraltar and Tangier, sketch by Josef Moser, ca. 1932. Part of the Atlantropa Project. The dam's monumental character is preserved even in alternative designs to Peter Behrens's original, such as this version by Moser. [Wikimedia Commons]

Fig. 5, Intersection of the South–North Water Transfer Project with the North Juma River, Dongchengfang Town, China, 2024. [Wikimedia Commons]

direction involves a more complex resemanticisation of the Leviathan–Dam dyad. It is compelling to reconceive the Leviathan not as a blind, monstrous force to be vanquished, but as a figure of environmental force, potentially destructive yet essential to planetary equilibrium. And contemporary theory and practice must respond, and be challenged to reimagine the Dam, no longer as a monument whose aura derives from the subjugation of nature, but as an artefact capable of mediating the difficult dialogue between human and more-than-human actors. If water infrastructure is to be symbolically and functionally relevant, then it is time to ask whether its monumental aura might be reoriented—no longer as an expression of *hybris*, but as a site for rethinking the relationship between design, environmental responsibility, and interdependence. In contrast to the Promethean ambitions of projects like *Atlantropa*, the future of hydraulic infrastructure may lie not in conquest, but in careful negotiation.

NOTES

1. Hasso Spode, "Fordism, Mass Tourism and the Third Reich: The 'Strength through Joy' Seaside Resort as an Index Fossil," *Journal of Social History* 38, no. 1 (Autumn 2004): 128.

2. M. Biraghi, "From the Perspective of Architecture: Twentieth-Century Infrastructure," in *The Architecture of the World: Infrastructure, Mobility, New Landscapes*, edited by B. Albrecht, M. Biraghi, and A. Ferlenga (Editrice Compositori, 2009), 50.

3. Following Susan Ballard (*Art and Nature in the Anthropocene: Planetary Aesthetics*, 2021), the Anthropocene is understood not merely as an environmental epoch but as an operative cultural framework that shapes design epistemologies and representational practices.

4. Quotation from Karl Marx as cited in M. Bookchin, *The Ecology of Freedom: The Emergence and Dissolution of Hierarchy* (Cheshire Books, 1982), 133.

5. Alois Rriegl, *Der moderne Denkmalkultus. Sein Wesen und seine Entstehung* (W. Braumüller, 1903), 1. Translated as *The Modern Cult of Monuments: Its Character and Origin*, in *Oppositions* 25 (Fall 1982): 21–50.

6. *Hybris*, in its original Greek meaning, denotes an arrogant transgression of the limits imposed on human beings, often against the divine or natural order, and is traditionally framed negatively as a sacrilegious act. However, as an artistic topos, *hybris* takes on an ambiguous value: it can signify both a transgression and a heroic gesture of human liberation from its own constraints.

7. The premodern worldview was grounded in a conception of nature as an almost sacred force. This concept is well exposed, for example, in M. Bookchin, *The Ecology of Freedom.*

8. Spode, "Fordism, Mass Tourism and the Third Reich," 129.

9. The term "*iron cage"* is Talcott Parsons's 1930 translation of Max Weber's original expression "*stahlhartes Gehäuse,"* which more literally means "steel-hard casing" or "shell as hard as steel." Parsons's choice has been the subject of scholarly debate, as it arguably dramatises and distorts Weber's original nuance, shifting the emphasis from structural rigidity and inevitability to a more metaphorically imprisoning condition.

10. See James C. Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed* (Yale University Press, 1998).

11. N. Mikhailov, quoted in E. A. Dobrenko, "The Art of Social Navigation: The Cultural Topography of the Stalin Era," in *The Landscape of Stalinism*, edited by E. A. Dobrenko and E. Naiman (University of Washington Press, 2003), 195–196.

12. A. Rodchenko and L. Slavin, *USSR in Construction*, no. 12 (OGIS, December 1933).

13. See M. Heidegger, "*The Question Concerning Technology*," in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (Harper & Row, 1977).

14. See Walter Benjamin, "*Theses on the Philosophy of History*," in *Illuminations*, edited by Hannah Arendt, translated by Harry Zohn (Schocken Books, 1969), especially Thesis VI.

15. It is important here to clarify the specific interpretation of the Leviathan adopted in this text. The figure of the Leviathan carries a rich and varied symbolic tradition, often subject to contrasting readings. In this context, the Leviathan is understood in its original sense: the biblical version, where it represents the untameable and chaotic power of the waters, and the Mesopotamian one, in which it symbolises the primordial element of marine chaos. It is therefore essential to distinguish this interpretation from another well-known reading: that of Thomas Hobbes, in which the Leviathan becomes the emblem of the ordering power of the modern state. In contrast, the present work takes the Leviathan as an embodiment of natural energy resistant to human control, positioning it symbolically against the dam, an instrument through which modern design seeks to subjugate what has traditionally been regarded as indomitable.

16. *The book of Job* 41:26–32, in *The Holy Bible*, New International Version (Zondervan, 2011).

17. R. Vidal and I. Cornils, *Alternative Worlds: Blue-Sky Thinking since 1900* (King's College Press, 2014), 20.

18. H. Sörgel, *Anregung zu einer Atlantropa Sinfonie*, quoted in Vidal and Cornils, *Alternative Worlds*, 25.

19. Vidal and Cornils, *Alternative Worlds*, 29.

20. Vidal and Cornils, *Alternative Worlds*, 23.

21. B. Albrecht, "Infrastrutture globali," in *L'architettura del mondo: Infrastrutture, mobilità, nuovi paesaggi*, edited by B. Albrecht, M. Biraghi, and A. Ferlenga (Editrice Compositori, 2009), 74–112.

22. Albrecht, "Infrastrutture globali," 74–112.

23. Albrecht, "Infrastrutture globali," 74–112.

24. Albrecht, "Infrastrutture globali," 79.

JACK WU AND ANDREW DOUGLAS

Aqueous place in the architecture of Luis Barragán: Dark Pink and surface-Other

Introduction

Touristic flows

What follows are divergent accounts of houses by architect Luis Barragán in *Ciudad de México*: *Casa Ortega* (1940–42), and *Casa-Estudio Luis Barragán* (1947–48). Barragán inhabited both, though the latter, being his primary home and workplace until death in 1988, has greater acclaim with a UNESCO World Heritage Site accreditation awarded in 2004.

Both operate as house museums, though differently, and persist by way of the visitor economies they tap into. The *Casa-Estudio* is jointly owned by the *Fundación de Arquitectura Tapatía* and the Government of the State of Jalisco. As an "Artistic Monument," changes require an *Instituto Nacional de Bellas Artes y Literatura* approval, a stricture similarly applied to the adjacent neighbourhood.[1] As the ICOM Committee on museology of historical sites requires, museological 'interpretation' of house museums is necessarily limited.[2] Consequently, the *Casa-Estudio* is both regulated and regulator of the flow of temporal transformations it and its neighbours can enter into. Contrastively, the *Casa Ortega* is home to José Manuel Bárcena Ortega, nephew of famed silversmith Alfredo Ortega, and the house offers tribute to both Barragán and the longer tenure of this subsequent owner. Hence, the *Casa Ortega* examples an architecture in modest transition—a space that blurs the lines between a museum and a lived-in home, with José Ortega and his extended family maintaining and adapting the home across generations, and in turn introducing layers of temporal and spatial flux at odds with the essentially static preservation occurring next door.

Accordingly, the nature of the 'public' awareness and accessibility for both houses varies. The *Casa-Estudio* is integral with the city's cultural tourism stock,[3] contributing via its media reproduction to an out-size 'Barragán presence,' yet it cuts from this representational flow a miniscule tributary of admittees—twelve people per house tour. Visits to the privately owned *Casa Ortega* are arranged informally (by email request, or, in our case, by a knock on the door). Despite their immediate proximity—both joined by a party wall and a large rear garden—the

Casa Ortega and the *Casa-Estudio Luis Barragán* draw, asymmetrically, from the city's touristic flow; as José puts it, this is "Luis Barragán's other house, his best-kept secret."[4]

With any visit to the *Casa-Estudio Luis Barragán* needing to be booked far in advance, we had secured only a single place in a Spanish-speaking tour on the days we were in the city. The alternative for one of us was a fortuitous place within a tour coincidently running in the *Casa Ortega* next door. Unable to experience the houses together, shared knowledge of the two depended on recounting our respective visits later. It is this retelling that has provoked the parallel dialogues offered here.

Water: Present and occluded

On a working holiday to the city, and anticipating this issue of *Interstices*, the question on our minds was how the aqueous might inform Barragán's work. There was good reason to anticipate such an underpinning. Firstly, the *Casa Ortega* and the *Casa-Estudio* sit in the 'uphill' neighbourhood of Tacubaya, a place whose name means, "where water is gathered," and which once comprised a separate township at the confluence of rivers on the shoreline of Lake Texcoco, the partly drained, partly reclaimed basin across which much of *Ciudad de México* has eventually spread. The lake, and now the city itself, sit in a larger, central hollow known as the Valley of Anahuac—"the Land Between the Waters"—an elevated plateau cradled on two sides by north-south lines of volcanic mountains themselves dividing the Pacific Ocean from the Gulf of Mexico. Given these geographic and hydrological legacies, and more pointedly, the loss of the lake and the ongoing water crises confounding the enormous metropolis that has replaced it, water and its absence make up an ecocidal condition, as Juan Villoro has argued.[5] The result is an insoluble tension between water-sapping modernisation and awareness of the loss of indigenous life and cultures Lake Texcoco sustained.[6]

A second reason for addressing the aqueous in Barragán's work is the prevalence in it of aesthetically staged water (fountains, jets, ponds, etc.). Yet it is necessary to consider how its converse, pragmatically directed service flows—that which washes and discretely expunges the unsightly and the 'unclean'—points to broader urban political ecologies and imaginative spheres. Both are written into Barragán's architecture because they are complexly inscribed—geographically, historically, and culturally—into the city and the region he practiced within. Loss of lake water has both its revenge—routine, rain-induced flooding of flat, low ground in the city—and its celebrated reappearance as an animator of public space and private *patios*. Water 'here' (as elsewhere) carries deeply sourced referential motivations and politicised worlds. As Néstor García Canclini notes, in Latin American contexts more broadly, modernisation (including modernised understandings of water) less displaces older traditions than it permits cultural elites to benefit from the secularisation and liberalising of modernisation while holding on to previous advantages bestowed by "Hispanic-Catholic traditions."[7] Hence modern culture in places such as Mexico is carrier of a "multitemporal heterogeneity,"[8] something that bears on understandings of the aqueous and its intersection with Barragán's work.

Travel chronicles

In considering these aspects, we are mindful of our own visitor status and the Anglophone ears and eyes we brought to this encounter. We are complicit in the tourist flows converging on Mexico and Barragán's work; no less are we influenced by the complex mediatisation shaping reception of his work. Further colouring encounter here is our own divergent generational amenability to canonical modernism—with one of us inclined towards Barragán's output across a long working career; the other, at the commencement of their architectural vocation, being inclined to question canonicality as such.

In response we work within and against 'travel writing' as a genre, recognising that in post-colonial Mexico such writing—*crónica de viaje* (or travel chronical)—resonates with the *crónicas de Indias* (or chronicles of the conquest of Latin America), and therefore carries with it a certain rhetorical "taking possession" of territory, knowledge, and place.[9] Conversely, contemporary reworkings of the chronical form, as Thea Pitman puts it, are often journalistic, stressing subjective engagement, detailed evidence of "being there," and the identity of the traveller projected onto encounter with "other[s] on the road."[10] In our case, we offer parallel narrative and visual stream aiming to draw out less routinely followed touristic currents and their chronicling.

Echoes of Barragán

Mexico has long been framed avariciously and redemptively. Post-revolution particularly, the country has been for reforming activists, artists, and writers, a reviving domain. As Mauricio Tenorio-Trillo describes, between 1920 and 1949, a "Cosmopolitan Mexican Summer" can be conceived, one in which cosmopolitan centres internationally found in the country "a season of revolutionary fascination, primitivism, and social hope."[11] Unavoidably, echoes of this earlier 'summer' sound in our visit. For William Gass, the Mexico Malcolm Lowry portrays in *Under the Volcano* (1947)—written following his own participation in this 'summer'—amounts to "constructing a place, not describing one; he is making a Mexico for the mind."[12] Analogously, our 'Barragán,' and the aqueous underpinnings we ascribe to his work, are necessarily adapted constructions. We see them reworking what Lucas Tromly has termed "echotourism," a form of visitation guided by previous discourses.[13] Our trip similarly echoes, though it is unpacked differently between us: for one, it has meant a close tracking of fictional and historically inclined texts; for the other, echoing has entailed a hushing of such textual chatter in favour of a relatively unmediated reflection, itself miming a disinclination towards the canonical.

Dark Pink

Entering-in

Let me explain. I adopt the form of prose poetry, not simply as a stylistic choice, but as a means of staying close to experience—to impressions. Turning away from accounts by others, I am wanting to bring forward presence, even when that immediacy entails a degree of drift. Specifically, the early work of Luis Barragán, and most intimately, *Casa Ortega*, his first house for himself. Prose poetry allows me to dwell in the ambiguity and texture of experience that conventional architectural writing often smooths over. Where architectural analysis seeks legibility, prose poetry permits diverse grasp; where analysis tends towards resolution, prose allows things to remain suspended, contingent, and incomplete.

This partialness matches experience. My writing mirrors the fragmentary access to the houses themselves—visits shaped not by design, but by circumstance, translation, scheduling, and refusal. *Casa Ortega*, unlike the *Casa-Estudio*, grapples with cultural tourism differently: it offers a sense of living continuity and casualness—for instance, access via a personal mobile number pinned to the door, as opposed to an online system booked ahead by months. It is less curated, more contingent, still bearing the imprint of ongoing life. To write from within this experience—not as an authoritative interpreter, but as a visitor out of sync with the guided narrative—is to rest attentiveness on partial knowledge.

surface-Other

Entering-in

Entrance to the *Casa-Estudio Luis Barragán* was oddly double. From General Francisco Ramirez Street, visitors were ushered into the studio's original reception room. There the rules of visitation were given (staying on designated walking paths, sticking with the guide, etc.), and reinforcing the *lingua franca* of touristic experience, photography permits were solicited from visitors for each of their photographic devices, receiving, on payment, a fluorescent tag ensured that only a paid flow of images could be drawn from the house. Led outside again, we were taken to an anonymous entry further down the street. There, a single blank door flush with the façade opened into a long vestibule running deep into the house, its closed nature occluding any sense of the spatial order beyond. Inside, three sensations prevailed: a deep flood of light from a yellow clerestory above the closed door; a long run of black volcanic pavers darkening passage towards and over further steps at the end; and a curious bitumen-like smell seemingly linked to the pavers (a polishing oil or wax perhaps?).

Borrowing a term from hydrology, the UNESCO World Heritage Nomination describes this vestibule as a "decompression sluice" whose aim is to install a "sensorial and therefore emotional filter" countering the street.[15] The claim echoes Barragán's assertion: "My home is my refuge, an emotional piece of architecture, not a cold piece of convenience."[16] Despite a certain swiftness in the vestibule's thrust, its sensorial palette invites a 'slow down,' triggering for me a run of queries: Why this 'cave-holed' volcanic flooring? Does this deep space mirror the yellow antechamber of Barragán's *Casa Gilardi*, which I'd visited yesterday, and will its traversal deliver some form of revelatory space—the famous luminescent pool in that case?

I extend this contingent attendance into the visual register. Just as prose poetry resists the polish and containment of rhyming verse, my black-and-white photographs resist the seductive similitude of colour. Together, they create a dialogue that approaches architecture's elusive tangibility, the sense that both absence and presence commingle. My intention has been less to document than to distil. In stripping away hue, the images search instead for the grain of surface, the slant of light, the murmur of texture (Fig. 1). The Ortega Pink, everywhere inside, becomes a whisper within grayscale, its fire extinguished, its seduction tempered. A wall leans into the sun. A lattice dissolves into shadow. What remains is not ornament but trace—the residue of gesture, of labour, of quiet devotion to place. In monochrome, the image is less spectacle than offering: a space where meaning hesitates, hovers, falters. Like prose, it leaves things unfinished.

as before water belongs, it roams;
before it becomes, it escapes . . .

Beginning anew

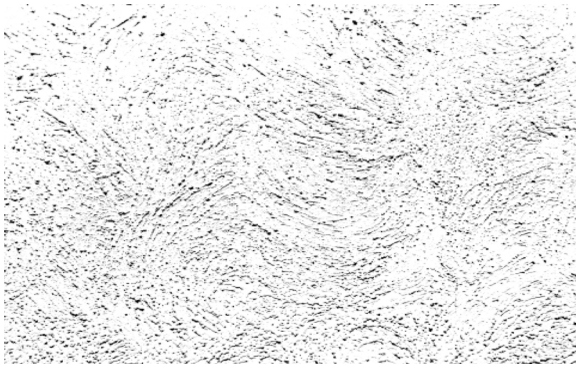


Fig. 1 *Casa Ortega* pink plastered wall [Photograph: J. Wu, 2024]

Up volcanic steps

Seven steps up and through a door opening awkwardly over the stairs, a flash of soft pink confirms the *Gilardi* pattern with arrival into the much-publicised entrance hall. Yet it is clearly more organisationally complex. With the vestibule door closed behind us, seven further routes beyond are suggested by closed doors and the stair; rather than a terminating space, it is, to continue the hydrological metaphor, a control chamber for directing varying flows elsewhere. Plainly this mechanistic analogy overlooks the emotive intent: like the descending light into the *Gilardi* pool, and unlike the transverse thrust of light in the vestibule, the hall leaves visitors bathing in bright vertical daylight, itself coloured by the gold-leaf abstract altarpiece by Mathias Goeritz on an overhead landing—a lure causing eyes to rise (Fig. 18).[17] Revelatory downward light is balanced by an upward flow of black pavers surfacing the hall floor and the stairs rising to the landing, a dark tectonic the World Heritage Nomination describes as "pre-Hispanic [stone] platforms."[18] It can be seen to enact an assemblage of excess in the sense that Georges Bataille has referred to an "accursed

Fig. 18 Hall, *Casa-Estudio Luis Barragán* [Photograph: A. Douglas, 2024]

Fig. 2 Casa Ortega, entry from the street [Photograph: J. Wu, 2024]

A wall—dark pink, textured like skin touched too many times, its hue whispering bruises and secrets—leans into the sky, unflinching, like an old truth that has nothing left to prove (Fig. 2*).*

At the threshold, where the street rises into a step.

A door of five-by-nine frosted-glass tiles. Its breath is heavy with time. One tile, scratched and weary, bears a name:

"The Ortega House, Luis Barragán's other house, his best-kept secret" (Fig. 3).

But secrets, like water, resist containment. They seep through cracks, pooling in corners where light cannot reach. Sometimes they find light.

share" or that sacrificial overflow of energy responsive to a larger solar economy—a link found in indigenous sacrificial consumption.[19] Accordingly, these stair/platforms continue their ascent through the levels, including the monastically inclined "room of the Christ," to eventually reach—by way of further shadowing and light colourations (Fig. 19)—the celebrated roof terrace whose high walls and paved surface form a pool-like vessel.[20] Its vacancy, to borrow a phrase from Gilles Deleuze, is left facing the "cosmic surface energy" of the heavens (Fig. 20).[21]

Fig. 19 Terrace stairs, *Casa-Estudio Luis Barragán* [Photograph: A. Douglas, 2024]

José stands framed in the doorway, his silhouette, as if rising with the tide, consolidates behind frosted glass. His face peers at a clear pane (Fig. 4).

He tells of tending to this place as a spirit might tend to an island—not as master, but as steward of its mysteries, architect of its continual becoming.

Inside, I imagine the Ortega House a breathing refuge, its dust-laden air, luminous with the day's light. Or, standing against the nightly flooded streets, it must hold the storm at bay, and in doing so, harbours its own kind of tempest. Time's wear.

Behind José, Barragán's shadow lingers—the magician of this pink-walled island—conjuring a house that refuses to be stilled.

Fig. 3 Casa Ortega, front door [Photograph: J. Wu, 2024]

Fig. 4 José Ortega, owner of Casa Ortega [Photograph: J. Wu, 2024]

Fig. 20 Terrace, *Casa-Estudio Luis Barragán* [Photograph: A. Douglas, 2024]

I will return to Deleuze's notion shortly. For now, what this ascent imparts is a central vertical fulcrum for the house, a spindle around which privacy and utility are also spun. Immediately doubled with this rise from dark to light—though unseen by visitors nor publicised in any way—is a spiral service stair (utterly without natural light) rising the full height of the house, one that serves various utilitarian spaces including the housekeeper's quarters at the top and a hidden *patio* for laundry. Not coincidently, the service stair is topped with an enclosed water reservoir, itself becoming a key compositional feature organising the view from the street and the solar terrace. In essence, the house operates as two partitioned circulatory cells—and two economies in Bataille's sense (the general and the limited, the solar and the calculative)—with only one point of exchange between them—a small lobby off the hall, itself linking the kitchen and the breakfast room.

Francisco Quiñones has recognised how these partitioned realms define the *Casa-Estudio Luis Barragán* as a house designed not for one (as routinely asserted), but for two people, Barragán and a full-time housekeeper, the last of whom, Ana María Albor, was provided with ongoing accommodation in the house after Barragán's death.[22] Quiñones points to the overlooked and exploitative dimensions of domestic labour in Mexico, dimensions that perpetuate prevailing class, gender, and racial hierarchies. Read against what our house guide suggested was Barragán's bachelor quest for solitude within the house, what was an emotionally enriched "refuge" for him was, for others sustaining that sanctuary, a calculative structure designed to keep them routinely out of the picture.[23]

Step inside (Fig. 5)

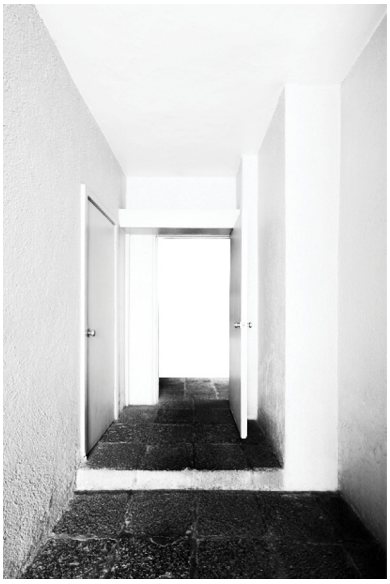


Fig. 5 *Casa Ortega* pink entry corridor [Photograph: J. Wu, 2024]

The corridor unfolds like a liquorice-pink wound.

The walls exhale dust—not in clouds but in whispers, soft and relentless, quiet proof of time's labour.

The floor beneath is volcanic, black as water after nightfall. The tiles are cool, unforgiving. Here water is silent, held within the stones, its flow hidden but unyielding.

The air thickens, like a house remembering too much.

The tiles drink rain from shoes and umbrellas, each crater cradling droplets: puddles within a house of puddles.

Welcome, José says. His voice, layered like the house itself—part keeper, part spell-caster—stretches across many who visit. He has lived here sixteen years, shifting walls not with magic but with will, recasting Barragán's vision to suit the present.

