DIALECTIC IX: DECOLONIZING

DECOLONIZING ARCHITECTURAL TECHNOLOGIES

Dialectic is the refereed journal of the School of Architecture at the University of Utah. Established in 2012, the journal brings together the most competing opposing voices on the most compelling questions in discipline today. It interrogates the issues, values, methods, and debates that are most important to the community of educators at the University of Utah and elsewhere.

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Design and technology are inextricably connected, radically impacting the way we produce form and inhabit space. In the last several decades, technological shifts have pushed efficiency, performance, and data mediated approaches to spatial production under the guise of objectivity and universal applicability. But the distance of these physical and digital tools from the idiosyncrasies of the human hand and mind, does not make them neutral instruments. Their placement after **decolonizing** (a process of achieving self-realization of a previously dominated people) in the title of *Dialectic IX* is strategic. It strips away from **"architectural technologies"** all claims of universality, scientific neutrality, and knowledge progression, reframing both decolonization and technology as cultural practices. Furthermore, the focus on techniques in our thematic identifies the locus of resistance to spatial inequity and colonial erasure, not elsewhere but squarely in designers, preservationists, urbanists, cartographers, engineers, programmers, and most of all in educators.

Acknowledging technology's role in perpetuating and amplifying spatial and social structures that discipline human behavior, choices, and imagination, how might it be used instead as a tool for delivering cultural sovereignty? We have numerous examples of this. In recent years, preservationists, anthropologists, and archaeologists have adopted digital techniques such as 3D scanning, photogrammetry, and augmented reality to protect, interpret, and transmit not only tangible or built heritage, but also intangible expressions of culture--performances, practices, oralities, and lived experiences. Indigenous artists and urbanists are employing digital media technologies such as virtual reality, mobile apps, and sound recording as new modes of storytelling that are immersive, relational, and non-linear. In architecture, interactive tools have fostered participatory and collective modes of working, expanding the agency of designers and community end users in creating more adaptive and inclusive environments. The building industry has transformed vernacular building materials such as earth and wood by connecting them to advancements in construction technology and contemporary concepts of ecological design and circular economies. Geographers, film makers and landscape architects have also brought the act of mapping into question. Learning the notation of landscapes with petroglyphs, natural observatories, smoke signals, and dance has brought into sharp focus scientific mapping as an instrument of cultural domination. The emerging field of cultural mapping, in conjunction with geo-spatial information technologies, has been employed to protect tribal resources, expand the potential for engagement and empowerment for indigenous communities, and spatialize new ways of knowing the relationships between people and places.

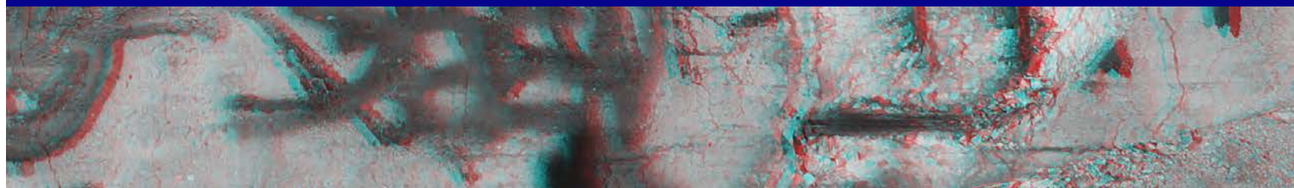
The editors of *Dialectic IX* welcome submissions on the braiding of different cultural attitudes to building construction with industrialized modes of project delivery, recoveries of endangered ways of building, harvesting materials, and the application of technologies both material and immaterial, animate and inanimate, in design thinking and practice. How are the lines of inquiry opened by immersive storytelling, cultural mapping, and the collection of indigenous epistemologies disrupting status quo practices of communication, analysis, and production employed in the design of cultural landscapes? Do we have good examples of new research methods in design that address the biases implicit in technology? Are there case studies that insist on human processes to offset technology's tendency to favor merciless efficiency, optimization, and cost-effectiveness? How are colonized peoples re-appropriating the technologies that have excluded, erased, and othered them in the past?

"Decolonizing Architectural Technologies" not only responds to the social inequities perpetuated through notions of knowledge progression and human advancement, but it also makes space for new directions in design technologies, informed by diverse ways of knowing and creating. *Dialectic IX* invites articles, reports, documentation, interviews, and photo essays on best practices of decolonizing architectural technologies. Possible contributions may also include mapping of ongoing debates across the world, and reviews of books, journals, exhibitions and new media.

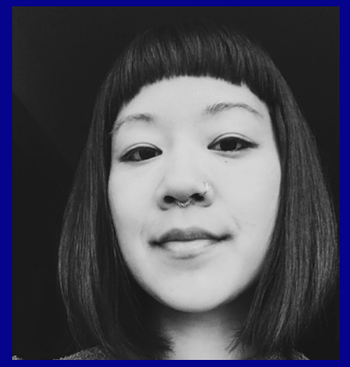
EDITORIAL

DECOLONIZATION IS NOT A VIRTUE SIGNAL. IT IS A CALL TO ACTION.

SHUNDANA YUSAF, TONIA SING CHI



Tonia Sing Chi's work explores the link between place-based building technologies and collective, cross-cultural approaches to design and preservation. She is a practicing architectural designer, preservationist, and scholar with broad experience in natural building, subsistence farming, and community-centered models of practice. Previously, she was a KPF Paul Katz Fellow where she researched the role of architecture and planning in dispossession and displacement in the settler colonial context of Sydney, Australia and how we might work towards the decolonization of urban land. She has taught community design-build at UC Berkeley's College of Environmental Design and has partnered with several non-profit organizations advocating for food justice and housing security on Chochenyo and Ramaytush Ohlone land (the San Francisco Bay Area), where she is from. Tonia is a core organizer with Dark Matter University and a founding member of Náátsʼílid Initiative, an Indigenous-led, coalition-driven CDC that strengthens the cultural and economic resilience of Dinétah through self-reliance initiatives in the built environment.



Shundana Yusaf is an Associate Professor of Architectural History and Theory at the School of Architecture, Uni¬versity of Utah. Her scholarship juxtaposes colonial/ postcolonial history with sound studies in architecture, framing each as a force of globalization. She is the author of *Broadcasting Buildings: Architecture on the Wireless, 1927-1945* (MIT Press, 2014) and the coordinator and primary author of *SAH Archipedia Utah* (Virginia University Press, 2019). She is currently completing the manuscript of her third book project: *The Resonant Tomb: A Feminist History of Sufi Shrines in Pakistan*. Together with Ole Fischer, she is the founding editor of *Dialectic*.

In addition to teaching and scholarship, she is the founding member of *Náátsʼílid Initiative*, a Navajo Community Development Collaborative, committed to strengthening the cultural and economic resilience of Dinétah through initiatives in the built environment and sweat equity housing.

DECOLONIZATION IS NOT A VIRTUE SIGNAL -IT IS A CALL TO ACTION

TONIA SING CHI, SHUNDANA YUSAF

> For the master's tools will never dismantle the master's house. They may allow us temporarily to beat him at his own game, but they will never enable us to bring about genuine change.[1]
>
> — *Audre Lorde*

This issue of *Dialectic* is published during a global pandemic, which suspended all non-essential activities involving human interaction and in-person gathering. We called upon technology to solve the human problem—to fix the disruptions in our daily lives caused by nationwide lockdowns and physical distancing measures. Those of us who were afforded the privilege of working and living remotely took to the internet to communicate, socialize, and gather from our homes. *Dialectic*, too, shifted to the digital realm, with Issue IX: *Decolonizing Architectural Technologies* being the first to be published as an online journal. The call for papers to decolonize architectural technology went out before the worldwide shut downs and came into relief in a different world. Receiving abstracts and papers in response to that call during a time of accelerated dependence on digital tools is not ironic, but timely. This year has only underscored the importance of critically interrogating the stories we tell about progress, innovation, and technological saviorism.

Consider the ways in which video conferencing has provoked a comparative critique of digital versus physical meeting spaces, bringing attention to the inequities coded in our workplaces, institutions, lecture halls, and meeting rooms. We were quick to praise the gridded view of our new virtual meeting spaces for equalizing communication and democratizing collaborative work, with each individual—from intern to principal, from student to professor, from audience member to keynote speaker—occupying an equally sized rectangle on an orthogonal grid, eliminating the hierarchies that characterize our physical spatial arrangements. Technology is often portrayed as evolving and improving humanity towards greater neutrality, objectivity, and equality. In collaborating closely with colleagues on Navajo Nation through unreliable internet connection, however, we have witnessed firsthand how our new dependence on video conferencing for communication has amplified the digital divide, exposing the impact of connectivity barriers and the circumstances of our domestic lives on equal participation.

Technology deepens and amplifies discrimination *by design*—and it becomes especially sinister as it does so under the guise of a neutral, universal lens. We have devised systems of measurement and weight to prove 'primitive' minds were smaller than European minds, designed facial recognition technologies to both target and misread people of color, and invented techniques for the continued subjugation of women.[2] Research shows that administrative and secretarial information on our AI apps is provided in female voice, while law, finance, and other higher function information is covered in male voice. Indeed, as Beth Coleman argues, race itself is a technology, one designed and deployed to segregate and sanctify the structural injustice experienced by racialized groups.[3]

Architectural technologies—from computer aided design (CAD) and building information modeling (BIM); to construction materials, means, and methods; to mechanical, electrical, and plumbing systems—are no different. None of them offer objective technical solutions for optimal production and performance. They, too, are designed by society and shaped by cultural, institutional, and funding biases. Science has built a reputation as a matter of fact, capable of fixing our human prejudices and errors. In reality,

it is tied to institutions of European imperialism and White hegemony, reflecting the values and ideation of people with wealth, power, and influence. Anyone in the business of production of knowledge and architectural research knows that so-called simplicity, clarity, uniformity, and objectivity projected in science and technology is achieved only through aggressive pruning of the complexity and chaos at the heart of any data and experiment. The elegance of a simple formula comes about only by rounding up and weeding out race, gender, religion, culture, ability, and language. Textbooks, for example, separate mechanical, electrical, and plumbing systems from the historical context in which they were invented and developed to stabilize them as technological "facts." This observation is nothing new; historians and philosophers of science like Paul Feyerabend have been making it since 1975.[4] Emboldened by Decartes' body-mind divide, scientific knowledge pretends as if "ideas" are independent of the bends of thought of embodied minds of those who invent those ideas.

This past year has also catalyzed a national reckoning with a second pandemic: systemic racism. It was not until we—as a global society—witnessed the murder George Floyd at the hands of state-sanctioned police violence that this centuries-long reality spread into the collective consciousness of those who have been shielded by the invisibility and neutrality of Whiteness. Widespread racial unrest has also brought the term "decolonization" (among other words such as anti-racism) into even greater academic and public discourse. We are being called upon to decolonize *everything* from our syllabi, to our bookshelves, to our closets, to our diets, to our newsfeeds. For the first time, people in the United States are learning and verbally acknowledging whose unceded land they're on, a practice that has been standard in Australia, New Zealand, and Canada for some time. While greater national awareness is a welcome development, the rhetoric of decolonization is often invoked in ways that evacuate it of its force. Decolonization is a matter of overcoming the sense of inferiority that the Western knowledge system has imposed on us. It *is* about political sovereignty and returning land back to Indigenous nations. It is *also* about cultural sovereignty. Technology and science are part of the cultural memory of a people. Land sovereignty is entwined with cultural sovereignty, and therefore any talk of land without culture and technology, and culture and technology without land, is meaningless. Aboriginal Australians know this entanglement of technology, culture, memory, and land as Country:

> For Aboriginal peoples, the country is much more than a place. … Country is filled with relations speaking language and following Law, no matter whether the shape of that relation is human, rock, crow, wattle. Country is loved, needed, and cared for, and country loves, needs, and cares for her people in turn. Country is family, culture, identity. Country is self.[5]

"Decolonizing Architectural Technologies" is not a return to an idealized, pre-colonial, puritan moment. It is not about disentangling the Rest from the West. Rather, it is a path that aims to braid different technological systems, not dismiss one or the other. The metaphor of "braiding" as opposed to the "melting pot" ensures that is not confused with assimilation, but a coming together of different visions of technology—materials, structures, and building envelopes—in a manner that maintains the integrity of each system. *The use of the word decolonization is not virtue signaling but a call to action.*[6] It is a way of thinking that creates an equivalence of different knowledge economies previously dichotomized as primitive and modern, archaic and cutting edge, civilized and uncivilized.

Since the European Renaissance, architectural technologies, be they for protecting fortresses from enemy fire or building slave ships, have been an instrument of encounter between the West and the Other, changing the consciousness of the colonizing and colonized people alike. A decolonial approach, we must reiterate, does not mean we denounce science and technology. Rather, it demands that we rethink what we consider as science and technology, and whom we think are its inventors and innovators, its customers and users. A decolonial approach must ask of our technologies: Who has designed them and with what questions in mind? Who has codified and marketed them? Who deploys and teaches them? Who benefits from them? How do they activate the survival of Indigenous, rural, oral, non-hegemonic knowledge, language, literature, stories, values, practices, and ways of knowing? This line of inquiry enables us to think about culturally appropriate architectural technologies and modes of representations. Decolonial architectural technologies do not just hold up a roof safely and cost effectively; they are technologies that partake in the self-determination of disinvested communities and strengthen their resilience and self-reliance. They are technologies that disentangle Western knowledge from superiority, evolution, and progress. They are technologies that center the individual and collective physical, spiritual, psychological, and social healing of historically exploited people. In short, they are technologies that serve the cause of justice.

In this issue of *Dialectic*, we call for broader research methods and technologies that partake in the hard work of cultural resilience as opposed to cultural assimilation. We envision a different trajectory for architectural technology, one that opens up new solidarities and methods towards liberatory ends. We invited papers that argue against the portrayal of technology as apolitical and acultural, and offer critical, decolonial engagement with existing, emergent, and divergent tools and technologies that shape our built environment. The contributions are divided into four sections exploring four types of architectural technologies: (1) technologies of representation, (2) technologies of mapping, (3) technologies of resilience, and (4) technologies of construction.

In Part I, "Technologies of Representation," the articles reveal ways in which technological forms of documentation destroy cultural and physical differences in pursuit of legibility. Sechaba Maape critiques methods of preservation through 3D scanning technology in that it not only fails to capture the value of liminal ritual spaces in his hometown of Kuruman in South Africa, but also destroys meaning and significance by undermining the potency of mystery, myth, and ritual in the production of space. By tracing the evolution of the anthropomorphic drawings of industrial designer Henry Dreyfus, Diana Cristobal Olave reveals how they disseminated the values of the middle-class, able-bodied, white male.

In Part II, "Technologies of Mapping," the authors discuss ways in which mapping and remapping of Indigenous land can occur through language and notation. Genevieve Murray and Joel Spring expose how the rhetorical re-mapping through "Acknowledgements to Country" are operationalized as optics by institutions to maintain structural White supremacy. Using their experience as sessional employees teaching within an Architecture school in Australia, they describe how they, too, were instrumentalized by the institution to extend the performative remapping. Manuel Shvartzberg Carrió describes spatial practices for managing territorial conflict through the settler-colonial city of Palm Springs, California, the ancestral lands of the Agua Caliente Band of Cahuilla Indians. He explores how architecture translates complex problems of sovereignty into neocolonial language of internal geopolitical containment.

In Part III, "Technologies of Resilience," the authors examine the social relations of architectural production, challenging the superiority of expert-driven design and building technologies towards a more inclusive understanding and practice of architecture. Naren Anandh explores the resilience and strength of the Kabuli Pastoral Nomads from Afghanistan through the intelligence embedded in their semi-permanent structures. Clint Abrahams, in turn, examines and centers building typologies and techniques of collective expertise through self-made buildings in Macassar township, South Africa.

In Part IV, "Technologies of Construction," Robert Cowherd interrogates the socio-cultural status of bamboo architecture in Indonesia in the context of its association with cutting-edge, sustainable design and its promise to solve our colonial crises. Selina Martinez, in conversation with Tonia Sing Chi, discusses Indigenous futurity, plurality, and healing through the informal and participatory process of adobe building.

The two editors of this issue, Shundana Yusaf and Tonia Sing Chi, make this critique from very specific vantage points. Shundana is a daughter, mother, and architectural historian from an indigenous Pakhtoon community in Pakistan. She spent her childhood between the city and her ancestral village and trained as an architect, realizing early on that her professional education gave her no skills, tools, or language to support building technologies developed in oral cultures. A technical assistant for building

schools in remote Pakhtoon villages with German grants, her work raised very difficult philosophical and technical questions about the Eurocentric paradigm of professional practice and architecture as an instrument of empowerment versus colonization of the mind. Tonia was born to Taiwanese and Chinese immigrant parents in the United States. The dissonance she experienced in her cross-cultural upbringing galvanized her to advocate for spaces that reflect diverse stories and cultivate healing and belonging for people who have been othered and invisibilized by structural exclusion. For her, building decolonial, anti-imperialist knowledge coalitions among Indigenous and diasporic communities is the work of overcoming colonial mentalities, internalized racism, and cultural assimilation.

Since its establishment nine years ago, *Dialectic: Journal of the School of Architecture at the University of Utah* has problematized the most pressing concerns of teaching architecture in a place like Utah. Our theme for this issue was recommended by a set of colleagues at the School of Architecture, University of Utah, as the School was revamping its curriculum to correspond training in architecture with training in civic entrepreneurship and activism. As editors, we found value in the theme for two reasons.

The first relates to the broader context from which we derive most of our students and into which we send them back. Utah is composed of several persecuted groups including the white Mormon majority who celebrate the first colonial settlers in the mid-19th century as pioneers. This majority has successfully brought many non-white Utahans like Native Americans, Polynesians, and Latinos into the church since the 1970s, creating new trajectories of solidarity. The result is that in Utah, colonization is seen as a question of Mormon survival, not a dehumanizing pathology of European culture. The discussion of colonialism and decolonization is not always received as an invitation to build a socially just future, but as an existential challenge to the narratives of self. An issue-wide airing to offer a new type of comradery therefore seemed worthwhile.

The second reason is tied to the more immediate disciplinary context in which architects are trained worldwide. Among the contemporary areas of architectural education—history and theory, communications, design, professional practice, and building technologies—architectural technologies have thus far been most resistant to calls for decolonization. Practitioners are in denial about their complicity in the project of racial domination. Pioneers in this sub-field trying to bridge the culture-science divide find themselves awkwardly positioned. The reason is obvious: the tactic to make science definitive has historically been to give it an agnostic, ahistorical, and placeless "logic" of its own. The moral authority acquired by science through claims of being above the fray has shielded education and practice of building technologies from questions of race, class, and gender. When Western science doesn't consider whose concerns it represents, it becomes a sinister instrument of neo-colonialism.[7] It suppresses non-European science and technology. It debunks research methods that intertwine physics with metaphysics, ethics with objectivity, and confuses power with conclusions. It reduces construction and fabrication to mechanisms geared towards a dull understanding of efficiency, economy, and bodily comfort. Such are the closures and impoverishments of what Western science has called progress.

The work of decolonizing architectural technologies will take time and intention, both of which run against technology's ethos of non-stop innovation and progress. We offer this issue as advice that we practice a slower, more nuanced, more inclusive and more conscientious "innovation." The work of decolonizing architectural technologies will require us to descend into the chaos of knowledge and become comfortable with the disorientation caused by the disappearance of canonic law. We are only beginning to recognize our complicity as architects in a world that valorizes a facile definition of "cutting edge." For architectural technologies to stop being an instrument of status quo, it must regard non-Western visions of architectural technologies not as the other, not as a threat but, as Audre Lorde puts it, a source of rejuvenation, strength, and purpose. ▪

ENDNOTES

1. Audre Lorde, *Sister Outsider: Essays and Speeches* (Berkeley: Crossing Press, 1984)

2. Linda Tuhiwai Smith, *Decolonizing Methodologies: Research and Indigenous Peoples.* (London: Zed Books, 2012), 86.

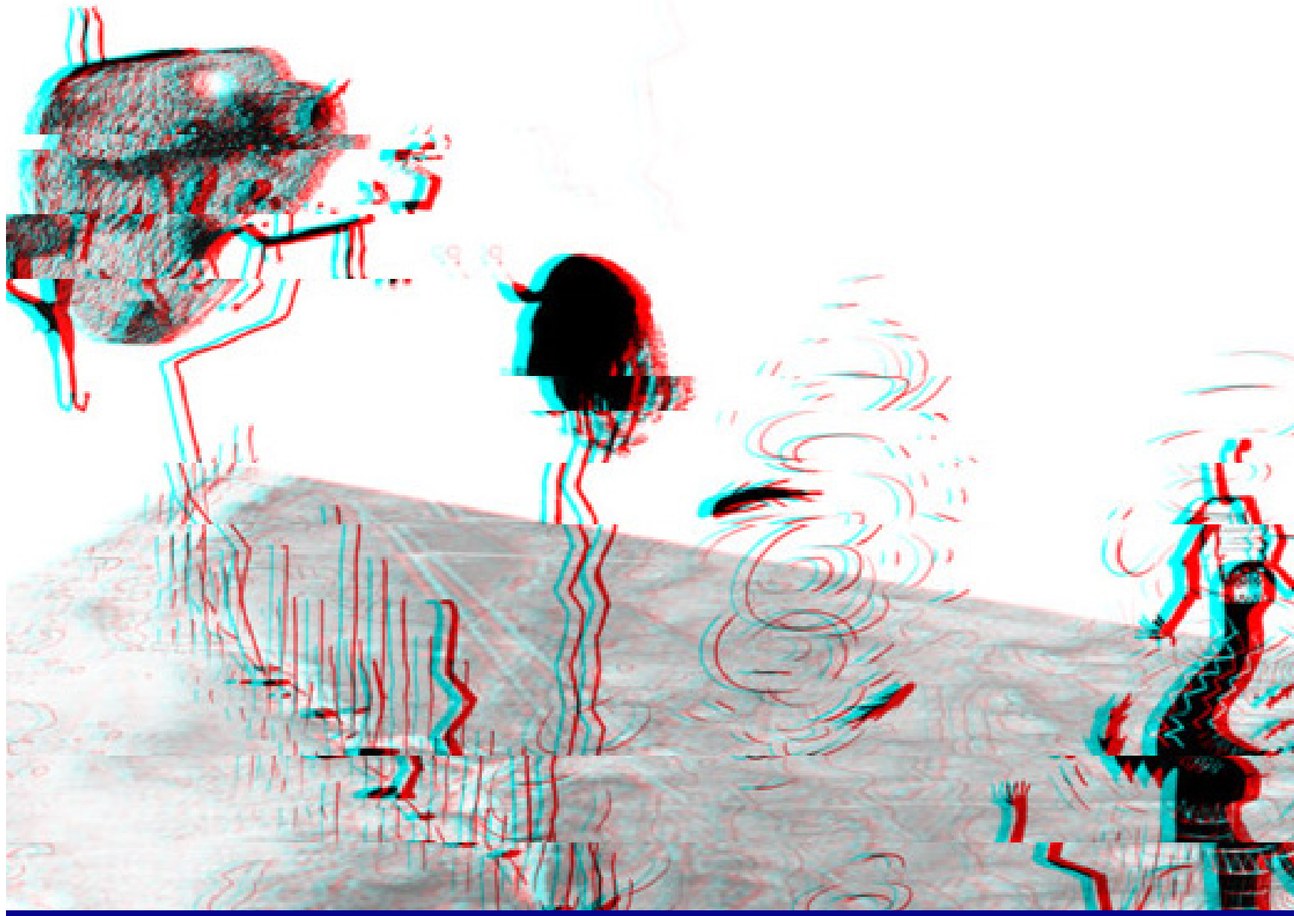
3. Ruha Benjamin. *Race After Technology* (Cambridge: Polity Press, 2019) and Beth Coleman, "Race as Technology," *Camera Obscura* 24, no.1 (2009): 176–207.

4. Paul Feyerabend, *Against Method* (London: New Left Books, 1975).

5. Palyku woman Ambelin Kwaymullina quoted in "Meaning of land to Aboriginal people - Creative Spirits," https://www.creativespirits.info/aboriginalculture/land/meaning-of-land-to-aboriginal-people (accessed April 11, 2021).

6. The title of this editorial is inspired by Eve Tuck and K. Wayne Yang, "Decolonization is not a metaphor," *Decolonization: Indigeneity, Education & Society* 1, no.1 (2012): 1.

7. Janet Browne, "A Science of Empire: British Biogeography before Darwin," *Journal of the History of Science* 45, no. 4 (1992): 453-475.



TECHNOLOGIES OF REPRESENTATION

Dr. Sechaba Maape is an architect and senior lecturer at the Wits School of Architecture and Planning. After completing his Masters in Architecture (Professional) he earned a PhD in architecture. His thesis explored people/place relationships, and ritual and climate change adaptation among pre-historic indigenous communities in Kuruman in the Northern Cape Province. His research enquiries led him to engage archaeological and paleontological material in depth. In his research, Dr Maape has always investigated the manner in which people survived change and variability, especially environmental change. His main finding—that rituals played a significant role in fostering psychological, social, and thus ecological adaptation—directed him to engage modern ritual spaces in South Africa towards deepening our understanding of the role of these practices and places in modern society.

DRAWING CREEPY PLACES: REPRESENTING LIMINAL RITUAL SPACES OF KURUMAN, SOUTH AFRICA

DR SECHABA MAAPE

ABSTRACT

Ritual sites have been studied and discussed by scholars in the disciplines of architecture, anthropology and archaeology. Within these disciplines, these spaces are typically represented using Western objective and scientific methods of representation including cut plans and sections, as well as laser scans. Using three ritual sites in the Kuruman area of South Africa as case studies, the paper argues that modern methods of representation have the potential to strip away the value of these spaces for those who use them for their spiritual and ritual purposes. The paper explores forms of representations that engage ritual spaces towards revealing their value for local practitioners who still use them, as well as humanity at large. The paper concludes by discussing the need for better understanding these spaces in relation to our contemporary global crises, and the role of representation of these spaces towards deeper forms of habitation.

INTRODUCTION

Kuruman is my home, and my people have inhabited its landscape for thousands of years.[1] It's beautiful, large, and wild landscapes have always held meaning for us, and continue to do so even today. It is characterised by great flat savanna bush veld, gentle hills, and a towering, massive, crisp blue sky. It is a magical landscape, sometimes harsh with heat, and in the wet seasons, precious water collects in pans and water holes, and falls down the ridges of rock shelters and caves. Water, earth, sky, rock shelters, and caves characterise the vitality and flux of this animated landscape.[2] This vitality of life was always sensed by my people, and through engaging particular spaces in the landscape we found ways of connecting. In this way we could be sensitive to the changes in our landscape, adapt, and make meaning.[3]

Today, contemporary society faces numerous complex challenges like issues of environmental collapse. Through studying my people in the past and in the present, I have discovered that we have faced environmental crises before, and ritual practices were part of the way we responded and built resilience. These practices mobilize brain chemicals in ways that makes rituals the methods of creating psychological adaptation and inducing dissolution of past behaviour as a response to environmental flux.[4] Ritual spaces are one of the tools that aid in the dissolution of the self.[5] Such spaces have been studied by researchers and scholars, and the methods of analysis and mapping of these spaces and their subsequent representations, particularly in fields like architecture and archaeology, have primarily taken the form of objective methods and techniques.[6] The result of these forms of representation, other than being useful research resources, is that they do not always include other forms of value of these spaces, particularly their value as tools of dissolution.

I will be discussing three ritual sites in the Kuruman area of the Northern Cape in South Africa which have gained considerable attention from researchers, one having been scanned using 3D laser scanning.[7] My argument is that these scans fail to engage the still-existing cultural value of the sites. I will be discussing field work findings that demonstrate the spatial and correlative ritual value of such spaces, particularly their link to emotionally charged narratives, and argue through an interpretation of ritual framed within cultural neurophenomenology that through these emotionally charged narratives, along with the form, quality, and locations of these spaces, the sites are rendered conducive for ritual purposes. In addition I will present exploratory drawings that are ways of engaging these sites and highlight their cultural value.