"Structure-Other" & "otherwise-Other"

My title for this essay, "surface-Other," takes its cue from the nature of other-relations in the *Casa-Estudio*. Rather than surface appearances concealing something beyond or behind (Quiñones's argument), my contention is that something 'other' arises with surfaces themselves. For this I draw on Deleuze's essay "Michel Tournier and the World Without Others."[24] In it he considers Tournier's restaging of Daniel Defoe's *Robinson Crusoe* (1719) in the novel *Friday* (1967). Compelling in Tournier's adaptation of Defoe is a switch in focus from the reconstruction of a 'civilised' world ruled by one (Defoe's theme), to "dehumanisation"[25] caused by the absence of others, a devolution that embraces the island's elemental, non-human constituents and their affective relations. The elemental—or avatars of the originating four elements (earth, wind, fire, and water)—become desired in the manner of human others:

> *Sun, are you pleased with me? Look at me. Is my transformation sufficiently in the manner of your own radiance? My beard, which pointed earthwards like a cluster of earthbound roots, has vanished, and now my head carries its glowing locks like a flame reaching upward to the sky. I am an arrow aimed at your heart, a sundial proclaiming with the shadow of my erect figure your mastery of the earth . . .*[26]

Deleuze finds in the elemental avatars described by Tournier indication of how we depend on human others to provide a "mantel" of surety and extended perceptual and existential depth—what he terms a normative, "structure-Other."[27] In the absence or the thinning out of human others, relational attachment turns instead to the elemental avatars an environment may provide—a quest, as he says, for the "otherwise-Other."[28] Such a quest brings to the surface a raft of "dehumanised" (or extra-human) attachments lived and enacted via "adventures of the [de-subjectified] spirit."[29] What this notion of the "otherwise-Other" offers is a way to think the aqueous non-reductively—that is, according to its transformations and not its literal appearance. For instance, as Deleuze argues, where the "structure-Other" and its mantle of normative relations persists, there is a terrestrially grounded "fire, water, air and earth"; alternatively, given the untethering and surfacing of the "otherwise-Other," released instead is "an aerial or celestial earth, water, air, and earth."[30]

Admittedly Tournier/Deleuze's articulation presupposes an extreme solitude removed from the relative withdrawal Barragán's domestic world crafted. Yet for Quiñones, the *Casa-Estudio* comprises a "total interior," purposely "designed [. . .] to protect [Barragán. . .] from unwanted human

This is no museum. Here, the past flows into the present, as water flows into cracks, as dust settles on what cannot hold it at bay—like fairy dust, luminous but heavy with the weight of time.

Glimpsed in the kitchen, his granddaughter, his son, a dog. . .

Walking onward, guest me and ghost him. José's shadow lengthens against walls that press closer. The pinkness guides tenderly, then abruptly sharpens at a bright end. I feel the pink's weight in this space, neither welcoming nor hostile, merely alive in its intensity.

Fig. 6 Angel at the end of the pink corridor [Photograph: J. Wu, 2024]

Ahead stands the angel (Fig. 6)

Carved from stone, its wings folded tight, it watches without saving. Its gaze fixed on something we cannot see.

Perhaps it remembers the fall—the time trust shattered like glass when a body, Barragán's friend, left the stair's edge. Now an added balustrade guards (Fig. 7).

Beyond the angel, the house opens in fragments. It stretches, pulls, unravels into rooms. Puddles. Each one housing a question: Why this varied and unsure geometry? Some are narrow, suffocating, dark. Others expand into the light as if trying to breathe.

contact inside his home."[31] How strange, it feels, in retrospective, to be amidst a sea of others coursing the capillaries of this total interior, seeking, against the dweller's desires, hold of his subjective and creative distinction. Yet what if, in this populous, *structure-Other* overlay, an *otherwise-Other* persists unseen? For instance, could the solar ascent in fact indicate a celestial remaking of the aqueous? To better test this notion, a detour is required.

Yelling into the void

A day earlier, we had visited Under the Volcano Books, the shop advertising itself as, "an embassy for the soul of the English-speaking world in Mexico."[32] No coincidence then that I sought partial language solace in its upper storey interior. Daytime visitors are presented with an iron gate barring entrance to a dark, seemingly empty tenancy. A sign instructs those seeking the bookshop to yell "VOLCANO!" into the void—an uncertain cry, that eventually yielded the shop's minder. The store borrows the title of Malcolm Lowry's celebrated novel published in 1947, a story in which the narrator, a retired alcoholic British consul, mostly recounts the events of a single day—the Mexican Day of the Dead, in the fictional town of Quauhnahuac—culminating in his death. Played out before two volcanos—still smoking Popocatépetl and sleeping Iztaccíhuatl—the tale pairs the destructive potency of fluid rock with a catastrophic psychical dissolve induced by alcohol—what Gaston Bachelard terms, "*eau de feu* or fire-water."[33]

Situated in the suburb of Condesa, the store can be found on a street radiating out from the *Glorietta Popocatépetl*—its spoke-like form determined by the old *Hipódromo* racetrack defining what today is *Parque México*. Dropped in via Uber, none of this was obvious, but for context, according to Google Maps, a 35-minute walk will take me to Luis Barragán's *Casa Gilardi* (which I'd visited earlier that day), and a slightly more taxing 48 minutes would allow me to reach the *Casa-Estudio Luis Barragán*.

Much later I realised that a more immediate parallel ties the *Hipódromo* racetrack and the *Parque México* to Barragán—water, horses, and suburban land development—a signature trilogy found at the *Cuadra San Cristóbal* equestrian estate (1966–68) itself part of the *Los Clubes* residential subdivision designed by Barragán (1961–66) on the outskirts of *Ciudad de México*. Adjacent to it the streetside, *Fuente de los Amantes* (Fountains of the Lovers), and the *Fuente del Bebedero* (Fountain of the Trough) in the nearby *Parque Los Bebederos* testify to Barragán's mobilising of water and horses as factors of desirability in real estate speculation.[34]

The windows, José Ortega says, are meant to disappear.

Its glass erased by maintenance, by ritual—a meticulous effort to sustain Barragán's illusion of continuity with a garden he wanted to bleed in (Fig. 8).

But no labour can efface the truth.

The panes divide worlds: an outside cultivated, an inside avariciously consuming it (Fig. 9). *Either side, either way, dust settles, needing to be erased and re-erased, as if the act of cleaning could dissolve the divide.*

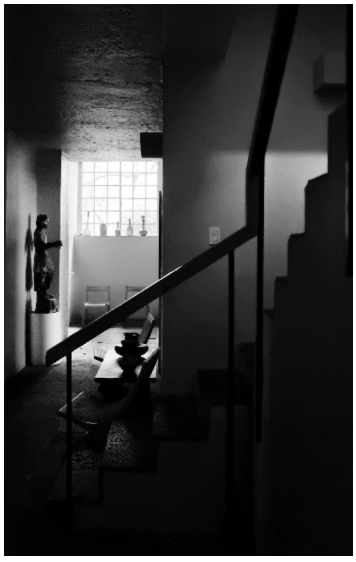


Fig. 7 Barragán never had balustrades until a friend fell off these steps [Photograph: J. Wu, 2024]

Fig. 8. José opening the stable door to let the garden in. [Photograph: J. Wu, 2024]

Fig. 9 The house opening in fragments [Photograph: J. Wu, 2024]

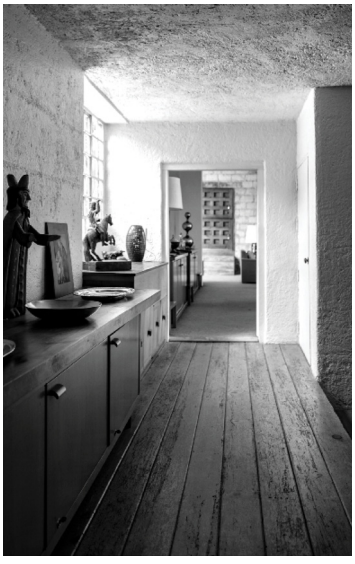
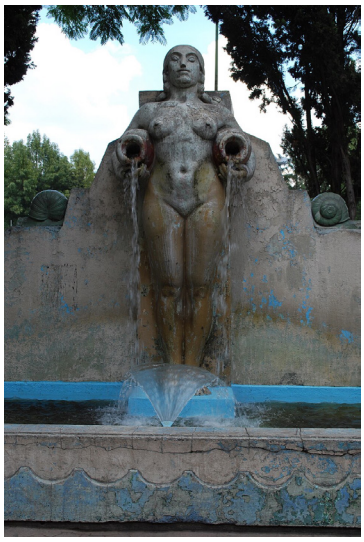


Fig. 21 *Fuente de los Cántaros* (1927) [Wikimedia Commons, Photograph: Thelmadatter, 2010]



"Camposcapes"

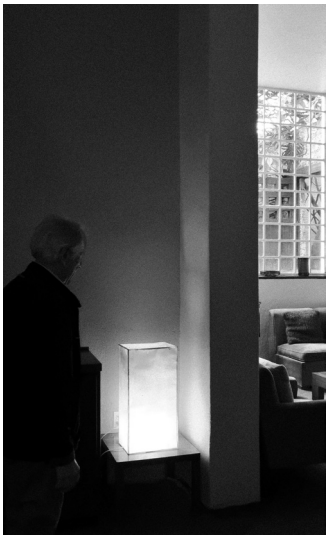
Latin American cultural historian, Ageeth Sluis, terms rural-agrarian idealisation of this sort appearing in Mexico's evolving urban contexts *camposcapes*—socio-politically expedient reproductions of pastoral beatitude. Increasingly evident from the late nineteenth century, *camposcapes* serve as a means of reconceiving modernising forces through an appeal to rural timelessness and female autochthony, all within a nationalist framework seeking to synthesise the complex nature of Mexico's urban and agrarian places.[35] The *Parque México* for Sluis is a key marker in *camposcape* evolution, appearing early after the revolution (1910–20). Designed by José Luis Cuevas in 1925—the same year Barragán visited the *Exposition internationale des arts décoratifs et industriels modernes* in Paris—the wider art deco subdivision that came to occupy the estate of the *Condesa of Miravalle*, left in reserve the equestrian *Hipódromo* as a park. At the heart of this "pseudo-countryside," as Sluis puts it,[36] is the *Fuente de los Cántaros*, a fountain created by José María Hernández Urbina featuring a naked depiction of Luz Jiménez, herself bearing two jugs delivering a continuous outpouring of water (Fig. 21).

For Sluis, what her obvious indigenous appearance signals is a *camposcape* whose "internal orientalism" had been adapted to "Art Deco spectacle," one in which widely publicised images of the female "deco body" were given concrete expression.[37] What these bodies were called on to do was tie desirability and health into a politically useful vision of "a lost, Mexican Eden."[38] In the post-revolutionary context, deco bodies made visible "new gender ideals" suited to the city's modernisation, ideals capable of "bridging the gap between two divergent racial discourses that accompanied revolutionary reform, *indigenismo* and *mestizaje*, paving the

Fig. 10 A Peruvian pepper tree in the *Casa Ortega* garden [Photograph: J. Wu, 2024]

Fig. 11 *Casa Ortega* drawing room, sunken below the garden [Photograph: J. Wu, 2024]

Fig. 12 A lamp [Photograph: J. Wu, 2024]



I imagine forgotten fingerprints lingering where light does not touch.

The garden waits outside (Fig. 10), *plainly lifted above this library floor, its soil reminding: the earth is always above, always cradling the house in its quiet power* (Fig. 11).

In these rooms, absence frames. Austerity guides the edge. Eroticism lingers like a breath—present and withheld (Fig. 12).

In the garden, water flows with precision. The fountains sing, but their music is orchestrated. This is not wildness—it is work.

way for a 'mestizo modernity.'"[39] For Sluis, the significance of Jiménez, a Nahuatl-language (or Aztecan) storyteller and model, within the *Fuente de los Cántaros* served to link "Art Deco spectacle" with evolving forms of *mexicanidad* or politicised, pre-colonial identification. If the continuous streams of water delivered by *los cántaros*, carried by Jiménez can be thought to invoke the Aztec goddess of fresh moving water and female fertility, Chalchiuhtlicue (she of the jade skirt), nakedness at the *Fuente de los Cántaros* suggests two easily overlooked scenographic facets central to land speculation then: an eroticisation of water and its purification (clear clean water), both facets Barragán redeployed in his subsequent work.

Detour through pre-revolutionary balneal space

Permitting water cleanliness at *Parque México* was the increasing homogenisation and reticulation of water. As Casey Walsh has argued, this homogeneity brought new 'virtues' linked, at one level, to the sanitariness and 'purity' of generalised water, and at another, to a residual place-specific taint of singular water sources. These opposing virtues rest on an historical evolving of water supply in the Valley of Mexico, a shift for Walsh from pre-revolutionary 'waters' to 'water,' the latter understood as a chemically singular, purifiable substance. In *Ciudad de México*, the heterogeneous sourcing of water in springs and wells was increasingly amalgamated in pursuit of "homogenized water" capable of merging new and old urban territories. Yet for Walsh, this "hydrosocial integration"[40] delivering convenience and hygiene, left in place an older belief in the therapeutic virtues of certain other waters if immersed in or ingested—the former of these resulting in the conversion of naturally forming springs into popular spas and bathhouses in the mid-to-late nineteenth century.[41]

Collective immersion bathing in *Ciudad de México* harboured mixed motivations: cleanliness, sociability, health improvement, and for some, erotic encounter. Victor Macías-González has traced these bathing motivations in Mexico historically, finding the origin of prevailing nineteenth-century division of male and female bathers in an early colonial fear of "nefarious sin" carried by mixed-gender bathing.[42] Under the pre-revolutionary presidency of Porfirio Díaz (variously spanning 1876–1911), male social bathing was integral with Porfirian political, cultural, and class intentions, with the bathhouses becoming sites for elevating 'hygiene' across male classes.[43] By the commencement of the twentieth century, a series of gender-transgressing and homoerotic exposés implicating Porfirian elites called any remaining value of bathhouses into question while prompting dissembling homoerotic legal scrutiny and penalties.[44] It is against this

The water obeys because it must, its freedom measured out in controlled streams. José leads us like actors in a scene, switching fountains on as we pass. Arcs of water leap into existence, brief and choreographed. When we turn our backs, he extinguishes them (Fig. 13).

Barragán's garden was once a retreat. A sanctuary from the city's chaos. Now, what once soothed the soul has become a currency, tended by José, its beauty exchanged.

Barragán's strange objects—manmade and hewn—resonate with and within the landscape (Fig. 14). *The vast and the human, the regulated and the chaotic—they collide.*

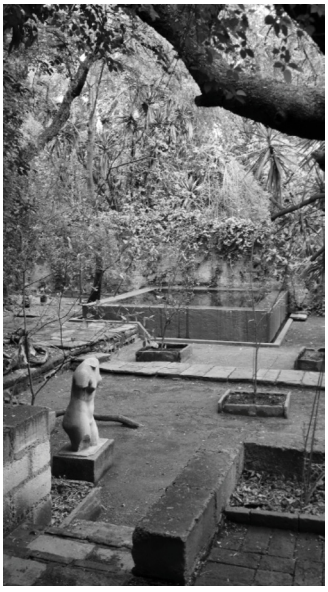


Fig. 13 *Casa Ortega* fountain [Photograph: J. Wu, 2024]

Fig. 14 *Casa Ortega* garden [Photograph: J. Wu, 2024]

backdrop that the post-revolutionary hydrosocial mandate unfolded, one where the tensions between moral and physical hygiene found resolution, as Walsh puts it, in a transition "from bathing together to showering alone [under . . .] modern homogeneous water."[45]

Two further propositions can be drawn from this intersection between hydrosocial traditions (themselves arising from deep pre-colonial roots)[46] and hygienism: firstly, the private partition of water and bathers was countered by a de-corporealised bathing in public spectacle (deco bodies, for Sluis), a scenography in Mexico recalibrated both for a nationalist *mexicanidad* and aspirational property speculation; secondly, the homogenised pool of hygienism transported by international modernism—in both its biopolitical and aesthetic modalities—was, by the 1940s, found wanting in Mexico (as elsewhere), and resulted in architectural expression seeking a counter-immersion in local or place-specific sources (sometimes read as regionalism or what might be better understood as an internationalised trade in autochthonic *camposcapes*). In Barragán's case, the displacement of 'waters' to 'water,' finds a complex return 'hydrology' in which a conformist hydrosocial—that renovation of the aqueous according to a post-revolutionary *structure-Other*—leaves open a range of other 'waters' exploitable as elemental avatars.

Volcanic waters

A source for such elemental avatars can be found some 22 minutes' drive from the Condesa's deco subdivision in what became *Jardines del Pedregal de San* Ángel, a vast development undertaken by Barragán between 1945 and 1950. Relevant for any consideration of the *Casa-Estudio* is the presence of *El Pedregal* as a pivot around which it and the *Casa Ortega* turned. The three combined define a decade across which Barragán broke with international modernism, but also architectural practice as typically enacted.[47]

At *El Pedregal*, in a location thought to be uninhabitable, Barragán conceived a radically updated *camposcape*. Set on a 2,000-year-old, "sea of lava,"[48] one that had buried important prehistoric townships,[49] he achieved a modern revaluation of this manifestly ancient ground, with a suburban plot determined by lava flows and punctuated by stone walls, metal fences, and gates, partially enclosed courtyards with neat lawns, and common areas enlivened by pools, fountains, and water jets.[50] If at Condesa, naked deco bodies and water were deployed to secure a marketable *mexicanidad*, at *El Pedregal* naked ground and its mediatising rested on topography itself aqueous in an arrested sense. Keith Eggener describes this mixed reality thus: "a dramatic, desolate, and venerable place, a visual mixture of violence and serenity,

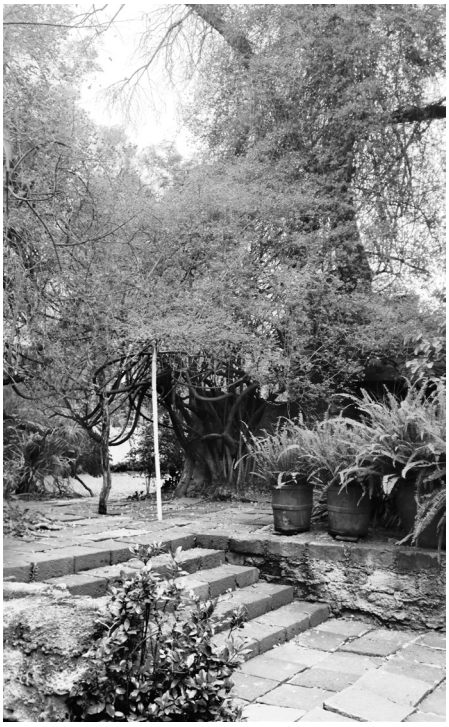


Fig. 15 *Casa Ortega* trees trained into shade [Photograph: J. Wu, 2024]

Old peppercorn trees bend under ivy, their trunks warped into curtains of shade. Decades ago, weights were tied to their limbs to train them (Fig. 15).

Nature, too, is bent into submission here—trained to serve as a backdrop of warmth. The clivias kneel at our feet; jasmine threads light through the coral tree's red. Each layer of colour builds a tableau—orange, yellow, green, red. The garden glows, but only if you stand in the right spot.

This garden asks nothing of the city, but holds the city's breath. It no longer recognises the city—its noise, its grime. It remembers only a forgotten retreat, a place once meant to shield, to hide, to be apart. But now, the garden has outlived its purpose. Its tranquillity swallowed by the sprawl.

like a turbulent body of water suddenly frozen."[51] Perturbing this surface further were indigenous accounts of wandering witches and disturbed souls.[52]

El Pedregal expanded an initial property purchased by Barragán called *El Cabrío*. There he had shaped a series of garden spaces for solitary retreat from the city.[53] Immediately bordering the volcanic topography that would become *El Pedregal*, *El Cabrío* offered a contrastive magic, a place for spiritual revision linked to *ociosidad*, or idleness. As Barragán put it: "Humankind's greatest contribution to culture is *ociosidad* [it . . .] is the art of beautifully and transcendentally passing through time and space."[54] *Ocio* for him meant, "unconsciously fall[ing] into an atmosphere of meditation without effort."[55] As Luis Carranza notes, the gardens at *El Pedregal* offer no 'agricultural' yield—they endure and mutate according to ancient rhythms indifferent to those of humanity. Yet in Barragán's formulation, the passivity of *ocio* instilled something immediately productive: private solitude capable of cultivating non-standard mentalities freed from the uniformity imparted by modern urban living.[56]

Masculinisation and marketing alchemy

So does *El Pedregal* contradictorily carry both *ocio*, as a productive flow of private time, and the inherently diverting action of media flows integral with real estate speculation. More concretely, it draws on the aqueous in passive and active senses, with the frozen fluidity of lava fields set against actual water play in the *Plaza de las Fuentes* say—a doubling matching that of dormant Iztaccíhuatl and still active Popocatépetl, their confluence tied to *El Pedregal* in the celebrated early photograph by Armando Salas Portugal, *Los Volcanes Desde El Pedregal* (1938).[57]

These interlacing modes of fluidity parry an older alignment of *camposcape* with indigenous female telluric forces (*El Pedregal* was considered the "primary school of witchcraft" after all),[58] and a broader masculine remaking of *campo* Sluis attributes to a post-revolutionary "cultural stage" in Mexico. As she puts it, the vitality and agency of the "*ranchero*" had displaced an earlier alignment of *campo* indigeneity with "female architypes."[59] While Barragán's appeal to idleness as a foundation for privatised and non-conformist individuality hardly aligns with *ranchero* machismo, at *El Pedregal*, "magical Mexico" was given an alternative spiritualisation of place/nature/essence via the solitary photographic contemplation of *de San Ángel* undertaken by Salas Portugal, a photographer whose earlier, brooding black-and-white images helped shape and more broadly publicise the mystical nature of its violent landscape.[60] For Salas Portugal, like Barragán, contemplative waiting was key: "All one has to do is observe,

The statues—those strange objects—once anchored in domestic embrace, now stir like creatures from a long-forgotten dream. Where water and dust meet—where they linger and leave, where life moves in halting steps before the inevitable boundary, before the wall. In the silence, we wonder: What is it to sustain beauty, when it must be framed by walls that never bend, by time that never halts?

The garden has been watered, but never with enough flow. Its purpose: to remain. Contained, contained, contained.

The house persists as a corridor linking these rooms. Each garden, an extension of its pulse—a living part of something larger, but fractured, fragmented.

The walls hold memory. The ground speaks of things long buried. A whisper rises from the fountain, tangled with dust. A family waits for something—a time when water will connect them to something beyond.

They wait for the promise Barragán's vision once held: to humanise the earth without losing its magic. Barragán's geometry—its grids and arcs—was meant to contain such sounds.

To frame them. To temper the wildness of water. But water, like memory, will not obey.

Dust and water: the two alchemists of this house. One carries the weight of what is gone. The other speaks of what refuses to leave. Together they weave a presence, a story told in whispers and droplets.

And at the centre, José—a figure between worlds. Barragán knew this truth: that water must be guided, that dust must be swept, that pink must be painted anew when time wears it thin.

enjoy and await the light to enter [. . .] the beauty of a wall, a stone, a ravine, a mountain. Things are always there but only appear when the light reveals them."[61]

Soon after meeting Salas Portugal at an exhibition in 1944, Barragán invited him, and painter/writer and amateur volcanologist Gerardo Murillo (Dr Atl), to join in planning the *El Pedregal* development.[62] Despite the necessary reticulation of homogeneous 'water,' the aqueous appealed to here better aligned with an older understanding of 'waters' as a distillate of ancient place-specific essence. Not coincidently, Salas Portugal, initially a chemical engineer specialising in the development of fragrances and essences,[63] can be imagined enacting his own light extraction and distillation of place peculiarities, but in the burgeoning age of synthetic scents (1920–40), it is the compounding and reproduction of artificial essences that permitted their broader consumption[64]—by analogy, precisely what the image-production and marketing of *El Pedregal* sought to achieve.[65] Threaded through this lava field then, an hallucinogenic vision chiastically parrying liquid violence and human repose, one in which a vast terrain of geologically slackened time was quickened by mediatised property speculation.