RITUALS—THE CULTURAL NEUROPHENOMENOLOGICAL APPROACH

Cultural neurophenomenology is the study of cultural practices, such as rituals, using a collation of data sets from anthropology, neuroscience, and the phenomenological traditions.[8] It claims that the cross-cultural experiences cited in anthropological texts are a reflection of our embodied selves with a particular brain, while at the same time not reducing such experiences to mere brain activity.[9] Neuroscientist Walter Freeman argues that rituals are in fact processes by which people adapt to new circumstances through the mobilisation of brain chemicals that facilitate dissolution and psychological change:

> The biological techniques of inducing dissolution are well known. *Individuals separate themselves or are isolated from their normal social surroundings and support systems.* They engage in or are subject to severe exercises … and the induction of powerful emotional states of love, hate, *fear* or anger [my emphasis].[10]

This description of ritual, particularly life crisis rituals, corroborates with many anthropological interpretations.[11] A key component of the process is the mobilisation of specific brain chemicals through the induction of various physiological and psychological states as in rhythmic clapping, chanting, and singing. Neuroscientists, through a number of studies and using various methods, conclude that these cultural practices, with the aid of the mobilisation of brain chemicals such as oxytocin, have the ability to do two things: create new bonds between people, and re-frame one's perceptions of the world and themselves.[12]

This process reframes one's boundaries of self, as in the assimilation of the self and a particular belief, a group, a set of circumstances, or a place. Previously held beliefs and biases become recalibrated, in many instances through an ordeal—what is commonly and unfortunately known as "brain washing"—and room is made for new sets of beliefs and perceptions. These rituals require specific conditions, and as seen in the above quote, one such condition is spatial. Being isolated, and in other cases being secluded in a dark, quiet cave or a remote forest tied to lifelong fearful myths, becomes the ideal set of circumstances for the induction of the appropriate psychological states, allowing for the possibility of change to occur.

Change and transformation are at the heart of these practices. This may be antithetical to most Western cultural norms and practices, especially the coercion of change in an individual's behaviour through fear, but many indigenous cultures across the world appreciate and continue to practice such rituals and understand them to be wisdom. This is no different in the context of my home; understanding fear as a way of reframing one's behaviour is intimately tied to respect and a process of maturation that sets up a human to ultimately and appropriately relate with life, and especially the natural world, with reverence.

This interpretation of ritual processes is crucial for my argument, and as we will see below, is demonstrable in cultural, artistic and spatial practices of indigenous communities in the context of Kuruman.

RITUALS SITES IN THE KURUMAN AREA

A dominant belief in Kuruman is that of a mythical snake; from a very young age, people in the community are told stories about this snake. It is known for causing numerous environmental calamities in the community, natural forces, lost people, and other tragic situations. It is strange in form and character, travels along underwater rivers and channels, is known to shape-shift and trick its victims, and is especially associated with "taking" people to specific places, especially water bodies and caves.[13] Caves and water bodies in general, and specific caves known to be the dwelling place of the snake, are seen by some in the community as frightening, to such an extent that people sometimes avoid crossing a stream, or entering a particular space.

Logobate Cave

These spaces, as much as they are dreaded, are precisely where teenage initiation and other ritual practices are performed. Logobate Cave, located on the fringe of Logobate village just north of Kuruman town, is a site for teenage female initiation and other forms of supplication. The cave is separated from the village by a river. The river is associated with the death of a young pair of twins who were taken by the snake, drowned and killed in the river, a narrative known throughout Logobate and told to many in their formative years. Having reached puberty, girls begin their secret initiation rites at a dwelling in the village, and are then taken to a proximal distance from the cave where they continue their ritual practices, including singing and dancing. The ritual requires the young girls to cross the river to the cave.[14] In this way, crossing a deeply embedded form of psychological priming that has been successfully instilled through conditioning, in the form of the narratives of the snake, makes the river and the cave a mythical boundary that needs to be crossed, thus allowing the initiate to successfully survive the snake as a mark of being an adult.

Ga-Mohana rock shelters

Another ritual site is Ga-Mohana rock shelters, located at a remote hill away from the nearest settlement. There are no signs or directions indicating the exact location of the ritual sites. They are made deliberately obscure and difficult to find. They are also associated with the snake, and similar to Logobate, are the place where the snake takes its victims once it has snatched them. There are two rock shelters: a main rock shelter where there are visible signs of ritual practice, and a second rock shelter that has rock paintings likely linked to early herder/hunter-gatherers, as well as rock gongs and rock engravings on large dolomitic rocks that all have evidence of contemporary ritual activity.[15]

The rock engravings have snake-like motifs on them, and are located specifically at an area of the site that collects water during wet seasons. This site has also been associated with male initiation rituals. Similar

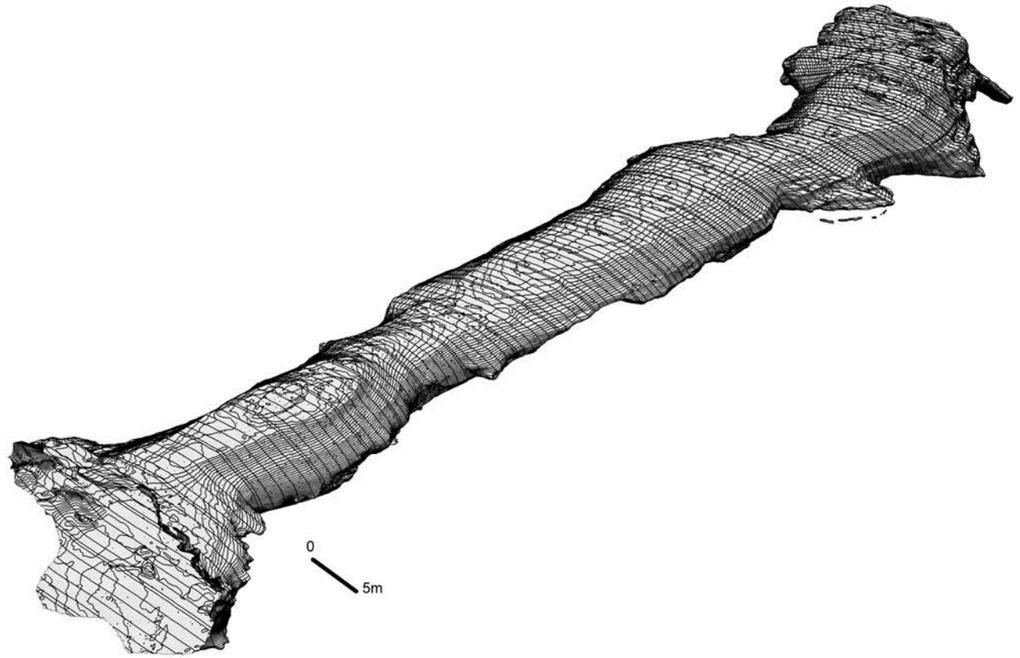


Figure 1: *3D scan: Zamani Project, Wonderwerk Cave.* Courtesy: School of Architecture, planning and geomatics UCT, 2009

to Logobate, initiates also have to cross mythical boundaries associated with the snake, such as water bodies or entrances into the actual rock shelter. Again, this means that initiates are required to face a life-long, established fear as part of their ritual process. Recently Ga-Mohana has become a research site. There have been significant archaeological and Palaeolithic findings at both the small and large shelters.[16] This has raised concerns regarding the manner in which both value the space, namely how ritual and research value will co-exist.

CHALLENGE OF REPRESENTING RITUAL SPACES

Wonderwerk Cave

These types of concerns are most prevalent in the third case, the Wonderwerk Cave. This particular cave has been extensively researched, primarily due to its archaeological value.[17] Although there has been some acknowledgement of its ritual value, very little has been explored in this regard. The cave is located about 40km away from Kuruman, near a water hole. It is a deep cave, about 140m horizontally into a hill. A consequence of its form is that the cave, particularly at the back, is extremely dark and quiet. Another key feature of the cave is its rock paintings, highly enigmatic images, some of known creatures and others of abstract shapes all layered and in some places fading and vague. Both the cave and the sinkhole are known to be places where the snake resides.[18] One story about the snake in relation to this particular cave is that once having "taken" its victims, it transports them to Chicago and engages them in endless sinning, then brings the person back so that they subsequently die and spend eternity in hell.[19] Therefore, albeit minimal, there are still associations of cultural value with the space.

This site was scanned in 2009 using "3D laser survey combined with conventional survey, photogrammetry and 3D modelling."[20] (Figure1) The project of scanning the cave was primarily focused on the "most important components of the site" and the scan was seen as an "integral part of the ongoing research."[21] However, there is no evidence in the method pointing to an appreciation of the ritual value of the site, perhaps through the inclusion of local ritual practitioners and following particular cultural protocols in the methodology, or even the subsequent representation. For instance, the scans expose the entire cave and represent it as an empty space.[22] Given the discussion above regarding the presence of the snake at this site, presenting the site as an empty space with no evidence of the snake means that those who depend on the fear of the space as part of the ritual process are presented with an impotent site. The location and structure of the cave is also not concealed, which may undermine its potency as a mysterious and frightening space.

The snake is known to be able to access this cave and all the other caves in the area through a series of underground tunnels, which is perhaps how it could transport its victim to Chicago to sin. In the 3D scanned representation, the cave merely ends, which is of course what in fact happens, but in exposing this, the representation undermines its mythical potential. Finally, and most importantly, the cave is a naturally and extremely dark, quiet space. For anyone potentially visiting the cave for its ritual qualities, this darkness and quietude would be invaluable, because it is in the darkness where the snake resides. The darkness makes the existence of the snake a possibility because one cannot see or affirm the snake's presence. However, in the laser scan, the cave is completely illuminated (which is similar to how the cave is illuminated by large flood lights during tours), a representation of the cave that totally negates its ritual and experiential quality.

Therefore, the laser scan of the Wonderwerk Cave presents a challenge and exposes the preconceptions of what is of value for both the researchers scanning the cave and those engaged in the ongoing archaeological research. The exposing of the cave, and the total survey of it, are reminiscent of the colonial and enlightenment project of "discovery" and conquest.[23] In this way, the cave scans have revealed and exposed the so-called

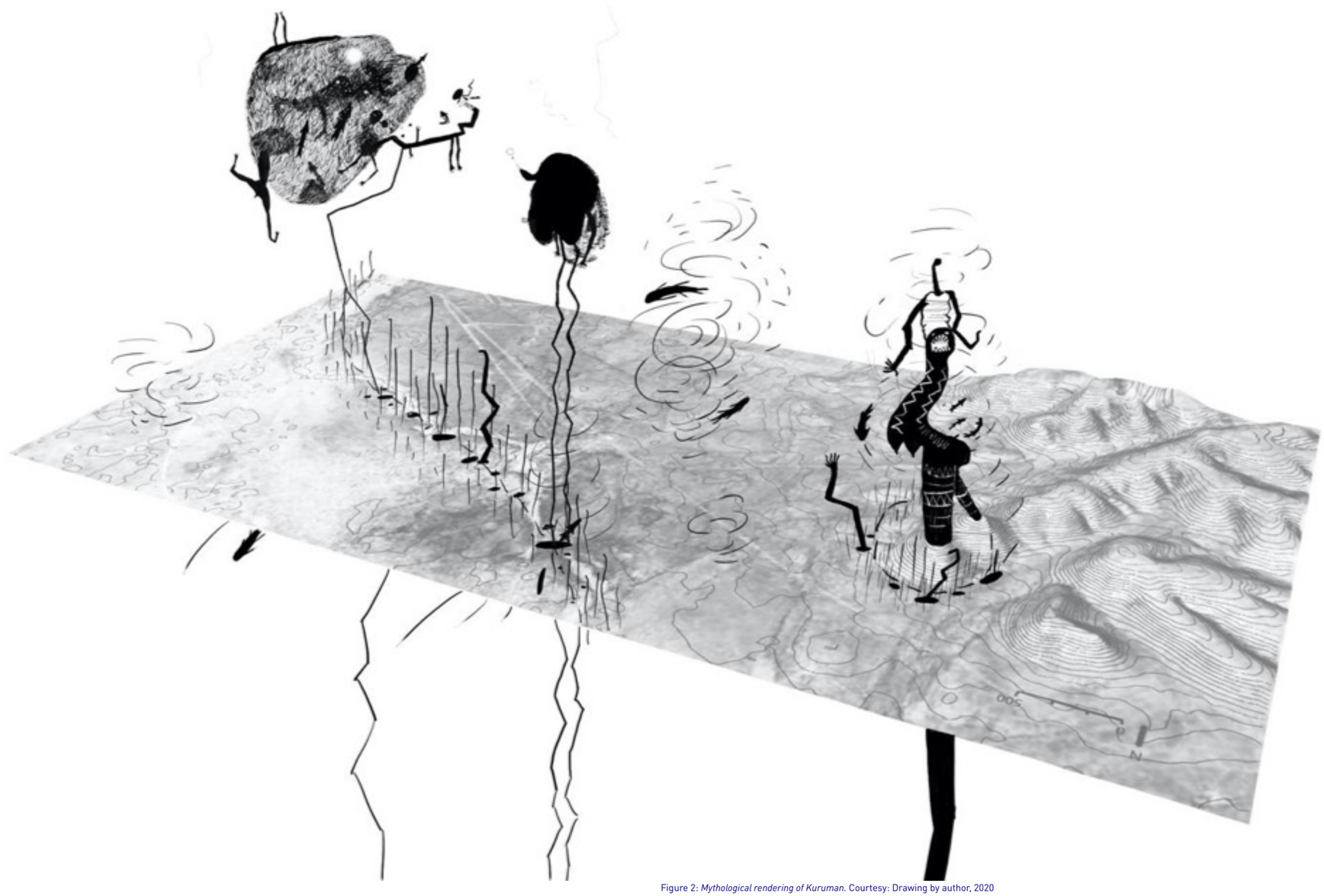


Figure 2: *Mythological rendering of Kuruman.* Courtesy: Drawing by author, 2020

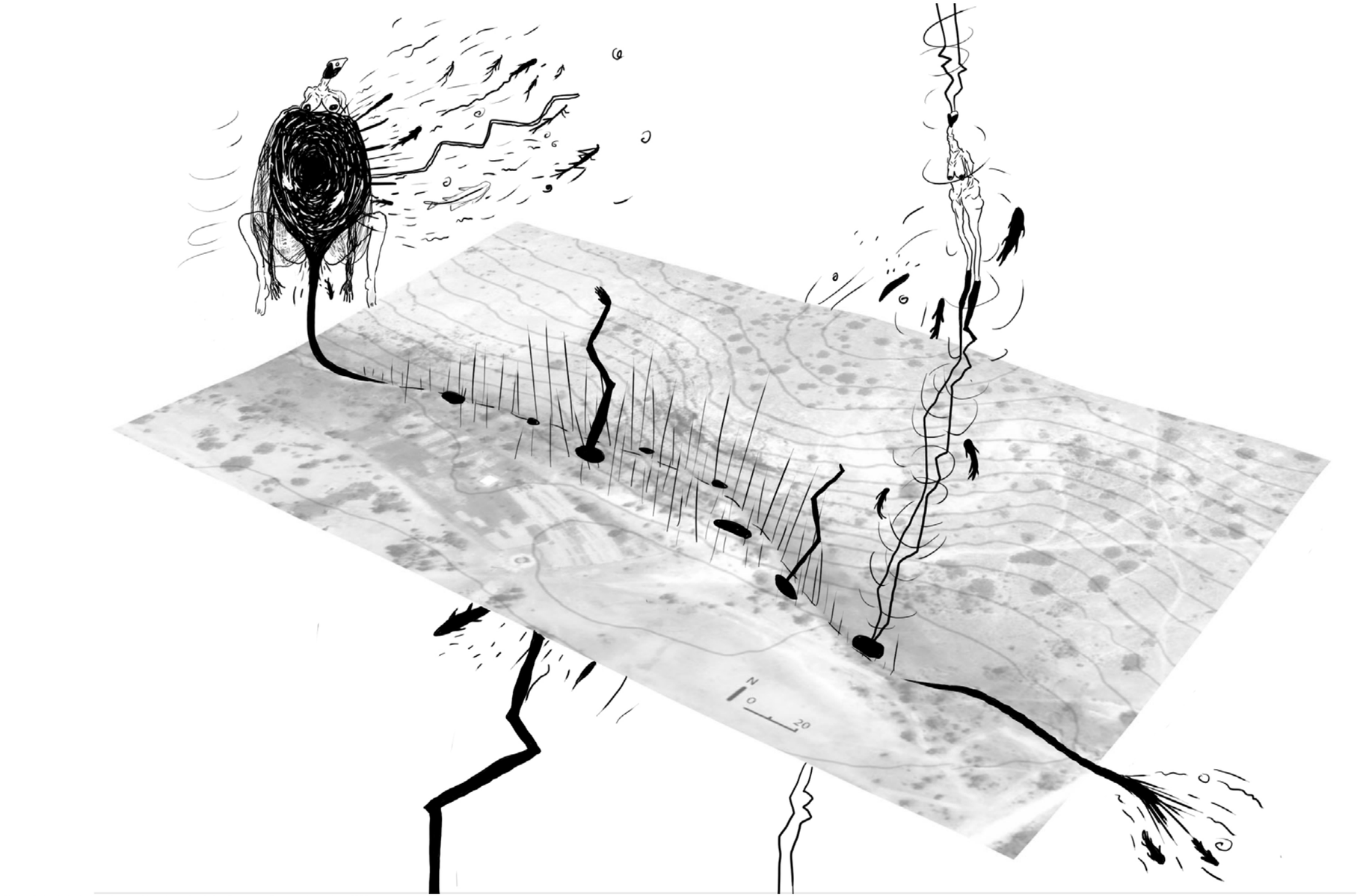


Figure 3: *Mythological rendering of Logobate ritual site.* Courtesy: Drawing by author, 2020

objective truth about the cave, which seems to be the appropriate and valued manner of engaging the site, exposing many significant archaeological and paleontological findings. The uncovering or discovering of the cave merely exposes what is there, shining a light on the darkness of ignorance. However, the one very objective element of the cave, which is by far its most prevalent spatial quality—its darkness—has not been captured in the representations at all. This same darkness is indeed what makes the cave ambivalent, and thus allows for the possibility of the snake. The darkness and seclusion make the cave valuable for those using it for its ritual purposes, which is in stark contrast to the project of illuminating the cave.[24] Thus, the project of representing objectively the "true" form of the cave immediately conceals it, while on the other hand, the ambivalent shape-shifting snake is a much closer representation of the darkness, which thus ironically illuminates it.[25]

RE-MYSTIFYING OR UN-DEMYSTIFYING THE LANDSCAPE

Through an exploratory method of drawing, in which the landscape was rendered to include mythical representations of the snake, I have begun exploring possibilities of opening up avenues to entrench, in some cases, and reinstate in others, the cultural value of the various ritual sites in Kuruman. The method was to create drawings on 3D terrains of the actual ritual sites, both to re/mystify and make potent these spaces.

The base of the drawings, a toggled 3D terrain, was created using Google Sketchup. Various other software were explored, including 3D Photoshop, Rhino, Revit and AutoCAD. Most of this software is used for architectural design and representation, but none of them could adequately respond to the cultural need of including mythical elements within the landscape. The base drawings were overlaid with images of the snake and other mythical symbols derived from the narrative collected from fieldwork, as well as inspired by pre-colonial indigenous African art from the numerous Southern African ritual rock art sites, including those discussed above. In addition, the drawings were also derived from my own personal emotions linked to

my life experience, having been told since childhood about the snake. Although this was, to a degree, idiosyncratic and subjective, it also took into account the intersubjective, collective experience of the people of Kuruman. These drawings were hand-drawn using a stylus pen on a tablet, then collaging it using Photoshop software with the toggled 3D terrain base map.

The drawings therefore include the ambivalent and fluid snake, not as a mere metaphor but as a representation of a real being that influences and facilitates the potential for a response to mutability. At the same time, the drawings represent the nature of these sites for those who value them as frightening spaces, and attempt to capture their equally ambivalent, liminal quality because in fact, ontologically speaking, the living and vital landscape *is* the snake. (Figure 2, 3, 4)

CONCLUSION

The tragedy of the forms of representation of these spaces is that they conceal their true value. Rituals are fundamental in aiding the human psyche to adapt to a mutable and contingent world. Through various tools, including high levels of excitation induced by emotions such as fear or love, and the subsequent mobilisation of brain chemicals that create the potential for meaning-creation, the reconstruction or dissolution of the self, and unlearning, humans thus have the potential to adapt to change. In today's world more than ever before, it is no doubt a fundamental practice to be reacquainted with. ▪

ENDNOTES

1. This is in reference to long-term hominin habitation in this context

2. As in related to an animistic worldview, the worldview of many of my people in Kuruman

3. Sechaba Maape, "Architecture for resilience: dialogues with place in the indigenous communities of Kuruman during the Holocene period" (PhD dissertation, University of the Witwatersrand Johannesburg, 2016)

4. Walter Freeman, *Societies of Brains: a study in the neuroscience of hate and love, Volume 2.* (New York: Psychology Press, 2014)

5. Thomas Barrie, *The Sacred in-between - The mediating roles of arcitecture,*

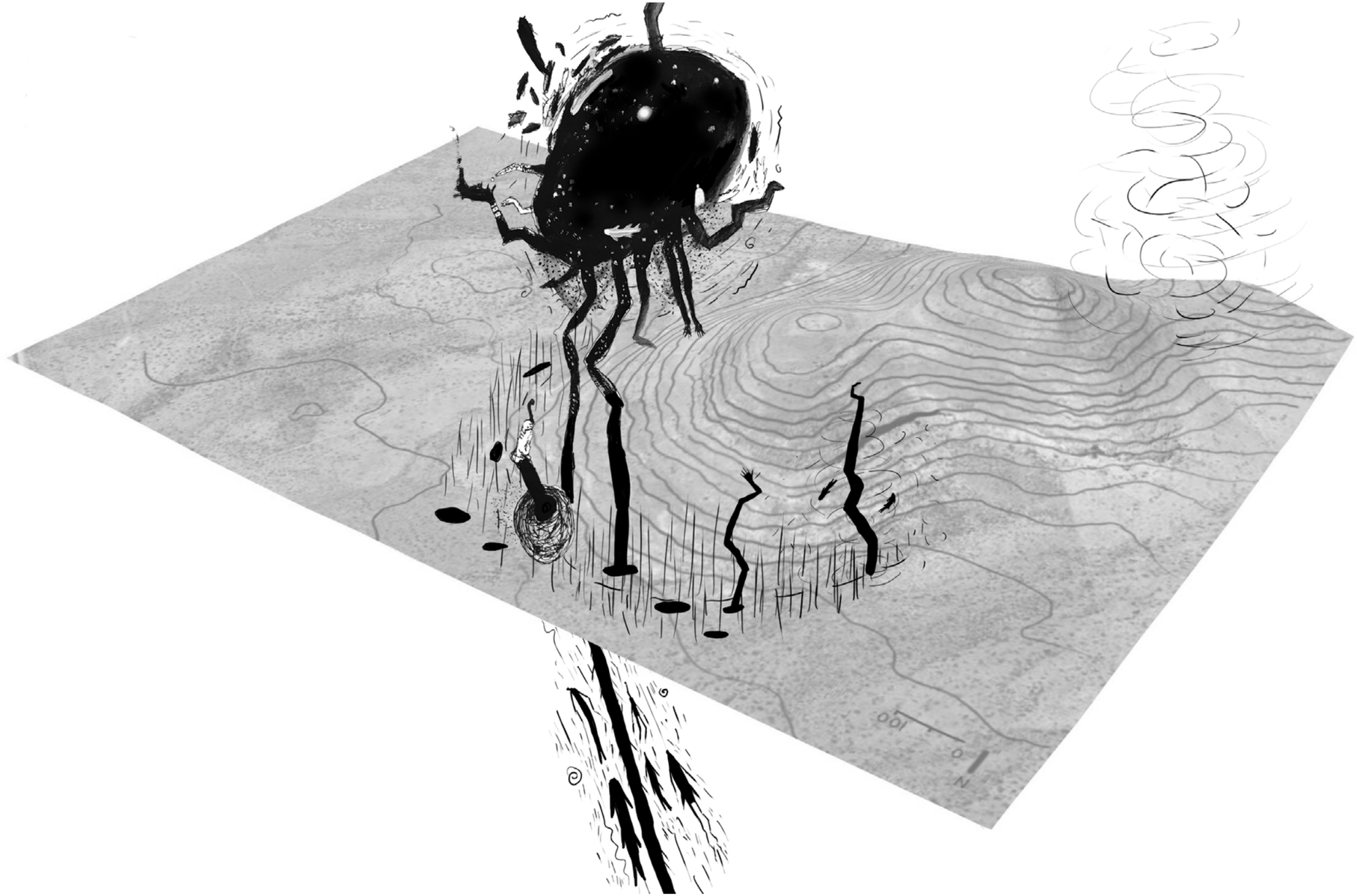


Figure 4: *Mythological rendering of Ga-Mohana.* Courtesy: Drawing by author, 2020

Volumne 1. (Abington: Routledge, 2010.)

6. Francis, Ching, Mark Jarzombek and Vikramaditya Prakash, *A Global History of Architecture, Volume 3.* (New Jersey: John Wiley & Sons, 2017.)

7. Heinz Ruther et al, "Laser scanning for conservation and research of African cultural heritage sites: the case study of Wonderwerk Cave, South Africa." *Journal of Archaeological Science* 36 (September 2009) : 1848, https://www.sciencedirect.com/science/article/abs/pii/S0305440309001344

8. Jennifer Dornan, "Beyond Belief: Religious Experience, Ritual, and Cultural Neuro-phenomenology in the Interpretation of Past Religious Systems." *Cambridge Archaeological Journal* 1, no.14 (April 2004): 28, https://www.cambridge.org/core/journals/cambridge-archaeological-journal/article/beyond-belief-religious-experience-ritual-and-cultural-neurophenomenology-in-the-interpretation-of-past-religious-systems/4F139D5DE377F8305FF86164AC618FD8

9. Evan Thompson, "Life and mind: From autopoiesis to neurophenomenology. A tribute to Francisco Varela." *Phenomenology and the Cognitive Sciences* 3 (December 2004): 382 https://link.springer.com/article/10.1023/B:PHEN.0000048936.73339.dd

10. Walter Freeman, "Neurodynamic models of the brain" *Nueropsychopharmacology* 28, (June 2003) 54-63, https://www.nature.com/articles/1300147

11. Victor Turner, *The Ritual Process* (New York: Routledge and Kegan Paul, 1969)

12. See Freeman above and d'Aquili, E. & Newberg, "The neuropsychological basis of religions, or why God won't go away". Zygon 33 (2) June 1998) 187-201, https://onlinelibrary.wiley.com/doi/abs/10.1111/0591-2385.00140

13. Ansie Hoff, "The Water Snake of the KhoeKhoen and /Xam" *South Afrcican Archaeological Sociaty* 52, no.165 (June 1997): 21-37, https://www.jstor.org/stable/pdf/3888973.pdf?seq=1

14. Based on the secrecy of the initiation rituals in this context, it is not always possible, or perhaps even ethical, to extract exact details about the ritual processes. This has resulted in me making inferences based on information gathered in the field, observations, as well as reports of rites by other researchers in similar contexts.

15. For more detailed studies on archaeology at this site see, David Morris, L Pinto and J Louw "A dolomite rock gong at Ga-Mohana, a ritual site in the Kuruman Hills" *The Digging Stick* 35, no.2 (2018), 7–8. R Steel, "Kuruman rock engravings." *The Digging Stick* 5, no.1 (1988), 3-4, https://www.archaeology.org.za/sites/default/files/attachments/publications/2015/12/31/vol_5_no_1.pdf

16. Jayne Wilkins *et al*, "Fabric Analysis and Chronology at Ga-Mohana Hill North Rockshelter, Southern Kalahari Basin: Evidence for In Situ, Stratified Middle and Later Stone Age Deposits" *Journal of Paleo Archaeology* (March 2020). https://doi.org/10.1007/s41982-020-00050-9

17. A number of studies have been conducted related to the cave, see http://www.wonderwerkcave.com/wonderwerk.html

18. Michael Chazan and Liora Horwitz, "Milestones in the development of symbolic behaviour: a case study from Wonderwerk Cave, South Africa." *Debates in World Archaeology* 41, no.4 (December 2009): 521–539, https://www.tandfonline.com/doi/abs/10.1080/00438240903374506

19. Michael Chazan, Personal conversation, December 2017

20. Heinz Ruther *et al*, "Laser scanning for conservation and research of African cultural heritage sites: the case study of Wonderwerk Cave, South Africa." *Journal of Archaeological Science* 36 (September 2009) : 1848.

21. Ibid.

22. For images of 3D scans see https://www.zamaniproject.org/site-south-africa-wonderwerk-cave.html

23. Mary Nooter "Secrecy: African Art that conceals and reveals." *African Arts* 26, no.1 (January 1993): 55,56, https://www.jstor.org/stable/3337109?seq=1

24. Ibid. 56

25. For more on the politics of hidden landscapes see Manuel Shvartzberg Carrió's paper "Theorizing Decolonial Modernity: Towards an Architectural History of Jurisdictional Technics" in this edition of Dialectic.

26. This may also be determined by my own skills or choice of software; however, one can be confident that the makers of these software packages did not consider culturally determined uses.

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SAFE SPACE: WAR, RISK, AND GLOBAL HAZARDS IN HENRY DREYFUSS' HANDBOOKS

DIANA CRISTOBAL OLAVE

ABSTRACT

The anthropomorphic drawings of industrial designer Henry Dreyfuss, published throughout the multiple editions of *Designing for People* and *The Measure of Man,* served as a seminal instrument by which explorations of the relationship between humans and design entered into architectural discourses in North America after World War II. By means of quantification methods, statistical analysis, data collection techniques, and other methodologies borrowed from scientific disciplines, these compilations of drawings attempted to translate tedious lists of information into a graphic language that could easily be understood by designers, architects, and planners. Today, the values portrayed by the early versions of these handbooks—certainty, neutrality, legibility, objectivity—remain unchallenged. This is evidenced, for instance, by the overwhelming popularity of a recent Kickstarter campaign that raised more than $300,000 in less than a month to reissue some of the graphic devices that Dreyfuss used. A closer look into these anthropomorphic drawings, however, reveals that these human figures are far from neutral.

This paper traces the evolution of the values embedded in Dreyfuss' figures, from the "average" man—white, male, healthy, adult, middle class—to the statistical "extreme" and the "outlier," notions used to determine the needs of specific injured bodies. I argue that these drawings depicted the environment as a hostile threat to the body, and offered a picture of human's habitability through protective spatial enclosures against physical and psychological hazards. The sources and nature of these hazards shifted from warfare scenarios and factory threats in the immediate postwar era; to household and transportation accidents in the 1960s and 1970s; to environmental contaminants—pollution, biohazards, radiation—in the 1980s. And today, the same techniques used for visualizing environmental hazards have returned as a response to COVID-19. What began as a preoccupation with the efficiency of complex man-machine warfare equipment eventually evolved into a larger set of global hazards that no longer involved maximizing productivity. The different editions of the Dreyfuss manuals reveal a shift from an industrial society to a "risk society," and offer important evidence as to how design disciplines responded—and contributed—to reformulate the notion of risk after World War II.

INTRODUCTION

The anthropomorphic drawings of the industrial designer Henry Dreyfuss, published for first time in *Designing for People* (1955), and later revised and expanded in the multiple editions of *The Measure of Man* (1959-2003), and *Humanscale* (1974, 1981), served as a seminal instrument by which explorations of the relationship between humans and design entered into architectural discourses in the United States after World War II.[1] These compilations of drawings, displayed as a compendium of cross-referenced human data, were visualizations of large data sets. They attempted to translate tedious lists of information into a graphic language that could easily be understood by industrial designers and architects. By means of quantification methods, statistical analysis, data collection techniques, and other instruments and methodologies borrowed from scientific disciplines, these drawings were emptied of their ideological significance, assuming the paradoxical discourse of silence (Fig.1).

Today, sixty-five years after the first publication of *Designing for People*, these handbooks are still perceived as deeply committed to the rhetoric of scientific rationality and objectivity. Not only was a recent Kickstarter campaign launched to reissue some of the instruments that Dreyfuss Associates designed, it raised more than $300,000 in less than one week, with the support of more than 1,700 backers.[2] The astonishing popularity of the project can only be comprehended if we assume that the epistemic virtues portrayed by these handbooks—certainty, precision, neutrality, legibility—are operating nowadays in a very similar manner to when these publications first appeared.

As books of practice, design handbooks remain poorly understood and rarely theorized, and tend to encourage debates that alternate between the morality claims issued by their most ardent apologists and practitioners, and the normalizing accusations of their detractors (Fig. 2). It is not until recently that handbooks are receiving increasing scholarly attention, and that their seemingly universal bodies, humans, and "users" are being interrogated.[3] Writing against the backdrop of militarization, mechanization

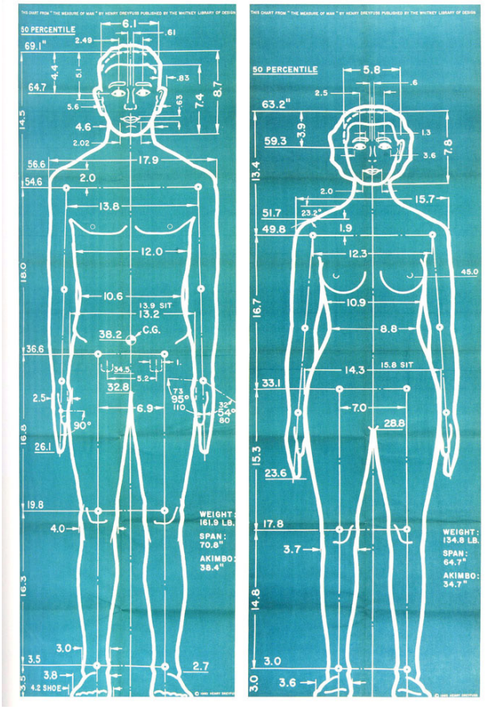


Figure 1: Average man and woman, Joe and Josephine. Henry Dreyfuss, *The measure of man; human factors in design.* (New York, Whitney Library of Design, 1960).

and industrialization, these scholars have excavated beneath the long-standing assumptions of neutrality and focused on notions of efficiency, productivity, and standardization.[4] This paper engages with these important discussions, but shifts the attention away from the guiding ethos of efficiency, to that of safety. It argues that Henry Dreyfuss' handbooks depicted the environment as a hostile threat to the body, and offered a picture of human's habitability through protective spatial enclosures against physical and psychological hazards.

A comparison between the different editions of *Designing for People*, *The Measure of Man*, and *Humanscale* reveals how their anthropomorphic figures hid dysfunctional and fragile bodies underneath the appearance of the natural metrics of man. From World War II, to factory threats in the immediate postwar era, to household

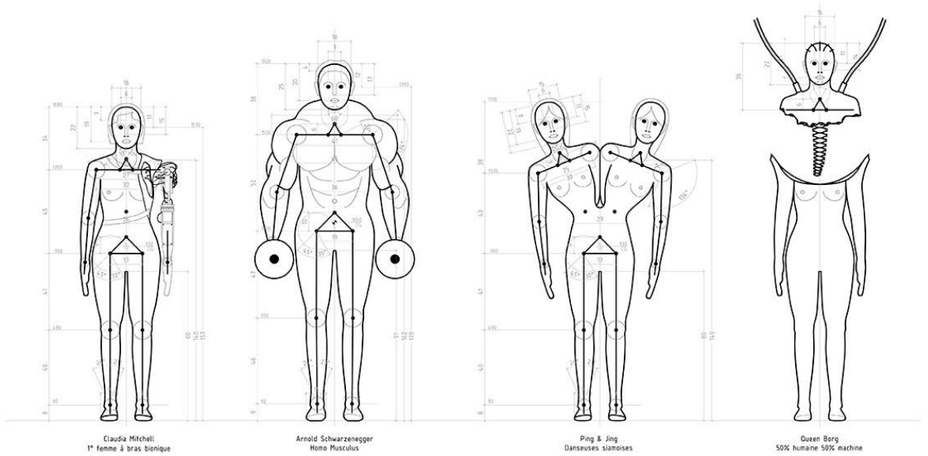


Figure 2: Thomas Carpentier, *Measure(s) of Man: Architects' Data Add-on* (2011).

and transportation accidents in the 1960s and 1970s editions, and to environmental contaminants in the 1980s, the Dreyfuss silhouettes appear as mediating outlines that aim to protect not only their vulnerable bodies, but also their wounded minds. What began as a preoccupation with the efficiency of complex man-machine warfare equipment eventually evolved into a larger set of global hazards that no longer involved maximizing productivity. The different editions of the Dreyfuss manuals reveal a shift from an industrial society to a "risk society," and offer important evidence as to how design disciplines responded—and contributed—to reformulate the notion of the human since World War II, ghost-writing many of the spaces that surround us nowadays.

IMMERSED IN DATA

Henry Dreyfuss Associates, and specifically industrial designer Niels Diffrient and *human factors*[5] specialist Alvin Tilley, were among the first to actively encourage the application of human factors in industrial design and architecture—an interest that came along with techniques of data collection. In 1960, Dreyfuss described *The Measure of Man* as a "miniature encyclopedia"[6] of human factors data presented in graphic form. Disturbed by the lack of any single body of knowledge that one could turn to, he explained how the office had been collecting books, articles, pamphlets, clippings, and dog-eared index cards since World War II, and methodically transferring such specialized knowledge into a "common language"[7] that could be shared by a non-technical audience.

Design was presented as a problem of information management. The obsessive collection of data into selector charts, cards, posters, scale figures, and manikins enacted an imaginary of design as a flexible and self-reflected interface—an interest shared by many designers after the impact of cybernetics and communication sciences after World War II. As a result, new techniques of calculation, measurement, statistical analysis, and storage became ethical and truth-producing methods that portrayed a fantasy of good, humane, and satisfying design. These techniques were considered "more reliable than intuition-based design"[8] because a growing body of data justified them. In other words, information overload had become valuable in itself, both a democratic virtue and an obligation.

The use of data collection techniques and statistical methods of analysis as evidentiary and persuasive devices is what separates Dreyfuss figures from the human silhouettes that appeared in earlier architecture handbooks. While Modernist conceptions of normative bodies, such as the ones that appeared in Ernst Neufert's *Bauentwurfslehre* or Ernest Freese's drawings in *Architecture Graphic Standards*, also appealed to pseudo-scientific and rationalized forms, these previous examples concealed the techniques and sources of measurements. In the Dreyfuss handbooks, data collection techniques were explicitly described throughout all editions. The nature of the data, however, shifted. What began in 1955 as a compilation of data about the "average" man measured in relation to the bell-shaped normal—white, male, healthy, nondisabled, adult, middle class—eventually evolved into an examination of the deviation itself, the statistical "extreme" and the "outlier." Moving away from the normative average man, succeeding editions of the handbook slowly showed other types of bodies. In 1959, the charts compiled for *Measure of Man* carried not only a drawn average male and female figure, but the "extreme"[9] small and large counterparts (Fig. 3).

Figure 3: "Extreme variations of the average man." Henry Dreyfuss, *The measure of man; human factors in design*, (New York, Whitney Library of Design, 1966).

Children were introduced in 1960. Racial differences and provisions for the disabled body and for elderly users were not drawn until the 1974 edition of *Humanscale* (Fig. 4). And Dreyfuss's original title, *The Measure of Man*, was only changed to *The Measure of Man and Woman* in 1993. What happened, then, between these years to produce such a significant shift of the architectural user?

Gender, age, race, and disabilities had slowly been introduced into the manuals, but their inclusion was not born from social justice discourses. Even if published amid the passage of major civil rights legislation for disabled people and people of color, terms such as *minorities* and the *oppressed* were first mentioned

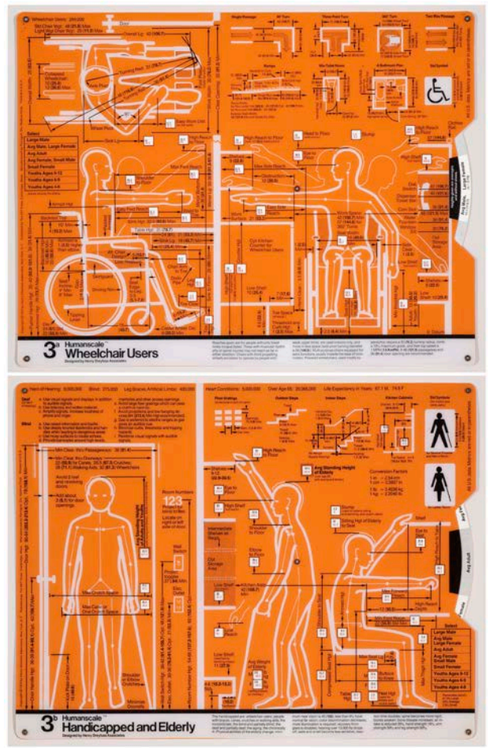


Figure 4: Provisions for "wheelchair users," the "handicapped" and the "elderly." In Niels Diffrient, Alvin R. Tilley, Joan C. Bardagjy. *Humanscale 1/2/3* (Cambridge, Mass, MIT Press, 1974.)

by Diffrient only in 1974 (and only in passing),[10] and normative terminology such as *cripples* or *handicapped* hinted instead to the intertwined interwar history of scientific management, human factors research, and rehabilitation that historian of disabilities Aimi Hamraie has traced.[11] Yet, the additions to Dreyfuss' handbooks directed more attention not only to the wheelchair user, but also to the aged, the paralytic, the blind, the deaf, the chronically ill, the obese, the socially alienated, etc. What, then, was shifting the attention away from the Gaussian distribution curve to the statistically atypical?

Merging military human factors and civil industrial design, the handbook's emphasis on non-normative, misfit bodies reflected designers' preoccupations with machine-driven danger. Its close relationship to the military ergonomic research conducted in Great Britain and America during World War II embedded Dreyfuss' images in the demands and exigencies of warfare, and brought designers to study the limits of the combined performance between men and machines by tackling physical and psychological problems. In the context of warfare, the bell-shaped normal could no longer respond to the needs of vulnerable and injured bodies. The exception, rather than the rule, became the focus of research and design.

WAR AND BODY

Dreyfuss Associates' interest in human factors grew out of their involvement with military design projects for World War II. From the design of combat vehicles, to specialized anti-aircraft protective devices, control devices, consoles, and prosthetic limbs for veterans, the participation of Dreyfuss Associates within war conflicts inflected their design values:

> Shortly after the war, our office was working on the interior of a heavy tank for the army. We had tacked a huge, life-size drawing of the tank driver's compartment on the wall... Surrounded by arcs and rectangles, he looked like one of the famous dimensional studies of Leonardo. Suddenly it dawned on us that the drawing on the wall was more than a study of the tank driver's compartment: without being aware of it, we had been putting together a dimensional chart of the average adult American male.[12]

These projects focused on the interaction between soldiers and their war equipment. They aimed at efficient man-machine systems and raised a whole range of psychological, anatomical, and physiological concerns—including stress, anxiety, and emotional disturbance.[13] Nothing can better portray the influence of the war in Dreyfuss' human factors research than the name chosen to designate the male version of the handbook silhouettes: Joe. Derived from the usage of G.I. Joe for the generic U.S. soldier, this theoretically average male adult refers specifically to the American soldier.[14] This American icon, seemingly young, strong, and healthy, is however reframed in terms of its potential to be damaged, both physically and psychologically. Underneath the appearance of the natural metrics of man hid dysfunctional and fragile bodies that suffered all types of pathologies: "Joe and Josephine have numerous allergies, inhibitions and obsessions,"[15] affirmed Dreyfuss already in 1955. A bad illumination could cause "nervousness, eye fatigue, or illness," while certain colors could make them "gay or sad; aid their digestion or make them ill."[16] "They react strongly to touch, ... they are disturbed by glaring, insufficient light and offensive coloring, and they are sensitive to noise."[17] In addition, Joe and Josephine are also frequently checked by all kinds of medical specialists: "ear doctors, neurologists, psychologists and opticians,"[18] for theirs is a preventive kind of research. What at first sight appeared as healthy was in fact broken and compromised, and invoked feelings of pain, fears, and anxieties.

This depiction of the human condition in terms of its failures and deficiencies responded to the traumatic experiences of World War II and its destructive aftermath. The postwar struggle was articulated around the necessity to respond to an irrevocably different world, one fundamentally changed by the horrors of combat, revelations about concentration camps, and the shock of the atomic and hydrogen bombs. The consequences of this scenario were not only physical or limited to those bodies that directly experienced the battlefield. As historians of architecture and technology Paul Virilio and John Harwood have demonstrated, the nuclear bomb was a paradigmatic example of a world-destroying object that distorted the relationship between subjectivities in a warfare scenario.[19] Space had become weaponized to an unprecedented scale, and the human being was responsible for it. World War II turned bodies into targets and the environment into a hostile and unsafe setting from which those bodies had to be protected.

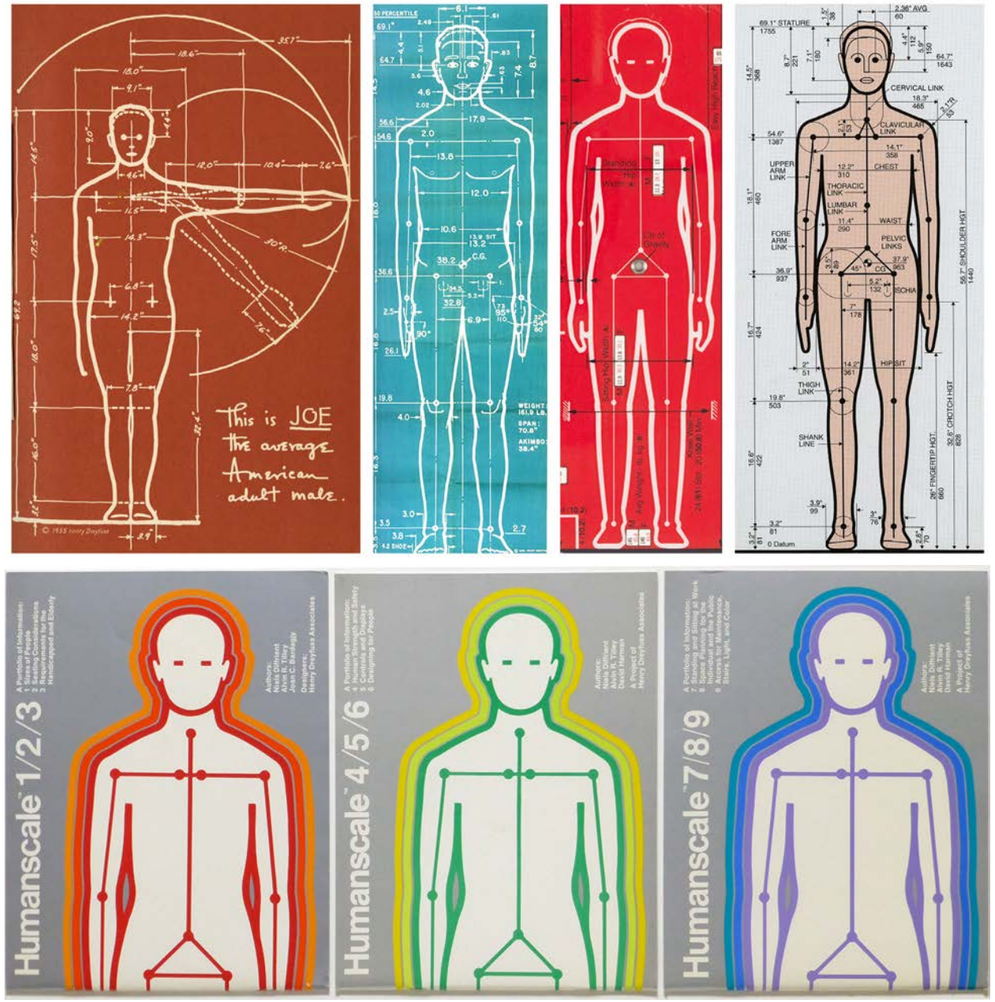


Figure 5: Evolution of the figure of Joe throughout different editions. Note the continuous emphasis in the skin.
Left to Right: Henry Dreyfuss, *Designing for people*, (New York, Simon and Schuster, 1955); Henry Dreyfuss, *The measure of man; human factors in design*, (New York, Whitney Library of Design, 1960); Niels Diffrient, Alvin R. Tilley, Joan C. Bardagjy. *Humanscale 1/2/3* (Cambridge, Mass, MIT Press, 1974.); Alvin Tilley, *The Measure of Man and Woman* (New York: Whitney Library of Design, 1993); Niels Diffrient, Alvin R. Tilley, Joan C. Bardagjy. *Humanscale 1/2/3* (Cambridge, Mass, MIT Press, 1974.); Niels Diffrient, Alvin R. Tilley, David Harman. *Humanscale 4/5/6* (Cambridge, Mass, MIT Press, 1981); Niels Diffrient, Alvin R. Tilley, David Harman. *Humanscale 7/8/9* (Cambridge, Mass, MIT Press, 1981.)

In this context, Joe and Josephine's anthropometric drawings should also be seen in relation to the war traumatic experiences. These empty silhouettes show no organs or skeletal structures, only outlines that denote an interface between man and environment (Fig. 5). Unlike detailed representations of anatomical studies, these drawings depict a simplified body outline, smoothed of any anomalies and variations. Excluding the accidental and eliminating impurities, they select, compare, typify, and generalize. They seek out the commonalities and differences of the studied subjects, separating the typical from the particular. They teach the observer to look at the essential and overlook the incidental. They are simplifications achieved by pictorial taxonomy.

But these harsh, bold, and thick outlines have a further signification. The obsession with an enclosed and simplified figure was not only the result of a logic of taxonomy and replicability—otherwise joints and axes would have taken on a greater relevance—but also an effort to redirect attention from the interior of the body towards its periphery, its surface. This boundary, conceptualized as a potential barrier against traumatic experiences, encloses the body in order to protect the mind. Seen from this perspective, Joe and Josephine's contoured bodies appear as mediating outlines that aim to protect not only their vulnerable bodies, but also their wounded minds. Their thick skins serve as a reinforced boundary that shields, prevents, and alleviates traumatic neuroses. They represent the desire to counteract a hostile environment that had become weaponized to an unprecedented degree from the smaller scale of the human body. Like suits of armor, Joe and Josephine's bold outlines and spatial envelopes protect the human subject from excessive external stimuli. The thicker this outline, the greater external variations they can survive.

OTHER HOSTILE ENVIRONMENTS

Concerns with hazards and safety permeated all the editions of Dreyfuss handbooks, but the sources of these hazards changed. Whereas the first edition of *Measure of Man* shows Joe and Josephine standing and sitting in standardized work areas filled with multiple safety requirements (safety guards, non-slip treads and floors, illumination that avoids reflection, etc.),[20] the 1966 edition no longer focus only on the performance of the machine operator. The extended set of drawings included Joe and Josephine seated in multiple vehicles: an automobile, tractor, airplane, railroad, bicycle, and even a space couch. Coinciding with public claims against the automobile industry for their reluctance to increase safety measures, such as the ones offered by consumer advocate Ralph Nader in *Unsafe at Any Speed*, Joe and Josephine were described as experiencing new sets of transport-related pressures, including dizziness, claustrophobia, lumbar and thoracic pain, and varicose veins, among others. In 1974, *Humanscale* shifted the emphasis once more and showed the household as a major source of danger, and the children and the elderly as the main subjects at risk. From open spaces in railings for stairs, landings, and balconies to open stair risers, slippery treads, undetectable hot objects, sharp edges, small objects, and even dust, the house was depicted as a space in urgent need of safety improvement, and so it was progressively filled with devices and appendages that minimized the danger.[21] However, it was not until 1981 that the sources of danger acquired an unprecedented scale, no longer limited to a defined space or a certain population group. Coinciding with the rising environmental movement, in this edition of *Humanscale* Diffrient identified more than seventy-five different types of danger sources related to environmental hazards, contamination pollutants, biological threats, and nuclear waste, and compiled their symptoms, effects, tolerances and human protections in a graphic form. He referred to the designed selector chart as a device that could enable a "rapid retrieval of basic information on dangers of humankind"[22] (Fig. 6).

From warfare scenarios and factory threats in the immediate postwar era, to household and transportation accidents in the 1960s and 1970s editions, and environmental contaminants in the 1980s, the earlier concerns with efficient man-machine relationships eventually evolved into a larger set of dangers that could no longer be limited to the space of the battle or to the work space, and that no longer involved maximizing productivity. In this transition, the different editions of the manuals designed by Dreyfuss Associates rendered visible the transition from an industrial society to a "risk society," as defined by the German sociologist Ulrich Beck:

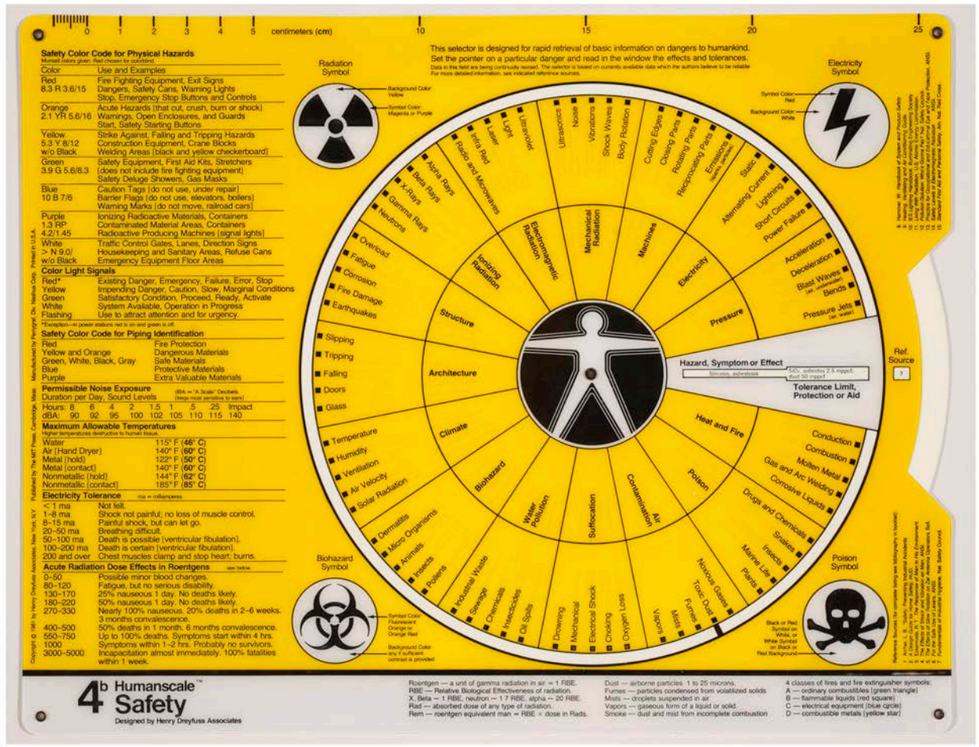


Figure 6: Graphic selector that identifies more than 75 sources of danger. In Niels Diffrient, Alvin R. Tilley, David Harman. *Humanscale 4/5/6: a portfolio of information*: 4. Human Strength and safety; 5. Controls and displays; 6. Head and vision. (Cambridge, Mass, MIT Press, c1981.)

> Risks may be defined as a systematic way of dealing with hazards and insecurities induced and introduced by modernization itself. Risks, as opposed to older dangers, are consequences which relate to the threatening force of modernization and to its globalization of doubt. They are politically reflexive.[23]

The later risks described by Dreyfuss Associates were no longer limited in time (future generations would be affected) nor in space (they crossed national boundaries). They became more difficult to perceive, and consequently to measure, manage, and control. As Ulrich Beck noted, in a *risk society* the focus is "more and more on hazards which are neither visible nor perceptible to the victims… hazards that require the sensory organs of science—theories, experiments, measuring instruments—in order to become visible or interpretable as hazards at all."[24] Thus, it comes as no surprise that the measuring techniques used by Dreyfuss Associates also shifted. If the postwar context saw the use of anthropometric techniques derived from military uses, such as the "andrometer"[25] that was used to make distinctions between successful fighters and those whose bodies were less likely to successfully win in armed combat, later editions portrayed a progressive interest in devices that measured less perceptible hazards.

An example of this appeared in the 1975 article

Figure 7: Selection of measuring devices depicted in Niels Diffrient, Joan C. Bardagjy and Nicholas Polites, "Dimensions of Experience: Understanding and Measuring Human Experience in the Designed" in *Design Quarterly, No. 96, Dimensions of Experience* (1975)

published by Diffrient for *Design Quarterly*, that compiled measuring tools and techniques used in a wide range of disciplines—from psychotherapy to behaviorism, anthropology, and sociology. The long list of measuring devices tested the limits of human inhabitation by measuring the body's physical and psychological response to various environmental phenomena. The electrogonometer, for example, recorded muscle activity and was used to treat hands with arthritis, polio, and stroke; the heat suit measured energy expenditure and was used to design specialized requirements in hospitals; eye movements were measured to enable quadriplegics and those who lacked arms or legs to control a motorized wheelchair; voice prints were studied to measure psychological states; and techniques to measure body sensitivity were applied to the design of prosthetic devices[26] (Fig. 7). Either monitoring oneself or others, these technologies were aimed at analyzing people's responses to changing environmental stimuli.