Coming-in/coming-out

Back at the *Casa-Estudio Luis Barragán*, a project realised in the immediate wake of *El Pedregal*, this doubling of savage elements and human repose found recalibrated form. Brought inside, volcanic surface terrain was given domesticated placement in the flooring and ascending steps that culminate in a pool-like vessel addressed solely to the sky. No lounging space or solarium this terrace, its tiled surface is manifestly a roof in the sense of collecting and directing rainfall to outlets. Yet its coloured planar resolution—white-washed plaster walls broken up by burnt orange and hot pink expanses, each rising many times human high and orientated to catch the daily solar arc—burn brightly against the sky (Fig. 21). Here, ascent, returning to Deleuze's commentary on Tournier's novel, expresses a "becoming solar."[66] And this becoming is not without desirous affects: while Defoe's Robinson asks how a society of one can replicate a country lost to misadventure—a kind of asexual generation that industriously turns an island of deprivation into an estate rich in goods[67]—Tournier's Robinson elides industry as an end, making "dehumanisation" the goal instead, or what amounts for Deleuze to a non-anthropomorphic sensory coitus carried by the elements in their becoming.[68]

To make Barragán a Crusoe, either purely in the mould of Defoe, or in the devolving form of Tournier, is certainly to overstep. Yet resonances of both seem feasible, particularly

Dust and water—one fleeting, the other enduring. As we leave, I carry them myself: the whisper of water, the grit of dust, the pulse of pink.

Dark pink sings in silence, its hue rich as wound. It folds around the visitor, pressing close like a lover, like a secret, like guilt.

Our return to dust—as fiction (Fig. 16).

Fig. 16 Looking to the rain of light [Photograph: J. Wu, 2024]

when the profitable engendering of desolate and then suburbanised *El Pedregal* is set against the noted reclusion and spiritualisation engineered at the *Casa-Estudio*.[69] And if these two poles speak to and of desire, then there is the issue of Barragán's own sexuality, something which is hardly avoidable, it seems, when visiting his work in *Ciudad de México*.[70] Quiñones refers to a dichotomy well-rehearsed in critical contexts when referring to Barragán as embodying "the personas of both a dandy and a monk," while Evan Moffitt more explicitly depicts him "an observant Catholic and closeted gay man" whose house is composed as a "black box of privacy" dedicated to withdrawal and contemplation.[71] Yet the issue of his precise sexuality is ultimately unknowable; more pertinent is an intense investment in solitude, which for Moffitt (citing historian Juan Acha) causes particular spaces "to revolve around [themselves. . .] and irradiate a convent-like [. . .] introspection and withdrawal."[72]

Barragán's elevation of *ocio* and the solitude that completes it mirrors a broader critique of modernity favouring individual distinction in the working out of metropolitan psychic life, as, for example, Georg Simmel argued in "The Metropolis and Mental Life" (1903).[73] Barragán, at home in a monastic carapace, enacts something akin to what Simmel termed the "path of the soul [back] to itself."[74] In conditions where religiosity or "objectified spirit" (carried by objects, beliefs, and systems created collectively) is eroded by a secular world increasingly calibrated according to trite goals, subjective investment "into certain forms of beauty and grandeur, sublimity and lyric emotion" offers a way of rendering religious motivations self-sufficient.[75] Barragán's appeal to emotional beatitude and a meditative beauty at home enacted such an islanding furnished for intransitive spiritual pathways (rather than direct transitive ones).[76]

Living/library/sea

To put this diagrammatically, if the primary transcending thrust of life in the house is articulated in the volcanic climb from shadow to the full face and force of the (Mexican) sky-cosmos, a secondary axis runs horizontally and westwardly from the entry hall into the altar-like living room[77] with a series of subspaces themselves held within a larger volume defined upwardly by the beamed structure holding the roof terrace. Beneath the stark solar container overhead, what faces here instead is the rear garden, itself a complexly overgrown and shadowed reserve revealed through the celebrated garden window, its monumental scale subdivided crucifix-like (Fig. 22).[78]

Deeper access into the room requires an about-turn and navigation of numerous half-height partitions (Fig. 23),

And beginning once again
(with Gabriel García-Márquez)[14]

At the threshold, where the street hesitates before the wall.

A wall—dark pink, the colour of old wounds healed over. Or pink deepened by absence of light, bruised by shadows it had always ignored. Its surface holds every scar of hands long gone. Textured as though it could feel the rain's insistence. As though it had absorbed the centuries and now exhaled them slowly.

This was Barragán's pink, made for light. But here it stood—unlit, but not unlived.

José Ortega turned off the last lightbulb. The house inhaled its night.

In the absence of electricity, a different current stirred: the whisper of rain slipping through the garden, pooling in the fountain's lips. It became not a sound but a presence—heavy, restless. As though the water had waited too long to move.

The fountain overflowed. Waters spilled over, refusing containment. Each drop bore trapped rivers, Lake Texcoco's erased body, a city that drank itself dry and asked for more. The rain thickened. It pulsed. It surged into the house—not with chaos, but with purpose.

Inside, the walls softened. Rigid geometry surrendered to the damp. It was no longer water; it was awareness. The house became aware of itself. Its walls turned to skin, breathing after a long-endured sleep.

Furniture drifted. Tables became rafts. Chairs floated like islands,

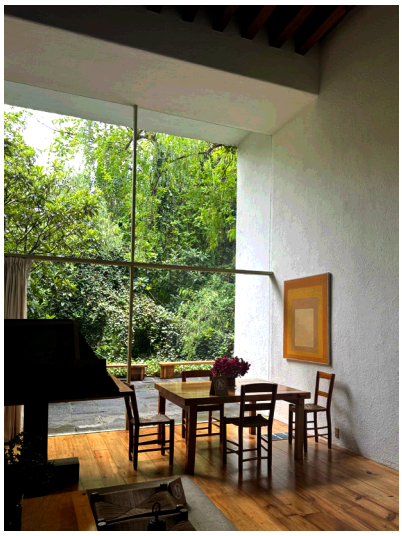


Fig. 22 Living room [Photograph: A. Douglas, 2024]

Fig. 23 Passageway through the library [Photograph: A. Douglas, 2024]

a transition that leads to the library proper with its floating zig-zag stair[79] whose handrail-less access offers a closed space excluded from the tour (Fig. 24).[80]

It astounds to learn subsequently that the living room and library were originally conceived as a single uninterrupted volume, with the cruciform garden window—or "great crystal opening"—being a later replacement for a semi-opaque glazed screen matching the high-level, street-facing library window (Fig. 25).[81]

With outlook dammed-up so to speak, the room must have been something like a lake of evenly diffused daylight where everything was rendered immediately and starkly viewable. Barragán's subsequent introduction of obscuring subspaces and the release of outlook into the garden has been attributed to his application of a Loosian *Raumplan*—a spatial nuancing of scale and volume tunned to discrete uses.[82] Contrastive with the terrace above, which initially had a

their legs skyward in defiance. The house became vessel. Water, like time, erased boundaries, spilled secrets. Furniture floated free. José climbed onto the dining table with his family—not to escape, but to move with the flood.

They navigated between islands of their lives: a photograph bobbing in the hall, a teacup spinning in the water like a lost moon. The water, cool and golden as light, carried whispers—of dust, clay, sunken lakes.

The fountain's waters became memory breaking free. They bore clay, dust, the sinking ground. They spoke of a time before loss, when land held firm. That night, the water reclaimed house, garden, family—flooding them with the uncontainable, the forgotten, the fantastic.

By dawn, the rain receded. The garden refused to shrink. Trees stood taller. Vines gripped eaves. Roots pushed deeper. The house, now dry, bore the marks of change: outlines on the wall, a scent of earth, a silence that felt alive.

The fountain sighed, empty again.

This was no longer Barragán's house. It had not been for some time. It belonged to the water now—to the past that would not be erased.

I wish to acknowledge the gracious hospitality and generosity José Ortega showed me across the short time I had at the *Casa Ortega*. José kindly agreed to my inclusion of photos of him for this essay.

Thank you, José!

overleaf:

Fig. 17 *Casa Ortega* afloat—a fiction [Drawing: J. Wu, 2024]

view over its western balustrade into the garden, but was later filled in,[83] the cellular subdivision of the simpler, living/library volume, and the selective release of outlook into the garden suggest a complicating machinery designed to both slacken and compound strands of duration loosened by *ocio*. Hence the importance of the figure of the labyrinth for the house. For Nicolas Gilsoul, Barragán's work directly taps the regressive and introspective qualities of labyrinthine places central to the Surrealist imagination—qualities experienceable first hand at the 1940 *Exposición Internacional del Surrealismo* in Mexico City. Noteworthy for Gilsoul too, the gardens comprising the Barragán property at General Francisco Ramirez Street were themselves formed over a quarry riddled with tunnels thereby aligning it with the maze of the Minotaur.[84]

Parallelling a growing entanglement of this garden over its unseen maze outside, the house, eschewing modernity's predilection for fixed form and unitary perception, transformed

Fig. 24 Library stair [Photograph: A. Douglas, 2024]

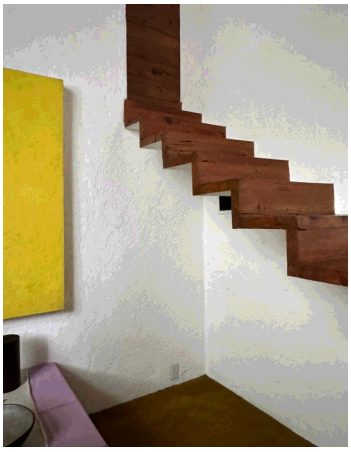


Fig. 25 High-level street-facing window in the library [Photograph: A. Douglas, 2024]

and mobilised viewpoints given sequentially and unexpectedly. An array of corner spaces formed at the convergence of wall planes offer pockets of stilled space.[85] These are the touch points, the tactile, furnished anchors most suggestive of Barragán's at homeness. Conversely, we, the sightseers, are mired in a perspectival mobility accelerated to absurdity: 'stand here not there, do not touch anywhere, have you had enough time to get a photo . . . move aside so others get a clear shot.' And so we dance around each other on a beige carpeted runway signalling permitted passage and rare touch points.

Nowhere is space and time more intensely compressed than in Barragán's library itself. As Alfonso Alfaro has written, though not systematic in approach, the bibliographic collection—present in the house, and under the care of the Tapatía Foundation—signals a solitary man's "active" inscription and dialogue with a plethora of "voices of sleeping ink."[86] Amongst these are publications by French illustrator, society chronicler, travel writer, garden designer, and architect, Ferdinand Bac. As Alfaro notes, his discovery of Bac while in Paris during the *Exposition internationale des arts décoratifs et industriels modernes*, provided an unexpected path to the paradise gardens of the "Spaniards of the three religions."[87] Moreover, the Mediterranean Basin itself, as Barragán's library suggests to Alfaro, shows an interest in diverse places and cultures gathered by the "tutelary skies" overarching this ancient sea ("Tangier, Venice, Istanbul and Alexandria").[88] They testify to referents far in excess of any singular "indigenist [Mexican] autochthony," joining instead Mexican traditional architecture with that of a cross-cultural enclave centred by this other basin, an aesthetic synthesis Barragán referred to as "Neo-Mediterranean,"[89] and for Alfaro underscores his interest in a "universalism of all cultures."[90]

So while the living room/library condenses Barragán's perspectivism and the referential sea it traversed, an additional insight can be drawn from the books he collected—spiritual mitigation. Fernando Curiel Gámez, building on Alfaro's bibliographic commentary, points to the importance for Barragán of reviving religiosity and its linking with art via mysticism. What Gámez draws from underlined phrases in Barragán's copy of Aldous Huxley's *Perennial Philosophy* (that "the beauty of art [alone can approach...] Divine Beauty"), is the importance of mystical detachment and a contemplative departure from everyday senses of self.[91] Read alongside the predominance of annotations by Barragán in his copy of Marcel Proust's *À la recherche du temps perdu* (*In Search of Lost Time*), and in French language commentaries on Proust, Gámez argues that spirituality within art rests on its address of a "proximity to eternity" through sensations that endure, as opposed to fleeting appearances defining

everyday life, a proximity locating the divine in the sensory as such.[92]

In Proust the eternal manifests in a pure time retained in, and reborn through, memory. The significance Proust afforded involuntary memory speaks to the rapturous, mystic recovery of a persisting time injected into the banality of everyday sensations—to borrow a phrase by Philippe Mengue, it affects a seeming "'visitation,' [or] 'annunciation.'"[93] What art concretises over memory, even its involuntary presenting, is a fixing of the enduring in a form that can be reproduced or accessed at will.[94] So does art achieve the spiritual. To the extent, as Barragán argued, his architecture is primarily autobiographical, it is so via a recalling and spiritualising of memories.[95] Imagination, reworking nostalgia, utilises memory, as Gámez puts it, as a "liquid solution" to deepen and preserve sensations across time.[96]

Sounding chamber

Such a mnemonic or 'liquid transfer' is explicitly enacted in the *Casa-Estudio's patio de las ollas* (courtyard of the pots), a small enclosure facilitating transfer from the larger garden back to the studio, a space inserted late in the house's history and experienced for us near the end of the tour. Like a canal lock adjusting water levels for transfer between varying terrain, the courtyard is reached through a series of tightly orchestrated bodily turns that culminate in a low pink gate. Stepping down and through, a small space enclosed by tall walls appears. In one corner a rectilinear reflecting pool is sunk into the ground. Dank, still, and of uncertain depth, a timber 'spout' suggests a possible inflow to the pool, and on cue, our guide announces, "Wait here while I turn on the water." Pitted volcanic pavers matching the entry and hall are here again, but now damp, slippery, and reflectively patchy from overnight rain—a dampness richly augmented by garden plants cascading into the courtyard over the top of the surrounding walls. Abruptly, a torrent of water fills the space with a deep-throated noise (Fig. 26).

Fig. 26 *Patio de las ollas*, timber spout [Photograph: A. Douglas, 2024]

Reverberating around the small space, this aqueous exuberance stands in contradistinction to the empty pulque pots, vessels routinely used to hold an indigenous intoxicant derived from the maguey plant, a liquor referred to as "alabaster milk."[97] Filling much of the courtyard, some sixteen or so pots leave little space for human others, suggesting it is less a place for pause and contemplation than one to transition through (Fig. 27).

Still, with no view in, or out, the patio's purpose and nature is puzzling, especially when considered against the earlier configuration of this area which featured a glazed wall

Fig. 27 *Patio de las ollas*, timber spout [Photograph: A. Douglas, 2024]

Fig. 28 Stable door opening off the *patio de las ollas* [Photograph: A. Douglas, 2024]

providing the studio with a view into the garden, much as the "great crystal opening" does for the living room still. A closed vessel instead, the courtyard suggests an agrarian reminder in the city, a memory cell less seen than heard, particularly when the stable door arrangement linking it to the studio interior is considered (Fig. 28).

Like sound baffles, these doors suggest the likelihood of a prolongation of audible water within the studio itself, an acoustic remainder channelling an (autobiographical) anterior time or analepsis—to borrow a literary/filmic term— into projects to come. Flashback-like, this anomalous time was central to Barragán's architectural imagination and process, as he asserted, and the implantation of the *patio de las ollas* into what was a broad view out into the garden, suggests the intensifying role of inner excursuses in his work—as Barragán asserted in 1980, "the architect must listen and heed his nostalgic revelations."[98]

For little reason better than a coincidence in time, I am drawn to recall, that hail into the dark with which I started this account—"VOLCANO!" No link I know ties Lowry's *Under the Volcano* to Barragán, yet I picture them together partly through the coincidence of their production: the first published edition of *Under the Volcano* arriving in 1947; the initial completion and occupation of the *Casa-Estudio* achieved in 1948. The analepses suggested directly by the *patio de las ollas*—but evident indirectly everywhere throughout Barragán's work via dialogic exchanges savoured locally and afar, both from the immediate now and nostalgically drawn from distant times—is a key temporal modality also mobilised by Lowry in his autobiographically inflected novel, as Pierre Schaeffer suggests.[99] No simple synopsis or arrival into and through the narrative of *Under the Volcano* is possible; it is riddled through with what William Gass calls the "wormy ubiquitousness of the sign,"[100] a referential deluge overflowing simple capture and containment.

Barragán's work has an unfathomability too, though the deluge filling it differs. As Stephen Spender says in his introduction of *Under the Volcano*, the novel offers, "perhaps the best account of a 'drunk' in fiction"; in Barragán it was sheer sobriety (in principle) that sustained. While Lowry portrays Mexico as that intemperate place capable of deterritorialising self to the point of destruction, Barragán, drawn to the spiritual/perceptual roulette imagined by Huxley, charts a different route to the richness of the multiple, as Gilles Deleuze and Felix Guattari define a compensatory world fallen beyond overarching religious unity.[101] Mirroring the loss of Simmel's "objectified spirit" and the resulting islanding of the religious soul, Deleuze and Guattari define the multiple this way:

> [. . .] unity is consistently thwarted and obstructed in the object, while a new type of unity triumphs in the subject. The world has lost its pivot; the subject can no longer even dichotomize, but accedes to a higher unity, of ambivalence or overdetermination, in an always supplementary dimension to that of the object.[102]

Key to overdetermination and a de facto unity of the multiple is a logic of subtraction: "Subtract the unique from the multiple [. . .] always n-1," as they say.[103] Such subtraction points to a rhizomatic structure concomitant with subterranean root systems of certain bulbs and tubers that seek water transversely and opportunistically across terrain.

In the *patio de las ollas*, subtraction and sobriety stand in plain sight via its emptied pulque pots. At one level, their presence calls up a far from temperate aqueousness. Consider Barragán's emphasis on "looking with innocence" in his Pulitzer Award speech, an attribute he credited to mentor and collaborator Jesús (Chucho) Reyes Ferreira, the Mexican artist renowned for his use of *papel de china* or "traditional Mexican coloured tissue paper."[104] The colouration Barragán instilled in his architecture drew directly from Ferreira's reworking of this rich tradition, an association most prominently fostered in the festive colours and motifs instilled in the *papel de china* used at the inauguration of pulque bars particularly. In this intersection of alcohol and coloured paper is a complex combining of "indigenous, European and Oriental traditions."[105] Pulque, that *alabaster milk*, reserved for priests and religious ceremony in pre-colonial times, and later regulated and restricted within *pulquerías* during colonial rule, is itself derived from the rhizomatous maguey plant. So does the sparseness of ground water rise, through rhizomatic and mnemonic relays, into the luminous and colour-tinted light Barragán achieved with Ferreira. So too does innocence, bypassing "the spirit in the plant" and its poisoning of the brain—to borrow Gass's phrase—rely on emptied vats, or pots in this case, as resonating chambers recalling times other than the present.[106]

From hydrosocial to transformative waters

A visit to the *Casa-Estudio Luis Barragán* follows a trochal structure: echoes of water and fire water from the *patio de las ollas* pass into the domain of drafted and photosensitised paper, the studio itself dense with drafted and photographed documents. The circle commenced with arrival is completed; predictably, exit passes via the gift store. The 'tour' as experienced is, of course, a contrivance. Any number of other ways in and through the *Casa-Estudio* are possible. Moreover, such a fleeting encounter with Barragán's home and workplace, is the opposite of his own dwelling as

such. The Ferris wheel of the everyday carves out cyclical spaces of occupancy rather than the singular lines of a 'pass-through.' Much has been written on the distinction between the Loosian *Raumplan* and the architectural promenade of the Corbusian *Plan Libre*. Tonghoon Lee, for instance, in his survey of these accounts, links the former with spatial subtraction from larger volumes in which tactility and contemplation are linked to immediate material qualities. The latter he suggests work through additive experience in which tactility is tied to movement and, to a degree, the distracted path of sight itself.[107] As tourist, and tour recipient, something like the architectural promenade predominates, one in which sight distractedly peruses the surface of things, irrespective of Barragán's commitment to a reworking of the *Raumplan* and a deep tactility in General Francisco Ramirez Street. On the other hand, any promenade can be thought and enacted differently, and for the Situationalist International, and Guy Debord particularly, the *dérive* or urban experimental drift was an antidote to the facile nature of tourism and the kinds of non-seeing it calls on. Not surprisingly, as Mark Goodall has written, the Situationists found in Lowry's *Under the Volcano*—itself a narrative structured by urban walking—a working model for the *dérive* and the recombinant action of *détournement*. As Goodall puts it, "the practice of psychogeography—a drunken drift through space and time—was dubbed by Debord and his colleagues as the 'Lowry game.'"[108] In pursuing the Lowry game myself, I have sought to redirect my own drift through channels of the aqueous Barragán shaped. Beyond the mute reticulation and plumbed-in presence of hydrosocial water, I have been drawn to imagine what appears to be three routes for aqueous 'waters' in the *Casa-Estudio Luis Barragán*: the ocean of the sky, a pan-Mediterranean sea, and the analeptic percolations and prolongations of mnemonic ground.

Conclusion

In titling this dual commentary on houses by Luis Barragán "aqueous place," we are mindful of its oxymoronic quality: place suggesting a certain bounded endurance; the aqueous implying, conversely, a 'watery' unfastening. *Ciudad de México* seems aptly suited to this paradoxical positioning, flooded, left dry, filled in, sinking down, rising up, as it all is. In our different ways we have sought, firstly, to tell each other of our experiences in houses on this marginally uphill edge of that which was once a lake—expanded and extrapolated as these accounts have become—and secondly, to keep those experiences alive through forms of prolongation. Both are standard modalities of touristic exchange with the latter, in our case, leaning towards travel writing, a protraction going well beyond the intimate retelling we initially entertained.

Yet we have sought to exceed and complicate travel writing in this disjunctive photo-essay too. Worked-through here is the divergent 'Barragáns' that come through to us—via museums and memory, bookings and detours, through photographs and forgetting, through puzzling and needing to dig scholastically for answers, and, ultimately, sensing an incompleteness in our understanding. Nevertheless, we have taken the aqueous as a kind of perturbing vector whose trajectory we have allowed to throw us off, thrown us beyond, the curated 'packages' on offer at these house museums. Despite their curation, our encounter with them has given rise to a fragmentary, incomplete, detoured beholding. The *Casa-Estudio*, in its regulated seclusion, asks for a touchless reverence; the *Casa Ortega*, still lived in, is rich in interruptive gestures and the touches of everyday life. One operates by way of the ticket; the other by a tap on the door. The two houses, the two experiences, share a wall. Once, they shared a garden in full. As José tells it, there was a door between them, long since patched over. The fictional remaking of the *Casa Ortega*—its open-endedness, its fluid temporality, its pink dust—was, in its own quiet way, an attempt to reach across that boundary. To test whether memory might seep through concrete, whether one could enter through a place no longer open. This was not about restoration, but about passage—about what might still flow, sideways, beneath walls. On the other side of the wall, tempering the step-by-step, photo-op-by-photo-op constraint and gauging of the *Casa-Estudio*, a dwelling of the mind has been proffered, one happily indicative of a drunken *dérive* not quite able to finish at the gift store.

NOTES

1. UNESCO World Heritage Nomination: File 1136/Luis Barragán House and Studio, "Description" (2004), https://whc.unesco.org/uploads/nominations/1136.pdf, 36.

2. Giovanni Pinna, "Introduction to Historic House Museums," *Museum International* 53, no. 2 (2001): 4.

3. The house and studio features on ArchDaily's "30 Sites Every Architect Should Visit in Mexico City" in the number two slot, the same place as it appears on Wanderlog's "The 49 Best Architecture in Mexico City" (see respectively: https:// www.archdaily.com/866897/30-sites-every-architect-should-visit-in-mexico-city; and https://wanderlog.com/list/geoCategory/98637/best-architecture-in-mexico-city).

4. José Manuel Bárcena Ortega, Unpublished pamphlet issued to visitors during the house tour.

5. Juan Villoro, *Horizontal Vertigo: A City Called Mexico*, trans. Alfred MacAdam (Knopf, 2021), 33.

6. Matthew Vitz makes this point about O'Gorman's painting in his discussion of the politics of water in, *A City on a Lake: Urban Political Ecology and the Growth of Mexico City* (Duke University Press, 2018), Kindle Edition, Location 140 of 9845.

7. Néstor García Canclini, Christopher L. Chiappari, and Silvia L. López, *Hybrid Cultures: Strategies for Entering and Leaving Modernity* (University of Minnesota Press, 1995), 46.

8. Canclini, Chiappari, and López, *Hybrid Cultures*, 47.

9. Thea Pitman, *Mexican Travel Writing* (Peter Lang, 2008), 2.

10. Pitman, *Mexican Travel Writing*, 37.

11. Mauricio Tenorio-Trillo, "Cosmopolitan Mexican Summer, 1920–1949," *Latin American Research Review* 32, no. 3 (1997): 224–242; see 224.