The shift from anthropometric tools that measured distances to devices that measured stimuli runs parallel to the shift from occupational hazards to global risks. Such changes reveal a different attitude to the notion of safety: from safety as a means to maximize efficiency and labor productivity in a work environment (an attitude derived from earlier "scientific management" practices), to safety as a means to achieve ethical and socially responsible products. This transition came alongside the departure from the average man, to the inclusion of certain minority groups. As the needs of wheelchair users, the elderly, the ill, etc. began to be considered, the manual's authors departed from concerns with maximizing economic productivity and claimed that the manual could become an opportunity to respond to social issues from the point of view of design.

It could be argued that such a shift was never achieved. Recent responses to the handbook, such as the one drawn by architect Thomas Carpentier, demonstrate with great creativity how normative these handbooks still are. Departing radically from the notion of the average or the standard, Carpentier's graphic subversion of Dreyfuss' silhouettes shows how these manuals could explore diversity rather than continue to carry modernism's dream of standardization and universality. But beyond criticizing Dreyfuss' normativity, projects like Carpentier's signal the main challenge of so-called "user-centered" design: how to accommodate the needs of a greater diversity of bodies and still account for replicability. Maybe one important lesson that we could extrapolate from the evolution of the Dreyfuss manuals is that the concerns of people with disabilities, the chronically ill, the elderly, etc. are not marginal, but rather central to a diverse population with a host of potential vulnerabilities. In the current COVID context, where the environment is being conceptualized (again) as a potential source of danger for a vulnerable body, such lesson seems more important than ever before. ▪

ENDNOTES

1. *The Measure of Man* was revised and enlarged in 1967; then again in 1994, 2001, and 2003 under the name *The Measure of Man and Woman. Humanscale* was first published in 1974, and then expanded in 1981.

2. See https://www.kickstarter.com/projects/iacollaborative/reissue-of-humanscale/posts/1961090 (accessed August 15, 2020)

3. Much of this attention has been garnered around Ernst Neufert Bauentwurfslehre. See Nader Vossoughian, "Standardization Reconsidered: Normierung in and after Ernst Neufert's Bauentwurfslehre (1936)," *Grey Room,* 54 (2014): 34-55; and Anna-Maria Meister "Ernst Neufert's 'Lebensgestaltungslehre': formatting life beyond the built" *BJHS Themes*, 5 (2020), 167-185. For a comparison between Ernst Neufert and Henry Dreyfuss handbooks see John Hardwood, "The Interface: Ergonomics and the Aesthetics of Survival," Aggregate, ed. Governing by design architecture, economy, and politics in the twentieth century, (Pittsburgh, Pa: University of Pittsburgh Press, 2012); and Paul Emmons and Andreea Mihalache "Architectural handbooks and the user experience" in Kenny Cupers, ed. Use matters: an alternative history of architecture (Abingdon, Oxon ; New York : Routledge, 2013.): 35-50. From a contribution to this scholarship from the point of view of disability, see Aimi Hamraie Building Access: universal design and the politics of disability (Minneapolis : University of Minnesota Press, 2017).

4. For a theorization on architectural standards as closely tied to military-industrial efficiency, see Vossoughian, "Standardization Reconsidered", 34-55. For a further relationship between technical 'norms' (standards) and social 'norms' (modes of conduct that enhance productivity and save time), see Meister "Formatting life", 167-185. For a brief compendium of how the human subject has been represented and 'designed' across multiple timeframes and geographies in architecture circles (with a focus on productivity, efficiency, and industrialization) see Beatriz Colomina and Mark Wigley "The Frictionless silhouette," Are we human? (Zürich, Switzerland : Lars Müller Publishers, c2016.): 147-161. Even the scholarship written from the perspective of the politics of disability argues that "ergonomic" design was about military-industrial efficiency. See Hamraie "Flexible users," Building Access.

5. *Human factors* or *human engineering* was the term used in the United States to denote the problems of human work and control operations that came into

prominence during World War II. The demands and exigencies of warfare raised questions concerning the design of the equipment and machinery, and brought psychologists to collaborate with physicists and engineers in the design of aircraft and electronic equipment. The institutionalization of the discipline came in 1956, when the Human Factors Society of America was voted into official existence. See "Human Factors a Brief History" in Alvin Tilley, *The Measure of Man and Woman; Human Factors in Design* (New York: Whitney Library of Design, 1993): 9

6. Henry Dreyfuss, *The Measure of Man; Human Factors in Design*, (New York, Whitney Library of Design, 1960): 4

7. Niels Diffrient, Joan C. Bardagjy and Nicholas Polites, "Dimensions of Experience: Understanding and Measuring Human Experience in the Designed" in *Design Quarterly*, No. 96, Dimensions of Experience (1975): 16, 19.

8. Diffrient et al. "Dimensions of Experience", 9

9. This is the term that both Dreyfuss and Diffrient use. As referred to in the handbooks, it includes all those below the fifth percentile and above the ninety-fifth percentile.

10. Diffrient et al. "Dimensions of Experience", 7

11. Aimi Hamraie argues that early disability discourses were entrenched in notions of military-industrial efficiency and productive citizenship, as defined by a person's amenability to both rehabilitation and enhancement. See Hamraie, *Building Access*, 41-64.

12. Dreyfuss, *The Measure of Man*, 4

13. Mainly taken from Air Force and Navy sources, the bibliography of *Measure of Man* cites medical, psychological, and physiological survey reports for military aircraft and undersea crafts that examine not only human measures in relationship to war machinery, but also the effect of psychological stress, anxiety, and emotional disturbance in warfare, and the design of prosthesis for amputee populations. For the complete bibliography see Dreyfuss, *The Measure of Man*, 15

14. During World War II the term "G.I. Joe" was used to refer to an enlisted soldier of the U.S. Armed Forces. The name appeared in the 1945 American film *The Story of G.I. Joe*; in 1952 it was used to name a large retail chain of army surplus merchandise in Portland, and in 1963 it gave birth to the military action figures developed by Stan Weston. In the context of the Dreyfuss handbooks, "G.I. Joe" first appears in the 1955 edition of *Designing for People*. See Henry Dreyfuss, *Designing for People*, (New York, Simon and Schuster, 1955): 30

15. Dreyfuss, *Designing for People*, 27

16. Ibid., 37

17. Ibid., 27

18. Ibid., 36

19. In contrast to other types of distance weapons that still encompass the concept of targeting (marking a subject and engendering a space in which both the target and the targeted are part of the same logic), the target of the bomber was no longer a subject, a machine, or an army, but the whole extension of the territory. See Paul Virilio, *Pure War* (New York, N.Y., U.S.A.: Semiotext(e), c1983.) and John Harwood, "The Wound Man: George Nelson and the "End of Architecture"" *Grey Room*, No. 31 (Spring, 2008): 90-115

20. Dreyfuss, *The Measure of Man*, 13

21. The main source of information listed in the bibliography that focused on this issue, *A Design Guide for Home Safety*, was a survey and design manual prepared by the US Department of Housing and Urban Development in 1972. Using reports from various governmental agencies and the National Safety Council, the HUD evaluated building codes and standards through human factor analyses, classified the nature and the cause of the different dwelling accidents, and proposed a series of design guidelines intended to provide architects and builders with preventive and safety measures. See Niels Diffrient, Alvin R. Tilley, Joan C. Bardagjy. *Humanscale 1/2/3* (Cambridge, Mass, MIT Press, 1974.): 10, 29-30

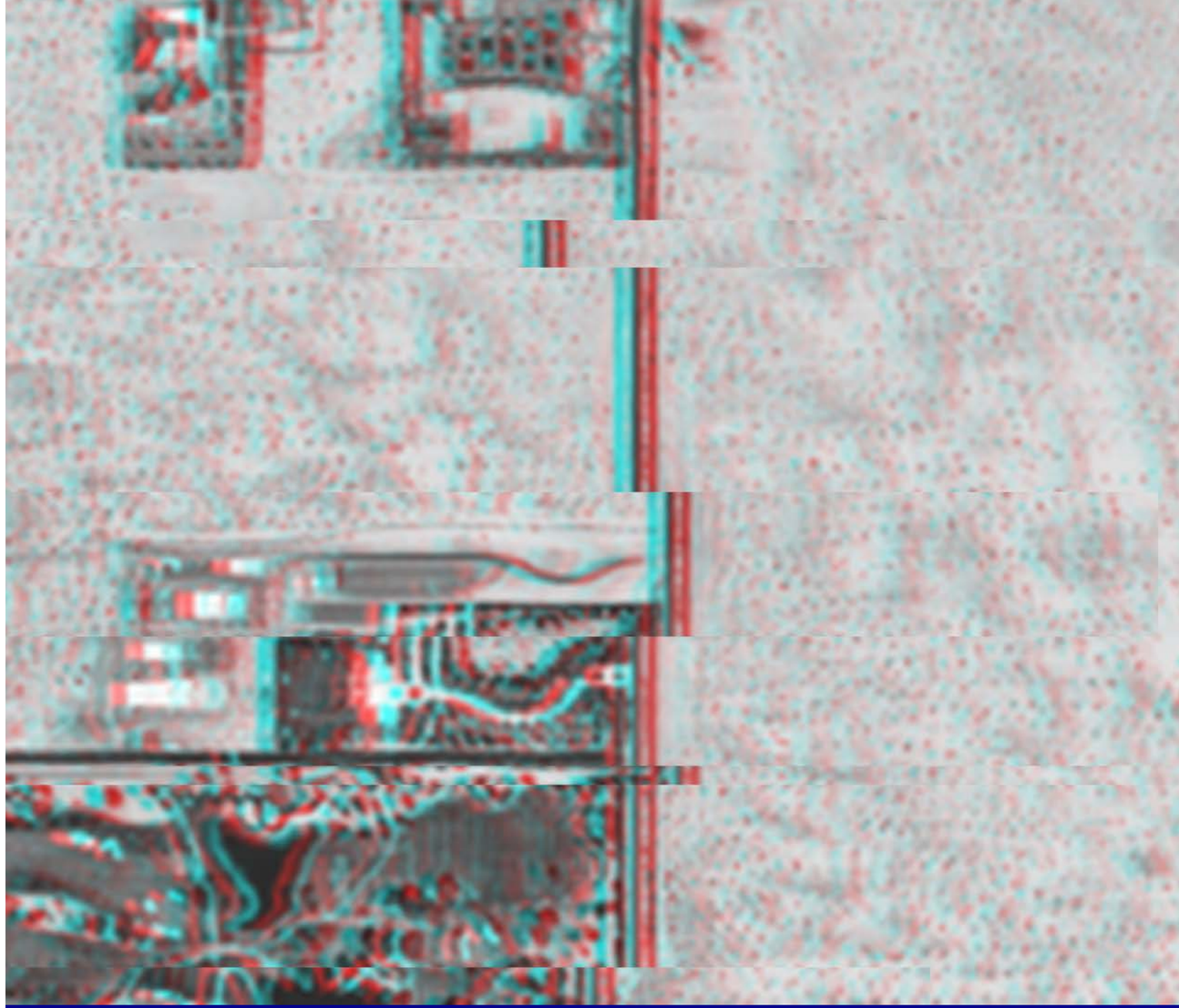
22. Diffrient et al. *Humanscale 1/2/3*

23. Ulrich Beck, *Risk Society. Towards a New Modernity* (London; Newbury Park, Calif.: Sage Publications, 1992): 21

24. Ilbid., 27

25. For a history of the use of human factors and anthropometric tools and methods in military contexts see Hamraie, *Building Access*, 41-64.

26. Diffrient et al. "Dimensions of Experience"



TECHNOLOGIES OF MAPPING

DECOLONIZING ARCHITECTURAL DISCOURSE

GENEVIEVE MURRAY, JOEL SPRING

SAFE THEORIZING DECOLONIAL MODERNITY: TOWARDS AN ARCHITECTURAL HISTORY OF JURISDICTIONAL TECHNICS

DIANA CRISTOBAL OLAVE

Future Method Studio

Directed by Wiradjuri (Australian first nation) interdisciplinary artist **Joel Sherwood-Spring** and white settler **Genevieve Zoe Murray**, Future Method Studio works collaboratively on projects that sit outside established notions of contemporary art & architecture attempting to transfigure spatial dynamics of power through discourse, political activism, pedagogies, art, design and architectural practice. The studio is focused on examining the contested narratives of Australia's urban cultural and indigenous history in the face of ongoing colonization.

Future Method have had works commissioned by the Biennale of Sydney, Newcastle City Council, the Museum of Contemporary Art Sydney, the NGV's Melbourne Design Week, Molonglo's MG Projects, RMIT Design Hub, Sydney Architecture Festival, Venice Architecture Biennale, the New Landscapes Institute, The Unconformity Festival, and has worked collaboratively with Nat Randall & Anna Breckon on **The Second Woman**, Dutch Design Group FOUNDation Projects on **Streetcamp**, with Alvaro Carrillo and Carmen Blanco on **Watertopia**, with Wiradjuri elders Lyn Syme and Kevin Williams on **Future Acts** for the Cementa Festival.2

DECOLONIZING ARCHITECTURAL DISCOURSE

GENEVIEVE MURRAY, JOEL SPRING

WARRANJAMORA[1]

We, an architectural practice of both Wiradjuri (Australian First Nation) and white settler origin, write from the unceded lands of the Gadigal people of the Eora Nation, the Boorooberongal people of the Dharug Nation, the Bidiagal people and the Gamaygal people who have practiced their sovereignty and law/lore on this land, Warrang, commonly known as Sydney, since the first sunrise. We acknowledge their endless and continuous care for Country, Country we were born on and call home. In doing so, we acknowledge their struggles through frontier wars and pay our respects to them, the Gadigal people, their Elders past, present and future. It is upon their land that we undertake our work as architects and researchers; we acknowledge these are stolen lands for which a treaty or sovereign agreement has never been negotiated.

"Acknowledgements to Country:" phrases similar to these are now routinely delivered within our institutions and at public events. "Welcome to Country," an offering from the first peoples of the places we work, live, and meet to those of us who are not of that place are also commonplace and remain important protocols that recognise time-honoured traditions connected to these places. Within institutional settings, this important protocol is perceived as a formality, often rushed, and routinely delivered as a performative expression of political correctness with little or no relationship to the people of that place. When considered alongside the institution's pedagogies, course content, and representation of First Nation staff, they act as an embedded and institutionalized "move to innocence."[2] In this paper we explore how these acknowledgements and welcomes are operationalised as optics and as "move(s) to innocence" by the institution. We explore how they work to reinforce structural white supremacy within the settler colonial regulatory frameworks of institutions, and how the institutionalisation of these gestures, and the manner in which they are performed, speak to a deeper "ontological disturbance"[3] at the heart of these performative optics. We use our experience as outsiders, as sessional, contracted employees teaching a Masters of Architecture Design Studio and an elective in 2018, both exploring decolonizing architectural methodologies, to illustrate how we too were instrumentalized by the institution to perform optically for them, and how this works to extend the performativity of "acknowledgments" and "welcomes" into course content and discourse, while acting to further embed eurocentrism within the institution. We offer, in conclusion, how we see a way out of this performativity.

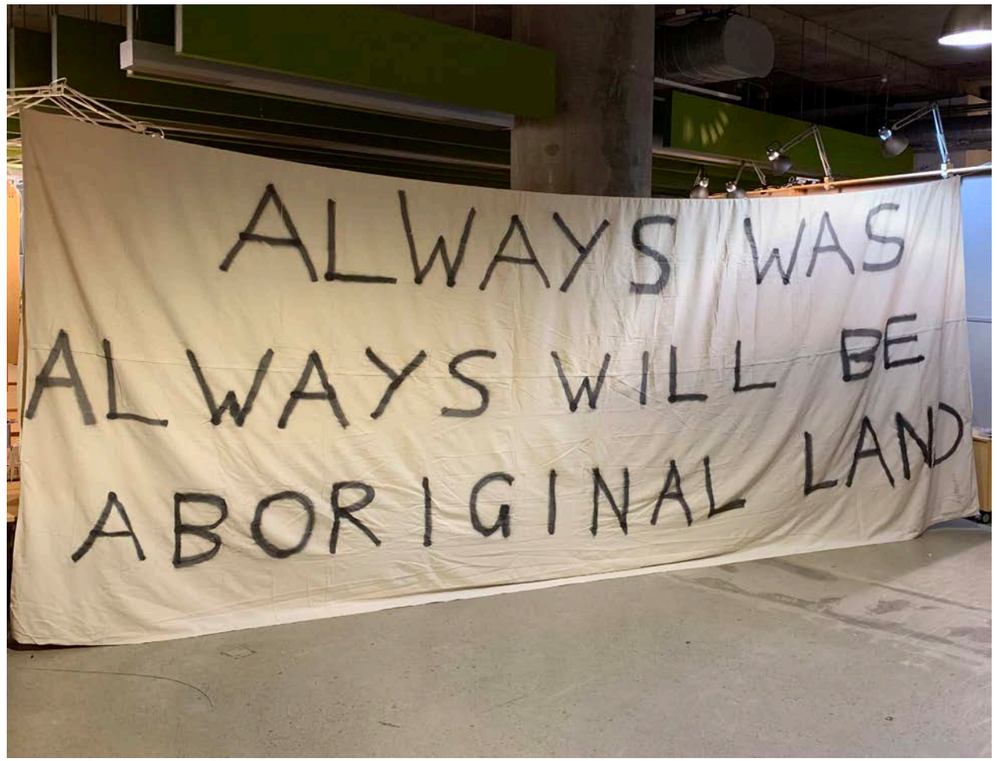
NGARRA[4]

Within Australian universities, a "Welcome to Country"[5] is understood as being the reserve of special occasions. Arranging a "welcome" requires time, foresight, scheduling, administration, and adequate remuneration, and often, given these structural logics, an "Acknowledgement of Country" is performed by a staff member in its place. In placing the responsibility on academic or senior staff, the observation of cultural protocols between sovereign bodies is opened up to subjective interpretation, even though the format is often prescribed. In institutional spaces such as the University of Technology Sydney (UTS), the now-customary "Acknowledgement to Country" operates as a rehearsed formality read aloud at events and the commencement of studies. Staff are provided with a template by the University policy document *Guiding Principles for Welcome to Country and Acknowledgement of Country*:

> I would like to acknowledge the Gadigal people of the Eora Nation upon whose ancestral lands our City campus now stands. I would also like to pay respect to the Elders both past and present, acknowledging them as the traditional custodians of knowledge for this land.

The provision of this template is a ubiquitous gesture among the majority of tertiary institutions within Australia, and while being an important protocol to attend to, they are often a rational virtue-signaling exercise to avoid offending First Nations people. The "Acknowledgement" is generally followed by introductions and indications to the fire exits and toilets; is often rushed, and sometimes even avoided for fear of making mistakes, or from a fear of reducing the words to a mere platitude. When there is an absence of something as essential as a relationship to the people and the *country* you are acknowledging, when there is no wholehearted expression of connection and recognition, it becomes an awkward and often anxious attention to protocol. It becomes, in a sense, an expression of how the processes of institutionalisation render us isolated in place, and how these awkward performative gestures express a deeper "ontological disturbance." The absence of a meaningful relationship to Traditional Owners, to Aboriginal and Torres Strait Islander people, their struggle, their history, and their talents manifests publicly through this process.

Furthermore, the generosity contained within a "Welcome to Country," its offering of an opportunity for a respectful sovereign relationship, is rarely considered for its richness, and rarely taken as a springboard for a more genuine and meaningful relationship. In the School of Architecture, where an understanding of place, site, and context are foundational tenets of design practice, the selective neglect of this offering is at best a missed opportunity, and at worst one that



serves to reinforce the institution's role as a mechanism of the processes of ongoing settler colonialism.

We use the ceremonies and protocols of a "Welcome to Country" and an "Acknowledgement of Country" as a starting point to this conversation, as it seems to be foundational to the way in which Indigenous knowledge, those that have been historically othered, excluded, and systematically quashed, are now attempting to be included and embedded in the institution's learning outcomes and course content. It is the language of inclusion that suggests the preservation of primacy of western and institutional academic processes and pedagogies in this power dynamic—as if this inclusion were a privilege, as if the knowledge had just sat there waiting for someone to ask if they could have it; that it is not dependent on people and their connection to their elders, on their connection to country, and to their community; and that it is able to be sustained despite the ongoing processes of settler colonialism that our built environment professionals are pivotal in.

That a "Welcome to Country" is never considered for the generous offering is symptomatic of this, and of the ongoing othering of Indigenous knowledge. There is no response to this generous offer. The question is not, in this dynamic, "How could our work be lawful on your country, in your eyes? What work might we have to do for this to be acceptable to you in the first instance?" It is, instead, "How can we use your knowledge and your generosity to progress our own work, our own expertise and service our own need?" It is the process through which the institution operationalises its "move to innocence."

NGARADIEMI[6]

As a way into understanding how this "move to innocence" manifests in the institution in other ways, and how people—predominantly Aboriginal and Torres Strait Islander guests, sessional, and visiting practitioners—are operationalised as optics for the institution, we will describe a sequence of events that individually do not represent much, but as a set of circumstances together form a symbolic picture of these processes and their power.

In 2018, in the Masters of Architecture program at the University of Technology Sydney (UTS), we were invited to teach a design studio. The invitation related quite directly to our emerging public presence at the time, one built through our political activism supporting public housing tenants in Redfern/Waterloo, an inner city suburb of Warrang/Sydney with an historically significant and politically active urban Aboriginal[7] community. As important context, this work had involved voluntarily running a community space called The Future Planning Centre,[8] in partnership with the Waterloo Public Housing Action Group headed by Aunty Jenny Munro and Richard Weeks on the Waterloo Estate. It was a space run independent of government that sought to centre Indigenous voices in the "master planning" process of what was the first significant sell-off of public land in an infrastructure-driven urban renewal corridor stretching from the Sydney CBD to Bankstown.[9]

The informality of the invitation to teach at UTS came about through a conversation at an exhibition opening that led to a few email conversations. This process, its informality, it being determined solely by the course convenor, and it occurring within cultural spaces that are very much in service to the cultural legitimacy of the institution, was to us, representative of the way in which privilege is operationalised through institutions. Within this process, we felt there were some consumptive urges being expressed. That we were relevant and necessary. That the nature of our practice, our politics, the intersection we represent was being seen as desirable, we were (and it is important to acknowledge, through our own proximity and through our access to the spaces and conversations born of a certain set of privileges) being given this opportunity and being included in how the school wanted to position itself politically at the time.

This inclusion, we think, was due to two factors. First, it came from an ongoing desire to be culturally relevant and thus part of this emerging global discourse on decolonisation. A discourse that, up until this point, had been entirely absent from New South Wales architecture schools. It is an appetite for cultural relevance that is not grounded in any relationship with First Nation struggles, struggles that are on the doorstep, quite literally, of the institution, but merely a product of the consumptive nature of institutions. There is no relationship to the origins of the discourse; in fact, the distance of academic and subject or object is the fundamental precursor to this dynamic. The logics of the institution, and this historic ontological and epistemological position embedded in academia, could never have produced this progressive discourse; the frameworks that support knowledge production and dissemination in that context are not,

of course, where resistance, struggle, and opposition can emerge. What we witnessed in this instance was essentially how the precariousness of our work, how our stepping outside of the systems and frameworks of institutions of capitalism and the mainstream had created a unique discourse within architecture that they wanted to include for its favourable optics.

Second, with not one tenured First Nations academic staff member engaged in this as a research area (at the time of writing), and with not one core learning agenda at the intersection of First Nations struggles and settler colonialism, the only way it could be included within these spaces was through this co-option, through this inclusion of already existing discourses operating externally.

This lack of core learning at this intersection is embedded in the logics of the institution and the methods by which it "addresses" First Nation struggles. The institution leans upon its Reconciliation Action Plans (RAP)[10] to address this, and important things do come out of them that include: a necessity placed on "Acknowledgements of Country" being de rigeur at the commencement of lectures; on Aboriginal and Torres Strait Islander staff and student representation being a priority; and on learning outcomes embedding Indigenous knowledge in course content being implemented. Ironically, through the instrument of the RAP there is now an imperative, across the faculty, to pay attention to include what has always been othered and excluded, but without any relationship to the community or knowledge of the people who carry this knowledge, those who struggle within the systems of oppression, and whose lives are impacted daily by it. There is no relationship to place and to the people who are spoken of so fondly in our acknowledgements of country, and there is certainly no conscientious exploration of what it might mean to live lawfully on country,[11] to respond wholeheartedly to the generous offer embedded in a "Welcome to Country." The logics of the institution and the institutionalisation of the Reconciliation Action Plans do not make a relationship seem necessary, or even relevant. The culture of the institution and the institutional mechanisms of Acknowledgement and RAPs are the barrier to a necessary relationship to people and place.

Before moving into a discussion about the ways in which we were personally operationalised as optics by the institution, it is important to first note that decolonisation discourses are not decolonisation, and they exist within institutions predominantly to service the white hegemony (in our experience); that at the time we were teaching at UTS, there were no First Nations staff in the faculty of Architecture; that Aboriginal and Torres Strait Islander students were often and are still often called upon to represent Aboriginality or an Aboriginal perspective; that there is no mandatory cultural competency training for staff; that there is no core course content that covers the role of architecture and the built environment in settler colonialism; and that no Aboriginal architectural history courses are available, despite there being significant scholarship on the topic.

The reason for these phenomena is the historic privileging of western ontologies that are incompatible with the potential processes of decolonisation within this context. That "legitimate" knowledge and the processes of its production are seen as the exclusive domain of the west, of European and North American scholarship, and that their dismissal of other ways of seeing and being in the world have rendered a culture of knowledge production embedded in the maintenance of its supremacy. The very processes of legitimising knowledge in this set of conditions works exclusively for a dominant western academic model.

The historic denial of other ways of "seeing and being in the world," with western discourse always "seeing itself as holding the knowledge production domain," is due to it being fundamentally in opposition to the very structures, power dynamics, politics, and impetus of the university and the architecture school. A decolonising discourse doesn't fit within the institutional logics of RAPs because of the necessity it demands of returning the gaze. It is not focussed on how First Nation people and their knowledge can be embraced and included in course content, it instead returns the gaze; it wants us to begin a process of challenging, dismantling, and dismembering the institution and its role in ongoing dispossession and settler colonial violence.

So in knowing all this, we felt some obligation to enter into this institutional context as an unsettling

force; what we didn't predict was how we would be operationalised to legitimise and service the processes by which the institution is co-opting First Nations' knowledge and bodies and struggles to service these processes of "move to innocence." How they are co-opting decolonising discourse to retain their cultural supremacy while doing nothing to enact a process of decolonisation or to educate a new generation in what this really means in this context.

That we ended up teaching a studio on Decolonising Architecture and an elective on Decolonising Discourse is a product of these collective logics that seemingly oppose each other, but somehow have become a necessity. The discomfort these conversations demand means that they exist only in electives and design studios, spaces within which they are optional and subject to the whims of the current course convenor and therefore included, but never as foundational

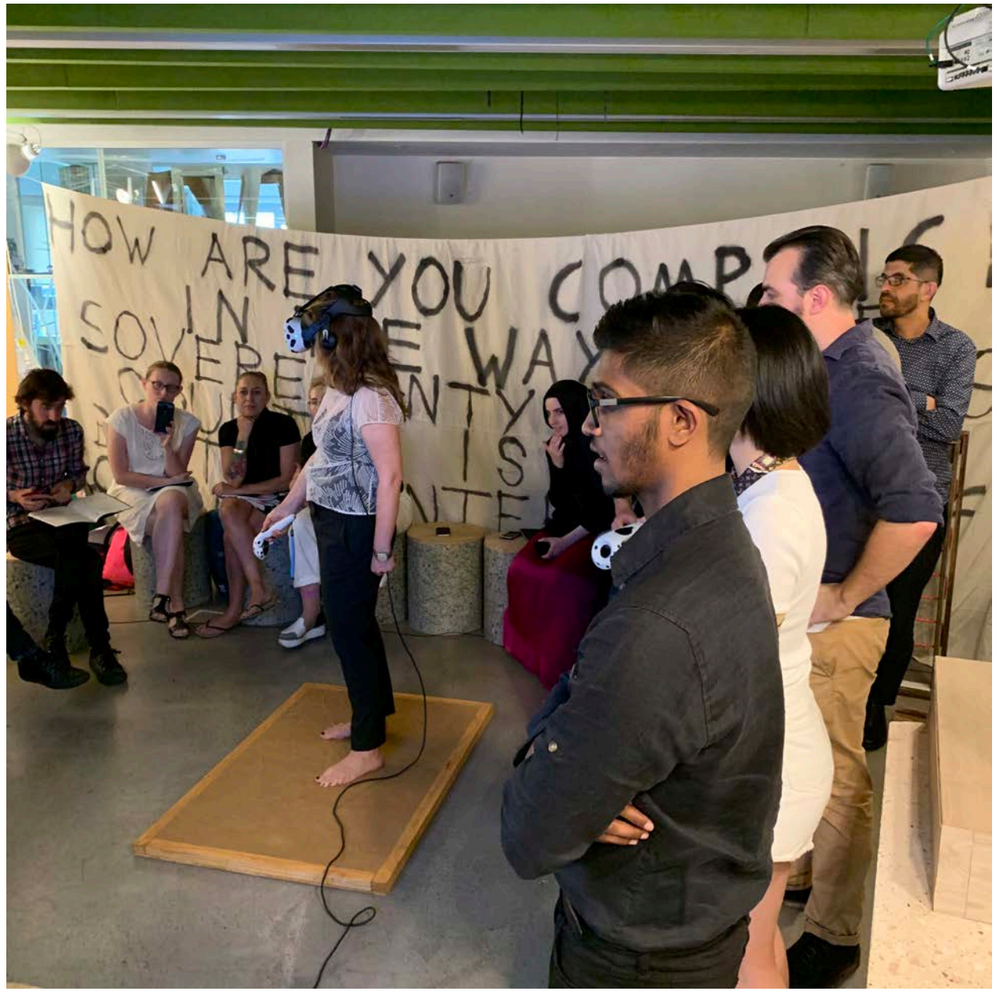
processes. This enables the white dominant culture and its pedagogies to remain intact and undisturbed by this gaze. The optics of inclusion rendered through the institutional logics of RAPs and learning outcomes work as a panacea to the discomfort rendered by the more political objections to the institution made through a decolonising discourse. Instead of addressing structural issues, they subcontract labour, both physical and mental, to optically address this. Educational institutions extract cultural capital from mostly sessional First Nations staff and people of colour, in the name of diversity and inclusion. While these people do, temporarily, benefit from being "invited" to participate in the institution, the university consumes visibility politics and the aesthetic economy of marginalised struggles, continuing to inevitably co-opt the knowledge economy around resistance history on multiple levels.

To help understand a little of how this process is operationalised, there are some key yet subtle instances that, for us, illuminate this dynamic very succinctly. The first was a lecture series we organised as part of our elective. We wanted a diversity of voices to speak on the topic, and from different and varying perspectives. We wanted a majority of First Nations perspectives, but we also felt it very necessary to introduce to the school the logics of settler colonialism so that students could better understand its processes, particularly the role the built environment professionals play in sustaining it: a necessary returning of the gaze. The lectures themselves were informal and done in a small space around a large table so that guests and speakers were in close proximity, and a conversational atmosphere was created. We intended this space to be welcoming and safe for the speakers, and one that gave students an experience of a different method of knowledge exchange. Although the lecture series was encouraged strongly by the course convenor and a modest budget allocated, there were some worrying indications to us that the series was somehow not significant to the school in the same way a visiting European or North American guest might be, and we could see how the minimal amount of advertising the series was given was enough to display optically the cultural relevance of the school, but without any real attention paid to making them well attended by staff or students or the general public.

The second instance came in the critique of our Masters Design studio from the course convenor at the end of the semester. We were working on a project with our students that sought to redirect student expertise and labour to a project for Grandmothers Against Removal (GMAR), an organisation run for and by Aboriginal women to support Aboriginal mothers whose children have been removed through government child protection policies and are often in very precarious circumstances. They wanted to create a healing centre for Aboriginal women that centred cultural healing and the needs of the women, and that would be safe and healing. Our students, having been at UTS in their undergraduate degree, had not once been introduced to the politics and history of colonial invasion in Australia, what that meant for us as architects in this context, and what the impacts of this had been on these women. We were essentially working with a completely blank slate, having to educate the students not only on the particulars of what a process of working with an Aboriginal organisation might look like, but also unpacking the ways in which they had been taught to work in their undergraduate degree. We chose not to focus on the outcome and instead on the process, on supporting the students to feel connected and empowered throughout the semester, giving them confidence in their instincts and decisions. We did not want the work to be focussed on performing in a particular way for the institution, but instead on the design processes and outcomes for GMAR.

The students worked collaboratively on the design with GMAR and built a VR model that put Aboriginal women in the driving seat, able to make decisions about the building while experiencing it in Virtual Reality. The outcome was less about the building and more about connection, relationships, empowerment, trust, and how our work could support GMAR in working towards their goals. The only feedback we got from the course convenor was that the building could have been better, with no comment or interest in the complex process and outcome that we and the students felt very proud of. The emphasis was on the object and not on the pedagogy; it was more concerned, it seemed to us, with our lack aesthetic fodder for the UTS Instagram page than it was in exploring our opposition to that as a measure of success.

These combined experiences painted a picture for us that was deeply problematic. We could see by the end how we had been instrumentalised by the institution so they could optically appear to be doing progressive and politically vibrant work, but their lack of understanding, and the degree to which they missed the point of our work was so profound we could see very clearly by the end of this how we were being consumed for the optics and how this functioned, alongside Reconciliation Action Plans, Acknowledgements, and the embedding of Indigenous knowledge in course content as "move(s) to innocence." In no way was the school interested in fundamental change, or in seeing their gaze returned.



YÅNGA[12]

If there is to be any meaningful transformation within the architecture schools of NSW and perhaps Australia, the mindset must shift. Instead of focussing on inclusion and how Indigenous knowledge can be embedded in western knowledge systems, we must ask what we can do to respond to the generous offer in a "Welcome to Country." What work do we need to do for our willingness to accept the welcome not be a hollow gesture, and how might academic processes and our pedagogies transform for this? It is a shifting that is required, a shifting in what is centred and what is privileged, we believe. It is a dismantling of western, Eurocentric cultural dominance in the architecture schools of NSW that is required, and to do this the processes for deciding who and what is taught, who and what is included, must be centred on and taken by traditional owners on whose country the institution is located. We must ask the questions: What should we be teaching our architecture students to make their work lawful on your country? What are the protocols we need to learn for this? What could we be teaching to make our courses more relevant and meaningful to your youth, your people, and your desires?

This process of course demands a necessary relationship with place, with its people, and with their struggle, one that is not about dominance but about listening, learning, and understanding the white possessive[13] tendencies embedded in inclusion logics. It is radical, but it is simple. Stop consuming, stop co-opting, and start listening. Radically rethink who is making the decisions about course content. Think about where these decisions are made, and by whom, and change that. Become responsible to place, become accountable to something other than the cultural hegemony that you sustain, and most importantly learn to listen. Hear, learn, listen. Radically restructure the power dynamics embedded in institutions to allow other ways of seeing and being to be centred, not marginalised. ▪

ENDNOTES

1. Warranjamora is the Gadigal word meaning 'I am in Sydney Cove' taken from documented conversations between Gadigal woman Patyegarang and settler William Dawes in the 1790's. https://www.williamdawes.org

2. Tuck, Eve, and K. Wayne Yang. "*Decolonization is not a metaphor.*" *Decolonization: Indigeneity, education & society* 1, no. 1 (2012).

3. Aileen Moreton-Robinson, Philosophy in the wake of Empire part 5: Tracks of thought. An interview for ABC's Philosophers Zone, https://www.abc.net.au/radionational/programs/philosopherszone/tracks-of-thought/11745888

4. Ngarra is the Gadigal word meaning "Listen," taken from documented conversations between Gadigal woman Patyegarang and settler William Dawes in the 1790s on Gadigal land. https://www.williamdawes.org

5. A Welcome to Country is an important cultural protocol in Australia. You can only be welcomed onto *country* by a Traditional Owner of that *country*. This important cultural ceremony takes many forms depending on the context, but they are mostly given by respected Elders.

6. Gadigal word meaning "I will listen," taken from documented conversations between Gadigal woman Patyegarang and settler William Dawes in the 1790s on Gadigal land. https://www.williamdawes.org/ms/msview.php?image-id=book-a-page-40 Andrea Mubi Brighenti, *Urban Interstices: The Aesthetics and the Politics of the In-between* (New York: Routledge, 2016).

7. We use the term Aboriginal to describe a community of Aboriginal and Torres Strait Islander people in Redfern living on Gadigal land, but connected to place through kinship ties. Even though they are living off 'country' due to colonization, they were not a diasporic community in that the Gadigal, Tharawal, Wiradjuri, Gomeroi, Kuring-Gai, Gundungarra and many more nations surrounding Gadigal land have had close relationships and connection through inter-marrying and trade since time immemorial.

8. For more on this space please read The Spatial Dynamics of Resistance: http://runway.org.au/spatial-dynamics-of-resistance

9. For more information on this, https://www.planning.nsw.gov.au/Plans-for-your-area/Priority-Growth-Areas-and-Precincts/Sydenham-to-Bankstown-Urban-Renewal-Corridor

10. https://gsu.uts.edu.au/policies/documents/reconciliation-statement.pdf

11. Porter, Libby. "Learning to Live Lawfully on Country." In *Questioning Indigenous-Settler Relations*, pp. 137-146. Springer, Singapore, 2020.

12. Yanga is the Gadigal word for "to do," taken from documented conversations between Gadigal woman Patyegarang and settler William Dawes in the 1790s on Gadigal land. https://www.williamdawes.org/ms/msview.php?image-id=book-a-page-40

13. Moreton-Robinson, Aileen. *The white possessive: Property, power, and indigenous sovereignty.* U of Minnesota Press, 2015.

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THEORIZING DECOLONIAL MODERNITY: TOWARDS AN ARCHITECTURAL HISTORY OF JURISDICTIONAL TECHNICS

MANUEL SHVARTZBERG CARRIÓ

ABSTRACT

This paper reflects on the relation between architecture and "jurisdictional technics"—my formulation to describe spatial practices for managing territorial conflict—through a midcentury modern case study from the settler-colonial city of Palm Springs (California), ancestral lands of the Agua Caliente Band of Cahuilla Indians. The Palm Springs Spa (1959) was commissioned by the Agua Caliente and designed by local modernists William Cody, Donald Wexler, and Richard Harrison. This project was built on the tribal grounds of the original natural spring that would give the city its name, and was one of the first formal long-term leases of tribal property for commercial uses in the United States. Through the highly complex coordination of myriad technologies and local, state, and federal agencies—from the US Geological Survey, to the Bureau of Indian Affairs, the Department of the Interior, and the US Congress—Cody and his team effectively produced an allocation of water uses between different geopolitical entities, at an architectural scale. This geopolitical complexity contrasted with other private developments that also used groundwater for their operation, especially for golf courses. Sunnylands, for example, a winter retreat for Walter Annenberg designed by A. Quincy Jones & Frederick Emmons in the early 1960s, was supplied by a privately operated water well. Rather than being technically sophisticated but politically "neutral," these architectures translated complex problems of sovereignty into a neocolonial language of internal geopolitical containment. Architecture was amenable to this because, as a technology of representation, it was able to visualize—and thus translate—landscapes of deeply contested sovereignty as (seemingly) purely geo-metric problems: issues of technical representation and functionality rather than jurisdiction. Apprehending midcentury modern architecture in this way denaturalizes the colonial foundations upon which it was born, showing how it was an effective tool for settler-colonial domination. However, it might also allow us to posit a different perspective on architecture's relation to landscape: less extractive of natural resources like water, and able to represent indigenous modes of sovereignty—predicated on discrete onto-epistemologies—rather than their negation. Drawing on these architectures' mediation of the relation between geo-politics and geo-metrics, this paper theorizes the concept of a "decolonial modernity" to understand the jurisdictional challenges posed by processes of decolonization.

Figure 1: Sunnylands Estate in the Coachella Valley. Imagery ©2021 Google, Imagery ©2021 Maxar Technologies, USDA Farm Service Agency, Map data ©2021
[Falls under fair use policy: https://about.google/brand-resource-center/products-and-services/geo-guidelines/#google-maps-google-earth-and-street-view]

INTRODUCTION

In 2013, the Agua Caliente Band of Cahuilla Indians, ancestral inhabitants of the Palm Springs area, sued for the rights to a large aquifer under their Reservation. This aquifer stretches from Palm Springs to the Salton Sea, supplying almost all the water that allowed the Coachella Valley to become one of largest golf resort areas in the world.[1] Through a discrete infrastructure of private water wells supported by public water pump stations, storage reservoirs, and associated pipework, the aquifer was a key, if largely invisible, component of many midcentury modern projects sited along lush golf fairways—spectacular signs of a rising American hegemony during the Cold War. Famed estates such as Sunnylands, designed in the early 1960s, were constructed with, and are still supplied by, privately operated water wells (Figure 1).

Since then, however, excessive water pumping and inadequate replenishment have severely depleted the aquifer and led to its progressive contamination—a key reason for the Tribe's lawsuit. This paper explores the governance history of the Coachella aquifer—what the UN calls the necessary "hydrodiplomacy" of "transborder aquifers"—through an exploration of the ways in which midcentury modern architecture made this resource visible and fungible in particular ways, thus producing certain *geopolitical relations* between the Tribe and the United States. Indeed, one of the first modernist projects to explicitly engage the groundwater basin was the Palm Springs Spa, designed by William Cody in collaboration with Donald Wexler, Richard Harrison, and Philip Koenig in the late 1950s, on Agua Caliente lands. This project was the first in the nation to implement a 99-year lease of Native American property for commercial purposes, thus establishing an illustrative precedent for transborder aquifers.[2] Through the designers' protracted coordination between technologies and regulators—including the US Geological Survey, the Bureau of Indian Affairs, the Department of the Interior, and the US Congress—the Palm Springs Spa effectively instantiated an allocation of water uses between different geopolitical entities,

at an architectural scale. To this day, there exists only one recognized transborder aquifer agreement with allocated volumetric water rights, between France and Switzerland.[3]

As hydrodiplomacy experts argue, the main impediment to developing transborder agreements lies in the technical and political challenges of governing a subterranean resource across different jurisdictions. The history of midcentury modernism in the Coachella Valley provides a case study of how these geotechnical and geopolitical relations are crafted—how the relations between territorial and architectural expertise determine the formation of rights to natural resources. Construction requires disclosing and sharing certain types of information among different parties, a process that is fraught with inherent tensions in colonial sites, and that is compounded when projects, such as structures over transborder aquifers, challenge or redraw regimes of jurisdiction. Sovereignty, in other words, must be made both visible and invisible in certain ways for its legitimation and enforcement. This paper argues that architecture is a crucial technology in this process, mediating the mechanics of epistemological closure and disclosure, and thus also of political domination and autonomy.[4]

"FRAGMENTED JURISDICTION"

The conflict over groundwater in the Coachella Valley has its roots in the way the territory was partitioned by the settler colonial state in the 19th century. The seemingly "virgin land" that made midcentury modernist projects so spectacular was due to the existence of the Agua Caliente Reservation, which is intermeshed with U.S. land in a checkerboard pattern[5] (Figure 2). This territorial pattern resulted from the juxtaposition of the Agua Caliente Indian Reservation—established by Executive Order—and the construction of the Southern Pacific Transcontinental Railroad in 1876, which was paid by the U.S. government with a public land grant of alternate square-mile sections. The checkerboard pattern interlocks the city and the reservation, creating an inherently complex and contentious territorial condition, described by Agua Caliente Tribal Chairwoman Vyola Olinger in terms of "fragmented jurisdiction."[6] Reservation land appeared "untouched"—an illusion of emptiness leveraged by developers seeking to build properties with desert views—because tribal development was legally thwarted and hemmed in by the territorial checkerboard. This fragmentation created an economic asymmetry: tribal underdevelopment made possible the existence of Palm Springs as a booming postwar consumer "playground" whose main attraction was its seemingly untamed desert location.[7] As the city grew, private developers constructed leisure amenities and homes by expanding the city horizontally and up to the limits of each non-Indigenous section of the checkerboard, thus entrenching its asymmetries in legal and built forms.

PALM SPRINGS SPA

This jurisdictional and economic conflict was prominently on display with the design of the Palm Springs Spa in the late 1950s. Built by a developer over the Agua Caliente's natural spring, it was the first time in history that the Coachella Valley's groundwater infrastructures were opened to public scrutiny, as the project's construction had to be approved by a plethora of US local, state, and federal agencies. The

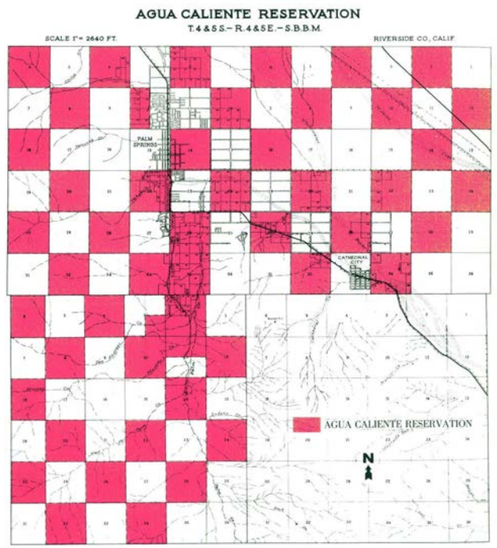

Figure 2: Reservation map, 1962. Progress Report, Agua Caliente Band of Cahuilla Indians. Courtesy: Agua Caliente Cultural Museum.

geo-metrics of the spring's hydrology, coordinated by architect Philip Koenig and carried out by colonial administrators, offered a stark contrast to the settler-colonial development of the Coachella Valley, where water extractions were most often performed by private parties themselves, and were thus strategically removed from public view.

The design of the new spa engaged the natural vertical water supply of the spring and deployed it horizontally with a sweeping monumental colonnade that thematized this horizontality by recalling the Spanish Colonial Revival architecture that first inaugurated Palm Springs's status as a leisure resort (Figure 3). The project required a different way of visualizing the Tribe's water, thus shifting how it could be managed. Since the first disputes arose in the late 19th century between settlers and the Tribe, the issue of water distribution had been adjudicated upon maps and plans. Ratios of water were apportioned according to use and availability, as the fundamental water sources could be seen by all in the creeks, canyons, and the network of engineered canals, diversion dams, and open ditches that brought it into the Reservation. The mostly horizontal nature of these exchanges and agreements allowed for their direct representation in maps and diagrams. Quantities could be ascertained by simply dipping measurement tools directly into the flow of the stream or at specific gauge points installed directly on the surface ditches and reservoirs. The ensuing political struggles over water were grounded in the techno-politics of visibility enabled by these horizontal water infrastructures.

This changed when the Tribe turned to develop its own natural spring. At first, the Tribe hired Victor Gruen Associates to draw plans for the entire Reservation, who proposed a horizontal distribution of different uses seeking to maximize commercial zoning. The result diagrammed the new status of tribal landowners as individual property holders, while also sharply delimiting the potential futures of tribal development to the reservation's checkerboard section closest to the commercial center of Palm Springs. Zoning, however, was a contentious issue; the city claimed jurisdiction over it even on Indigenous land, which mired the Agua Caliente's plans in the courts. Thus, when the Gruen plan was rejected, the Tribe began to consider a more surgical approach, developing vertically instead of horizontally. Rather than seeking to grow on their land's surface, they turned inwards to develop the natural spring itself into a large commercial venture.

The new approach worked, but while providing new potentials, it also reconfigured the terrain on which sovereignty was being exercised. The turn from land to water was accompanied by a shift from space to time—from the Tribe's own use and operation of the natural spring as a source of Indigenous medicine, physical replenishment, and cultural transmission, to a real estate asset in the form of a short-term lease over the entire spring, assigned to an external developer. Thus, as economic growth via zoning was thwarted by jurisdictional challenges, the Tribe sought to capitalize on the possibility of leasing land as a financial asset. This was more than just a commercial transaction for the Tribe, as it also strategically shifted the development's burden to the developer, who had to

Figure 3: Council Chairwoman Eileen Miguel and developer Sam Banowit outside Palm Springs Spa Hotel entrance colonnade. Cover, "Palm Springs Spa Hotel and Mineral Springs: First Anniversary," c. 1964. Courtesy: Agua Caliente Cultural Museum.

make sure the project was constructed within the short time window allowed by the state before the lease would have to go through another lengthy review and extension by the Department of the Interior.

Given the project's program as a natural spring spa, the critical variable of time was also crucially entangled with quickly obtaining an understanding of the hydrological mechanics of the spring itself. Indeed, as plans took shape for the new spa, it became apparent that *geological* expertise would determine the project's success or failure—a flow of expertise that was mediated by the project's architects. As Sam Banowit, the spa developer, noted in a letter to the Tribe, associate architect Philip Koenig had been charged with "researching the bathhouse and engineering problems [and] coordinating the efforts of the various geologists and engineers required to properly explore the Springs," seeking approval by local authorities as well as "the Department of Indian Affairs."[8] The key issue, Banowit emphasized, was that Koenig's efforts were geared towards achieving knowledge and approvals "by the U.S. Geological Department ... within the time allotted under the lease agreement."[9] The significance of this piece of evidence lies in how Koenig managed to translate, via architectural coordination, Banowit's demand for speed in a way that pushed the otherwise slow colonial technical bureaucracy to the Tribe's ultimate advantage, as it managed to sidestep the jurisdictional problems inherent in horizontal development (zoning) that the city was thwarting.

Thus, while the local press noted the new building's "eye-filling manse of artistic décor crafted by the Southland's best artisans"[10]—including Italian glass, ceramics, and terrazzo—the real challenge, they pointed out, lay in the complex engineering beneath the structure.[11] Before construction, Koenig organized a number of hydrological and geological investigations. The water's origin appeared to lie in a deep splinter of the San Andreas earthquake fault, requiring sophisticated geological mapping to determine its precise nature.[12] The challenges of coordinating matters of subsurface measurement, testing, and administration would prove to be inseparable from the putatively "political" issue of Native development.[13] Reporters were ecstatic about what they called the "giant jigsaw" of the spa's geotechnical coordination.[14]

This jigsaw was simultaneously legal, geological, political, economic, and architectural. Not only was it imperative that any construction tread lightly over the spring, but also the neat, geometric sovereign boundary of the checkerboard—a simple line in plan upon which the spring was located—was much more fuzzy and complex underground (Figs. 4 & 5).

Indeed, the vertical view opened up by the spa clarified that the tribe's "fragmented jurisdiction" was not just about horizontal distributions of property, but about the particular kinds of expertise that were available politically and jurisdictionally to begin extracting an economic surplus from their land. The Agua Caliente's history and culture, always centered around the spring, suddenly depended on the spring's particular geophysics—internal dynamics and morphology—while, in turn, jurisdiction over such knowledge was monopolized by a patchwork of U.S. colonial agencies that threatened to undo the tepid native gains over short-term leases.[15]

The result of this coordination, displacing and fragmenting the jurisdictional issue of zoning into the realms of geology and real estate, was a veritable architectural machine for accelerating the controlled extraction of the aquifer's waters. Once the spring was cleared and its basic natural components were inspected and documented, "it was agreed that a large water-collecting tank should be installed in the ground in a carefully excavated hole at the spring orifice."[16] Set directly atop this "orifice," the new tank collected the entire flow of the spring. Once the rest of the facilities were completed, the tank would allow for specific pressure regulation as desired, providing water supply at higher speeds of flow than the natural spring itself.[17] The tank, in other words, was designed as the beating heart of the new spa, an apparatus to modulate, regulate, and administer water therapy and relaxation to Palm Springs' growing numbers of tourists. But even more than a machine, the new spa, located in the center of Palm Springs, also became an architectural symbol of the Agua Caliente's successful maneuvering around the development blockages imposed by the colonial checkerboard and the settler-colonial technologies that enforced it, such as the city's zoning plans.

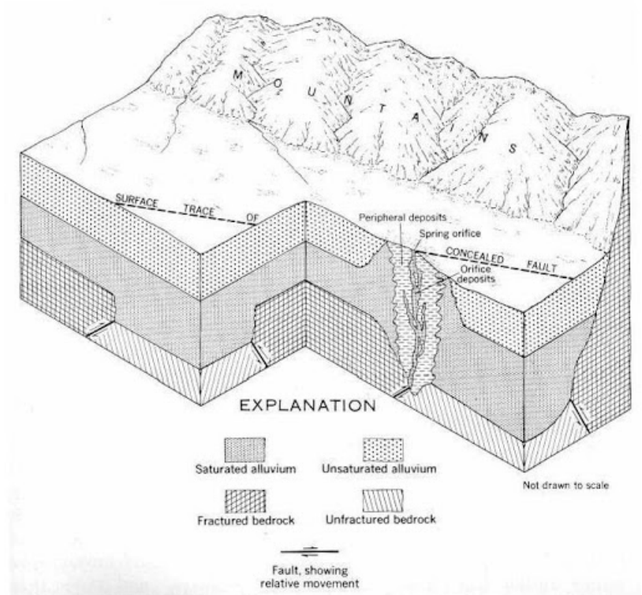

Figure 4: "Generalized sketch showing possible relation of spring to geology." L. C. Dutcher and J. S. Bader, *Geology and Hydrology of Agua Caliente Spring, Palm Springs, California*. Washington, U.S. Govt. Print. Off., 1961.

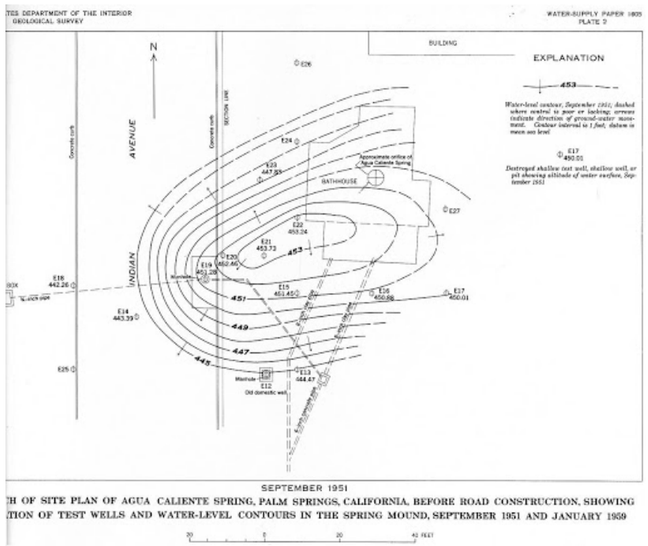

Figure 5: Topography and water supply infrastructure around Agua Caliente hot springs, 1951. L. C. Dutcher and J. S. Bader, *Geology and Hydrology of Agua Caliente Spring, Palm Springs, California*. Washington, U.S. Govt. Print. Off., 1961.

JURISDICTIONAL TECHNICS

These technologies, however, could not ultimately be contained within the state's own apparatuses, and could thus be subverted. For example, the spa's hydrological coordination and design overseen by Koenig had resulted in a special report by the US Geological Survey, comparing the spring to the artificially constructed wells managed by the privately owned Palm Springs Water Company.[18] Although ostensibly only a geotechnical report, its findings were also deeply geopolitical—publicly exposing, for the first time, the private water wells that fed the growing desert resort (Fig. 6).

By leveraging the problem of short-term leases to their advantage, the Agua Caliente had managed to turn the colonial water infrastructure into a weapon for its own financial empowerment. This was a cunning reversal of the burdens of colonial oversight and technological monopolization that were at the root of tribal underdevelopment. If Karl Wittfogel had argued that the control of large-scale irrigation infrastructures was the key condition of possibility for a certain type of empire governed through bureaucracy, in the settler colonial context of the Coachella Valley, small-scale and discontinuous infrastructures of extraction suggested a different kind of empire altogether.[19] Instead of a single ruling bureaucracy, this type presented a vertical version of Olinger's "fragmented jurisdiction"—a multiplicity of public agencies with extreme oversight and control over horizontally-mapped social groups, but barely any oversight over those who operated vertically, drilling their own private water wells while depleting the aquifer as a common resource. The power emanating from private wells did not require camouflage; its achievements were celebrated and shared in the open, through conspicuous leisure in golf clubs and luscious midcentury modern estates.