12. William Gass, "Malcolm Lowry," in *The World Within the World: Essays by William H. Gass* (Basic Books, 1976), 57.

13. Lucas Tromly, *Travel Writing and Re-Enactment: Echotourism* (Routledge, 2023), 3.

14. I reference Gabriel García Márquez's short story "Light is Like Water" found in *Strange Pilgrims* (Pilgrim Books, 1992). I found my way to this story by way of Sheryl Tucker de Vázquez's "Light is Like Water: Barragán and the Question of Magic," *Third Text* 19, no. 3 (2005).

15. UNESCO World Heritage Nomination, 45–47.

16. Barragán cited by Emilio Ambasz in *The Architecture of Luis Barragan* (The Museum of Modern Art, 1976), 8.

17. Titled "(Job XXVIII:3, 1960)," the abstract gold-leaf panel was the first in a series Goeritz produced after the death of his wife in 1959. As Evan Moffitt describes it: "Its gold leaf catches sun at certain hours, giving brief light to interior gloom" (see "Uncovering the Sexuality and Solitude of a Modern Mexican Icon," *Frieze* 202, 18 March 2019). Utilising a nailing technique referred to as "Clouages," Goeritz titled these works overall "Mensajes," or message-bearing mediums (see Lily Kassner, "Lot Essay" in Christie's online auction posting, May 2009, https://www.christies.com/en/lot/lot-5077509).

18. UNESCO World Heritage Nomination, 47.

19. Georges Bataille, *The Accursed Share: An Essay on General Economy, Volume 1, Consumption* (Zone, 1988), 28, 34. On the specific link Bataille makes between the Aztec world view and a sacrificial becoming-solar, see 45–61.

20. Noteworthy is the characterisation in the UNESCO World Heritage Nomination of the terrace as something in excess of the name—a spatial experience better understood as a cross between, as Emilio Ambasz put it, a "'pool, patio, observatory, chapel or hanging garden [whose larger task is. . .] framing the view onto the sky," 48.

21. Gilles Deleuze, "Michel Tournier and the World Without Others," in *The Logic of Sense* (Columbia University Press, 1990), 302.

22. Francisco Quiñones, "Mi casa es mi refugio: At the Service of Mexican Modernism in Casa Barragán," *The Avery Review* 48 (June 2020): 1, 11. In fact, the World Heritage Nomination indicates that there were three permanent inhabitants in the house responsible for maintaining and cleaning it, Ana María Albor amongst them; see 114.

23. Quiñones points to an obvious glitch in the occluding machinery found in a 1951 photograph by Elizabeth Timberman of Esther McCoy at the first landing of the hall stair while visiting, an image simultaneously capturing a housekeeper known as Ángela answering the phone. See "Mi casa es mi refugio," 9–10.

24. Deleuze, "Michel Tournier."

25. Deleuze, "Michel Tournier," 303.

26. Michel Tournier, *Friday*, trans. Norman Denny (John Hopkins University Press, 1997), 203.

27. Deleuze, "Michel Tournier," 305, 38.

28. Deleuze, "Michel Tournier," 305.

29. Deleuze, "Michel Tournier," 305.

30. Deleuze, "Michel Tournier," 302.

31. Quiñones, "Mi casa es mi refugio," 11.

32. Under the Volcano Books, http://utvbks.com.

33. Gaston Bachelard, *The Psychoanalysis of Fire*, trans. Alan C. M. Ross (Beacon Press, 1964), 83, 95.

34. Visiting the former on our last day, we found an empty fountain being cleaned out by a worker, while the latter was closed for repair.

35. Ageeth Sluis, *Deco Body, Deco City: Female Spectacle and Modernity in Mexico City, 1900–1939* (University of Nebraska Press, 2016), 102.

36. Sluis, *Deco Body, Deco City*, 186, 189.

37. Ageeth Sluis, "Journeys to Others and Lessons of Self: Carlos Castaneda in Camposcape," *Journal of Transatlantic American Studies* 4, no. 2 (2012), https://escholarship.org/content/qt2k72p3w7/qt2k72p3w7.pdf (pages unnumbered: page 7 of online document).

38. Sluis, *Deco Body, Deco City*, 102.

39. Sluis, *Deco Body, Deco City*, 62.

40. Casey Walsh, "Waters, Water, and the Hydrosocial Politics of Bathing in Mexico City, 1850–1920," *Water Alternatives* 14, no. 1 (2021): 47–48.

41. Casey Walsh, "Waters, Water, and the Hydrosocial Politics of Bathing," 50.

42. Victor M. Macías-González, "The Bathhouse and Male Homosexuality in Porfirian Mexico," in *Masculinity and Sexuality in Modern Mexico*, edited by Victor M. Macías-González and Anne Rubenstein (University of New Mexico Press, 2012).

43. Macías-González, "The Bathhouse and Male Homosexuality."

44. Macías-González, "The Bathhouse and Male Homosexuality."

45. Walsh, "Waters, Water, and the Hydrosocial Politics of Bathing," 54–55.

46. Read more broadly, the *Fuente de los Cántaros* and the various other water features of the *Parque México* can be imagined carrying what remains of long-practiced hydrosocial traditions starting in pre-colonial times with the sweat lodges, or temãzcalli (in the original Nahuatl language of Luz Jiménez),

running through to the public immersion baths of the city. See Walsh, "Waters, Water, and the Hydrosocial Politics of Bathing," 54.

47. For instance Keith Eggener, who references a shift in Barragán's work from 1940, particularly resulting from the evolving implementation of *El Pedregal*. See "Postwar Modernism in Mexico: Luis Barragán's Jardine del Pedregal and the International Discourse on Architecture and Place," *Journal of the Society of Architectural Historians* 58, no. 2 (1999): 137.

48. The term is Emilio Ambasz's. See *The Architecture of Luis Barragán*, 11.

49. The age of the lava flow and the indication of earlier settlement comes from Barragán himself. See Damian Bayon, "An Interview with Luis Barragan," *Landscape Architecture Magazine* 66, no. 6 (1976): 530. Eggener refers to the remains of the ancient cites of Copilco and Cuicuilco found at *Pedregal de San Ángel* in nineteenth-century archaeological digs—see Eggener, "Postwar Modernism in Mexico," 125.

50. The demonstration gardens for the subdivision including the *Fuente de los Patos* (Fountain of the Ducks), *Plaza de les Fuentes* (Plaza of the Fountains). See Ambasz, *The Architecture of Luis Barragan*, 117.

51. Eggener, "Postwar Modernism in Mexico," 125.

52. Cited in Eggener, "Postwar Modernism in Mexico," 126.

53. See Ambasz, *The Architecture of Luis Barragán*, 11, 116.

54. Barragán cited in Luis E. Carranza, "Barragán Lecture No. 1: 'On Time and Experience,'" 8 May 2023, Vitra Design Museum, 34, 36, https://www.youtube.com/watch?v=5YyncSECDXc.

55. Barragán cited in Carranza, "Barragán Lecture No. 1."

56. Carranza, "Barragán Lecture No. 1."

57. See Gonzalo Mendoza Morfin, "Armando Salas Portugal, His Eyes on El Pedregal," in *Architecture and Photography: Luis Barragán*, published lecture series (Architectural Association School of Architecture, 2020), https://www.academia.edu/47930018/Armando_Salas_Portugal_His_Eyes_on_El_Pedregal (pages unnumbered: pages 5–7 of online document).

58. Eggener, "Postwar Modernism in Mexico," 126. Eggener is citing Francisco Fernandez del Castillo's account of *El Pedregal* in *Apuntes para la historia de San Angel (San Jacinto Tenanitla) y sus alrededores: tradiciones, historia, leyendas* (del Museo Nacional de Arqueología, Historía y Ethnología, 1913), 151. In it the latter links witchcraft here with the preparation of potions derived from plants.

59. As Sluis puts it, camposcape is subject to "a masculine reinterpretation of the campo by mid-century [meant . . .] the realm of the tehuana gradually transform[ing] into the land of the charros." Sluis, *Deco Body, Deco City*, 258.

60. Morfin, "Armando Salas Portugal," page 6 of online document.

61. Claudia Rueda, "Armando Salas Portugal: Dialogues Between Landscape and Architecture," in *Click 2/Form+* (Iniciativa Digital Politècnica, 2016), 56.

62. Morfin, "Armando Salas Portugal," page 12 of online document.

63. Rueda, "Armando Salas Portugal: Dialogues Between Landscape and Architecture," 56.

64. Olivier R. P. David and Franco Doro, "Industrial Fragrance Chemistry: A Brief Historical Perspective," *European Journal of Organic Chemistry* 26, no. 44 (2023): 5–6.

65. Eggener points to Frank Lloyd Wright and Richard Neutra's validation of irregular and difficult sites as appealing to wilderness specificity, a view remaining influential in Mexico through to the 1940s. More absurdly, Wright's *Fallingwater* made an appearance in a remodelled *El Pedregal* context as part of the suburb's advertising campaign, a transposition between water and lava engaged with in this essay. See "Postwar Modernism in Mexico," 131, 136.

66. Deleuze, "Michel Tournier and the World Without Others," 302.

67. Deleuze reference's Pierre Macherey's "The Thematic Ancestor: Robinson Crusoe" when asserting Defoe's commitment to an experimentation with origins, one whose socio-economic undertaking is essentially asexual. In Macherey's phrasing: "From the destitute gaze to 'my island,' the genesis marks the stage of an appropriation. From an initial absolute poverty, Crusoe becomes a 'king of my kingdom,' and he comes to speak of it as 'my estate.' His adventure is indeed a history of economic development. The island represents the natural place of an economic autarchy." See *A Theory of Literary Production*, trans. Geoffrey Wall (Routledge, 2006), 272 (emphasis in original).

68. Deleuze, "Michel Tournier," 303.

69. I am mindful of Keith Eggener's welcome reading of Barragán's work at *El Pedregal* and subsequently, one that recognises the need for a reading of his creative output within "nationalistic and exoticizing" frameworks aiming to 'protect' the architect from the onslaught of foreign appropriation, including "touristic" consumption, but which also sees in his work a greater synthesis of architectural and globalising forces (see "Postwar Modernism in Mexico," 140). My own approach in this essay is seeking to parry a reading spanning the inevitable ignorance of a foreigner and borrowed readings from those within and beyond Mexican critical appraisals. The otherness I reference intends, not an othering of Barragán, but the elemental, estranging appeal of the aqueous *tout court*.

70. On visits to each of his works, guides raised—with degrees of slyness apposite to the sharing of an "open secret"—the possible role homosexuality may have played in his work and life. This was particularly so in the *Casa-Estudio*, when the Spanish-speaking guide reverted to English when asking the two older single men, as opposed to the remaining 'couples' in the group, if we would like to live in such a house. Predicably

our response was yes, with the distinction in tour group sexuality being confirmed by the couples collectively renouncing the opportunity.

71. Francisco Quiñones, "Mi casa es mi refugio," 8; Moffitt, "Uncovering the Sexuality and Solitude of a Modern Mexican Icon," *Frieze* 202 (18 March 2019), https://www.frieze.com/article/uncovering-sexuality-and-solitude-modern-mexican-icon.

72. Moffitt, "Uncovering the Sexuality and Solitude of a Modern Mexican Icon."

73. Georg Simmel, "The Metropolis and Mental Life," in *Simmel on Culture: Selected Writings*, edited by David Frisby and Mike Featherstone (Sage, 1997), 177, 182–184.

74. Georg Simmel, "The Concept and Tragedy of Culture," in *Simmel on Culture*, 55.

75. Georg Simmel, "Culture and Crisis," in *Simmel on Culture*, 88.

76. Simmel, "Culture and Crisis," 88–89.

77. As Fernando Curiel Gámez says of the living room and its great window looking onto the garden, "[it] function[s] as a frame of reverence, as a kind of alter that sanctifies nature and relates us to the transcendent." In "Luis Barragán's Criticism Towards the Publicity of Modern Life and his Vision Concerning the Spirituality of Art Embodied in his Architectural Work: 1940–1980," ACE, author trans., 16.

78. Gámez, "Luis Barragán's Criticism," 17.

79. Nicolas Gilsoul ascribes the "floating" nature of the stair to the Surrealist practice of seeking the unfamiliar in the familiar. See his "Emotional Architecture Scenographic studies in the Works of Barragan (1940–1980)," HAL archive, Sciences of the Universe [physics] (AgroParisTech, 2009), https:// pastel.hal.science/pastel-00005540v1/file/Gilsoul_2009_ArchitectureEmotionnelle.pdf.

80. UNESCO Nomination File, "Justification For Nomination" (2004), https://whc.unesco.org/uploads/nominations/1136.pdf, 65.

81. UNESCO Nomination File, "Justification For Nomination," 54–55, 76.

82. UNESCO Nomination File, "Justification For Nomination," 29.

83. UNESCO Nomination File, "Justification For Nomination," 77–78.

84. Gilsoul, "Emotional Architecture," 108. This insight was attributed to poet and chronicler of Mexico, Salvador Novo López.

85. UNESCO Nomination File, "Justification For Nomination," 30–31.

86. Alfonso Alfaro, "Voices of Sleeping Ink: Spiritual Itineraries of Luis Barragán," author trans., in *Artes de México: Nueva Epoca/ En El Mundo de Luis Barragán—Numero 23* (Primavera, 1994), 44. Collected across the fullness of his adult life—the sheer size of the collection requiring renovation of the Ortega House (see Gilsoul, "Emotional Architecture," 60). Many of the books are heavily annotated in pen and coloured pencils, with passages torn out in disagreement, or newspaper and magazine articles folded into the pages as part of broader conversations; so do the pages carry the tactile inscription of agreements, objections, and questions (see Alfaro, "Voices of Sleeping Ink," 44, 47).

87. Alfaro, "Voices of Sleeping Ink," 54.

88. Alfonso Alfaro, "In the World of Luis Barragán" (En El Mundo De Luis Barragán), author trans., in *Artes de México*.

89. Alfonso Alfaro "In the World of Luis Barragán."

90. Alfaro, "Voices of Sleeping Ink," 63.

91. Gámez, "The spiritual conception of art," 160–162.

92. Gámez, "The spiritual conception of art," 163.

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HANNAH BRODIE, WITH SIMON TWOSE

Spatial momentums

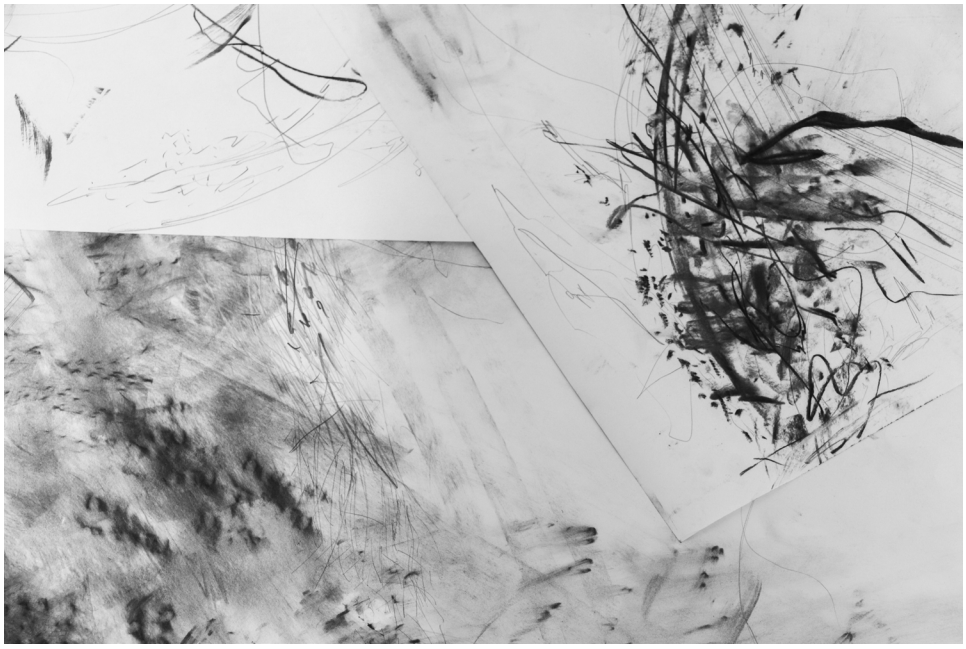

Fig. 1 Hannah Brodie (2024). Performative drawing overlapped [Drawing]

Prologue

A fixed and final architecture often follows the act of drawing, but what if architecture were to remain a drawing, with the vitality of an open sketch? Drawing brings performative gestures to life through records of its making—its traces. *Spatial* moment*ums* experiments with these traces, using their performative possibility to reframe and alter conceptions of architecture, and in doing so, offers new perspectives on urban space. It is a contemporary critique on the relation between drawing and built space and engages drawing's capacity to be an ongoing, open process directed towards architecture, in an effort to discover sketch-like performative possibilities.

Spatial moment*ums* poses the question: How can architecture remain a sketch? This is pursued through three "acts" or drawing experiments, with each progressively increasing in scale and architectural complexity. The acts distil strategies that allow architecture to remain in an open, sketch-like state. Act I offers a spatial installation that explores drawn gestures at a bodily scale. These performances are subsequently "staged" through a series of architectural drawings, and in the final act, Wellington City becomes part of the sketch performance, imbuing both city and architecture with the spontaneity and openness of a sketch.

This research orchestrates an inter-subjective encounter, bringing together the artistic realms of performance, drawing, and writing to expand architecture as a traditional discipline. The artistic research considers (the act of) drawing as a performance that unfolds through an interplay of thought, surface, and the drawing hand. This exploration draws upon diverse forms of embodied and artistic knowledge that arise through moments of slippage and deviation, where different modes of drawing practice enter into dialogue, intersecting, overlapping, and at times, colliding.

It is framed as creative practice research, weaving together experimental practices and critical reflections, with each creative act marking a canvas of understanding, of artistic knowledge and its agency. Through intensifying drawing's sketch-like potentiality, *Spatial* moment*ums* seeks to contribute to understandings of drawing and architecture, as well as to meticulously interact with the potentialities of drawing with the city.

The term "drawing" is synonymous with "sketch," with both considered simultaneously nouns and verbs. This embraces the idea that drawing is not solely a static representation but also a dynamic expression, a fusion of bodily action and resistance, of material, blurring the lines between the performance of drawing and unexpected acts of drawing's matter in response. Therefore, a ten-minute sketch is not just a drawing enacted within a specified timeframe, but a performance involving drawer and drawing, embedding a host of complex spatial, temporal, material, and conceptual conditions within the act of sketching. Performative drawing in this research is thus the capacity to render thought visible, where thoughts become actions in concert with space, material, and time.

The performative methodology aligns with art historian and theorist Sarat Maharaj's notion of "no-how," which challenges static and fixed scientific and art research methodologies.[1] Following these ideas, the work approaches design as an open practice of engaging with ever-evolving indeterminacies that are never fully captured. Through this, drawing as a terminal, finite representation is jolted into becoming an active force in the creative process.

This performative methodology unfolds through three distinct "acts," each of which introduces a set of elements or "actors" that operate within the overarching framework of "drawing" as a performative medium. "Drawing" as a character entangles itself through various performances with paper, space, material, site, and event. These create an overall performance in the spatialisation of the sketch, as both ongoing architectural thinking and an ongoing, open architecture. Each act presents a series of investigations, which theatricalise—through the medium of drawing—architecture's ambiguous presence.

Act I The moment of the drawing: An installation

Act I is a result of performative drawing that is a spatialised installation at the scale of the body. The installation was developed over a series of interconnected experiments entitled *Line, Object, and Choreography*. The installation's design examined the intersection of improvised movements and drawing, culminating in the final installation as a performative spatialised architecture—one that persists as a sketch, synthesising drawing, thought, and action.

Drawing serves as the primary medium within architectural representation,

Fig. 2 Hannah Brodie (2024). Act I, Installation of the objects [Photograph]

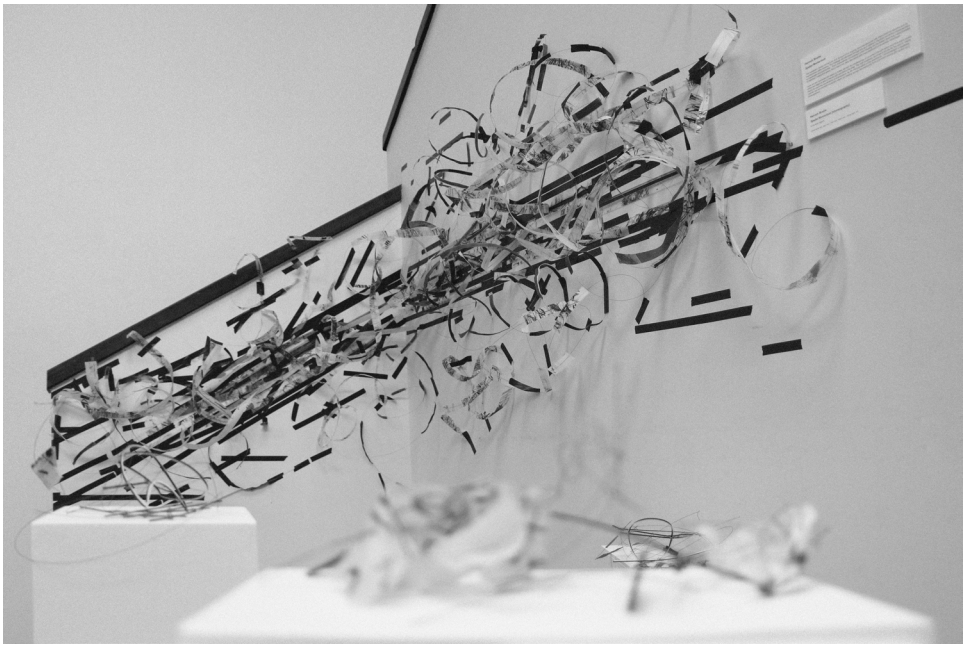

Fig. 3 Hannah Brodie (2024). Act I, Installation [Photograph]

yet its influence is more than solely instrumental. Drawing's techniques, performances, and materialities hold the ability to contribute to expressive architectural outcomes. In this work, drawing is an active tool for thought more than a final constructed representation. Drawing serves as a means of continual speculation, and drawings exist as the actual works themselves. Philosopher Jean-Luc Nancy suggests that drawing exceeds a functional purpose; its multifaceted and pleasurable nature challenges drawing as a static object, instead becoming a record of performative engagement.[2] Act I activated the inherent dynamics of pleasure. The works produced during this phase also resonated with the artist Nikolaus Gansterer's practice, which engages playfully with didactic forms, finding enjoyment in challenging rigid structures and rejecting dogmatic approaches, revealing the subversive pleasures of drawing.[3] In the words of

architect Peter Cook, when drawing "[...] becomes more abstract than illustrative, it becomes more generically spatial."[4] Wherever you stand in the Act I installation, there is an experience of "drawing" generating architectural potentials through multiple, embodied readings (Fig. 2–3). Through the creation of drawings as spatial structures, the installation allowed the viewer to become part of the drawing, inhabiting the drawing space. This caused the drawing to become connected to the spatiality of architecture and to generate thoughts in answer to the question of how architecture can remain a sketch.