Where large-scale water projects were undertaken, such as with the Boulder Dam and its subsidiary system that fed the Imperial Valley through the All-American Canal, governmental intervention was conceived from above, over a particular surface of territory to be geometrically apportioned between a set of recognized claimants—states, companies,

Figure 6: "Geologic map of the Agua Caliente spring area, Palm Springs, California, showing location of wells, and water-level contours for 1958." L. C. Dutcher and J. S. Bader, *Geology and Hydrology of Agua Caliente Spring, Palm Springs, California.* Washington, U.S. Govt. Print. Off., 1961.

and consumers—with Tribes and other marginalized social groups having to work against the grain of these interventions. When the issue was enclosing a surface resource, like a forest or river, public agencies—from the Bureau of Indian Affairs to the Bureau of Reclamation—were deployed to publicly handle the task, allowing for a certain degree of political discourse (and maybe struggle) to occur in the process.[20] By contrast, the vertical geopolitics of extracting aquifer water precluded political questions as, for the state, settlers occupied non-contested lands. Thus, their supervision required "only" technical, not political, expertise—the seemingly universal scientific functions of the U.S. Geological Survey and of private civil engineers—in order to ensure the desired amount of water flow and quality.

The Agua Caliente had sought to transform their spring to achieve this type of technological fungibility, and turning the problem of "fragmented jurisdiction" to the vertical plane, they ultimately succeeded. In pushing ahead with long-term leases and a new infrastructure for the natural spring, they managed to gain enough financial muscle to begin challenging structural conditions, such as jurisdiction over their own planning. Throughout the 1960s and 70s, the Tribe and city were locked in court over who had authority over zoning Indigenous land, a struggle eventually settled by the Supreme Court in 1977 when it ruled that tribes could zone their own lands for the first time. That same year, the Agua Caliente and Palm Springs signed the first land use contract between a city and Tribe in the US, outlining a set of shared decision-making protocols and other terms on a nation-to-nation basis.[21]

While Palm Springs's midcentury modern architectures claimed a quasi-universal jurisdiction over space and matter—falsely presenting Indigenous land as "empty" desert—this actively masked the insidious jurisdictional containment performed by the territorial checkerboard. The "hydrodiplomacy" involved in each case, as witnessed in the Palm Springs Spa project,pointed to radical asymmetries that in many ways anticipated contemporary debates surrounding transborder aquifers—less the result of "diplomacy" than of territorial power politics.[22] In all these cases, architectural expertise was required to coordinate the different elements involved to patch over these asymmetries, conceal them, or exploit them—technically commensurating problems of jurisdiction into the more politically manageable terms of economic production and consumption.[23]

The Agua Caliente's struggles to harness their natural spring waters, involving a turn from zoning to leasing, and using architectural coordination as a weapon against the slowness of colonial bureaucracy, suggests a need for detailed analyses of the relations between Indigenous epistemologies and modern architecture. The Palm Springs Spa project was "modern" in the sense that it involved a series of techno-political reassignments between things and social roles—from an aquifer, to property leases, to knowledge transfers across colonial and capitalist divisions of labor. But it was also "decolonial" in the way it actively reconfigured relations with and through the territory to articulate relative degrees of Indigenous self-determination. Whether or not Indigenous sovereignty can be preserved without assimilation into the dialectics of capitalist-colonial rule is a question that continues to haunt and mobilize radical activists throughout the world. But such a question cannot afford to ignore the specific jurisdictional technics that underpin it and which architecture so intimately constructs. ▪

ENDNOTES

1. One hundred twenty (120) golf courses carpet this area of the Colorado Desert, consuming 37 billions gallons of water annually. Matt Stevens, "Tribe Fights Coachella Valley Water Agencies for Aquifer Rights," *Los Angeles Times*, March 31, 2015.

2. Native American property leases were restricted to five years until 1955, when they were extended to twenty-five years. The Agua Caliente Tribal Council was key in lobbying Congress to pass an act in September 1959 that extended leases to 99 years. Spa History Project Collection. Agua Caliente Band of Cahuilla Indians, History Background Summary, 2. Box 1, Folder 7. Agua Caliente Cultural Museum Archive.

3. Kirstin I. Conti, *Factors Enabling Transboundary Aquifer Cooperation: A Global Analysis.* International Groundwater Resources Assessment Center, 2014, 8; UNESCO, International Hydrologic Programme, *Hydrodiplomacy: Legal and Institutional Aspects of Water Resources Governance* (2016): 37-8.

4. Processes of closure and disclosure also structure Indigenous self-determination, such as the protection of certain cultural rituals. See, for example, Sechaba Maape's paper in this issue.

5. For a detailed account, see: Manuel Shvartzberg Carrió, *Designing "Post-Industrial Society": Settler Colonialism and Modern Architecture in Palm Springs, California*, 1876-1977, Ph.D. dissertation, Columbia University, 2019.

6. Vyola J. Ortner and Diana C. du Pont. *You Can't Eat Dirt: Leading America's First All-Women Tribal Council and How We Changed Palm Springs.* Santa Barbara, California: Fan Palm Research Project, 2011: 57, fn. 142.

7. Lawrence Culver, *The Frontier of Leisure: Southern California and the Shaping of Modern America.* New York: Oxford University Press, 2010.

8. "Palm Springs Spa, Inc." Letter from Sam Banowit, May 15, 1958, 1-2. Spa History Project Collection. Box 1, Folder 5. Agua Caliente Cultural Museum Archive.

9. "Palm Springs Spa, Inc.", 2.

10. "World's Most Beautiful Spa Opens Today: Spa Construction Like Giant Jigsaw," *The Desert Sun* (January 21, 1960): 2.

11. "World's Most Beautiful Spa Opens Today," 1.

12. George Ringwald, "PS Indian Spa Leased for $Million Resort," *The Daily Enterprise* (February 14, 1958).

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TECHNOLOGIES OF RESILIENCE

RESOURCEFULNESS IN SCARCITY: THE ARCHITECTURE OF KABULI PASTORAL NOMADS

NAREN ANANDH

THE MARGINALIZED CITIZEN AS AN EXPERT: TYPOLOGIES AND BUILDING TECHNIQUES OF SELF-MADE BUILDINGS IN MACASSAR TOWNSHIP, SOUTH AFRICA

CLINT ABRAHAMS

Naren Anandh is a jJunior in the College of Architecture and Planning at the University of Utah. He recently received funding from the University of Utah Undergraduate Research Opportunity Program to research the Kabuli nomads. Anandh examined their unorthodox architecture styles and practices, under the guidance of Professor Shundana Yusaf. Anandh's research focuses on analyzing cultures that break traditional notions of architecture and withstand time, hardship, and war. He was drawn to the field of architecture due to his interest in exploring prehistoric and global vernacular architecture. When designing, he draws inspiration from nature and building techniques that stay true to the region. He admires the work of Geoffry Bawa and his approach to showcasing the materials and cultures of the area. Anandh's goal is to develop environment-friendly structures that create a sensorial connection and mutual living experiences. In his spare time, he enjoys cooking, hiking, and studying different cultures.

RESOURCEFULNESS IN SCARCITY: THE ARCHITECTURE OF KABULI PASTORAL NOMADS

NAREN ANANDH

ABSTRACT

Pastoral nomads play a critical role in the functioning of local and global economies. Due to the rise of ranchers and international borders in the 21st century, they have been marginalized. This article studies the built environment of the Afghan nomads of Khyber, known as the Kabuli people. These nomads historically moved across the borders of Afghanistan and Pakistan, but due to the closing of the Durand Line, the international border between Afghanistan and Pakistan, the Kabuli people were forced to take the role of farmers in the local agrarian society of Pakistan. Their adaptation to poverty, statelessness, and hostility from their agrarian neighbors, has lead them to produce an architecture that can be best described as shuffling between the architecture of scarcity and resourcefulness, or better, resourcefulness within scarcity. This article examines the built principles and cultural significance of their semi-permanent structures. With limited resources, they produced a sustainable and functional, 100%-zero-waste camp. These structures are examples of a self-built work that holds a mirror to the standards of certified green buildings on carbon, extraction of natural resources, and the logic of economies of scale. Their built response was a hybrid between mud and tensile construction, applying the intelligence of both fixed and mobile systems. The Kabuli people developed a resilient community with natural materials that others would view as refuse and waste. Even under extreme conditions and threats, they have shown great resilience and strength.

INTRODUCTION

Although many overlook pastoral nomadism as a way of life, in the global south these people play a crucial role in the local and global economies. They are the primary providers of meat, milk, hides, and other goods. They are also skilled carpet weavers, herders, musicians, and traders. Compared to modern industrialized meat and dairy producers such as ranchers, who have dominated the global marketplace since the 1960s, pastoral nomads have a radically lower carbon footprint. Therefore, it is no surprise that Jonathan Davies, coordinator of the World Initiative for Sustainable Pastoralism (WISP), a non-government organization, states, "Pastoralism can be up to ten times more productive than commercial ranching under the same conditions."[1] These nomads are masterful wayfinders who embody a technique that environmental scientists describe as "seasonal migration." Similar to landscape behavior and spatial practice, seasonal movement between pastures allows the land to rest and the environment to heal. Davies pleads for the protection of pastoral people as they have seen their practices and lifestyle come under increasingly great threat under the sign of modernity. Pressures from industrial ranches, the growing impermeability of international borders, and the transformation of land into private property has had a major impact on pastoral people.[2] For example, to allow their cattle to graze freely, pastoral nomads have had to obtain special grazing permits that challenge their survival. Since the environmental turn of the 1960s, these people have begun to experience the diminishment of their way of living in accord with the land. The land that nurtured them was being pulled from beneath their feet. Even with the odds stacked against them, they refused to submit without a fight. The adaptation of their building practices is a testament to the resistance of a people that the bureaucratic state, nationalism, and the narrative of progress are determined to eradicate. The conceptual paradigm of architecture as a discipline, born of these very same ideologies, is complicit in speeding up the disappearance of their lifestyle.

This article reports on the environment that Afghan nomads of Khyber Pakhtunkhwa (known as the Kabuli, meaning belonging to Kabul, Afghanistan's capital city) have built as a particular example of the response of pastoral nomads in the 21st century. Historically, Kabuli nomads have moved seasonally across the two sides of the Afghanistan and Pakistan borders, spending summer in the cool pastures in the valleys outside Kabul in Afghanistan, and winter in the snow-free agrarian villages in the province of Khyber Pakhtunkhwa in Pakistan. In 1979, the Durand Line, the international border between Pakistan and Afghanistan, was closed. This forced the Kabuli nomads who lived near the Durand Line to take up a sedentary lifestyle in the rural regions of Pakistan. As a result, they built campsites throughout the area that incorporated both mobile and stationary architectural techniques. After the Soviet invasion of Afghanistan in 1979, and the transformation of local pastures into a battleground, these pastoral communities lost most of their livestock. Their animal holdings shrunk further because of the need to get grazing permits in Pakistan, which was troublesome since the formal state administration failed to recognize their informal settlement. Further, clashes with local crop sharers and prominent landowners in Khyber Pakhtunkhwa in Pakistan have narrowed their choices since 2008. Their adaptation to poverty, statelessness, and hostility from their agrarian neighbors has produced an architecture that can be best described as shuffling between an architecture of scarcity and resourcefulness, or better, resourcefulness within scarcity. By applying the intelligence of both fixed and mobile systems, the Kabuli nomads have built structures that have been a hybrid between mud and tensile construction. Most importantly, these structures are an example of self-built work that holds a mirror to the standards of certified green buildings on carbon, extraction of natural resources, and the logic of economies of scale. It reveals the competition between the environmentalism of indigenous communities and the environmentalism of high-tech, affluent, market approximate world and its disciplined architecture.

My research methodology began with a set of images photographed by my architectural history professor, Dr. Shundana Yusaf, during two field trips in 2018 and 2019 (Fig. 1). In the spring 2020 semester, I received a grant from the Undergraduate Research Opportunity Program to examine this campsite through a series of study models (Fig. 2). We evaluated the images

Figure 1: *Camp Overview.* Photographed by Shundana Yusaf.

and the design principles of the settlement built on the commons land. When analyzing the architecture, we began to appreciate the intricate design, building strategies, skills, tools, and the collaboration between men, women, children, and elders in building this structure. It looked flimsy in the beginning, but after our analysis, this structure revealed its exceptional resilience. Though seemingly ad hoc, it was well thought-out. It could be dismissed as dull and unattractive, but it was built with great intelligence and innovation. Kabuli nomads have built a resilient community using natural materials that others view as waste. Their limited resources were offset with machine-like coordination of human capital, skills, and collective memory. The result was a green, zero-waste camp that is highly attentive to hygiene, sunlight, shade, humidity, and water-borne disease.

CAMP LAYOUT

The documented camp has about 40 members of the same extended family, consisting of two brothers, their wives, six sons, daughters-in-law, and grandchildren. It is strategically situated near the local irrigation canal, an electric pole, a water source, and a road that connects the camp to nearby villages. Small, informal settlements do not have a formal avenue to get electricity and potable water from public facilities, so power for pedestal fans and lights in the camp is poached from the nearby electric pole, and potable water is sourced from a neighboring landowner through an informal financial agreement that indicates that they are allies in the agrarian community. The Kabuli people are deeply integrated in the rural context in which they find themselves. They have a different safety net than the sedentary locals in the area. Their wealth and networking is mobile and isn't fixed to land or geography; they work in the fields during harvesting season, they sell milk, wool and felt, but they do not butcher their animals. One example of their integration into the rural economy is their participation in village fairs. Unlike the weekly markets, which follow the calendar of agriculture and harvest times, village fairs follow the calendar of animal husbandry, taking into account factors like the pregnancy of animals in a particular season. This leads to a robust system accommodating individual participants.

A deciduous Indian rosewood tree marks the main entrance of the nomadic camp. It leads to a courtyard, whose proportions are reminiscent of a wide meandering street rather than the rectangular hollows that we expect in Islamic cities from orientalist and typological studies. The courtyard serves as a place to meet, work, play, study, rest, dine, and pray. Freestanding, single-cell huts surround the courtyard (Fig. 3). These huts serve the function of rooms, rather than being an entire house, while the courtyard serves as a hall for daily events and affairs. Incorporating their traditional practices in the camp's construction process has created areas that reflect their culture and customs.

A great deal of attention is given to the construction and placement of each single-cell hut. Each is faced in a direction to ensure the most privacy for each nuclear family. They are shaded by tall foliage that was planted during the Green Revolution of the 1960s, when millions of trees were planted along roadsides up and down the country. Now fully matured, they create an airy and shaded greenbelt along the road. The most decorated and auspicious hut in the camp is the common kitchen, an elevated structure located opposite of hut 1

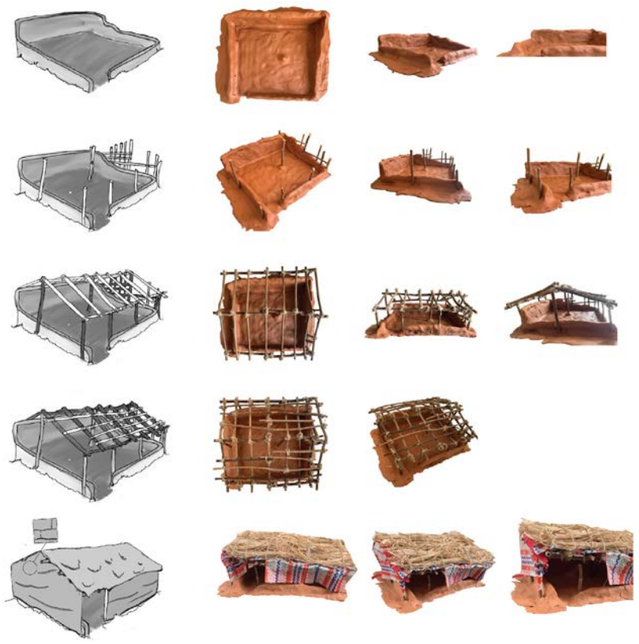

Figure 2: *Hut 1 Model funded by the Undergraduate Research Opportunity Program.* By Author

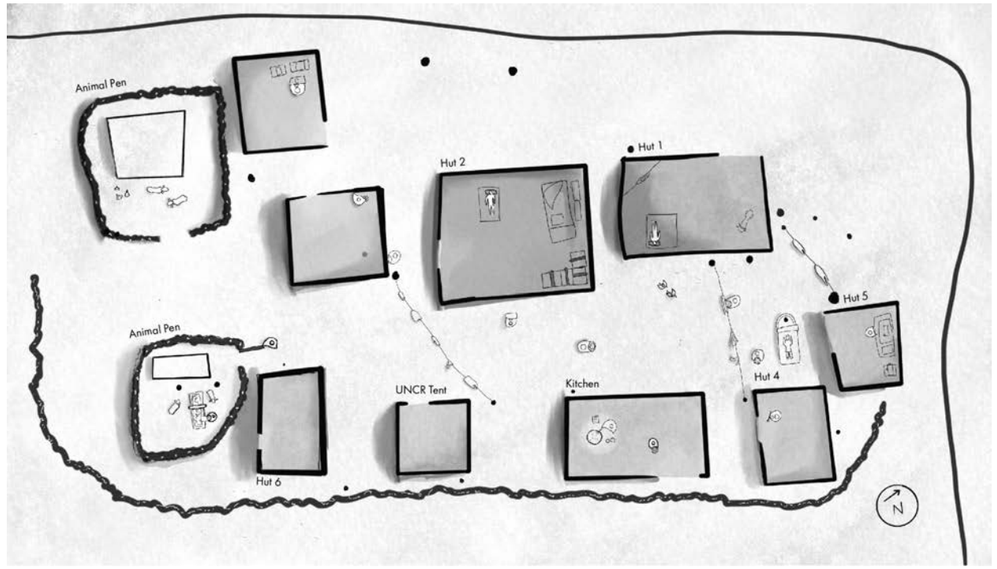

Figure 3: *Camp Master Plan.* By Author

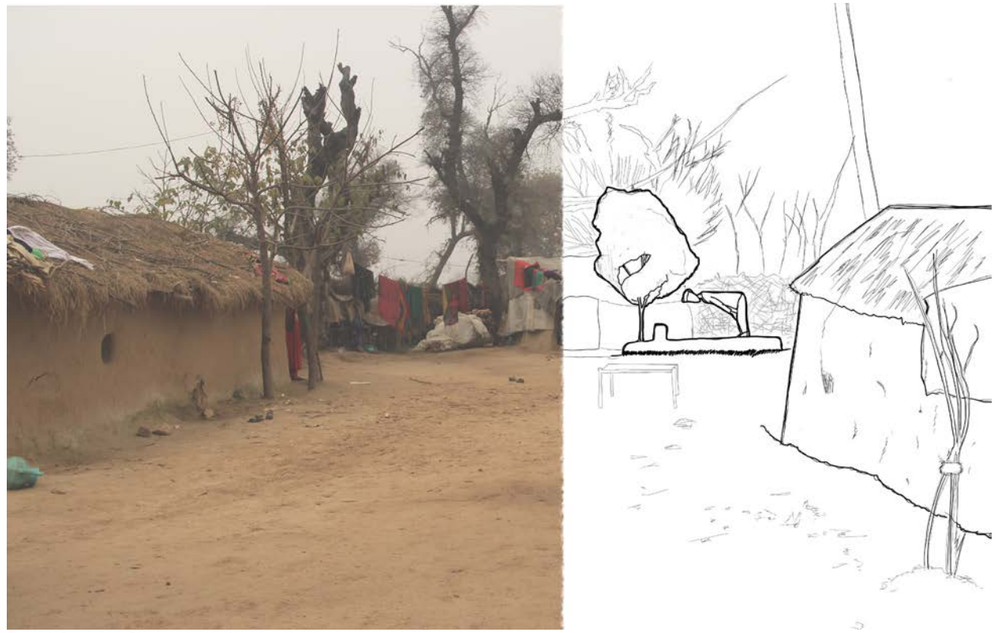

Figure 4: *Prayer Area.* Photographed by Shundana Yusaf.

Figure 5: *Animal Pen.* Photographed by Shundana Yusaf.

and adjacent to hut 4. The kitchen includes a central firepit, ornamental mud wall, ochre smudges, and floral patterns in ashes from the hearth. The intricacy and detail given to this hut show the people's precision, creativity, and expression of personal values.

The layout of the camp is organized around the concept of corporate living. Men and women of the camp share many activities, like tending to animals, working in the fields, building, cooking, and raising children. Women show significant spatial and creative agency in building, designing, and maintaining their living spaces. They play a crucial role in the functioning and development of the camp. Women use weekly calendars to distribute the responsibilities of collective childcare, cooking, cleaning, laundry, and tending to animals while others go to work in the fields. They swap duties and cover for each other when needed. All work-related negotiations go through the matriarch, who is the wife of the eldest man in the camp. An experienced and skilled person, she is tasked with maintaining the social structure of the camp. By pooling their human resources, they accommodate for the lack of material resources. The recognition of their interdependence is evident in their language and predefined roles. As in every patriarchal society, men have far more license to venture out of their orbit, but there is little room for negotiating expectations and duties to others, gender aside.

A unique structure in the nomadic camp is the fixed prayer area for a single worshipper, located across from the entrance (Fig. 4). A 3'x 6' earthen platform, 6" above the ground, is demarcated by a 6" tall and 6" thick parapet. A semicircular area suggests a mihrab, and a planted, slender tree marks Mecca's direction. The tree, where one prostrates, shows the persistence of animistic traditions that prevailed in this region before the widespread presence of Islam in the 10th and 11th centuries. The logic behind having a single prayer area is based on the tradition of praying in Islam: while men

Figure 6: *Housing practices, cow dung technique and burning of Khushkash.* By Author

pray as collective in a mosque, women's daily praying is atomized. They take turns to pray at the same janamaz (praying area). When men pray at home, they follow the female practice of individually performed prayers as well.

The first structures to be erected on the site were animal pens, due to the necessity born out of the conditions (Fig. 5). As a result, it has played a crucial role in the planning of the camp. Bushes and thorny branches demarcate the animal pen, which occupies the farthest end of the courtyard from the entrance. The material and amenities fixed inside the animal pen give life and intricacy to the structure. A tarp-style tent provides shelter for the animals in extreme weather. A discarded bed cot with a light wooden frame and ropes netted from tall grasses is repurposed to serve as a gate. This gate fits with the bush and twigs around it, revealing the relationship between animals and humans, lost in modernity. A feeding trough was assembled using glued cement bags and Y-shaped branches that hold up the structure. Khushkash, dried poppy leaves, and stems are foraged and burned in an open pot to get rid of pests in the camp (Fig. 6). Fumes released from the pots kill pests inside their households, and ashes from the pot are later smudged on the face, arms, or feet of animals and people to protect the bearer from the evil eye, disease, or unforeseen calamity.

RITUALS AND PRACTICES

The Kabuli people perform various rituals during the process of building their structures. Before starting construction, they people slaughter an animal, usually a goat or a sheep, drain the blood at the site of first dig, and distribute the meat among themselves and neighbors. During construction, they take two ritual breaks for the afternoon and evening prayers, and they eat a meal together. When the project is completed, they host a feast and perform prayers, and smoke the huts, animal pens, and courtyards to protect them and their bearers from the evil eye.

Figure 7: *Hut 1.* Photographed by Shundana Yusaf.

Figure 8: *Hut 1 Section.* Photographed by Shundana Yusaf.

Figure 9: *Hanging Decorations.* Photographed by Shundana Yusaf.

I studied in depth the design of one of the huts, named Hut 1 by virtue of being the closest to the entrance (Fig. 7). It is a 14'4" x 16' cell with a pitched roof at 6'6" clearance on the interior (Fig. 8). A central rod functions similar to a ridge board in heavy timber construction, but unlike a ridge board, it is not concealed in the ridge joint. Walls are built of rough ashlar, mud bricks, and reinforced mud plaster.

Fresh cow dung collected from the animal pen reinforces the walls and is used to repair water damages and cracks. Cow dung is an organic and natural insect repellent with antifungal and disinfectant qualities. Though overlooked by many as a waste product, cow dung has many applications that enrich the built environment. As a fertilizer, it improves the productivity of the soil while maintaining the health of the soil in the long term, unlike chemical fertilizer[3] and dried cow dung provides fuel for cooking, heating the rooms, and making fire outdoors on frigid days in December and January.

BUILDING TECHNIQUES AND TECHNOLOGIES

The four sides of the rectangular hut exhibit three different wall conditions. The west wall facing the road is a full-height structural wall reaching 5'6" without any openings. The mud segment of the north wall, along the entrance opening, steps down from 5'6" to only 18" high. The east and south walls only have 8" high mud parapets. A 4-foot-wide opening on the east wall gives access to space from the courtyard. The overall structure is a composite. The one load-bearing wall gives way to a wood frame. A net of ½" diameter sticks, bamboo, and tall grass stems is created by tying them with pieces of rope, rags, discarded belts, and laces. The entire structure is clad not in concrete, but with concrete bags collected from construction dumps. Waterproofed to protect the cement and strengthened enough to carry a ton of material each, the cement bags are lightweight, weather-resistant, and durable. The accompanying ritual is similar to the dressing of a bride. The cement bags are cut open, dusted, straightened, woven, glued together, and hung on the hut's frame. The dressing does not remain consistent throughout the seasons. Each facing is tied in a manner that can be raised during summer evenings and nights to bring in cool air. In winter, a layer of quilt filled with loose cotton wool is wedged between two layers of tall grasses and reeds.

The Kabuli people have developed an innovative roof system that makes use of a braced wooden frame for stability (see Fig. 2). The roof is later covered with empty cement bags, which are water-repellent, portable, and durable. A layer of dry grasses on top of the cement bags offers sound and temperature insulation. Finally, these two membranes are tied to the structure with jute rope. These ropes are locally made, affordable, and easily repaired. As a result of the material construction and housing practices, the huts have withstood the worst of local weather conditions.

Though the nomads' architecture has begun to show signs of "putting down roots," the interiors suggest the contrary. Inside the huts, furniture can be transported with ease (Fig. 9). Value is still placed on lightweight, portable furnishings that can be kept on the ledge where the mud wall meets the roof structure, or hung from the wood frame. The only items on the ground are a motorbike and two reed mats under the bedding to protect it from the dirt. A hammock cradle is hung from the column of the roof. The ridge pole supports an electric fan, bags of fruit, decorative paper buntings, fabric flowers, and a miniature replica of a prayer mat protected by the plastic wrapping in which it was bought (Fig. 10). The low ceiling height gives the structure a cozy intimacy and provides a surface from which the occupants can hang all furnishings and decorations. The hut is a living, breathing structure rather than being a template for a house.

OUTLOOK

The Kabuli people face certain pressures that are partly a question of public policy (getting absorbed into the sedentary, rural society) and partly a question of the marketplace (receiving support for development of their social structure, on their terms). The question of absorption has come all too often around the globe in the past sixty years. Modernity has consistently

Figure 10: *Modular Furniture.* Photographed by Shundana Yusaf.

demonstrated an intolerance of the kind of coexistence needed for the survival of nomadic systems. This is a loss, for with it we will lose yet another system of knowledge that holds a mirror to the western model of development. Modern education has created lifestyles that are valued above nomadic ones, not only by others, but at times even by them, too. Industrial modes of food production have institutionalized impersonal knowledge, destroyed meaning in work, and brought the planet to the brink of annihilation.

Yet, 250 years of investment in the superiority of western modernity still remains intact. In regions like North Africa, municipalities have forced tribal and pastoral people into midrise, concrete-framed flats in urban environments. Countries like Libya and Algeria have used guerrilla tactics to create modern nation

states, destroying the nomadic knowledge systems and their function in the local and global economy. In Pakistan this possibility is unlikely, for it is hampered by a weak state and fragile economy.

Another option, as mentioned above, is creating a robust environment in which nomadic societies can thrive on their terms. This direction is only being explored successfully in Mongolia, whose majority population is nomadic. There, the majority of the land is owned by the government as "commons"—an informal arrangement—and it has recently taken an active role in protecting it. This is helped by Mongolia's setting, particularly suitable for the herding economy. Mongolian herders are disconnected neither from the rest of Mongolia, nor from modern technology. They have invested in technological solutions and use solar LEDs for electricity. They use phones and the internet to get the market prices for their meat. They use motorcycles to get to places quickly when needed. They have made these modern inventions work for them, rather than reconfiguring their lives to them. The major advantage that Mongolian herders have over Kabuli nomads is they are valued by the modern state and not seen as "others."