Fig. 4 Hannah Brodie (2024). Spatialising the drawing [Photograph]

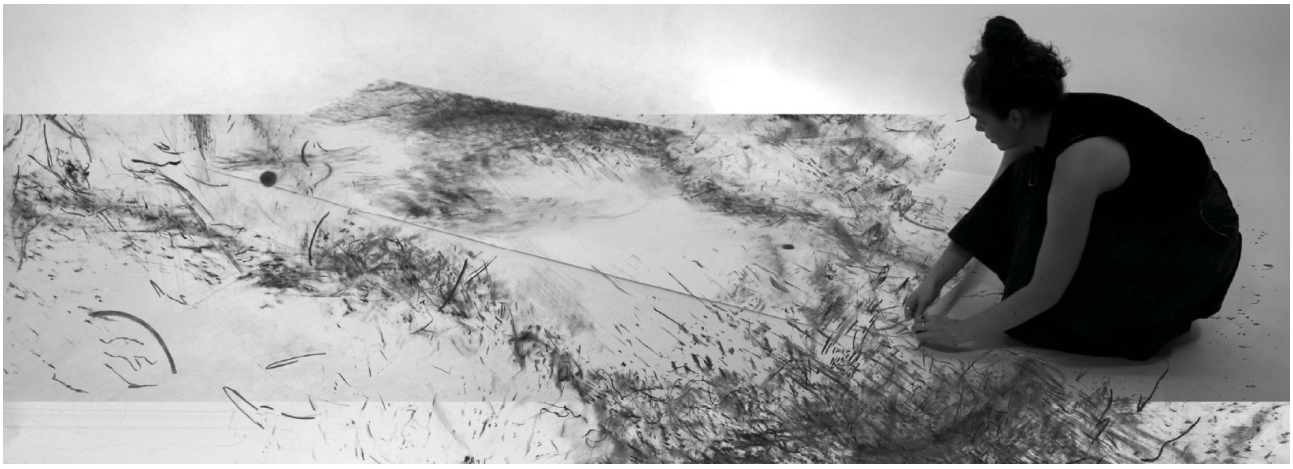

Fig. 5 Hannah Brodie (2024). Performative drawing hung [Photograph]

Act II Spatialising the drawing: Space and site

Act II was the result of investigating "spatial moments" through the exchange of drawing media, performance, and site. Expanding upon the performative dimensions of drawing introduced in Act I, Act II explored the ways in which drawings materialise within the physical world, acquiring a degree of permanence. The aim of Act II was to explore how performative drawing is affected by two opposing spatial fields. The first is the space of drawing, tested by sketching space on a large white sheet of paper (Fig. 4–5). The second is the space of the city, tested by sketching with a site in Eva Street, Wellington (Fig. 6). Act II explored how the performative nature of sketched drawing, across two spatial fields, could hold potential for open and ambiguous architectural outcomes.

Architect Jonathan Hill identifies the term "white paper" as appropriate for architectural drawings as it acts as both programme and site.[5] This is because the paper possesses edges, surface, and depth. In the first part of Act II, the performative drawing on the expansive white paper surface engaged with these qualities, creating a dialogue between drawing as a site and drawing as an act. Smudges and smears within these drawings were reminders that drawing happens on a surface, creating accidents which shift intentions and enact new ideas on a page, drawing out new responses to the project, and by extension, new thoughts on architecture.

In the second exploration of Act II, the conditions of drawing shifted from white paper to an urban territory: a location in Eva Street, Wellington. The site is already marked by a pre-existing field of traces on its surface. By drawing with the street and its field of marks, I was able to reframe the street as a sketch, working with built limitations that inherently brought a structured nature to the

Fig. 6 Hannah Brodie (2024). Act II, Drawing on site [Photograph]

performative drawing. This urban field drawing engaged iterations of density, layering, expanding, and recombining through drawing out material impressions involved in mind, body, and action. These found their way onto paper (Fig. 7–9).

As architectural theorist Sonit Bafna identifies in drawings, specific marks on the paper are linked to "[...] the artist's ability to take advantage of our natural propensity to see figures in certain arrangements of marks."[6] In the final stages of Act II, the work shifted to physical modelling, to distil the marks and figures in the drawing as three-dimensional entities or "characters." Moving from two dimensions to three served as a method to materialise and embody qualities expressed in the drawings, illustrating aspects such as occupation, scale, light, and atmosphere in a three-dimensional context.

Through the research in Act II, it became easy to draw things that were impossible to build, so herein lies the question: What might a sketch architecture be? The materiality and small gestural qualities of these three-dimensional characters tested this by enabling a shift in dynamic from the drawing of impossible architecture to spatialised and possible spatial outcomes. Act II aimed to translate the nature of performative creation and its adopted language into something that can be truly manifested as architectural space.

Fig. 7 Hannah Brodie (2024). Act II, Maquettes exposed [Photograph]

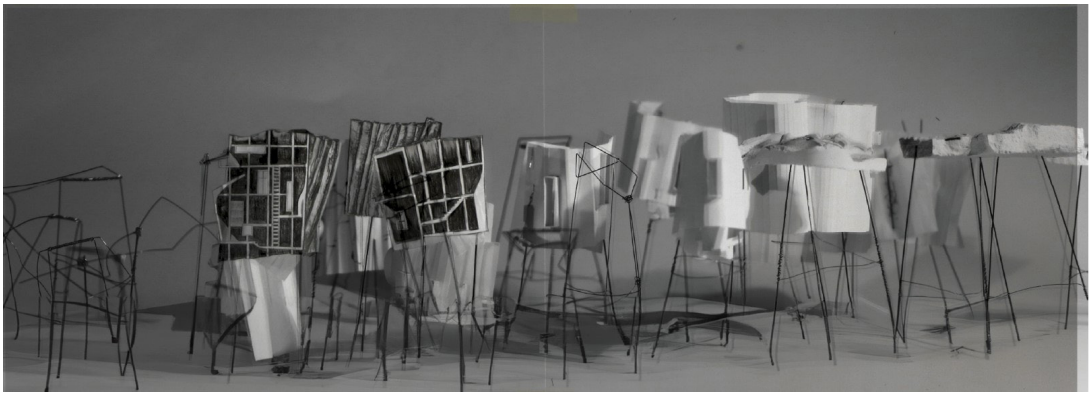

Fig. 8 Hannah Brodie (2024). Act II, Maquettes habitation [Photograph]

Fig. 9 Hannah Brodie (2024). Act II, Drawing maquettes [Photograph]

Act III Staging the drawing: Event and architecture

Act III was a continuation of thinking about how architecture can remain a sketch, as both a drawing performance and spatial proposition. Act III responded to the question posed by architectural theorist Marcia Feuerstein and Gray Read: "What if buildings were considered not as objects but as actors in the city, which perform with and among people in the small improvisations of urban life?"[7] In Act III, drawing emerges as a performance of investigation, extracting design elements and programmatic considerations from the city's unexamined spaces, accentuating their potential to prompt architecture as a drawn performance.

Act III is set within Wellington City. The site extends beyond the limits of Eva Street out into the wider city. By employing architectural objects as props and the city as a stage, the buildings become actors. A sequence of spatial propositions was generated that engaged the myriad actors, reimagining the city's domestic and private typologies as a play of architecture and occupation (Fig. 10).

Fig. 10 Hannah Brodie (2024). Act III, Drawing in the city [Drawing]

Performative drawing as a research method led to ambiguity and complexity through adventitious marks that enabled imaginative modes and narratives to emerge. Instances of clarity and architectural significance were woven together, capturing fleeting moments of form and presence as the work progressed. The architectural characters depicted shapes and formal qualities that are closer to what someone might consider to be a habitable, usable building. Yet they still possess the qualities of the performative drawing that engendered them. The qualities manifest through atmospheres of drawing—qualities of charcoal and graphite smudges, which find their way into the architectural propositions. The lines and marks produced through the performative drawings actively shaped space, cutting, erasing, mapping, extracting forms and wrapping them around buildings, transforming them into entities of their own and changing the city (Fig. 11).

The sketched characters proposed a type of event in the landscape, where the architectural programmes of dwelling, orientation, and rest offer architectural provocations, to coerce imagined ways occupants, space, and material engage with the city. Through performative sketching, the work prompts reflections on how architecture in city spaces can remain a sketch while interrupting the very fabric of the city, with the sketch acting as both architecture and device for thought.

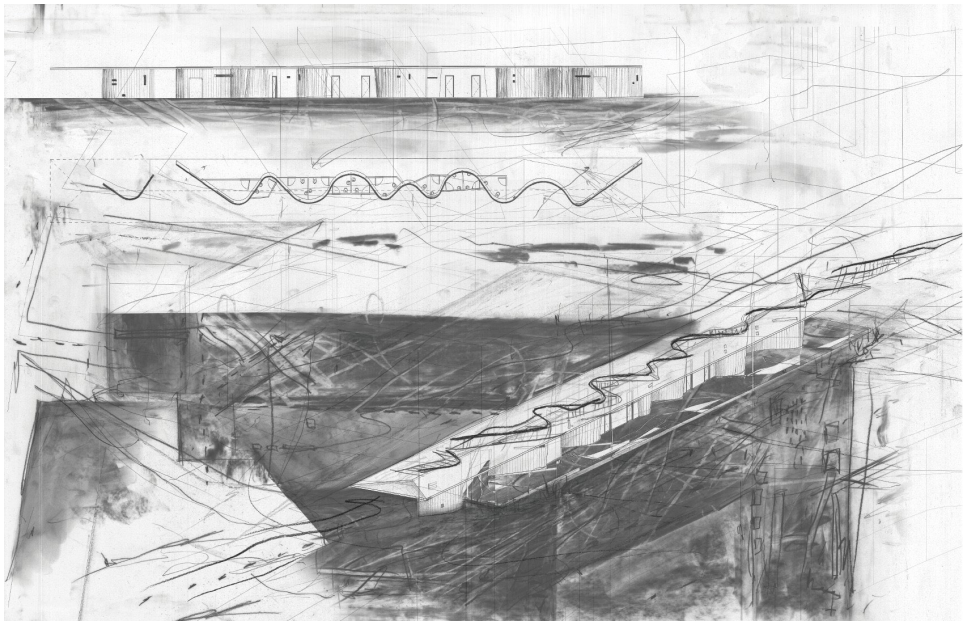

Fig. 11 Hannah Brodie (2024). Drawing Act III, Creature 2 [Drawing]

Epilogue: Drawing conclusions

The drawing/s and architecture resulting from this research remain sketches collecting acts of discovery that are inherently open, sketch-like and in-between states. This way of reimagining architecture, through instilling it with performative possibility, challenges the way architecture is considered and, perhaps, might manifest in a material reality. This potential to challenge architectural norms is a key outcome of *Spatial* moment*ums*, drawn from a realisation that drawing is not only a medium of expression but also a performative and investigative tool.

The answer to how architecture can remain a sketch lies in conditions of drawing that allow things to remain irresolute, incomplete, unfixed—in an ever-present sketch-like state—whether the end result is a drawing on paper, an object in space, or a built reality. The question prompts new ideas of what constitutes an architectural outcome. This work reconsiders the notion of a "final" architecture by asking how a building might embody the open-ended, exploratory qualities inherent in a messy sketch.

The beauty of this type of work is that it never ends. There is no chance of getting stuck—where one mark ends, hundreds more wait to be drawn. Endless drawings and sites equate to endless improvisational partners and therefore endless possibilities. Even the field conditions of the white paper allow a connection between thought and the drawing hand to open architecture as an unending continuation, suggesting ways that architecture may forever remain in a sketched-like state.

The conclusion to this research question remains inherently contingent, as the work persistently pursues an idea that resists definitive resolution—an ongoing search for something that can never be fully grasped. To answer the research question, as an end, is to close off the answer completely, but a sketch is open-ended—you can complete the drawing of architecture as and when you choose.

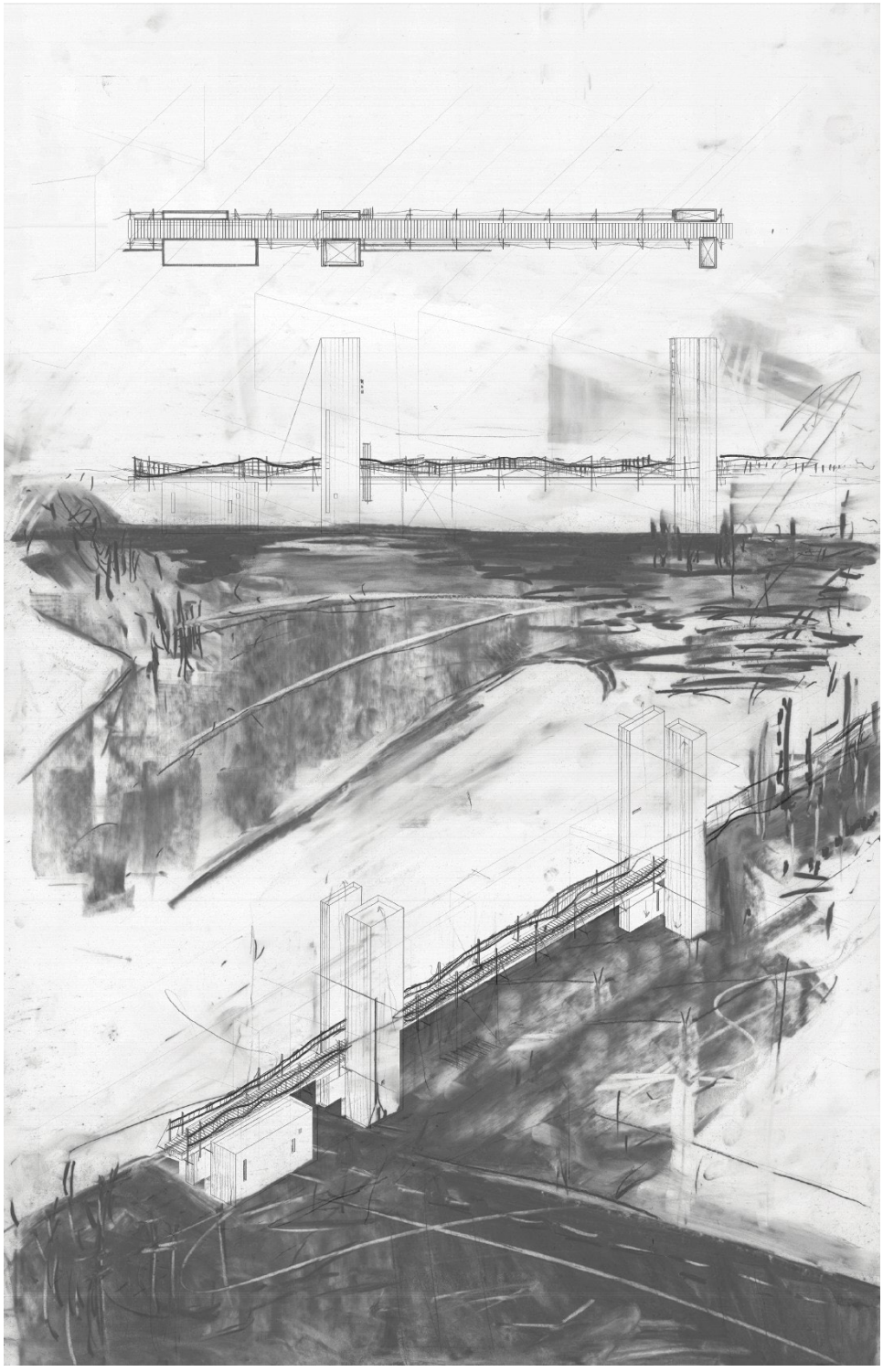

Fig. 12 Hannah Brodie (2024). Drawing Act III, Creature 3 [Drawing]

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BETH WILLIAMS, WITH JAN SMITHERAM

The Keeper of My Memories

Storytelling in architecture can foster a world rich in possibilities.[1] For architect Perry Kulper, storytelling is used as a critical design tool that allows us to challenge "default assumptions" offering a reframing of what is taken for granted.[2] Equally, architect Andrew Bernheimer, in *Fairy Tale Architecture*, suggests that fairy tale narratives offer architecture a way to move beyond retelling the story of people, the past or place, but rather to speculate.[3] For Bernheimer, fairy tales provide the built environment with "stories that traffic in magic, [and] require a suspension of disbelief."[4] The exploration of architecture through the lens of fantasy and narrative offers the potential to construct imaginary worlds through space and time and to construct a "compelling promise of a magical home."[5] *The Keeper of My Memories* presents a flight into the fantastical through the everyday domestic.

The Keeper of My Memories occupies the intersection between architecture and storytelling and questions, what if childhood daydreaming can bridge the real and the imaginary, sparking moments of reverie and nostalgia.[6] Using an autoethnographic approach that draws on my childhood daydreams, this practice-based research stages moments, memorialises the past and the future, to create an architectural fantasy out of fragmentary worlds. Existing in three acts that scale in complexity, this imaginary fabrication shifts from an installation to a house and finally a mise-en-scène.

Act I explores the miniature as a tool to transport viewers to an imagined place. It follows the Model-maker as they construct *The Dream House*. Act II follows the story of seven characters: the Boatbuilder, the Dressmaker, the Lepidopterist, the Gardener, the Stargazer, the Model-maker, and the Writer. Act III builds on the dreams of Act II, where the house becomes a mise-en-scène and we are welcomed to the inner workings of *The Keeper of My Memories*. These are the lives I have wanted to lead, woven into a story, sited in my birthplace, 8–10 Lime Road, Bristol, England. This house is never presented as a static piece of architecture but always evolving with its inhabitants.

Act I: The doll's house

Act I commences with the doll's house. As historian Catriona McAra suggests in "Dollhouse architecture," the doll's house is used as a figure in art to make evident "traditionally marginal spaces" and to bring them "to the centre of critical attention."[7] Here, the doll's house is used as a motif to reclaim a space traditionally associated with women, as both a feminist design principle and as a reference to the imaginings aof my childhood. I started to develop a storyline around a little girl who sits in her bedroom creating a world from her imagination. The research then developed around an extended narrative of imagined characters, where visual media became a way to generate reveries through possible worlds.

> *The Model-maker sits in their workshop, stringing together intricate creations and imagining those who might occupy the world inside.*
>
> *The little boy with his grandfather.*
>
> *The woman watching her son on his first day of school.*
>
> *Each one carefully glued into place.*
>
> *Each one with their own story.*

As the imagined world is constructed, the fairy tale begins. The Model-maker builds *The Dream House* with two different façades (Fig. 1 and 2). One side is restrained in its ornamentation, whilst in contrast, the other is covered in ivy and decoration. It is here our story begins, where

> *The Dream House protects the dreamer, and here we shall dream. Watch the world inside, transfixed by the stories one can conjure.*

Viewers are encouraged to engage with *The Dream House* through levers engraved with "pull me" and controlled viewports, which alter the interior scene.

Fig. 1 Beth Williams (2023). *The Dream House* [Photograph]

The Dream House orientates the viewer towards an endlessly reflected vista created through opposing mirrors, where glimpses of their own reflection are seen in an estranged world full of imagination and wonder. Rich hues in pink, green, orange, and yellow animate *The Dream House* and the stories of the Modelmaker. Colours, shapes, and materials cue questions about the nature of home and architecture's often chromophobic formal propositions.

Welcome to the reverie. The space between our reality and the imagined.

I am not the storyteller.

You are.

Fig. 2 Beth Williams (2023). *The Dream House* [Photograph]

Fig. 3 Beth Williams (2023). Form finding [Painting]

Act II: A spatial fairy tale

Act II bridges real and imagined realms to spark moments of reverie. My questions and stories drive the narrative, a "what-if" to the lives I could have led. I question what if I were a marine biologist, a fairy, an astronaut, a set designer or an author? And what if I were an architect? The house design explores these questions through seven fictional characters. The initial explorations in Act II used painting as a method to create organic forms, which were translated into physical models and developed digitally into the architecture of the house at Lime Road (Fig. 3).

The tales of the Boatbuilder and the Dressmaker, the Lepidopterist, the Gardener, the Stargazer, the Model-maker, and the Writer are told over 172 years. The story gathers the past and projects the future, evolving and responding to the occupants who reside in its form. Colours are used as a character foil for each of the house's inhabitants. It is the objects of the home that are central to the storyline, running water in the bathtub or the activities in the kitchen become "departure points" for "sophisticated imaginings."[8] This is a design that rebels against typical architectural documentation, instead encouraging the imagination through un-fixed imagery and accompanying narrative (Fig. 4–8). The story begins.

The Boatbuilder and the Dressmaker

Our story starts in 1851, when a baby boy in Number 8 Lime Road and a baby girl in Number 10 are born, on the same night, on the same street, moments apart.

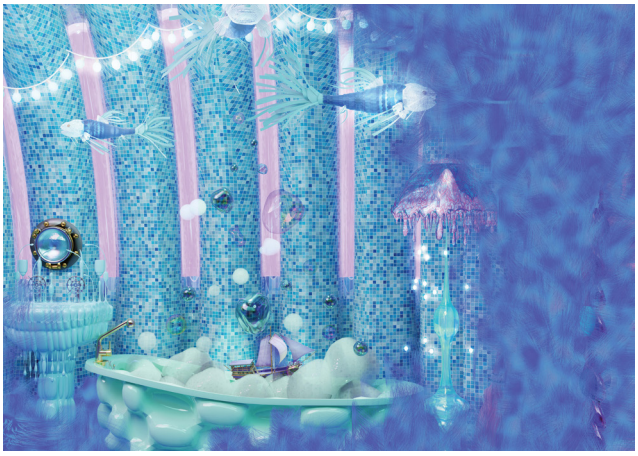

Fig. 4 and 5 Beth Williams (2023). [Digital collage]

The boy is called the Boatbuilder and the girl, the Dressmaker. In 1876, they are engaged to be married and inherit the neighbouring houses at 8 and 10 Lime Road. Later, there is a fire that destroys both homes, and the two buildings vanish into a pile of smoke. The double plot of land becomes the blank canvas for their dreams (Fig. 4 and 5).

The Lepidopterist and the Gardener

The child of the Boatbuilder and the Dressmaker is the Lepidopterist. She becomes the new custodian of 8–10 Lime Road after her parents pass. The house becomes a symphony of colour, with intricate brushstrokes of butterflies, moths, and vibrant flowers. The Lepidopterist meets the Gardener, and they share their home as a haven for those in need. It is through these actions that they meet our next protagonist (Fig. 6).

Fig. 6 Beth Williams (2023) [Digital collage]

Fig. 7 Beth Williams (2023) [Digital collage]

The Stargazer

The Stargazer lives with the Lepidopterist and the Gardener for many years. She infuses Lime Road with celestial motifs, and stars dance on the walls. She becomes a surrogate daughter to the couple, looking after them in their old age, before selling the house to another family in 1971 (Fig. 7).

The Model-maker

A little girl's tale unfolds in Bristol. Her world is captivated by the miniature, where tiny spaces hold boundless potential for magic and wonder. She becomes the Model-maker, envisioning stories and animating worlds. Here, she conjures dreams of dolls' houses and dream houses. (Fig. 8).

Fig. 8 Beth Williams (2023) [Digital collage]

The Writer

In 2023, 8–10 Lime Road comes up for sale, capturing the heart of the Writer. She falls in love with the house. The Writer starts a family at Lime Road where she laughs, cries, and grieves in her dream home. This is the house's story (Fig. 9).

Act II becomes the focal point of the story. It is a project which emerges into existence constituted between (and with) the past and present, real and imagined. Inspired by daydreams, the house is explored as an extension of the fictional inhabitants, becoming its own evolving character. The spectacle that emerges is both ordinary and extraordinary, simultaneously private and public, and is a house that encourages viewers to project their own stories into the space.

Fig. 9 Beth Williams (2023) [Digital collage]

Fig. 10 Beth Williams (2023) [Digital collage]

Act III: Public scale

Act III begins to bridge the real and the imagined, and is revealed as a mise-en-scène, built from fragments of Lime Road. The lives of its inhabitants unfold through a collage of spaces, and places.

> *Look closely at the world presented. What can you see? The cast and crew? The slides and ladders? The department gondolas? The rooms of 8–10 Lime Road?*
>
> *The house and its characters are actors revealed in this mise-en-scène.*
>
> *Welcome to the inner workings of Lime Road.*

The narrative unfolds through the design of a gondola for each of the five departments:

Directorial and Script Department: The writer and director travel in a hanging gondola across the film sets.

Hair and Makeup Department: The Hair and Makeup gondola calls in at the Costume Department to pick up the cast for the next scene.

Lighting Department: Next along the gondola's pathway is the Lighting Department, allowing for multiple sets to be lit from a singular position.

Costume Department: The Costume Department is adorned with hanging garments and fabrics, ready to be fabricated into flooring panels or clothing for the cast.