The semi-permanent structures of Kabuli camps in Khyber Pakhtunkhwa are a testament to the resourcefulness of traditionally mobile people attempting to address the challenges of the contemporary world in an effort to preserve their independence. They have been arrested in areas with extreme weather conditions, endured a proxy war between the United States and the Soviet Union and all its permutations, experienced the rise of radical militarism in Afghanistan, and a weak state in Pakistan. But still Kabuli nomads continue to persist and push past these challenges.

Dire conditions force innovation. As the axiom goes, "necessity is the mother of invention." Invention is the provenance not only of western science and modern educational institutions, but also of those whose knowledge systems are delegitimized by several registers, like the nomadic people, who demonstrate an astute understanding of the environment. We as architects must approach the world with humility and curiosity about what the historical canon silences. This shift in thinking alone would pave the way for decolonizing building technology, material practices, and design strategies. This is just one story of many that are concealed from our disciplinary imagination. ▪

ENDNOTES

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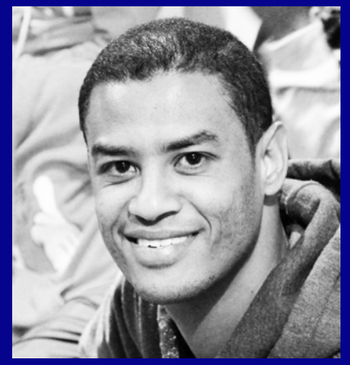
Clint Abrahams is an architect and lecturer at the School of Architecture, Planning & Geomatics, the University of Cape Town, South Africa. His research in architectural tectonic culture, social engagement, and design-build seeks to critically engage the postcolonial challenges of displaced groups in South Africa. As an embedded practitioner, his research interests and practice come together through his non-profit community development organization, Studiolight, in the community of Macassar. In 2020, he was awarded the UCT creative works award for his identity formation project "Who we are Macassar."

He is currently busy with his PhD entitled the "Tectonics of the Displaced." The study seeks to trace the tectonic idea of self-made spaces of the subversive public realm in the apartheid township of Macassar. Key collaborators are architect Carin Smuts and writer Diana Ferris.



COLLECTIVE EXPERTISE: TYPOLOGIES AND BUILDING TECHNIQUES OF SELF-MADE BUILDINGS IN MACASSAR TOWNSHIP, SOUTH AFRICA

CLINT ABRAHAMS

ABSTRACT

This essay contrasts the western thinking behind the design of South Africa's apartheid townships with the thinking behind the self-made buildings and spaces created by people who have been forced to live in segregated communities. In this essay, selected photographs from a photo journal compiled by youth from Macassar, a township located in the Western Cape of South Africa, are examined to center the marginalized citizen as an expert by looking at how their self-made buildings are transforming the original apartheid township design. The essay starts with some background information about apartheid housing to contextualize the conditions in which self-made buildings develop. The self-made buildings of five local residents are then presented as a selection of photographs. Thereafter I examine the typology, material experimentation, and building techniques that emerge in conditions of scarcity to draw a comparison with western ideas.

Prioritizing social concerns over technical concerns sets the thinking behind self-made buildings apart from environments that assert western ideas. People use what they have and produce local spaces that support human life in neglected communities more adequately, while revealing the shortcomings of apartheid design. The thinking behind self-made buildings is collective, and uses cheap material that is abundantly available and practical. The experience-based knowledge produced through these buildings expands the role of the marginalized citizen, no longer a mere bystander or spectator of their environment, but one who actively participates in restoring, shaping, and building their world. The marginalized citizen as an expert is a timely reminder to architects and designers to reengage the social relations of architectural production to develop architectural processes that can challenge outside expert-driven approaches of the past.

INTRODUCTION

Western thinking and understanding of culture and societal progress influenced several disciplines that sought social change through modernism during the late 19th and early 20th centuries. Unfortunately, modernist ideals have also been used to justify political agendas[1] that have oppressed much of the global South. In doing so, certain populations' ways of being and the subsequent lessons it has to offer for contemporary society have been overlooked. For example, in apartheid South Africa, the appropriation of modernist planning and design principles reinforced the colonial legacy of social inequality with separate urban development for blacks and whites. Today, in South Africa the legacies of this urbanization, such as unemployment, poverty, and crime, continue to cripple many townships[2] and characterize the lived reality of the poor. A quarter of a century into the country's democratic era, many of these townships continue to struggle to create a sense of identity and belonging.

According to Pieterse, many scholars over-explain the structural economic causes of African urban conditions.[3] Although largely due to poor service delivery on the part of the government, it has become too easy a premise to explain the complexity of the poor's living conditions. The problem with this perspective is that it hinders a careful look at the agency of the poor' to transform their surroundings. More importantly, it negates the poor's intrinsic experiential knowledge that develops in conditions of scarcity. From a western perspective, the built environment that has developed under oppressive conditions to support township life could be misread as unordered, and the antithesis of humane conditions of being.[4] From a local perspective, people in poorer communities do what is needed to keep a sense of belonging alive.[5] By creating local spaces, people set out to meet their material and immaterial needs. Intrinsic to these self-made places and buildings are functional knowledge systems established by social relations and the forged community identity[6] by which people can define themselves.

This essay contrasts the western thinking behind the design of South Africa's apartheid townships with the thinking behind the self-made buildings and spaces created by people who have been forced to live in segregated communities. In this essay, selected photographs from a photo journal compiled by youth from Macassar, a township located in the Western Cape of South Africa, are examined to center the marginalized citizen as an expert by looking at how their self-made buildings are transforming the original apartheid township design. The essay starts with some background information about apartheid housing to contextualize the conditions in which self-made buildings develop. The self-made buildings of five residents are then presented in a selection of photographs. Thereafter I discuss the typology, material experimentation, and building techniques that emerge in the township to draw a comparison with western ideas.

THE APARTHEID TOWNSHIP GROUNDED IN WESTERN IDEAS

Modernist planning and design principles had a strong influence on South African architects starting in the late 1930s, with students from South African universities visiting the works of prominent architects such as Walter Gropius, Mies van der Rohe, and Le Corbusier in Europe.[7] In 1938 students from The University of Witwatersrand hosted a conference that focused on "applying ... modern planning ideas and design approaches to speculative projects... for a model native township."[8] Students demonstrated *ideas* such as "the standardization of housing types, rational and geometric design layouts in landscaped settings" through a thesis outlining the model native township. These ideas reflected the work of European architects and urbanists and revealed the "contradictions between the idea of modern planning as a vehicle for radical social change,"[9] and South Africa's racial segregation and inequalities at the time. In 1944, the government attempted to reconcile racial segregation with town planning principles using modernist reasoning. Consequently, the government adopted the idea of creating communities separated by greenbelts, as used in the United States and the United Kingdom at the time. This idea of separating communities with green belts was interpreted as planning racially segregated areas with buffer strips between them.[10] In 1950, the Group Area Act[11] made urban segregation and separate development for black and white South Africans law under the rule of the

National Party. Together with several other legislative acts and policies, racial segregation was legalized, out of which emerged the design of the Bantustan[12] and the township to control the black urbanization.[13]

PRIORITIZING TECHNICAL CONCERNS

Following western examples, apartheid planning took a scientific approach to the concern of how people's lives would be impacted by separate development. Technical solutions such as cost-effective development, circulation patterns inside houses, minimum space standards, the layout of houses, the density of housing schemes, and construction methods[14] formulated a criterion used to build the townships. Townships were planned and built on the periphery of cities, separated from white areas with buffer strips (manmade and natural features such as railways, main roads, rivers, streams, and ridges). The basic building blocks of the township were a set of single-story standard house designs[15] referred to as "house type NE/51,"[16] an acronym for Non-European / 1951, and hereafter referred to as a council house. These dwellings were built at minimum cost using robust materials to lessen maintenance, while the lack of decoration referenced abstract modernist architectural design. This technique of urbanization effectively sought to assert western ideas of domesticity[17] on black South Africans.

The prioritising of technical considerations in the design of townships left many communities with no positive public open spaces. Instead, leftover spaces between houses became unsafe places. "This lack of designing the public space can be seen as a total disregard for the ... "nature of human action and behaviour in that it is social, participative, relational and how societies are made."[18] The township eventually became overcrowded, polluted, and a monotonous wasteland[19] that was rife with crime and poverty. Consequently people found it difficult to connect with these environments.

Figure 1: Typical township layout with standardised housing deployed in Macassar during the 1970's. Courtesey: Department of Rural Development and National Geo-spatial Information of South Africa. Aerial photo, 1977.

In post-apartheid South Africa, the intrinsic values of the NE/51 typology remain largely unchallenged. In its haste to address the growing housing crises, South Africa's' Reconstruction and Development Program's (RDP)[20] housing schemes did not improve on apartheid design. Many believe that RDP housing has reinforced apartheid planning principles in that it formalized peripherally located shack settlements by making these permanent.[21] More disastrous is the inferior build quality of these homes, with the majority reported to be a high risk.[22] In these conditions, where the government has failed to provide a suitable built environment that can adequately support human life in the townships, these environments are still characterized as places of unity.[23] Here people continue to carve out a meaningful existence, multiply in numbers, and continue to transform the townships into a liveable place. In fact, the township has been a major site for people's struggle for a transformed society,[24] both politically and spatially. In other words, the townships have become places where political practice and architectural knowledge come together.[25] As such, the built-up urban fabric of the township is a piece of physical evidence[26] encompassing multiple interpretations of architectural ideas of how to live in environments intended to control. It thus becomes

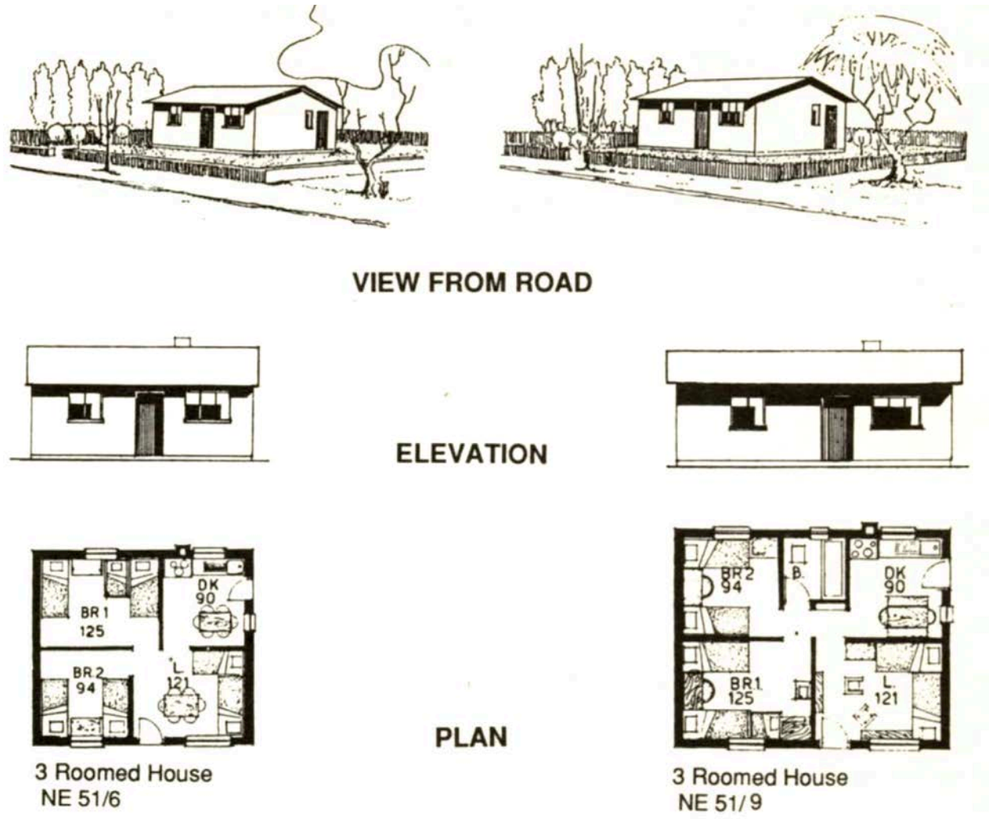


Figure 2: Plan drawing of standardised housing block in Macassar. By author 2020.

Figure 3: *Jannie's Games Room exterior view.* By author 2018.

Figure 4: *Jannie's Games Room interior view of community.* By author 2018.

possible to identify the intrinsic experiential knowledge of marginalised citizens by looking at the self-made buildings and spaces that contest the original apartheid township design. [Figure 1 & 2]

PHOTOGRAPHING LOCAL SPACES IN MACASSAR

In 2016, local spaces frequented by youth in the community of Macassar became the inspiration for a group of young people to document their world through street photography.[27] The project aimed to visually tell the story of how residents build local spaces to create a safer community.[28] The project also sought to change distorted outside perceptions of neglected communities : that of being poor, idle, and lacking the capacity for change without outside help. After two years the group produced a photo journal to present their perspective of life in Macassar. The photographs presented in the subsequent section are selected from the photo journal to tell the stories of how five Macassar residents have transformed their apartheid council houses into much-needed public spaces for people to connect.

Jannie Charles is a local pastor who constructed a games room for youth. Here, a ten by fifteen-meter shack was made over time to fill in a once crime-ridden alleyway between old council houses. With the help of unemployed youth, used building components were collected from several building sites. The fifteen-meter roof span was made using shorter lengths of timber beams that were connected using a lap joint technique to create continuous beams that span the length of the structure. The structure is also used for local community functions such as meetings, weddings, funerals, exhibitions, and storytelling (Figure 3, 4).

Figure 5: *Street view of shack made at Bong's Place.* By author 2018.

Figure 6: *Inside of shack at Bong's Place with community exhibition event.* By author 2018.

Figure 7: *Street view of Owen's treehouse.* By author 2018.

Figure 8: *View of space between Owen's treehouse and the council house.* By author 2018.

Rastafari Joey Sampson, known as Bong by residents, built a shack over the old council house with his friends to accommodate his teachings and practices. Over the years, the shack has also functioned as a greengrocer and a taxi business. Timber gum poles and second-hand mild steel corrugated sheets were used to construct the shack's envelope. Large doors open during the day to create positive outdoor space onto the street and blur the inside -outside boundary. Today, firewood is sold from the shack while passersby take part in storytelling around an open fire. The shack has also been an important place for young people to meet up (Figure 5, 6).

Owen Amsterdam is a local musician who enjoys building treehouses. Together with long-time friend Mervyn Speelman, he combines woodcutting and carpentry skills to construct a four-level treehouse that ascends above the township roofscape. Firewood, timber offcuts, laminate floorboards, and PVC pipes are nailed together and supported by an existing tree trunk. The treehouse is located between the old council house and the street-facing garden wall, creating an intimate space where friends and neighbours meet daily around a fire to talk about life in the township (Figure 7, 8).

Figure 9: *Street view of Paul' Swartz's house.* By author 2018.

Figure 10: *View of private courtyard with entrance to work space.* By author 2018.

Local sculptor and television repairman Paul Swartz built a small space to work and cook behind the council house. A boundary wall is built to create a private courtyard between the self-made structures and the council house. He recycles old building rubble, clay, wire mesh, and TV parts to build the walls of his buildings. Pieces of pottery and sculptures adorn ' his work, to which he applies new layers of paint each year. The scale and dimensions of these spaces are determined by the 80-year old Paul's body, and the size and weight of available materials. In front of his property, an organic folding garden wall references his courtyard buildings. The street-facing garden wall encroaches over the boundary and creates sitting areas for youth and elders, from where they watch over the street (Figure 9, 10).

PRIORITIZING COMMUNITY

According to Smith, "self-made buildings are sites where people merge with objects..., sociality with economics, and the individual with the communal."[29] This means that people's identities and buildings are inextricable and shaped together. It is not only the space that is transformed, but also the social identity of all participants. This is because "the transformation of buildings and... [social transformation] ... is seen to be... [concurrent]." In conditions of scarcity, we can argue that people's experiential knowledge is integral to the structures they make as they persist in creating a world that exemplifies a world they want to see. It is through this persistent "invention and reinvention... [of worlds that]... people's knowledge emerges."[30] Particular to the spaces created by the five residents presented in the previous section are their knowledge of the social conditions that surrounds them, and their experimentation of materials and building techniques. These buildings and spaces are first concerned with social issues, such as creating safe places for youth and economic opportunity at Jannie's games room and Bong's place, and individual expression at Paul's sculptor's house and Owen's treehouse. Found materials and building techniques are then assigned to these buildings and made to perform under new technical specifications. These characteristics are in line with Frey's description of contemporary building culture in South Africa, in that it is a "collective ... [social enterprise that]... makes use of cheap materials that are abundantly available and is... [practical]... in its construction."[31] Consequently, these structures stand in stark contrast to apartheid council houses in respect of typology, building techniques, and materiality. Because of these differences, it is helpful to draw comparisons between the thinking behind these self-made buildings and that of the original apartheid township. To do so, we need to see these buildings as inventive places that connect with people, instead of a bad example of western standards.

TYPOLOGIES OUT OF A COLLECTIVE ENTERPRISE

In the buildings presented, people worked together with their neighbours to help make buildings that forge purposeful social identities that can resist the social ills posited by an environment designed to control. An example of this is the making of safe spaces for youth at Jannie's Games Room and Bong's Place. Here we see unemployed youth working together to help create a space that can purposefully shape their identities. In both instances, dangerous alleyways were built up incrementally and then used for multiple forms of social gatherings such as community meetings, an arcade, a fruit and vegetable grocer, and even a transport business. At Paul's sculptor's house, Swartz carefully constructed an introverted space for himself. He then shared his knowledge by building a front garden wall with seats that are used with his neighbours. At Owen's treehouse, Amsterdam works closely with his friend to create an aspirational space . These different public uses next to the private council house significantly redraw the boundaries of the council house and the land parcel it sits on. This in turn creates other typologies such as infill, courtyard, and street edge buildings. Less functional is Owen's treehouse, but no less important. As a vertical typology (tower building) it creates an important urban marker in what is predominately a flat urban landscape.

An important feature in all these buildings is how they encroach over or step back from the site boundary to create positive outdoor public spaces facing the street. Large doors and gates facing the street are opened during the day to conduct public services and closed at night for private use. Because of this, the street becomes an expanding and contracting public space that supports everyday social life in the township. As a collection of spaces, these buildings work together to create a subversive public domain needed for the community to function efficiently. Contrary to apartheid planning, which grouped all public buildings away from residential areas, these spaces can be described as a disseminated urban typology made up of several smaller constituent spaces located within the community. These buildings are operated by residents, are accessible, and connect people and their place. In 2018, a community exhibition was hosted by the Macassar community where several self-made buildings were used instead of the state built public buildings. A large reason for this was that many state-built buildings in the area were not accessible because of politics and their locations. The success of the exhibition revealed that conventional civic centres and community hall design did not function optimally as a place for building community. Because of this, the design of public building typologies can benefit from examining how marginalized groups invent and re-invent buildings suitable for their context. The experiential socio-spatial knowledge that these buildings produce is important for imagining typologies that can support the diverse way of life in townships, while forging a sense of place and belonging.

CHEAP MATERIALS AND BUILDING TECHNIQUES THAT ARE PRACTICAL

A large percentage of South Africa's construction industry's labour force lives in the townships. Carpenters, bricklayers, plasterers, and tilers bring home with them the knowledge of conventional construction. Leftover building materials and other found objects that are useful for building are also collected. Building techniques are then re-invented in the making of self-made buildings because of the use of found materials. People recycle and reuse found materials because they are affordable and available. These cheaper materials are given new technical specifications, as they are made to perform under new conditions. Under these new conditions, materials and components are brought together in unexpected ways that move away from conventional building techniques. For example, at the sculptor's house, Swartz constructed a circular studio entrance using the steel reinforcement frame reclaimed from a discarded stormwater pipe. He then layered the frame using a clay and cement mix. Fiberglass fruit carrier bags were used between each clay-cement layer to create a watertight envelope. This technique was perfected and then used to construct other parts of the building. Consequently, the walls of the self-made buildings are organic and decorated with broken tiles and paint, and juxtapose the conventional, undecorated standard council house that was made using concrete blocks. At Jannie's Games Room, a thin roof spanning fifteen meters was made using several shorter timber beam lengths. A timber double lap joint was used to connect the timber lengths to make long, continuous beams that span the structure instead of conventional truss construction. In parts of the building, local reeds were used to clad the ceiling for thermal, acoustic, and aesthetic reasons. At Owen's treehouse, lateral stability is achieved by using a grid where structural columns are made by bundling lengths of reclaimed timber together. The ladders between each platform act as a brace to further stabilize the structure. Built on top of an existing tree trunk, the self-made structure and the growing tree converge to create a vegetal aesthetic that softens the predominately urban landscape.

This constant experimentation with materials and building techniques creates a hybrid aesthetic that is decorative and expressive. People find it easier to connect with this aesthetic because it is the product of their aspiration and capacity. Because of this, we can argue that these buildings are more representative of people than the reductive qualities of apartheid buildings. In thinking about an architecture that can represent people's cultures and ways of being, it would be important to understand how technological innovation can be adapted to suit locally available skills and materials. The experiential technical knowledge that these buildings produce is important for considering how to make robust and durable buildings that do not revert to reductive qualities in these contexts.

SUMMARY

Western ideas, in the form of apartheid design, sought to address the complicated needs of South African society with grand schemes and rigid rules. The result was bland architecture that people had trouble connecting with. Apartheid design created an anti-social, controlled environment and hindered the advancement of black communities. In response to these contexts, citizens have been forced to take greater responsibility to make their communities more liveable and representative of who they are. People use what they have and produce self-made buildings to meet their material and immaterial needs. Today, self-made buildings make the largest contribution to the transformation of the South African urban landscape[32] and can more adequately support human life in neglected communities, while revealing the shortcomings of apartheid design. These buildings prioritise social concerns over technical concerns, and contest the thinking behind environments that assert western ideas. [This]..."foregrounding of the social in postcolonial contexts... [is important to instill a sense of belonging and community identity in]...populations that have been historically marginalized."[33] However the application of western technologies and aesthetics in local conditions remains evident in the design of buildings produced by the state and their appointed architects. The design thinking and implementation behind many of these public buildings do not always include the marginalized citizen's experiential knowledge as a genuine contribution to the social project of architecture.[34]

For this reason, the choice of pictures presented in this essay was not just selective; it was tendentious. The photographs do not only present the perspectives of local youth (and the spaces that shape their everyday experiences), but it also attempts to "expand the role of the citizen..., no longer a mere bystander or spectator of his or her environment, but one who actively participates in restoring, shaping, and building his or her city."[35] The self-made buildings by citizens offer valuable insights into how architecture and technologies are reinterpreted by marginalized groups and the subsequent knowledge this produces. In conditions of scarcity, new typologies that accommodate emergent social groups, material experimentation, and alternative building techniques offer glimpses into "subjugated knowledge and subjectivities."[36] These are important considerations if architects and designers want to learn how to design in low- resourced communities. We need to see these self-made buildings and the worlds they construct as alternative modernities instead of bad examples of western standards. Studying these sites as examples of inventiveness can reinforce the idea that technological innovation has to adapt to local capacities by taking into account locally available skills and materials.[37]

The marginalized citizen as an expert is a timely reminder to architects and designers to reengage the social relations of architectural production. As designers, we need to build our capacity to understand poorer communities. Low writes[38] that a reengagement of social anthropology and ethnographic methods can help designers include the expertise of those with lived experiences in the design process. The emerging field of architectural ethnography[39] offers a good methodology that can help us understand the hybrid-built environments created by these experts. Architectural ethnography focuses on drawing as a means of describing architecture not as a static result, but about what people do in, around, and for it. Such humanistic techniques can reveal the experiential knowledge of the citizen and can transform the way architects and designers engage with the communities in which they work. Consequently, we can develop a more inclusive architecture that respects and acknowledges local ways, and challenges outside expert-driven approaches of the past.[40] ■

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11. Group Areas Act was a law that was passed by the Parliament of South Africa's apartheid government. The act allocated racial groups to separate areas for residential and business sections in urban areas. Also see https://www.sahistory.org.za/article/group-areas-act-1950

12. A partially self-governing area set aside during the period of apartheid for a particular indigenous African people; a so-called homeland.

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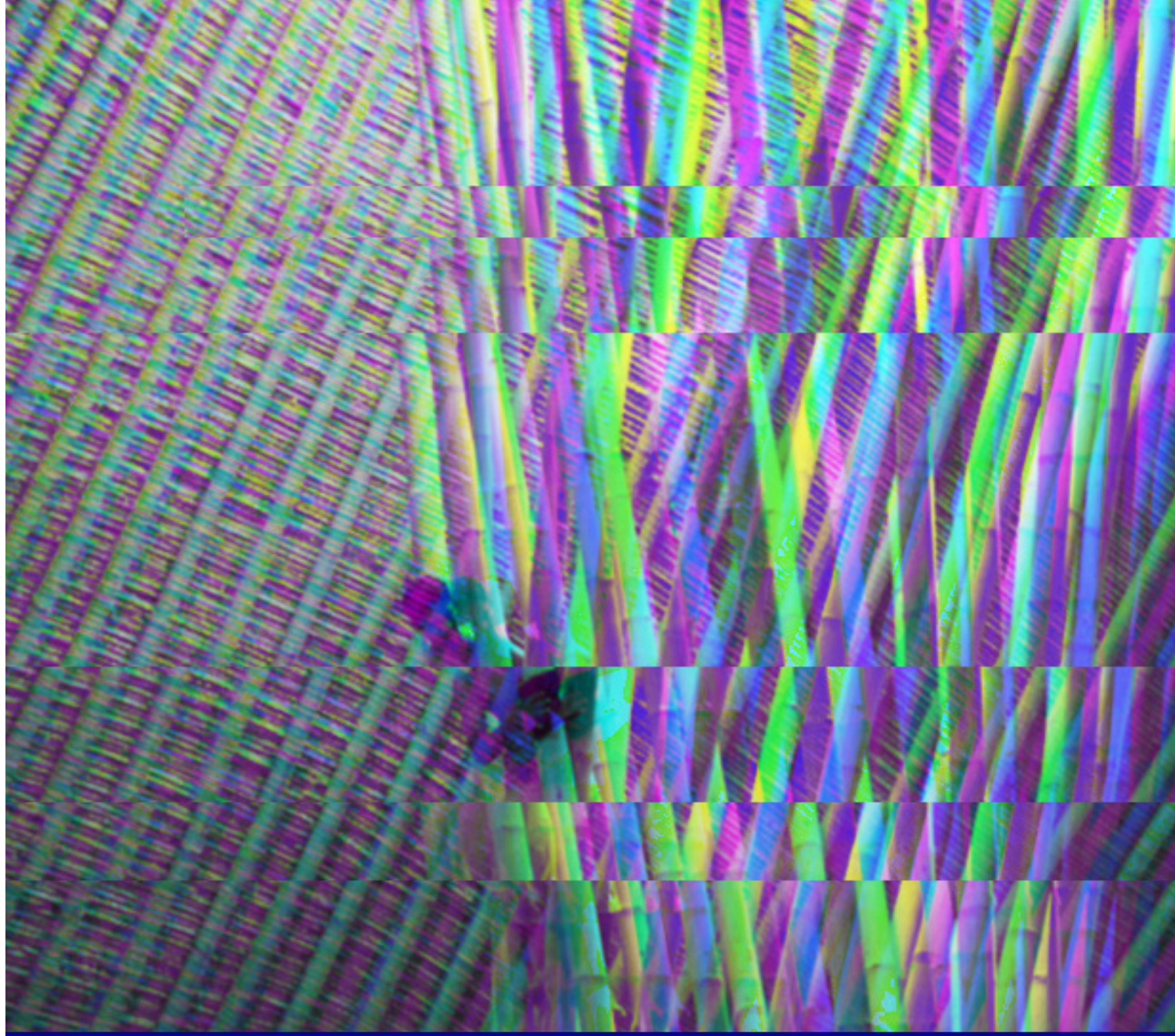

TECHNOLOGIES OF CONSTRUCTION

DECOLONIZING BAMBOO
ROBERT COWHERD

UNEARTHING INDIGENOUS FUTURITY
SELINA MARTINEZ INTERVIEWED BY TONIA SING CHI

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DECOLONIZING BAMBOO

ROBERT COWHERD

ABSTRACT

In the Southeast Asian archipelago prior to European contact, a ubiquitous knowledge of bamboo construction fed, and was fed by, the ritual assembly of village structures. Each family unit renewed social contracts and reaffirmed power hierarchies according to the bamboo they grew, harvested, and fashioned into components of buildings. As the twin imperatives of colonial extraction and missionary conversion swept across Asia, Africa and the Americas, waves of campaigners preached the gospel of single-family houses and more "salubrious" buildings. Before the turn of the 20th century, these sermons were re-asserted as regulations and compulsory standards of morality and hygiene, virtually eliminating bamboo structures beyond bridges and animal pens. In the early decades of the 20th century, pro-independence architects in the colonial service sent to enforce prohibitions in bamboo construction across the Dutch East Indies encountered a series of joinery and treatment methods capable of preventing infestations. They presented their findings at the 1922 Social Housing Congress, proposing that the socio-cultural practices of bamboo, along with its economy, were the key to solving multiple crises facing the colonial administration.