Effects Department: Next on the gondola journey is the Effects Department, which adjusts the imagery.

Act III shows Lime Road as a fragmented collection of visual tricks, painted backdrops, and miniature models.[9] This visual playground connected through moving gondolas links the people, the house, and my daydreams (Fig. 10).

No longer a backdrop, the architecture now plays an integral role in the story, forever developing the tale of Lime Road.

This is a story for the dreamers.

Concluding comments

The Keeper of My Memories dares to consider the possibility that the imaginary worlds we have conjured and created over our lives are no longer lost childhood daydreams. The project explores the promise of a magical house and questions whether this daydreaming could be harnessed through architectural narrative, bridging the imaginary and real, providing hope for the dreamers.

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LEITH MACFARLANE, WITH ANDREW DOUGLAS

To the Lighthouse

Fig. 1 Leith Macfarlane (2023). The lighthouse in a quilted form. [Photograph: Daniel Ho]

To the Lighthouse is a title borrowing from Virginia Woolf's 1927 novel of the same name. The latter tells the story of a summer retreat for the Ramsay family to Scotland's Isle of Skye—a remote place visited over a decade in the early twentieth century that witnesses a mix of joys and tragedies for the family. The lighthouse in Woolf's novel is a kind of ever-present draw that the family keeps putting off visiting, but which represents an object of shared desire and potential fulfilment.

Lighthouses, of course, are utilitarian yet dreamy architectures, standing on coastal edges radiating caution to nighttime mariners, but also suggesting a certain solace, signalling that land is here awaiting return and the completion of journeys. These complex associations fittingly organise the difficult topic of investigation undertaken in this research—family violence.

Aotearoa New Zealand has one of the highest rates of family violence in the developed world. It is an intergenerational issue that cuts across socio-economic differences, affecting people of all genders, ethnicities, ages, and sexualities.[1] Both a taboo topic and a complex and difficult issue to address, no part of life in Aotearoa is untouched by the pain caused by family violence, with the architectural profession in no way being excluded from its implications and effects.

Instead of reimagining current architectures associated with family violence, like police stations, courts, refuge and transition housing, this research looks beyond what already exists and considers the possibility of new typologies and ideas for facilitating foundational changes to patterns of family violence. Looking beyond individual homes, the research speculatively considered alternative ways through which architecture might foster social sustainability and care. The proposition was that improving this may substantively shift the context in which violence occurs.

Fig 2. Leith Macfarlane (2023). Parting the quilts at the end-of-year critique, revealing the speculative street and suburban lighthouses, with a table of artefacts and counter-artefacts in the foreground. [Photograph: Daniel Ho]

This creative research complemented an earlier body of legal research that investigated the role of family violence courts in Aotearoa. Now, in a different disciplinary context, the question became how to address the runaway violence unfolding in our homes directly. Revisiting the topic twenty years later in an academic, yet creative, field offered both a new perspective and a new opportunity to further reconsider the place family violence holds within our social and cultural fabric.

It is important to acknowledge that dealing with a complex issue like family violence is fraught with difficulty. Being part of an academic institution gave me the ability to examine such violence at a distance. That said, the project had a profound impact on me, and in many ways, my emotional experiences and responses to the design research directed the work. In encountering this work, I hoped it would be understood as both a protest signaling the urgency of an affirmative architectural response and a wish to speculate on a world beyond family violence.

The making of dark machines

The pervasiveness of family violence in Aotearoa is such that it exists all around but often in silence, with the New Zealand media referring to it as our "dirty little secret,"[2] a "hidden pandemic,"[3] and "the taboo topic."[4] The initial positioning of the design research was therefore to make visible and reveal this open secret. My way of grasping the severity and life-altering consequences of intimate violence involved the production of a series of abstract artefacts or machines that sought, in some way, to express what is often inexpressible—the painfulness of persistent violence at home. This making, in turn, offered some agency in the face of what appeared at the time to be an insurmountable challenge facing the research—finding an architectural vocabulary capable of credibly working with others' pain.

Fig. 3 Leith Macfarlane (2023). Photographs of the artefacts. Clockwise from top left: *The Void*, *The Watchtower*, *In the Bellows*, and *Pirouette Silhouette*, along with an example of the narratives underpinning each artefact. [Photographs: Christopher Young]

Fig. 4 Leith Macfarlane (2023). Photographs of the counter-artefacts. Clockwise from top: *Scrap Yard*, *Under Renovation*, *In Tension*, and *The House that Burnt Up*, along with an example of the narratives underpinning each counter-artefact. [Photographs: Christopher Young]

This approach is derived from aspects of Elaine Scarry's landmark text, *The Body in Pain: The Making and Unmaking of the World* (1985). For Scarry, the inexpressible, world-destroying dynamic inherent in pain can be expressed by another through the creation of material artefacts.[5] Scarry suggests that the act of creating artefacts in response to another's pain is an act of empathy, a powerful expression of compassion, and an attempt to feel another's pain and wish it away.[6] The artefacts can therefore be described as empathetic bridges that aim to reach towards hurt, on the basis that sharing calls forth awareness and, ideally, ultimately, healing.

The conceptual artefacts sought to approximate survivors' accounts of experiencing and getting free of violence.[7] Four dark machines narrate violence: *The Void*, *The Watchtower*, *In the Bellows*, and *The Pirouette Silhouette* (Fig. 3). Arrayed

against these, four counter-artefacts revolve around ideas of hope and resilience: *Scrap Yard*, *Under Renovation*, *In Tension*, and *The House that Burnt Up* (Fig. 4).

Drawing from architect, teacher, and architectural theorist John Hejduk and his work *Victims* (1985) and *House of the Suicide and House of the Mother of the Suicide* (1980–82), the artefacts similarly aim to foreground fraught, complex relationships through narrative means. The commonality shared by these artefacts is that they speak to each other of difficulty but also of the potential joy of an emotional and material reshaping of that difficulty. At the immediate level of their specific assembly and crafting, the artefacts all involved some form of collaboration—a way, perhaps, to subconsciously share the burden of the research with others.

Rather than isolated machines, the artefacts are depicted relationally and are gathered together on a black tabletop called *Suburban St*, where the outlines of house plans are shown in white chalk (Fig. 5). The result is a streetscape housing the artefacts and counter-artefacts that reveals the complex reality that surrounds our everyday lives. Reference here is to Lars von Trier's *Dogville* (2003), a film similarly telling the story of family and community violence, that was shot within a table-like, empty sound stage. Adopting the confronting nature of *Dogville*, the curation and scale of the artefacts and counter-artefacts intentionally confront viewers with the intention of drawing them towards a sense of collective responsibility, but also empathy.

Fig. 5 Leith Macfarlane (2023). The streetscape shows the artefacts and counter-artefacts housed as a collective. The artefacts are shown contained within the house outlines with counter-artefacts breaking free from the house boundaries. [Photograph: Leith Macfarlane]

Luminous ground

The introduction of counter-artefacts pushed the design research towards a more optimistic and hopeful direction, shifting the focus, which had until then been heavy and dark. From this, the work redirected towards countering the initial exploration of the pain of family violence with radical softness, vulnerability, and care. Reference here was drawn from a collection of essays titled *Radical Softness*

Fig. 6 Leith Macfarlane (2023). The final pair of quilts. The first quilt (left) and its yellow square represent a welcoming light in a window and suggest a deconstructed lighthouse in a stormy seascape. The second quilt built on the first and suggests a brighter landscape. [Digitally edited photograph: Leith Macfarlane]

as a Boundless Form of Resistance (2015),[8] which, amongst other things, emphasised the power of care and vulnerability as acts of protest, subversion, and resistance.

Initially, this focused on the craft and political agency of quilt-making, that everyday, mostly female, art that, in certain circumstances, has given voice to a radical societal accounting—the 1987 AIDS Memorial Quilt project being a well-known example of this. Quilts embody a labour of care, enacting loving cover both literally and figuratively. Homes bestow these qualities too, or can, and emphasising how care could be amplified suggested how violence might be eclipsed and curtailed.

Pursuing this insight, two final artefacts were produced—a pair of quilts, each carefully stitched together from the remnants of old family clothes. Unlike traditional quilts, they were intentionally left without a backing, leaving the stitching exposed. This exposure aimed to reproduce how a home subject to family violence presents to the world—the front of the quilts being clean and tidy, while the underside remains messy and thread ridden. In making the first quilt, I included an off-centred square of yellow, and on reflection, it suggested a deconstructed lighthouse within a dark blue seascape (Fig. 6). The second quilt, built upon the first, suggested a brighter landscape—one filled with more lighthouses perhaps.

Across the various stages of artefact-making, there was a building tension seeking to move beyond the representation of family violence towards more concrete architectural interventions able to suggest social restoration. The last of the artefacts—the quilts—bridged this gap, laying the foundation for an architectural response drawing more fully on the idea and actuality of lighthouses. Their dual nature, signalling caution and relief, prompted the question of what a corresponding architecture might become.

In conceiving of such lighthouses, I wondered how they might be situated. In finding a home and ground for them, I looked to streets and ways in which houses

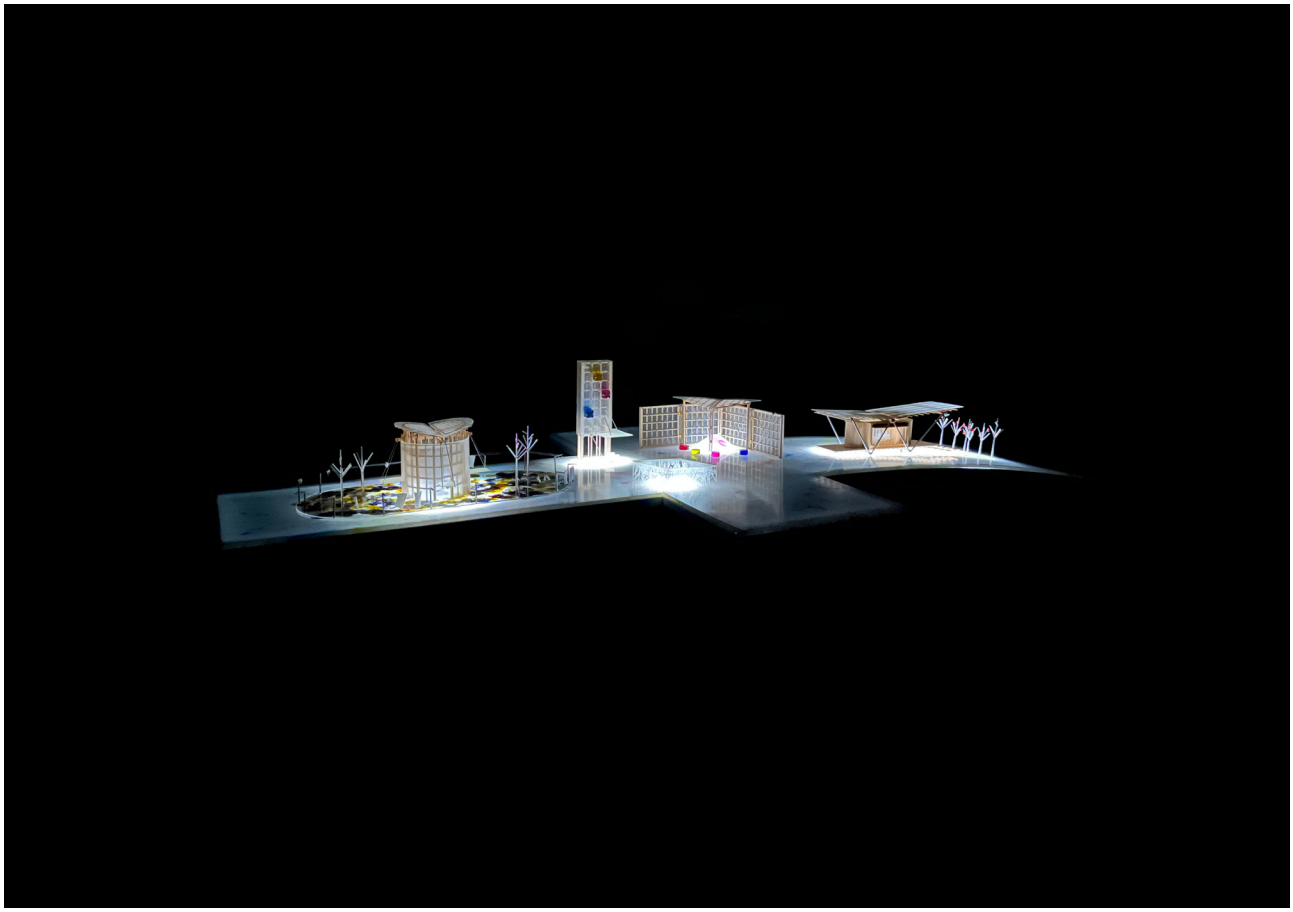


Fig. 7 Leith Macfarlane (2023). Final speculative street with the four illuminated speculative lighthouses. The speculative street is made of recycled plastic milk bottles on a welded steel frame. [Digitally edited photograph: Leith Macfarlane]

turned outward might become responsive to collective care (rather than closing in around a "nuclear family"). Streets aren't just places of vehicular transit; they have long been sites of protest and societal reckoning. With the future of cars uncertain, what if all that in-between tarmac became shared spaces held in trust by neighbourhoods? And what if houses surrendered their autonomy and decanted part of their routines into shared spaces that were social, cooperative, and even joyful?

Home becoming

With this step towards speculative architectural interventions, the work shifted from representation to restoration. Charting a journey from worlds of loss to world-making, knowing that the latter won't necessarily "fix" the former, but that it might make loss and hurt unsustainable. Restoration took the form of speculative lighthouses, intended to dot our suburban streets and restore a sense of collective care in our communities (Fig. 7). Like traditional quilts and lighthouses, the intention was for these architectural interventions to embody both a soft protest and a sense of supporting comfort.

Drawing reference from both the Women's Police Stations of Argentina[9] and Maggie's Cancer Caring Centres,[10] these lighthouses were to be community-based, prevention-oriented, bright and welcoming, small and iconic, functionally enabling, yet symbolically uplifting. Instances of everyday care and beauty, both argued to be counters to pain, were adopted to guide the use and form of the speculative architectures. Supporting this notion that everyday care carries much

Fig. 8 Leith Macfarlane (2023). Illuminated lighthouses on the speculative street. In the centre, *The Playroom* (and inverted hill sitting across the street intersection); to the right, *The Caretaker's Cottage*. [Photograph: Daniel Ho]

potency was found in Robert Davis's "Practice of the Everyday in the Literature of Nursing" (2005), which explores how nurses, responding to the world-reducing aspect of pain, practice everyday acts of care.[11] And I called on the issue of beauty as a just quality to be shared widely through Scarry's *On Beauty and Being Just* (1999).[12]

What resulted was the design and making of four speculative lighthouses that revolved around four everyday acts of care: washing, watching, playing, and resting. All were formed with Scarry's five tenets of beauty in mind: symmetry, colour, clarity, vivacity, and unity.[13] These lighthouses either blocked, bridged, sat beside, or between the street (Fig. 8). The models for these structures, each meticulously handcrafted like the quilts, serve as embodiments of care. A "laundry" and garden for drying washing (Fig. 9); a "bus stop" with street table and chairs beneath a tower for climbing and collecting games and books, all the better for waiting than getting someplace else (Fig. 9); an outward-opening "play room" for kids or adults, one that messes up and slows down the intersection (Fig. 10); and lastly, a "caretaker's cottage" of sorts, along with a citrus grove, both for retreat and sustenance of neighbours (Fig. 10). Like the earlier artefacts, these speculative lighthouses were embodied in detailed and redolent narratives.

The proposed speculative architectures, while conceptual, are entirely feasible and designed to be built by communities from common building materials. The ability for communities to place their lighthouses on the street sought to draw out family violence from the confined walls of the home onto the street and into a place of publicness and unavoidable visibility (Fig. 11), engendering a sense of collective accountability and responsibility.

Nevertheless, the Edenic crafting of care shown here won't look the same in every city neighbourhood. Streets will "collectivise" according to their own acts of care. The "street" shown in this project is a fiction, a compilation of remembered streets I have lived in across the years. And the lighthouses installed on it bear acts of everyday care important to me. I don't imagine the specificity it

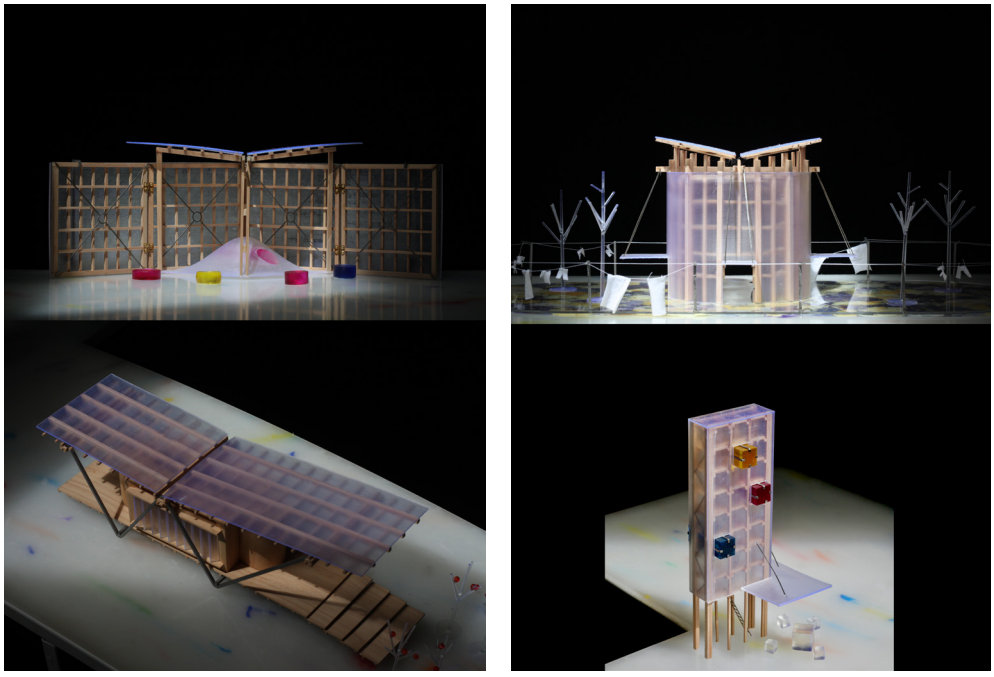


Fig. 9 Leith Macfarlane (2023). *The Laundry* and *The Bus Stop*, made from a combination of hand-cut cypress, 3D-printed resin, water jet-cut steel and cast coloured resin. [Photographs: Leith Macfarlane]

Fig. 10 Leith Macfarlane (2023). *The Playroom* and *The Caretaker's Cottage*, made from a combination of hand-cut cypress, 3D-printed resin, water jet-cut steel and cast coloured resin. [Photographs: Leith Macfarlane]

describes will be reproduced everywhere. It is a lighthouse like that of Virginia Woolf, a beacon that warns of the troubled ground we hold, but also the joy of a home becoming invested with care.

My aim has been to engender critical discourse and give visibility to the issue of family violence. It has also been to imagine troubling circumstances differently. In this, I argue that architecture has a role to play in navigating these difficult issues and spaces within society.

Fig. 11 Leith Macfarlane (2023). Example of *The Laundry* as a beacon on an imagined suburban street. [Digital collage: Leith Macfarlane]

NOTES

1. United Nations Women, *Progress of the World's Women: In Pursuit of Justice* (United Nations Women, 2011), 134; "United Nations Report on Status of Women Released," New Zealand Family Violence Clearinghouse, 28 July 2011; "NZ worse for domestic violence—UN report," *Stuff*, 24 July 2011, https://www.stuff.co.nz/national/5332717/NZ-worst-for-domestic-violence-UN-report; The Joint Venture of the Social Wellbeing Board, *Prevention of Family and Sexual Violence: Briefing to the Incoming Minister, 3 November 2020* (Joint Venture, 2020), 8–9.

2. Leighton Keith, "Increasing family violence cases are New Zealand's 'dirty little secret,' police say," *Stuff*, 11 August 2016, https://www.stuff.co.nz/national/83058580/increasing-family-violence-cases-are-new-zealands-dirty-little-secret-police-say.

3. Radio New Zealand, "Family violence in NZ a 'hidden pandemic'—agencies," 26 November 2021, https://www.rnz.co.nz/international/pacific-news/456549/family-violence-in-nz-a-hidden-pandemic-agencies.

4. Helen Twose, "Facing violence, the taboo topic," *New Zealand Herald*, 26 August 2016.

5. Elaine Scarry, *The Body in Pain: The Making and Unmaking of the World* (Oxford University Press, 1985), 6.

6. Scarry, *The Body in Pain*, 289–290.

7. I found valuable the personal accounts offered in the sixteen-part New Zealand documentary series *Breaking Silence* (Naashon Zalk, dir., 2020 and 2021; *Stuff*, accessed 25 March 2023, https://interactives.stuff.co.nz/2020/06/breaking-silence/?cid=youtube); the book *Double-Edged Sword* by New Zealand family violence survivor and advocate Simonne Butler (Simonne Butler and Andra Jenkin, *Double-Edged Sword: The Simonne Butler Story* (Mary Egan Publishing, 2016)); and the research and interviews of survivors undertaken by Australian investigative journalist Jess Hill in *See What You Made Me Do: Power, Control and Abuse* (Blank Inc, 2019), 111–112.

8. Be Oakley, "Radical Softness as a Boundless Form of Resistance," in *Radical Softness as a Boundless Form of Resistance* (GenderFail, 2020), 7.

9. Kerry Carrington, Maximo Sozzo, Vanessa Ryan, and Jess Rodgers, "How Women's Police Stations Empower Women, Widen Access to Justice and Prevent Gender Violence," *International Journal for Crime, Justice and Social Democracy* 9, no. 1 (2020): 48.

10. Charles Jenks, *The Architecture of Hope. Maggie's Cancer Caring Centres* (Frances Lincoln Limited, 2015), 7.

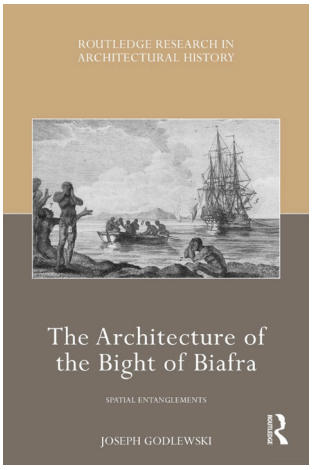
11. Robert Davis, "Practice of the Everyday in the Literature of Nursing," *The Journal of Medical Humanities* 26, no. 1 (2005), 8–9.

12. Elizabeth Smith, "'The Body in Pain': An Interview with Elaine Scarry," *Concentric: Literary and Cultural Studies* 32, no. 2 (2006): 234.

13. Cambridge University, *Elaine Scarry: Beauty and Social Justice*. Posted 22 June 2010, by Cambridge University, YouTube, 55:49, https://www.youtube.com/watch?v=GhlOwhlxSEw.

book review / MARK L. JACKSON

The Architecture of the Bight of Biafra: Spatial Entanglements
By Joseph Godlewski
Routledge, 2024, 310 pp.



Ékpó èkóm mi ényin.

What is it to review? To see or to see again? To see as if for the first time what, indeed, was always there to be seen (or not seen). This review is of quite a remarkable book by Joseph Godlewski. I write it under the sign of that implicit erasure that every reviewing necessarily entails, necessarily enacts, or performs. Erasures, all manner of them, then, sign this work.

Ékpó èkóm mi ényin.

At the commencement of his book, almost, just a few lines into the "Acknowledgements," Joseph Godlewski has *cause* to quote an Èfik phrase, we might even say 'proverb.' It 'roughly translates' to "ghost blindfolds my eye."[1] Cause? In an "Acknowledgements" that is one of several exemplary accomplishments of this book, running to almost four pages, Godlewski signs his work over to a small army of colleagues, advisers, publishing agents, and friends. This signing over implicates "this incredible cast of characters" as those who in multiple ways lifted more than one blindfold, more than one haunting. Blindfolds can be personal, and they can be institutional. For in his next sentence Godlewski mentions the emergence, while his project was underway, of the Black Lives Matter movement in the United States, then globally, the necessity to recognise what is there in front of us, "the multifaceted contributions of Black culture." The book, then, is written in order to take on a view of the manner whereby architectural histories and theories, most often grounded in Western knowledge frameworks, require their blindfolds to be removed. The task of the book is to elucidate an architectural history that at every moment challenges how 'architecture' is to be understood, and how 'history' might be written.

The book's cover presents an enigma. Let's aim to read it, from the top. The cover's first announcement references the publisher, Routledge, that this book fits into a series on research into architectural history. We are able to see listed other works in that series.[2] The series list suggests that Routledge is a Western publisher (London and New York) with a hefty global reach. The series emphasis is on research into how histories are written. Below this is an image. In fact, it is the lower half of an image reappearing on page 81 of the book. We find there that this image is dated 1725, an engraving by Serge Daget. Its title, not printed on the

cover, is *Slave Market*. The upper half, missing on the cover, depicts another view of this slave market on the shoreline of Old Calabar. We recognise in the foreground figures on shore, either captives waiting their turn to be rowed to a slave ship, or their captors. We notice that those rowing the captives are themselves Black. Then, below the image we have the book title, referring to architecture and the Bight of Biafra. Then a subtitle: "Spatial Entanglements." Perhaps the image aims to solely alert us to a locale and an era. But surely it cannot be alerting us to 'architecture,' unless the book's focus is on 'naval' architecture, the architecture of floating vessels. The enigma of the cover, and of the book as a whole, is that for Godlewski this image is a vital elucidating on just what it means to loosen those Western blindfolds when it comes to recognising the architecture that is in front of us. The cover does more than simply announce a subheading of "spatial entanglements." The cover performs such entanglement.

Biafra. My own haunting with respect to this word, this name, is the global humanitarian aid that was distressingly visible at the end of the 1960s. I was transitioning from high school to university, beginning an architecture degree at the University of Sydney. There was a war in Biafra, a civil war from 1967 to 1970, between a secessionist State and the military government of Nigeria. An effective blockade of Biafra resulted in famine and attempts at international relief. Biafra, the name, has a very long 'history,' preceding that of Nigeria. It appears on fifteenth-century maps of the West African coast, as do the coastal waters of the Bight of Biafra. Biafra, after the failure of the breakaway movement, underwent erasure. There has not been a Bight of Biafra since 1975. It is the Bight of Bonny. The Bight of Biafra is an historical marker for the West African slave trade. The book's cover image sharpens this reading. During the seventeenth and eighteenth centuries two locales in the Bight were key trading ports for slaves. The predominant one was Calabar, eventually overtaken in the mid-eighteenth century by Bonny. While the book's title suggests a Biafran region as the location of an architectural study, the genuine, in fact sole, focus of the book is the port city of Calabar, also known as Kalabar and Old Calabar. The traditional inhabitants of this city are the Èfik people, with their own language. We might now assume, then, this is a book that researches the architectural history of Èfik settlement during the volatile centuries of European and American slave trading. But we would be wrong. This is the most surprising thing of all.

My aim in this review is not to tell the story of the book, recount in summary fashion just what Godlewski says and does. In common parlance, that's now called a 'plot spoiler.' Why deprive you of the task, the excitement of reading? But what, then, will a review do? What will I do? In the context of the book's decolonising emphases, its persistent alerting to implicit and explicit racisms, obviously in accounts by Western traders, missionaries, and colonial administrators, but also in accounts by nationalist zealots in post-independent Nigeria, searching for or inventing a unified national tradition, I need to ask a simple but obvious question: How do we read other than by ways of translations that cannot remove the blindfolds or hauntings of persistent blindness? To say we genuinely see is perhaps the gravest loss of vision. I digress momentarily to amplify this. The French philosopher Jacques Derrida, in a remarkable reading of Marx and Marxism, opens his analyses with ghosts, masks, and questions of becoming visible.[3] There is something uncanny, resonant, with things Godlewski explores in Èfik culture. But that's my haunting. Derrida plays on words, on a homophonic

sounding of words. He coins a word, "hauntology," to play out and play on what he terms the "visor effect" of ghosting. The sounding board equally plays out the French 'ontology.' Why am I telling you this? Ontology is something never once mentioned by Godlewski. So, why am I mentioning it? My reckoning is that 'ontology' haunts this work, its ghosting, its blindfolds. In other words, I want to explore the ontological dimensions to a book that occasionally aims to clarify its epistemological framing. To do this, my focus is on the book's Introduction and its Conclusion, what might be called its delineation of methods, and its reiteration of those methods in light of the journey taken. Of course, we know good scholars write their introductions last of all, when even the concluding tropes are settled upon. In passing, I want to mention the gratification I received in reading this Introduction. It is an exemplary model we can all learn from. So, there will be no criticism here, no snarling at something left unsaid.

I asked a few sentences back what reading is. I want to say something more on this, concerning precisely the 'unsaid.' Perhaps what I am pointing to is not 'reading' but 'writing,' a writing that is equally a reading of something. The efficacy of such a writing/reading is not in quietly replying to questions posed, providing answers, as if the certainty of knowing is primarily the stakes of thinking. Efficacy seems, for me, to lie elsewhere, precisely in the questions posed that cannot but lead to further questioning, arriving at basic questions, *arkhē* questioning, arriving at a sense of what is question-worthy. In such a task of writing/reading, we then are alerted not so much to what is said, but to what is left unsaid in what is said, to the tangle of questioning that never aims at closure. This is how I come to understand the *arkhē* of the architecture referenced in the book's title. We listen. This review, then, speaks to things unsaid in what is said, not for a moment to suggest the incompletion of a project, but to alert me, in my own reading, to how this book becomes a call to thinking. The Introduction draws out three structuring frameworks that on the one hand are explained in sequential fashion though, on the other hand, are entirely entangled in the work of historicising. The first comprises what the author calls "Organizing Themes." Organising what? Navigating Calabar's epistemological terrain. There are five of them. Each of them poses a confrontation or challenge to what could be called orthodox (both Western and Nigerian) modes. In this sense, 'epistemology' is a contested 'terrain.'

Briefly they are, firstly, narrative and discourse. Nothing unusual there. What historiography would not be an encountering of narrative and discourses? For Godlewski, the thematic task here is a mode of reading that acknowledges but contests a double blindness in extrinsic Western accounts and intrinsic romanticised nationalism. What 'position' is left? Godlewski suggests a kind of mobile tacking, which I read from my own haunt as a kind of destructing of position. If there is 'position' at all, it must be written in the plural. The second theme acknowledges the challenge of writing on the architecture of Old Calabar, what the word or thing 'architecture' means when for much of Calabar's 'history' structures were highly impermanent. We need a 'new' way of thinking architecture and urbanism that recognises ephemeral performativity as a basis for understanding an architecture eschewing monumentality. Allied to this is a third theme that asks us to think differently about space as dominant practices of containment, to encounter space as processual and diasporic practice: mobile and networked spacings as an essential understanding of the Biafran region. A

fourth theme alerts us to a long history of Western architectural theorising that has avoided race in a depoliticising or neutralising of built environments as either aesthetic wonders or technological feats. Perhaps even both, at once. As Godlewski says, he tackles this 'head on.' Finally, with a proviso, Godlewski nominates his fifth theme: filling the gap. Old Calabar already had quite a bit of scholarship before Godlewski arrived there in 2010 on his first exploration of the region. As a significant slave trading port and early settlement in what was to become Nigeria, the region is well researched. Though accounts of the 'urban landscape' and architecture have always been short on detail, or the kind of detailing that Godlewski recognised as missing. The book redresses this. I note in passing that we are introduced in the discussion of these themes to the extensive bibliography that Godlewski has amassed. This aspect of the book is truly impressive. The bibliography as an archive of historical and contemporary writings on Calabar, Nigeria, architecture, and urbanism more generally, from politicised perspectives of race and African studies, is a tremendous asset to the book and evidences the depth of scholarship the book harbours.

The second structuring ensemble goes under the heading 'entanglements': "To entangle, or *kòmó* in Èfik, means to foul or involve someone in complicated circumstances. It describes the competing and overlapping interests that constitute territory and their intertwined histories."[4] Godlewski suggests four modalities of entanglement. The first is entangled modernities. Let's face it, modernity in its European guise carries the hallmark of enlightenment, universal declaration of the rights of man, a universalism granulated into every political motive of Eurocentric governmentality. Godlewski refuses the corollary to this, that colonialism comprises European violence on passive and servile peoples. Rather, Godlewski looks to evidence of contested modernities, of practices of modification, hybridisation, adaptation, and invention. This is in order to "enfranchise other spatial rationalities."[5] The second entanglement is that of temporalities. European time reckoning, the datable, habitual patterns of consuming time or inventing it all arrive with European traders. Old Calabar becomes a locale of entanglement of European and local modalities of existing in duration. Colonial narratives often describe the colonised as 'timeless' peoples living a static culture, ruptured by the time of modernity as the time of historical peoples. If the first two entanglements refuse what Godlewski calls on occasions a "penetrationist" model of colonising, with respect to spatiality and temporality, the third mode refers to entangled objects, that the importation of European things did not result in either wholesale adoption of the foreign, nor in dumb refusal of what is unknowable, but in practices of incorporation or use that modify how these things may be understood. This witnesses an agency of resistance and reinvention. The fourth sense of entanglement is perhaps the most surprising, a little vexing. Though, that would precisely be its point. Godlewski calls it "quantum entanglement."[6] Its appeal is initially to quantum physics, to the strange attractors at a distance, of quantum particles, to a reference to Einstein who called this aspect of quantum physics "spooky." This is by way of introducing something essential to our understanding of Èfik peoples, especially from the late eighteenth century to the present, with the practice of Ékpè. This is at once a secret society of wealthy men, a system of law and judicial implementation of law, a religious practice, and a public performance of costumed masquerade as an instrument for making visible the force of law that is Ékpè. The word means leopard. That force of law, binding a people religiously, economically, and juridically, is a forest

spirit, made manifest in the masquerade. This is the strange entanglement introduced by a comparing of Newtonian physics to quantum physics. We might momentarily take a breather and reflect on how the five themes and the four entanglements possibly mesh to provide something like the complexity required for rethinking architecture and history in a West African locale. This is something you do . . .

. . . Okay. Back to it. Now we move on to the third ensemble of structuring moves. If the first two become an interweaving meshing throughout the chapters that follow, this third ensemble names the actual chapters. It defines the book as a cohering work. For this reason, I want to spend a little more time with these. There are five of them, called "Paradigmatic Spaces," in Èfik, *Ùfàn*. In fact, I can name them quickly, for it is not so much what Godlewski nominates as a Spatial Paradigm that I want to discuss, but rather how Godlewski understands this notion, what it is, how it works. It is here that I begin to hone my own questioning, looking for that rich vein of what is unsaid in what is said, if my mixed metaphor makes any sense at all. The five chapters are titled, in sequence: Compound; Masquerade; Offshore; Enclave; Zone. There is a sixth, concluding chapter, Spaces of Entanglement, that summarises and in places reiterates things said in the Introduction. The five chapter-headings/Paradigmatic Spaces do not look that challenging to decipher. They all seem familiar enough. In fact, compound, enclave, and zone have enough allusive association that they could each *almost* be referring to the same entity. Masquerade is something we briefly alluded to in Èfik cultural practices of Ékpè. And 'offshore' might not be surprising as Calabar is and was an important trading port, a locale of exchanges of all kinds coming from offshore. But, again, we would be wrong. Everything is much more complex, or subtle, than this levelled-off reading. Perhaps these headings lent themselves to Godlewski precisely because they are familiar tropes. To unpack their titular positionings we would need to entangle ourselves for a time in the details of each chapter. Crucially, they need to be read epochally, so to speak, "Compound" nominating the earliest timeframe, displaced yet not erased by the next, "Masquerade," and so on, from the seventeenth century up to the arrival of special economic zones in Nigeria in the late twentieth century. Godlewski does, in the Introduction, spend a little time deliberating on just what these headings name. And reiterates this in the Conclusion. His initial deliberation asks if these headings form a series of types. Is this a typology? Typology seems to have been good enough for other scholars. Though, 'type' constrains, narrows focus, even to the point of resuscitating racial tropes of static, timeless, originary forms. Without any intended irony, Godlewski then comments: "While some have considered alternatives to the idea of type to consider urban transformations and power relations, they often come from a narrowly Eurocentric and white worldview."[7] Godlewski rather deploys the particularly Western 'philosophical concept' of 'paradigmatic spaces': "Spatial paradigms are culturally situated organizations of space and power that are used to typify moments in history."[8] Godlewski will modify this verbal locution derived from 'type' to explain himself, this time suggesting spatial paradigms "represent organizational arrangements typical at particular moments in time."[9] In a sense, 'type' has moved over from a spatialising locution to a temporalising one. Crucial here is the nexus we begin to read in how Godlewski is looking for analyses that alert us to spatio-temporal articulations of power, its exercise, or its substance.

He mentions Thomas Kuhn in passing, the one who made this notion popular in discussing how change happens in science. Though his genuine exemplars are Walter Benjamin and Michel Foucault, Benjamin's arcade, and Foucault's panopticon. Siegfried Kracauer and Giorgio Agamben are also mentioned. Mind you, none of this is discussed in detail, just in passing. In his Conclusion, Godlewski reiterates: "This study argued that spatial paradigms are useful mechanisms for tracing transformations in the Bight of Biafra. They have served as productive constructs to convey the history of socio-political dynamics in southeast Nigeria. Similar to Benjamin's arcade or Foucault's panopticon, they have operated as diagrams of power and the spatial intersection of socio-historical forces."[10] Let's break mid-thought here, just for a moment. An attentive and consistent reader of the journal *Interstices* might recognise the uncanny resonance happening at this very moment, an 'untypical' moment. Wasn't it Mark Jackson, the one composing this review, whose own book-length publication, titled *Diagrams of Power in Benjamin and Foucault: The Recluse of Architecture*, had been reviewed (by Stephen Zepke), in the last published issue of *Interstices*.[11] I knew nothing of Godlewski's methods, nothing at all concerning Calabar, when I nominated myself to undertake this review. It came as a complete surprise, what Godlewski might himself nominate as an entanglement of the quantum kind, a strange attractor operating at a distance. So, there is a great deal I *can* say concerning diagrams of power, how they might or might not be contiguous with how Godlewski explains spatial paradigms. Let me cut to the chase, which means cutting to the hauntology of this book. So far, we have delineated what might be called the architectonic of the book, its 'organising themes,' its 'spatial entanglements,' and its 'spatial paradigms.' But have we got any closer to the inherent problem which Godlewski grasped and aimed to bring into view? I want to conclude this review in eliciting a response to this question, doing so with a focus on how Godlewski brings into view a spatial-temporalising of power's exercise and in doing so as the genuine efficacy of the project, leaves *unsaid* what I come to understand as the Western metaphysical (ontological) colonising of the project. Godlewski decided on the notion of paradigm over other categorial conceptualisations, especially for the manner whereby there is something inhering to paradigms concerning not their stability or stabilising but concerning forces of or for destabilising. He acutely recognises the difficulties in locating one's own discursive positioning in the motility of incommensurable paradigms. Between Calabar and European traders there are tangled non-commensurabilities even as languages, goods, and human beings become exchangeable.

Power is something mentioned often in Godlewski's close analyses, even if it does not appear as a theme, an entanglement, or a paradigm. It is implicit or implied in all of these. Yet power is not 'unpacked,' itself discussed. This might seem odd given that Foucault was a harbinger of an appropriate synthetic concept. It was not Benjamin who used that expression, "diagram of power." What does it mean? Diagram? Say that word to architects or planners and we are already off on the wrong foot. No, it is not the drawing up of extant entities, not even the drawing up of the relational ties between extant things. If we say we know something, knowing is the form extant things take. Again, say form to architects or planners and we're also wrong-footed. Form means what is determined, with respect to determinable matter. Does this mean Godlewski's paradigms are formal syntheses of a manifold of extant entities? That might well be an epistemological levelling-off of his entire project. But, for a third time we

would be wrong. The problem Godlewski brings into view, nominated under the notion of a diagram of power, is not epistemological, concerning the entangled domains of the certainty of knowing. It is ontological, concerning the entangled exercise of competing forces that are productive of our forms of knowing, along with the subjectivities of those who say they know anything at all. When Gilles Deleuze discusses Foucault's diagram of power, he alerts us to the following differentiations: Knowing concerns us with the forms matter takes and the finality that functions take. Power concerns us with unformed matter and non-finalised functions.[12]

We then need to understand diagram as a 'mapping' of what is possible rather than of the extant that is, as ontological difference. Diagrams are unstable, motile. Godlewski alerts us to this ontological (rather than epistemological) horizon of the project, precisely in what is left unsaid in what he says. He emphasises these paradigms are "fictions . . . composed of heterogeneous and conflicting fragments, processes and meanings . . . I'm inevitably entangled in these constructed spaces."[13] I recognise here a way of reading the book that opens us to a radical understanding of power's exercise. Yet, this comes at a cost. Throughout the book there are assumption that I think of as Western metaphysical colonisations.[4] We are not entirely comfortable with assaying English or Dutch or French or Spanish understandings of spatiality and temporality between the sixteenth and twentieth centuries as more or less monolithically the same. Study of that alone would comprise a rich problematic. Though where is the assaying of Èfik seventeenth-century 'cosmological' 'understandings' of 'space' or 'time'? How are these Western constructs practised otherwise? Surely, they are not the same. How does Èfik language say 'space' or 'time' or 'person' or 'urban landscape'? I don't mean dictionary entries. I mean capacities to exist. Can we even use the entirely Western notion of 'subject' or 'agent' to nominate Èfik 'subjectivities' or 'agencies'? What is 'personhood' in Èfik 'culture'? Can we use the entirely Western notion of 'culture'? These are what I might call ontological entanglements. What are the entities that exist whereby we can ask that 'what is x' question? Is there the verb 'to be' in Èfik? There is not one in pre-colonial te reo Māori,[14] nor in classical Chinese thinking. How, then, do relations of force act on unformed matter and non-finalised functions to produce our knowing selves, always already a blindfolding, a concealing, in whatever we can say we see?

NOTES

1. Joseph Godlewski, *The Architecture of the Bight of Biafra: Spatial Entanglements* (Routledge, 2024), xv.

2. Godlewski, *The Architecture of the Bight of Biafra*, iv.

3. Jacques Derrida, *Specters of Marx: The State of the Debt, the Work of Mourning, and the New International*, translated by Peggy Kamuf (Routledge, 1994).

4. Godlewski, *The Architecture of the Bight of Biafra*, 15.

5. Godlewski, *The Architecture of the Bight of Biafra*, 15.

6. Godlewski, *The Architecture of the Bight of Biafra*, 17.

7. Godlewski, *The Architecture of the Bight of Biafra*, 21.

8. Godlewski, *The Architecture of the Bight of Biafra*, 21.

9. Godlewski, *The Architecture of the Bight of Biafra*, 22.

10. Godlewski, *The Architecture of the Bight of Biafra*, 249–250.

11. Stephen Zepke, "Review: Diagrams of Power in Benjamin and Foucault: The Recluse of Architecture," *Interstices* 23 (2024): 137–142.

12. See Gilles Deleuze, *Foucault*, translated by Seán Hand (University of Minnesota Press, 1988). Deleuze suggests, concerning diagrams of power: "Lastly, every diagram is intersocial and constantly evolving. It never functions in order to represent a persisting world but produces a new kind of reality, a new model of truth. It is neither the subject of history, nor does it survey history. It makes history by unmasking preceding realities and significations, constituting hundreds of points of emergence or creativity, unexpected conjunctions or improbable continuums. It doubles history with a sense of continual evolution," 35.

13. Godlewski, *The Architecture of the Bight of Biafra*, 250.

14. I am especially aided in my thinking of metaphysical colonisation by the Māori philosopher, Carl Mika. In a series of essays, he clarifies his understanding of both the blindness and immense difficulties posed in addressing ontological displacements. See, for example, "Reclaiming Mystery: A Māori Philosophy of Being, in Light of Novalis's Ontology" (PhD thesis, University of Waikato, 2013); "The Co-existence of Self and Things through Ira," *Journal of Aesthetics and Phenomenology* 2, no. 1 (2005): 93–112. See also, for discussion of Mika's work in contexts of urban design in the Anthropocene, Amanda Yates, "Whakaaro Papa: Anthropos Design & Decolonising Metaphysics" (PhD thesis, Auckland University of Technology, 2018).

MEGAN RULE

Experiencing water as a spectator: The art practices of innovative mid-century women from southern New Zealand

Water, weather, and inevitably climate are never far from our conscience. Our desires, perspectives, relationships, genealogy, and even survival, hinge upon its presence in just the right amount, and its condition within a relatively narrow band of chemical balance. When these aspects are not quite so, and do not align, either physically or mentally, we intervene or interrupt the state of nature to extrapolate our own experience of this valuable and indeed precious natural and commodified element.

Frances Pound, in *Frames on the Land*: *Early Landscape Painting in New Zealand*, points to a painter as a "spectator of nature" and the painting as a metaphoric "window on the world."[1] He argues the genres of early New Zealand landscapes, including watercolour paintings, are stained windows with shapes and colours, in other words, they are signs with intentional codification to evoke emotion from a spectator.[2] Our reading of Pound approaches the nature of water in architecture as a technique manifest in an "arc" or "filter" through a framed reiterative reflection, a circular interpretation, like a painting, a drawing, or poetry.

My story begins by exploring the creative practice work of overlooked pioneering mid-century southern-New Zealand women who trained in architecture and became registered architects. This sets a scene by which to examine the watercolour art of Monica (Ford) Barham (1920–1983). Barham grew up and was educated in Invercargill, later completing her architecture training at Auckland University College.[3] She became the first female architect in Otago and Southland in 1945, by qualifying for associate membership of the New Zealand Institute of Architects (NZIA) and Royal Institute of British Architects (RIBA), and set up her practice Barham and Barham Architects in Invercargill with husband Cecil Barham from 1946.[4]

This paper explores selected Barham watercolour paintings and seeks to establish how the paintings interpret the dynamic of water, weather, and/or climate. In addition to Pound's "spectator's" filtering frame or lens, the paper finds a parallel to Barham's watercolours in the poetry of her near contemporary Ruth Dallas (1919–2008), who also grew up in Southland.

Dallas, a well-loved writer of poetry and children's books, hailed from Invercargill before moving to Dunedin in 1954. In her writing, she was a discerning observer

and recorder of environmental, social, and weathered conditions. Over many decades and in many narratives about growing up in Southland, Dallas expressly drew on the vigour of the ever-present weather, evoking an impression of the atmosphere, uniquely southern and of its time.[5]

This exploration of the parallel creative lives of two southern women artists responds to provocations expressed in the call for papers for this issue of *Interstices*, to consider "water's metaphorical force," and "how architecture might be formed, thought about, created, or occupied by the elemental force of water."[6] Together lines of poetry and watercolour paintings are paired to draw forth conditions of water movement relating to the land such as a brisling effervescent edge, the decay of sodden earth, purity in an icy blanket, or nourishment in colourful vegetation.

Barham's surviving family members talk of her interest in watercolour painting and carving stone even though her general interests changed from time to time as she looked to learn new skills. The majority of Barham's known paintings are not dated and those that are show either 1963 or 1970, when she became an art teacher, initially at Southland Boys' High School for a year in 1970 and then from 1971 until 1977 at James Hargest High School, Invercargill, in parallel with architecture practice.

As to why she was mainly interested in watercolours rather than oil paintings is not clear. It could be that this was the most pragmatic, economic, mobile, and user-friendly approach when she divided her time between her two studios located at Otatara and Queenstown. A sample of her watercolour paintings shows a strong interest in the spatial relationship of local landscapes and seasonal variation. Each of the four selections below expresses transitional and extreme states of water, from sparkling summer seas to evaporating autumn winds, chilly winter snowflakes, and hydrated spring flowers.

Omaui Beach

Fig. 1 Monica Barham (ca. 1970s). *Omaui Beach* [Watercolour on paper, Private collection of D. Barham]

Riding the Planet Earth

All day no cloud crosses the deep sky.

The sea is turquoise, with white waves booming

Along the beach like muffled guns.

[…]

Wars like the waves of the sea have erupted and gone.

Somewhere hidden in the long grass, the lark

Must surely have a mate listening to his song.

— Ruth Dallas (1979)[7]

Barham's watercolours typically begin with wateriness as brushes are saturated in bottles or dishes and hues are layered onto crisp paper to construct layers of space starting with the whiteness of the paper background to fill in the whitest atmosphere of puffy clouds, snowflakes, or splashes of water in ocean waves. In this case initially water is created by the absence of watercolours, and by the presence of the watery process of drawing forth the mashed pieces of timber shavings that slide together and congeal to form a papery background.

The watery clouds and ocean meet on the horizon line and consume a majority of the framed view. A rocky shoreline abutting a rich ground vegetation is portrayed like debris washed up in more vigorous weather storms. Dark sculptured cabbage trees speckle the coastline of tussock intermingled with grasses that are layered over with watery shadows. Small threshold structures such as a building, bridge, or gate feature in the vicinity of the perspective vanishing point.

These techniques find favour in the landscape watercolours of William Matthew Hodgkins (1833–1898), a founding member of the Otago Art Society. Francis Pound

draws our attention to Hodgkins' influential paper, "A History of Landscape Art and its Study in New Zealand" (1880), that demonstrates his interest in the landscape's poetic content as well as investigating atmospheric conditions; gaseous envelopes of clouds, vapour, or mists.[8] Furthermore his daughter, artist Frances Hodgkins (1869–1947), would later become an important local figure in Barham's art circle. Hodgkins' paintings became widely acclaimed for their bold colour palettes with increasingly modernist reinterpretations of scenery.[9]

Lovells Flat South Otago

Fig. 2 Monica Barham (ca. 1970s). *Lovells Flat South Otago* [Watercolour on paper, Invercargill Public Art Gallery, Cat 715, Collection of J. Friend]

The Ship

To hear the ship among the trees, in creaking

Boughs that never rested, feel the wide

And cool dark leaves of summer suddenly breaking

Into waves that sang above the wind.

[…]

And yet, when through the stories told and told

Again among the swinging shadows, white

And cloud-like, beautiful, the strange ship sailed,

It troubled us like something half remembered.

—Ruth Dallas (1953)[10]

Lovells Flat is situated down the valley from the Taieri Plain where excess hill country headwaters after torrential rains have occasionally flooded the lower nooks and crannies. Close by at Lawrence, Gabriel's Gully experienced a most dramatic expansion and decline within a matter of years due to gold prospecting from 1861. Beyond the flat, the infamous flowing icy blue Clutha River is melted snow fed from the Southern Alps.

The Lovells Flat Sod Cottage (ca. 1862) has survived on a prominent country road highway, capturing a vernacular moment of that time.[11] The earth or soil in the immediate vicinity combined with a consistency of water and sand brought this construction into realisation. The watercolour's dark and golden dilapidations hint at and reinforce its derelict status, but give hope. After this painting the sod cottage was restored.[12]

After the Blizzard

Fig. 3 Monica Barham (ca. 1970s). *After the Blizzard* [Watercolour on paper, Invercargill Public Art Gallery, Cat 383]

Snow

On fallen snow we find

As on a chart, patterns

Of man's restlessness.

[…]

The sun glittered for a moment

On the unblemished

Streets of the blind.

—Ruth Dallas (1976)[13]

This watercolour is perhaps Barham's most vivid expression of glistening water with the light and shadow capturing a state of water in the weather. The nature of water is soft, light, and still, with various shades of white, shadows, and light in painterly material layers that construct space.

Several of Barham's paintings give expression to the more extreme environment and weather/climate presence. Notably the deep south of New Zealand experiences long shadows in its latitudinal location. The winter days are relatively short, while summer days stretch on. The greenest in vegetation is also deep and seasonally well fed by water. In contrast, the moisture taken by the Southern Alps leaves the inner valleys with intermittent relief. Is it scorching or is it chilly?

Snow and glass share some translucency and filtering qualities, although it is less clear how they may share a sense of natural connection, and I wonder if the interest in chilly snow harps back to Barham's experimenting with glazing and sandblasting, with its ability to reflect or refract light with a degree of transparency.[14]

Telesis

Fig. 4 Monica Barham (ca. 1960). *Telesis* [Watercolour on paper, Collection of J. Friend]

Morning Mountains

I could not look at the mountains that morning

Because of the avenue of poplars,

The lamp-like willows guiding the stream,

And the tulips in your garden:

Yet all the time I knew they hung like curtains,

Looped and caught by silver ribbons,

To the glittering blue October sky.

—Ruth Dallas (1946)[15]

The painting captures the Barhams' first house, Telesis (1947), showing it with a later addition (ca. 1960s) and the stone terraced gardens fully established. There is a bright whimsical feel to the painted image with pastel colours introduced (aqua blues, sunny yellows). It is as if the painting is producing a more surreal optimism or impression.

An unfinished watercolour painting from a similar era by New Zealand artist Rita Angus (1908–1970) shows a modern setting of *The Artist's Cottage, Clifton* (1945), in which she resided for a year. The landscape vegetation is awash in rich green hues while the minimal rectilinear lines of building remain brief and inconclusive in pencil form.[16] Angus was part of the Canterbury artists' collective known as the Group. She is well known for her oil paintings of landscape and especially *Cass* that captured the heart of the Southern Alps further north.[17]

Fig. 5 Rita Angus (ca. 1945). *The Artist's Cottage, Clifton* [Watercolour and pencil on paper, Museum of New Zealand Te Papa Tongarewa, courtesy of the Estate of Rita Angus]

The publication of Frances Pound's *Frames on the Land* coincided with the end of Monica Barham's lifetime and career in Invercargill. Pound suggests that the early New Zealand landscape impressions do give some sense of what the context may have been like, in some cases before it was further disrupted by the industrialisation of European settlers. Pound laments a colonial British construct or perspective though, since Māori did not record their landscapes, however he accepts that further perspectives would follow his.[18] In his later book, *The Invention of New Zealand: Art and National Identity: 1930–1970* of 2009, Pound ditches many of his earlier themes framing New Zealand landscapes and argues for a newer "complex critical analysis" of paintings. In his search for a New Zealand difference in art he admits to further change being warranted by the book's gestating closure.[19]

Barham's later creative period related to the timing of a design for a family holiday cabin (1969) at the holiday park in Queenstown and regular family excursions up the road inland to Central Otago from coastal Southland. The contrast in weather between the two family abodes could not be more different – Southland with its higher than average wind speeds combined with their water or wetness carried from the mainly cooler southern coast, and the inland alpine area with its dryer sunnier extremes of hot or cold temperatures. These climate characteristics are deftly captured in Barham's impressions.

Having seen a photograph in the family archives that inspired one of the paintings, I am led to believe that Barham tended to paint from photographed images of scenes visited and experienced. As an art teacher she would over time become increasingly aware of the techniques that illuminate the spatial and climatic atmospheres in her paintings.

Barham's art speaks to the nature of water, whether in context, materiality, by arrangement or methodology, or whether present, suggestive, or absent. The "spectator's window" of art critic Frances Pound, local writer Ruth Dallas, and artist Monica Barham suggests that Southlanders are acutely attuned to their climate, weather, and water conditions, perhaps more so than those from elsewhere in New Zealand, due to the occurrence of greater extremes in seasonal variation.

NOTES

1. Frances Pound, *Frames on the Land: Early Landscape Painting in New Zealand* (Collins, 1983), 12.

2. Pound, *Frames on the Land*, 12.

3. Megan Rule, *Monica Barham: So You're Building: You and the Architect* (SPA Press, 2024), 19, 52; Megan Rule, "Crit/Itinerary 75: Monica F. Barham in Southland," *Architecture New Zealand* (May/June 2024): 84–87; "Debutant Ball," *Evening Star*, 7 June 1938.

4. Megan Rule, "Not Afraid to try Anything: Monica Barham," *Making Space: A History of New Zealand Women in Architecture*, ed. Elizabeth Cox (Massey University Press, 2022), 144.

5. Ruth Dallas, *Curved Horizon: An Autobiography*, Te Whenua Series No. 5: Pacific People, Land and Literature (University of Otago Press, 1991).

6. "Call for Abstracts Issue 24: On Water: The Aqueous in Architecture," 22 June 2024, https://interstices.ac.nz/index.php/Interstices/announcement/view/19.

7. Ruth Dallas, *Steps of the Sun: Poems by Ruth Dallas* (The Caxton Press, 1979), 28.

8. Pound, *Frames on the Land*, 64, 66.

9. Catherine Hammond and Mary Kisler, *Frances Hodgkins: European Journeys* (Auckland University Press, 2019).

10. Ruth Dallas, *Country Road and Other Poems: 1947–52* (The Caxton Press, 1953), 22.

11. "Old Sod," *Otago Daily Times*, 29 November 2023, https://www.odt.co.nz/rural-life/rural-life-other/old-sod.

12. Clutha District Council Heritage: Lovells Flat, accessed 24 November 2024, https://heritage.cluthadc.govt.nz/nodes/view/66.

13. Ruth Dallas, *Walking on Snow: Poems by Ruth Dallas* (The Caxton Press, 1976), 35.

14. *Evening Standard*, 22 August 1942; M. F. & C. V. Barham, "Remodelled Brown Owl Milk Bar," *Home & Building* 11, no. 3 (Dec 1948–Jan 1949): 38–41; Rule, "Not Afraid to try Anything," 144, 147; Molly Macalister and Monica Ford, "Talented Young Sculptor at Work on Museum Exhibits," *Evening Star*, 22 August 1942.

15. Dallas, *Curved Horizon*, 84, 85. Published in *Southland Daily Times*, 22 June 1946.

16. Lizzie Bisley, ed., *Rita Angus: New Zealand Modernist: He Ringatoi Hou o Aotearoa* (Te Papa Press, 2021), 10, 25, 27, 111.

17. Bisley, *Rita Angus*.

18. Pound, *Frames on the Land*, 12, 13.

19. Frances Pound, *The Invention of New Zealand: Art and National Identity: 1930–1970* (Auckland University Press, 2009), xxi, xxii.

exhibition review / JACK WU

Our garden and its waters: A review of *Derek Jarman: Delphinium Days* (2024)

Gus Fisher Gallery, 15 June–14 September 2024

Derek Jarman's voice was forged in protest. A unique and distinctive voice honed protesting against the strictures of life in post-war Britain,[1] it carried the urgency of AIDS activism, the defiance of queer punk, and the raw intimacy of approaching death. As a prominent member of OutRage! who spoke passionately at the 1988 inaugural AIDS and Human Rights conference,[2] Jarman understood the power of voice as both medium and message—a tool for demanding visibility, care, and justice in a world that preferred silence.

Yet voices change as they travel through time and across mediums. For those who encountered Jarman's work in the 1980s and 90s, his voice arrived with the immediacy of cinema screens and gallery walls, charged with the political urgency of its moment. For my generation, raised on the internet and far from the particularities of British queer culture of that era, his voice reached us differently—through YouTube uploads of *Blue* (1993), through fragmented digital archives, through the mediated distance of screens. *Blue*, Jarman's final feature film released four months before his death from AIDS-related complications,[3] became for many of us a first encounter with his work: an unchanging blue screen accompanied by "a densely interwoven soundtrack of voices, sound effects and music" that conveyed both literal and allegorical experiences of living with AIDS.[4]

This is a generational shift in how we encounter Jarman's work. Where once it was necessarily loud, urgent, protesting in the face of indifference and death, now it arrives with different resonances: sometimes whispered through laptop speakers, sometimes discovered in the quiet of late-night browsing, sometimes shared through social media's networks of connection and care.

Delphinium Days, a travelling exhibition on show in Tāmaki Makaurau Auckland at the Gus Fisher Gallery across July and September 2024, offered an occasion and space to consider this transformation of voice and its translation into contemporary contexts of care, celebration, and community building. The exhibition's tone was notably different from the confrontational energy that characterised much of Jarman's original work. Rather than anger, there was something closer to reverence; rather than protest, a kind of gentle insistence on the ongoing relevance of his vision was offered.

This shift in tone becomes particularly significant when considered alongside the building that houses the Gus Fisher Gallery itself. Occupying a 1934, Category 1 listed heritage building that was formerly home to Radio 1YA and TVNZ—the southern hemisphere's first purpose-built radio studios[5]—the gallery occupies a space historically dedicated to broadcasting, to the transmission of voices across distances. The building's art deco architecture, with its emphasis on modernity and communication, created, for me, an unexpectedly resonant backdrop for Jarman's work. Here was a space originally designed for the pioneering transmission of voices and images, now hosting an exhibition of an artist whose career was fundamentally concerned with finding new ways to voice the unvoiced—queer experience, AIDS, environmental destruction, spiritual seeking.

An irony then: Jarman, who refused to live and die quietly,[6] whose work was born from the margins and the underground, found a temporary home in a former broadcasting headquarters—an institution of mainstream media transmission, and now the "flagship art gallery" for Waipapa Taumata Rau, the University of Auckland.[7] Yet rather than feeling like a sanitisation of his radical edge, the setting suggested something more complex: the possibility that institutional spaces, like the bodies of water that flow through Jarman's work, might contain currents capable of carrying transformative voices to new audiences.

Just months before encountering *Delphinium Days*, I had completed my thesis titled "Dandelion Minds, Stories that Make a Room," which explored how architectural practice might become more responsive to the collectives it serves.[8] Drawing on thinkers like Louis Kahn and Jarman himself, my research considers how "the room"—both literal and figurative—can act as a site for storytelling, care, and social transformation. This tension between space, memory, and collective encounter felt central to experiencing the exhibition.

The opening night was electric, filled with people from across generations—queers and allies, art-world regulars and those drawn by something less definable. While it wasn't the confrontational energy of an AIDS protest or the underground urgency of 1970s queer punk, there was a different kind of vitality: people lingering over works, making eye contact across the room, engaging in conversations that the exhibition seemed to generate naturally. Throughout the exhibition's run, a programme of performances and talks by queer artists and thinkers unfolded alongside the show, expanding its meaning and keeping it alive as a gathering point for numerous communities finding relevance in Jarman's work.

Jarman never came to Aotearoa New Zealand, but in 2024, his work arrived here—carried across seas; a drift of film, pigment, soil, and memory. His father, Lancelot Elworthy Jarman, was born in Canterbury in 1907, leaving New Zealand in his early twenties to join the Royal Air Force in Britain. It's a slender thread of connection, but in the comments of the exhibition's launch post, others with the surname Jarman tagged one another with quiet, knowing recognition. This suggested to me, not surprise or discovery, but a kind of acknowledgement: a shared name resurfacing in the flow of cultural memory.

Delphinium Days didn't frame this genealogical connection as a major narrative, and wisely so. Instead, it allowed these threads to flicker into view between the blue-painted walls, between screenings and silences, suggesting that legacy operates not through linear inheritance but through resonance—the way a name, a work, a gesture continues to ripple outwards, landing in unexpected places and familiar hands.

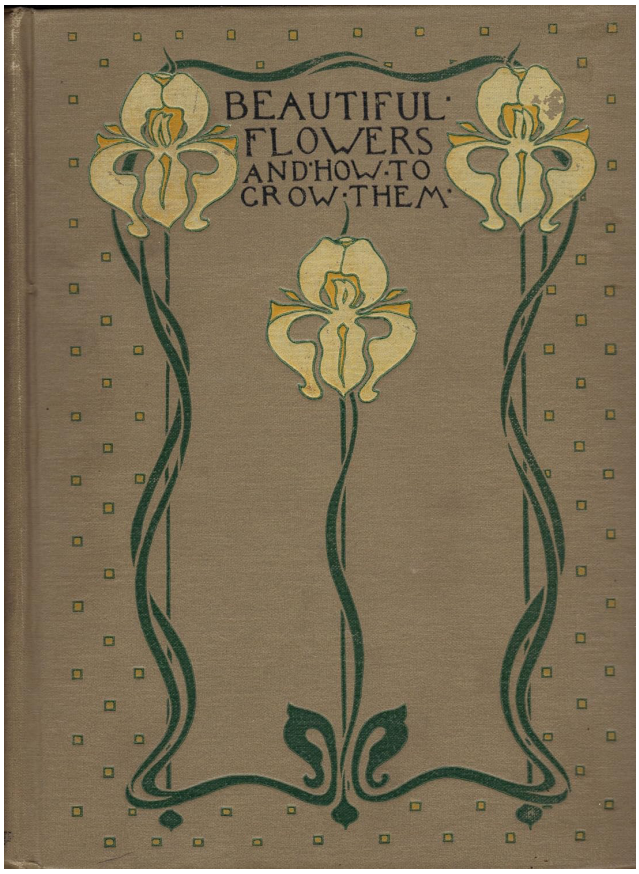


Fig. 1 Cover of Horace J. Wright and Walter P. Wright, *Beautiful Flowers and How to Grow Them* (London: T.C. & E.C Jack, 1909)

Blue wasn't screened in the Auckland show, but its presence was felt everywhere: in the colour of the walls, in the pacing of the rooms, in the way the exhibition invited visitors into a feeling of time slipping, of memory stretching both backwards and forwards. As Tony Rayns puts it, *Blue* is "not only elegiac and diaristic; at times the film is angry, philosophical, and prosaic. It is communal, featuring the voices of friends and collaborators."[9] This multiplicity of voice—individual and collective, private and public—seemed to echo through the exhibition's curatorial approach.

One of the earliest gifts Jarman received was a book called *Beautiful Flowers and How to Grow Them*, given to him by his parents when he was just four years old.[10] It is difficult not to read this as a seed that germinated into the garden at Prospect Cottage, but also into a broader understanding of cultivation as both artistic practice and a form of care. In my own research, I've argued that gardens are not static heterotopias—separate, contained spaces—but thickened enclosures where time, memory, and encounter interweave. Jarman's garden at Prospect Cottage was, as literary critic Jim Ellis writes, "a site of resistance and refuge,"[11] but also a space of continuous learning and ongoing care.

The garden's layout, with its semi-formal geometries and mix of stones, text, and wildflowers, resists easy categorisation. It's neither a symbol of nature nor a rejection of culture, but a third space where meanings intertwine. Like Jarman's films, and *Delphinium Days* itself, the garden doesn't prescribe particular readings but opens itself to being remade with each encounter.

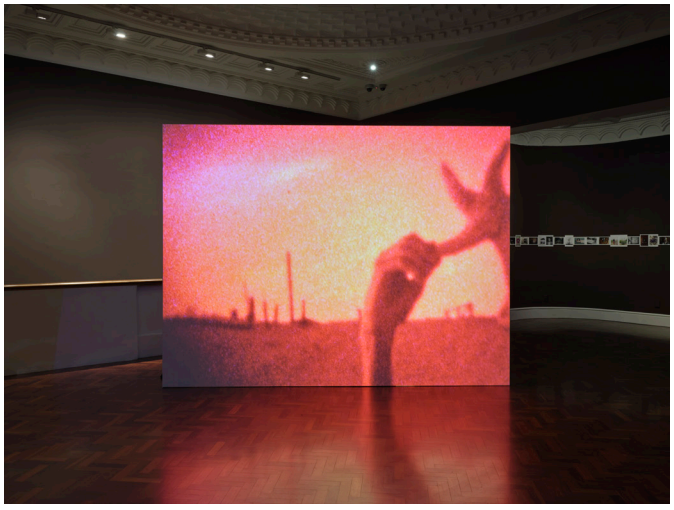
This openness proves radical in a time when pressure to define, categorise, and market are so intense. Jarman's work resists these pressures, inviting us to think about art not as product but as process: not as message but as site for conversation. Conversation, as Jarman understood, is itself a form of care—a way of tending to what we don't fully understand, of holding space for what remains unresolved.

What struck me most about *Delphinium Days* was how it managed to honour Jarman's legacy while allowing his voice to speak differently in this context. The exhibition didn't try to recreate the confrontational energy of his original moment, but instead created space for his vision to resonate in new ways. Where his voice once needed to be loud to be heard over the noise of indifference and hatred, here it could be more contemplative, more layered, more open to the kinds of conversations that happen when people gather not in crisis but in curiosity and reverence.

This is not to suggest that the urgency of Jarman's political vision has become irrelevant. Rather, *Delphinium Days* demonstrated how that urgency might be carried forward through different registers—not always the raised voice of protest, but sometimes the quieter voice of invitation, of care, of making space for others to speak and be heard. A sort of welcoming and inclusion, of those LGBTQI+ or not.

Seeing the exhibition in Auckland was not an experience of nostalgia or mourning, but of possibility. It asked visitors not simply to look back at Jarman's life and work, but to consider how we might carry his vision forward: How do we create spaces where difference is not erased but cultivated? How do we sustain practices of care that are generative rather than merely reactive? What does it mean to make art, gardens, or communities in the face of loss?

These questions remain vital, not just for queer communities but also for anyone concerned with how we live together in the face of precarity, environmental crisis, and the demands of a world that too often treats bodies as expendable. In the former broadcasting building that now houses the Gus Fisher Gallery, surrounded by the blue walls and flowing conversations of *Delphinium Days*, I felt these questions move like water across generations, across oceans, into new hands ready to take up the work of cultivation, care, and ongoing transformation.



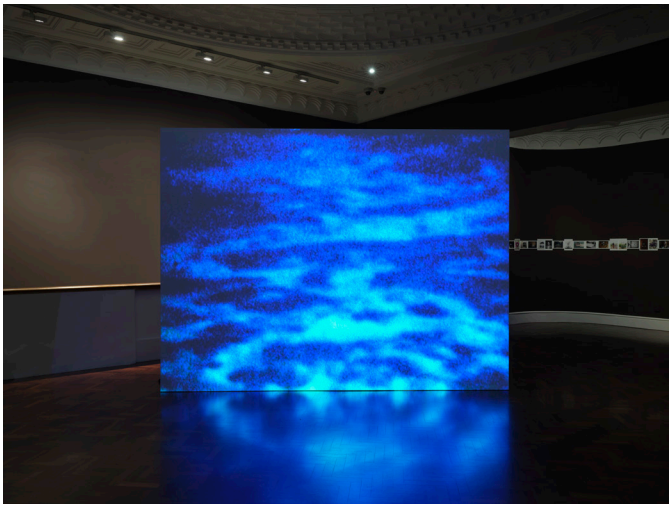


Fig. 2 Derek Jarman, *My Very Beautiful Movie*, 1974 [Courtesy of James Mackay and LUMA Foundation. Photograph by Sam Hartnett]

NOTES

1. James Mackay, "Derek Jarman Super 8," *Guardian*, 7 May 2024, https://www.theguardian.com/film/article/2024/may/07/standing-stones-urban-hellscapes-and-male-nudes-derek-jarmans-glorious-super-8-short-films.

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8. Jack Wu, "Dandelion Minds, Stories that Make a Room" (MArch(Prof)UrbPlan(Prof) thesis, University of Auckland, 2023).

9. Dupin, Gordon, Khan, and Todd, *Experimental Film*, 4.

10. Jim Ellis, *Derek Jarman's Angelic Conversations* (University of Minnesota Press, 2009), 142.

11. Ellis, *Derek Jarman's Angelic Conversations*, 142.

bios

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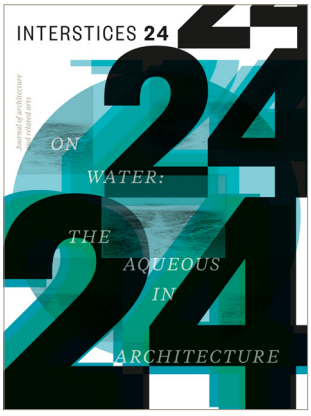

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