A century later, bamboo structures have emerged at the cutting edge of sustainable design, simultaneously providing architectural media with some of its most startling imagery. The present global state of bamboo design and construction provides a framework for a return to the same Balinese villages where Dutch colonial architects first encountered the building cultures of bamboo. The article interrogates the socio-cultural status of bamboo architecture at a moment when a luxurious seven-story bamboo mansion in Bali appears as the cover image of Apple TV's "Home" docu-series: What meanings are associated with bamboo structures? How have international building codes and engineering standards adapted to the "nonhomogeneous element behavior" of bamboo poles? What do the master builder/architect priests of the stronger-than-ever Hindu-Balinese religious practices see in the legalization of building methods that once played a central role in village life and social order? Well into the anthropocene, where do we stand in relation to questions posed in 1922 on the potential for bamboo architecture?

INTRODUCTION

In the 1970s, Green Revolution agricultural technologies were embraced by the Indonesian government and brought three successive years of record rice yields to Bali. When the trend line dipped in year four, the response was to apply more pesticides and fertilizers. What happened next was a shock to everyone. From 1982 to 1985, plant stress from water shortages and catastrophic losses to pest infestations resulted in unprecedented food scarcity. Farmers rebelled, rejected government interventions, and returned to their prior rice farming routines. But what accounts for the success of these routines, given that the rugged area of south central Bali feeds more people on less land than almost any other region in the world? While archeologists excavating the canal networks of Cambodia and Thailand had long speculated on the role of religion in water allocations, the collapse of the Balinese rice system suddenly brought its centuries-old Hindu-Balinese temple practices out of the shadows and made it the focus of intense scrutiny.[1] A decade of computer modeling by University of Southern California researchers revealed the remarkable sophistication of the Balinese *subak* temple system in its capacity to dynamically respond to shifting parameters large and small to restore balance.[2] In light of their catastrophic failures and the subsequent systems analysis, even the true believers at the Asian Development Bank took a step back from their constitutional zeal and admitted that no bank project had ever exhibited such a high performance and capacity for self-regulation comparable to that of the centuries-old terraced rice system of Bali.[3] This short history of the momentary displacement, and urgent return, of a previously invisible yet inexplicably sophisticated set of socio-religious practices is prologue to a similar, albeit elongated, history of suppression and nascent revival.

Throughout much of Southeast Asia prior to European contact, buildings, villages, and infrastructures were made of bamboo. Like the Balinese *subak*, the unique role of bamboo in the equatorial ecosystems and material properties placed it at the heart of a rich building culture and complex socio-economic order. Along with colonial extraction and missionary conversion, hygiene campaigns swept across Asia, Africa and the Americas with the aim of imposing moral and physical health on colonial subjects. Thatch and bamboo buildings were declared to be dangerous breeding grounds of rot, rats, and malaria. Bamboo was discouraged and banned outright, beyond animal pens and bridges. Entire villages were removed to address the threat posed to European enclaves by bamboo structures and their inhabitants.[4] It was a war pitting European modernism against indigenous tradition. Now, some seven decades after Southeast Asians brought an end to formal colonialism, the stigma of bamboo as a sign of poverty and backwardness remains. Even as bamboo structures have provided a global architectural media with some of its most stunning images since the 1990s, bamboo remains a material for the very rural and the very rich. Against the largely successful displacement of bamboo culture, this article interrogates the socio-cultural status of bamboo architecture at a moment when bamboo structures are found on the pages of *National Geographic* and as the ultra-luxury mansion on the cover image of Apple TV's "Home" docu-series, but nowhere in between.

SIMPLE MATERIALS, COMPLEX STRUCTURES

Irish designer Linda Garland pushed back hard against the cultural stigmatization of bamboo: "If you took the properties of bamboo and you called it 'techno-fiber' ...governments [would say] 'my god, of course we want it.'" By its common name, it is shunned as being just for the poor.[5] As founder of the Environmental Bamboo Foundation, Garland traveled a path forged half a century earlier by two Dutch architects who, like Garland, disseminated techniques of bamboo preservation and promoted its use for inexpensive self-construction of housing. But unlike Garland, their troubled roles simultaneously as instruments of, and anti-colonial activists working against, the late colonial project of the Dutch East Indies (now Indonesia), compelled a more explicit socio-political critique.[6] Thomas Karsten (1884-1945) and Henri Maclaine Pont (1884-1971) defined "the task" (*de taak*) of the age as the expression of "...the insoluble duality [that] lies in the essence of the colony: the contrast in tradition, degree of development and aims between dominating European and dominated indigenous life."[7] They were explicit in their own roles as placeholders and catalysts of a transition to indigenous self-governance.

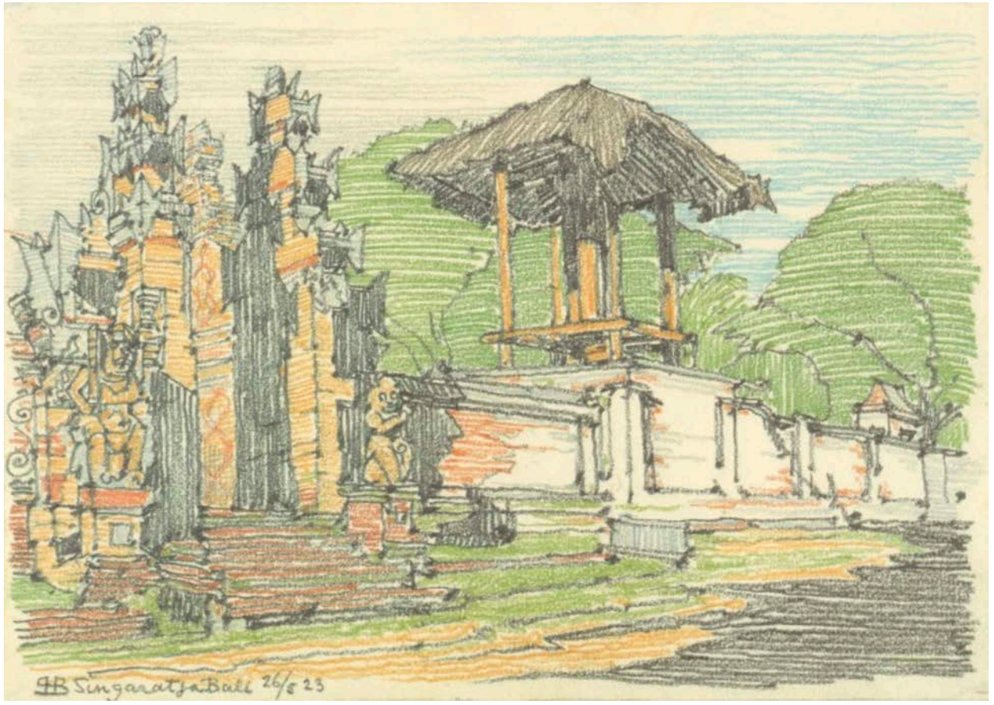

Figure 1: H.P. Berlage's 1923 sketch of a Balinese gateway and bamboo kul-kul bell during his tour of the Dutch East Indies (PD), from H. P. Berlage, Mijn Indische Reis (Rotterdam: W.L. & J. Brusse, 1931), 118.

When Hendrik Petrus Berlage (1856-1934) visited them in the Indies, he was drawn to the pre-European landscapes that were soon to be lost to progress. For Karsten, the loss was not a foregone conclusion. He expressed the conflict as manifesting in the very materiality of colonial constructions in which every masonry block exemplifies European domination in the extraction of wealth. Underlying outward expressions of deference to colonial power, the *tukang* (workers) withdraw to the *kampung* (rural and urban villages) to weave *tikar* (bamboo mats for walls, ceilings and floors) or thatch grasses into roofs.[8] Within the walled and gated enclaves of rural and urban village *kampung*, these impermanent constructions are deployed as "spiritual weapons" renewing connections to a socio-religious-ecological order. After more than two centuries of colonial modernization and post-independence "development," questions remain: What now is included in the larger "cultural package" when a building is locally harvested, hand-wrought, and communally assembled?[9]

In his struggle to probe more deeply the "insoluble dualities" of the Dutch East Indies, Pont traveled the archipelago first from 1912 to 1915 and then more extensively as part of a Public Service Technical Inspection Tour from 1920 to 1923. Sent to enforce a ban on bamboo and thatch, Pont instead returned from his tour with a recipe for salt solutions capable of protecting bamboo from insects, and joinery techniques to reduce nesting. He pointed out that without bamboo, structures required the expertise of skilled carpenters.[10] Previously, every child grew up learning to fashion buildings out of materials gathered from the surrounding forest. The first Europeans marveled at buildings being picked up and relocated, houses built in "60 man-days," and entire settlements of several hundred houses reestablished in three or four days after a disaster.[11] The larger impact of the bamboo ban was the need, for the first time, for cash to pay skilled carpenters and acquire scarce timber.

Just as the archeologists excavating the temples and canals of Cambodia and Thailand were eager to study Bali's still-living culture of the *subak*, Pont was fascinated by the ongoing practices of communitarian *sambatan* construction that was threatened by the prohibition on bamboo buildings. In the absence of dependably recorded histories prior to European contact, this kind of "ethno-archeological research" may help us draw historical connections that would otherwise escape notice.[12] The term *sambat* means to donate. *Sambatan* practices, where they can still be found, are not just a pragmatic strategy for housing affordability, like the English building societies, but lay at the heart of a vibrant gift economy.[13] Each family unit renews social contracts and reaffirms power hierarchies according to the size, quantity, and elaborateness of building components they harvest, fashion and install. Historian Anthony Reid draws on contemporaneous accounts to place the material properties of bamboo and thatch at the heart of a 15th to 19th century Southeast Asian social order in which every person was a builder.[14] Prior to the displacements of the gift economy within villages by commodity trade, the ability to mobilize labor through tribute arrangements was the necessary precondition for accumulating and defending power and wealth.[15] Far from being merely symbolic "spiritual weapons" against domination, Pont identified the practices of *gotong royong* (mutual self-help) found throughout his travels to be a powerful alternative political-economy embodied in the materials themselves. The impact of a ban on bamboo and thatch was a great acceleration of modernity driven by the dual imperatives of extractive capitalism and a missionary Enlightenment project.[16] What if rather than having been driven to extinction, the socio-religious system of bamboo and thatch had, like the Hindu-Balinese *subak* water temple system, simply escaped notice beneath the tropes of colonial "modernisation," and post-colonial "development"?

Figure 2: Wentworth Architecture and Bamboo U student Jonah He proudly displays a traditional "fish mouth" joint made with simple hand tools, Sibangkaja, Bali (Robert Cowherd CC BY-SA).

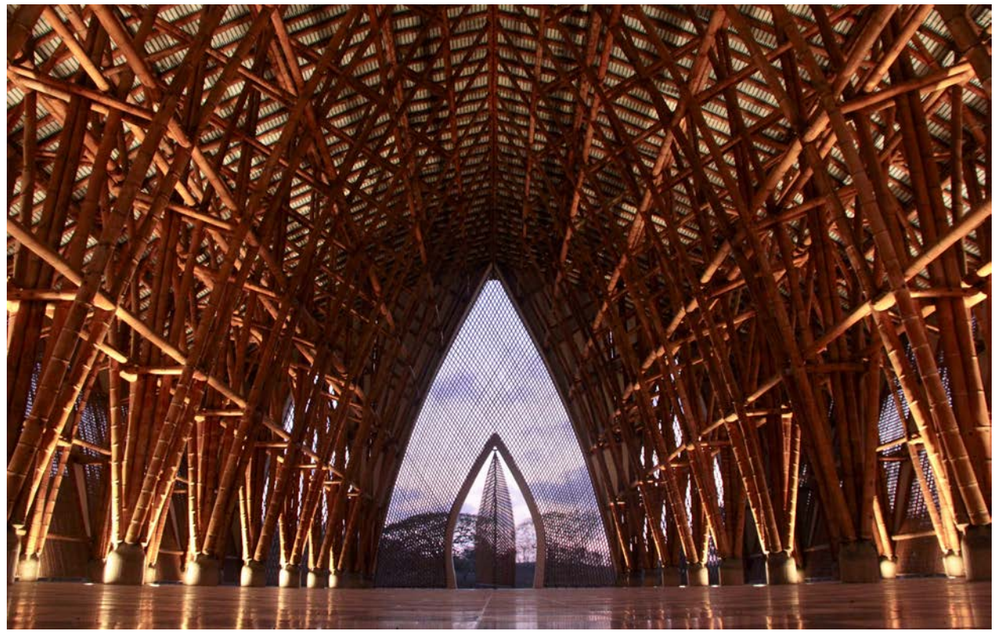

Figure 3: Temple of No, Cartagena, Colombia by Simón Vélez (Namagool7 CC BY-SA)

BAMBOO REVOLUTION?

In the 1970s, when Irish designer Linda Garland found herself on a small boat shuttling between islands, she demanded to see where its enormous bamboo pontoon had come from. Thus began her life-long obsession with bamboo's untapped potential. While the use of naturally occurring salts to protect bamboo probably predates the arrival of Europeans in the tropics, Garland's foundation worked with Dutch and German scientists who claimed to have "discovered" boric salt preservation methods.[17] Ironically, Garland's team likely found itself promoting bamboo preservation to some of the same villages where the techniques were first shared with the Dutch technocrats some 60 years earlier.[18] So thoroughly had the colonial campaigns against bamboo succeeded, that there was no one around to point out this connection. In the Balinese villages where Garland and her team worked, bamboo was for poor people in the far-flung "outer islands," not Bali. Despite Garland's foundational work of disseminating bamboo preservation and construction methods, the spark of "revolution" did not catch. Instead, her bamboo housing work is overshadowed by celebratory displays in *Architectural Digest* and the celebrity of her client list, including David Bowie and Sir Richard Branson.

The socio-political implications of the bamboo revolution have been much closer to the surface in Latin America. In the 1980s, Colombian architect Simón Vélez pioneered a technique of injecting concrete into bamboo joints to quickly create lightweight, long-span structures in Colombia's coffee-growing region of Caldas, south of Medellín. Vélez has promoted the native guadua bamboo, the world's largest bamboo, as an alternative to colonial building cultures and materials of concrete and steel. Guadua bamboo, which grows up to a meter per day, can quickly reclaim lands ravaged by eucalyptus and other species brought from Europe in what he calls "botanical colonialism." After decades of development locally, his remarkable Zero Emissions Research and Initiatives (ZERI) Pavilion at Expo 2000 in Hannover, Germany brought the extraordinary aesthetic and technical potential of bamboo structures to a global audience. When the pavilion was reconstructed back in Colombia, it was part of a larger demonstration showing how bamboo housing could outperform conventional approaches to rural housing.[19] Like Garland, Vélez operated at both the cutting edge of flamboyant architecture in the increasingly global public eye, and in educating rural communities. His 2000 book, *Grow Your Own House*, was aimed to help the vast majority of rural Colombians house themselves better without crippling cash outlays.[20] Vélez came to a critical juncture when, as he flew to the Netherlands to accept the 2009 Principal Prince Claus Award for contributions to Culture and Development, Guadua was declared "endangered" in Colombia, ushering in a moratorium on the cutting of Guadua for construction or any other purpose.[21] After the ceremony, upon hearing this news the Dutch President called to urge the Colombian Minister of Forestry to lift the moratorium and write bamboo into the Colombian building code.[22] Since the 2010 passage of the first-ever structural code for bamboo, Colombia has led the world in bamboo construction. Ecuador, Peru, India and Bangladesh have recently passed their own codes.[23]

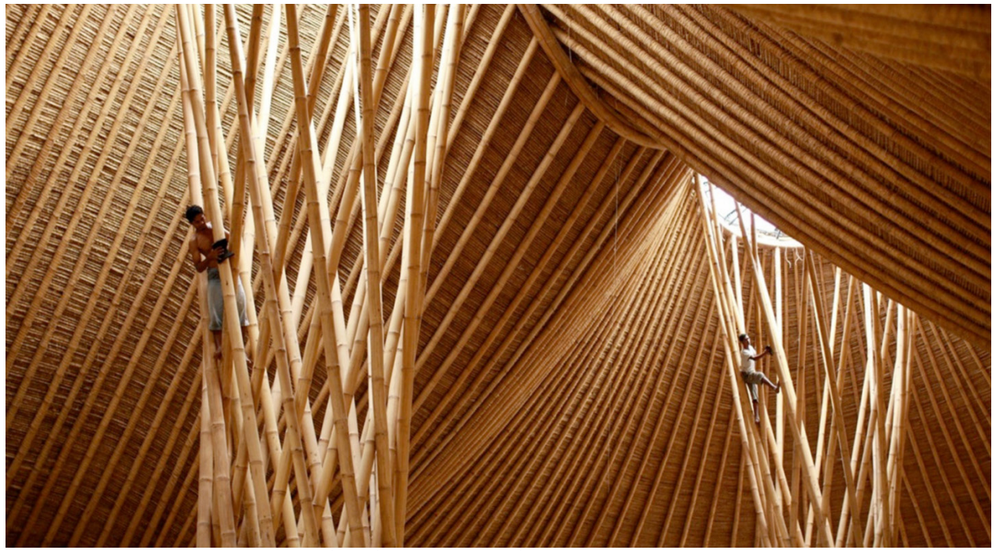

Figure 4: 2006 Three Mountains Hall, Bali by Jörg Stamm (©Ibuku) courtesy of Elora Hardy / Ibuku.

If Colombia has begun to see bamboo structures built at both extremes of the very rich and the very poor, the brilliant design innovations of Linda Garland and those following in her footsteps continue to capture the imaginations of a global elite beyond the notice of the villages still participating in *sambatan* bamboo building cultures.[24] While Vietnam's Vo Trong Nghia Architects has produced some of the most revolutionary bamboo architecture of the "bamboo revolution," his concrete-and-steel-framed, low-cost house prototypes use little bamboo and spark no revolution. [25]

Among those swept up in the ripples emanating from Garland's vision is her neighbor in Bali, world-renowned jewelry designer John Hardy. In 2006, as their daughters approached school age, Hardy and his wife Cynthia saw Al Gore's "An Inconvenient Truth." They sold their jewelry business and turned to the task of building their Green School. The first trained architect on site presented a model of rectangular boxes sitting predictably on leveled terraces cut out of the jungle. John responded by plucking the largest block labelled "Administration" from the center, rolling and twisting the plasticine into a coil, and suggested

Figure 5: Wentworth Architecture/Bamboo U course in the Heart of School, Sibangkaja, Bali by Jörg Stamm & John Hardy for the Green School (Vrajesh Patel CC BY-NC-SA).

that students, not administrators, belong at the "heart of the school."[26] The tale has ever since been deployed as a symbolic architect's-head-on-a-pike-warning to the overly credentialed, lest they bring industrial-era norms and conventions too close to the Green School gate—right-angles, flush toilets, enclosure. In their place, the Hardys assembled a team of master bamboo builders of Belaga and Bona villages, and a polyglot cast of creative souls like sculptor Aldo Landwehr and Simón Vélez's master carpenter, Jörg Stamm. Inspired by the volcanic peaks of Bali visible only on cool mornings, Stamm picked up John Hardy's clay coil—the challenge thrown at the feet of architecture—and adding a second spiral, he twisted them together into a model for a triple-vortex bamboo cathedral of learning without walls. Around this "Heart of School" the Hardys have since built more than 100 bamboo structures, each more audacious than the last, challenging all who enter to map out new possibilities for education, architecture, and the planet. Although limited in reach by the costs associated with a selective international school, close to 20 percent of the students are on full scholarship, some 270 Balinese students are enrolled in the after-school program, and the model is being replicated in three other countries. The voluptuous curvilinear forms of the Green School rendered in bamboo and thatch provoke a serious rethinking of how to respond to the global climate emergency, sequestering both carbon and lingering toxins of the "Bilbao effect."

Expanding out from the bamboo epicenter of the Green School, John's daughter Elora Hardy left Donna Karan's Manhattan fashion design studios to lead the design-build firm Ibuku. Her team has since handcrafted some 100 bamboo buildings across Bali and the world. Their artistic approach retraces the steps of William Morris and the English Arts and Crafts movement, at least in creating every stair tread, light switch, and shelving unit as a made-to-fit, one-of-a-kind work of art. Like Morris, any trace of latent communitarianism associated with human hands shaping the once humble bamboo pole is swept away by Ibuku's business model targeting a luxury, "bespoke," market. Ibuku's target market is decidedly upscale, seeming to inherit her celebrity client list directly from Linda Garland. Each creation seems to be more breathtaking than the last. Her 2012 seven-story bamboo mansion and Ms. Hardy's remarkable artistic journey have deservedly landed her as the focus of Episode 3, and the cover image of Apple TV+'s 2020 "Home" series. With a television in every *kampung*, and a smartphone in every pocket, what cultural resonances might vibrate through the bamboo groves of the archipelago?

Meanwhile, back in the village, Linda Garland's son Arief Rabik has picked up the mantle of the Environmental Bamboo Foundation to design and implement an ambitious vision for "1000 Bamboo Villages." He leads his audiences through a "bamboo yoga" routine as a mnemonic device to internalize the principles and numbers of the plan. Stretch up inhaling, visualize sequestering one of the 40 billion tons of human-produced carbon dioxide each year. Bend forward exhaling, visualize each clump of

Figure 6: The design process moves from hand sketch to bamboo model to construction (©Ibuku) courtesy of Elora Hardy / Ibuku.

bamboo holding 5,000 liters of water to sustain the surrounding forest over the increasingly unpredictable periods of drought.[27] The kinesthetic stimulation is Rabik's admission that, conditioned by constant meetings with governors and their technocrats, his numbers tend to, well, numb. To increase the carbon sequestration of bamboo to more than two percent of global annual output, these numbers are all big. Once again, the "techno-fiber" outperforms all competition: softer, stronger, more odor-resistant than any cotton or silk; less land, pesticide and water-intensive than wood for pulp and paper; and the biggest potential, Laminated Bamboo Lumber (LBL) that outperforms wood equivalents on structural consistency, cost, and environmental justice. As a bonus, the byproducts of each process convert well to liquid or gaseous bio-energy.[28] The ambitious scale of Rabik's vision would seem to be a requirement to break the chicken-egg impasse where investors in each of these sectors are reluctant to commit until a dependable supply can be demonstrated.

What is to prevent this huge mobilization of bamboo out of the villages and into markets from replicating the human and ecological carnage of the plantation system? Rabik points to three factors. First, bamboo thrives in mixed forests interspersed with medium-depth and deep rooted species, not mono-cropped plantations. Second, bamboo is labor intensive and makes sense only with value-added processing optimized at the scale of around 2000 hectares, a small cluster of *dusun* or *banjar* village units. Third, the Bamboo Village app brings Forest Stewardship Council accountability from clump to consumer.[29]

Figure 7: The construction is executed by scaling directly from the 1:50 model in the field (©Ibuku) courtesy of Elora Hardy / Ibuku.

Beyond Rabik's pitch in the idiom of the technocrat/investor class, the actual engagements on the ground in 30 or so established bamboo villages and the hundred more in progress suggest a refreshingly humble approach. In place of the two-week-in-a-hotel-crash-course, the eight-month "Field School" immerses Rabik's team in one village at a time. It takes several months of listening, social mapping, and inevitably failing repeatedly before earning the trust of the community.[30] It is an approach informed by the ruins of history, which in Indonesia is littered with the remains of well-intended efforts like the 1900s hygiene campaign against bamboo, the 1980s rice famine triggered by the Green Revolution's engineered rice, and the 2000s deforestation driven by palm oil subsidies. Rabik's experiences in reclaiming these deforested lands suggest that the longer ethno-archeological perspective reveals the continuation of a centuries-old struggle. Even before direct contact with European colonialism and its continuation as extractive capitalism, the wealth of Southeast Asian forests inextricably entangled these communities with the luxury markets of the Mediterranean world.[31] Rather than playing into modernity's trope of rupture, empathy and humility appear to be prerequisite attitudes in the Anthropocene. What had been rendered invisible by the attitudes of history are suddenly made plain in an ongoing dance between rupture and continuity played out village-by-village, one generation after another, between collectivized practices and its displacement by individual commercial ventures.

Asked if the economy and performance of bamboo for building might finally overcome its deeply embedded stigmas, Rabik plants his feet firmly back in the numbers:

Figure 8: 2012 Sharma Springs, Green Village, Abiansemal, Bali by Elora Hardy / Ibuku (Thomas Darr CC BY-SA)

> With 430,000 poles per year coming out of each village, they can certainly spare 250 poles for a six by nine meter house. They don't want to live in what they have seen, but if they see a model house they can see a new possibility.[32]

With so much visibility in recent years, bamboo would appear to at last be ready for its close-up. If it is indeed to be a bamboo revolution, what kind? Much depends on whether designers are able to excavate the deeper roots of what might otherwise be merely symbolic, or superficially aesthetic, to resurface otherwise forgotten practices tying our fates together with that of the planet. ▪

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Selina Martinez, is a member of the Pascua Yaqui Tribe and Xicana born and raised in Phoenix, AZ. She completed her master of Architecture degree from ASU in 2020, and is currently pursuing her architectural license. She has been involved in a diversity of projects with local tribal nations through the ASU Indigenous Design Collaborative. Selina is the cofounder and lead instructor for Design Empowerment Phoenix, a program of the Sagrado Galleria in South Phoenix that provides opportunities for youth and community to engage in design tools and processes.

UNEARTHING INDIGENOUS FUTURITY

SELINA MARTINEZ INTERVIEWED BY TONIA SING CHI

ABSTRACT

The following is a transcription of an interview conducted by editor Tonia Sing Chi with Selina Martinez of Design Empowerment Phoenix on May 23, 2020. The conversation explores the suppression of Indigenous building knowledges, the role of personal identity, experience, and ancestry in design practice, Indigenous futurity and plurality, adobe block making as a mechanism for collective healing, and the decolonization of architectural practice through informality. The interview is illustrated by a selection of Martinez' drawings from her thesis project *Bachia*, renderings from the design of the Sagrada Galleria backyard, and videos from the adobe block making workshops with Design Empowerment Phoenix.

onia Sing Chi (TSC): Personal identity plays a fundamental role in your practice. How has your ancestry, community, and lived experience shaped your work as designer? In thinking about the importance of legitimizing personal experience and perspective as a form of knowledge and expertise, what is the value of bringing your whole self to your work—including the facets of your identity that may have been historically excluded, silenced, or erased through the professionalization of architecture?

Selina Martinez (SM): I've always been connected to my Yaqui culture—but in more of an unanalyzed way, until I was exposed to the idea of Indigenous architecture. For most of the time I was in architecture school, I didn't relate to the history we were learning about, which skipped Native American architecture. It wasn't until I met Wanda Dalla Costa, who was in the construction school at the time teaching an Indigenous architecture, planning, and construction course, that I even considered Indigenous architecture as a possibility. This really opened my mind to what I could potentially do within my career. Much of what I was being taught were old generation approaches to design process to create a very objectified architecture, which always felt disconnected from reality and from the people it affects. Architecture is a heavy thing to place in a community. The role of an architect, until that point, was limited to very "iconic" architecture. Even the fact that Wanda was a woman was very empowering for me to see. That's when I began to further explore—through the lens of my Yaqui roots—what *our* architectures were and where they could go, considering the historical gap and the architecture in our communities that have been influenced by Eurocentric ideas.

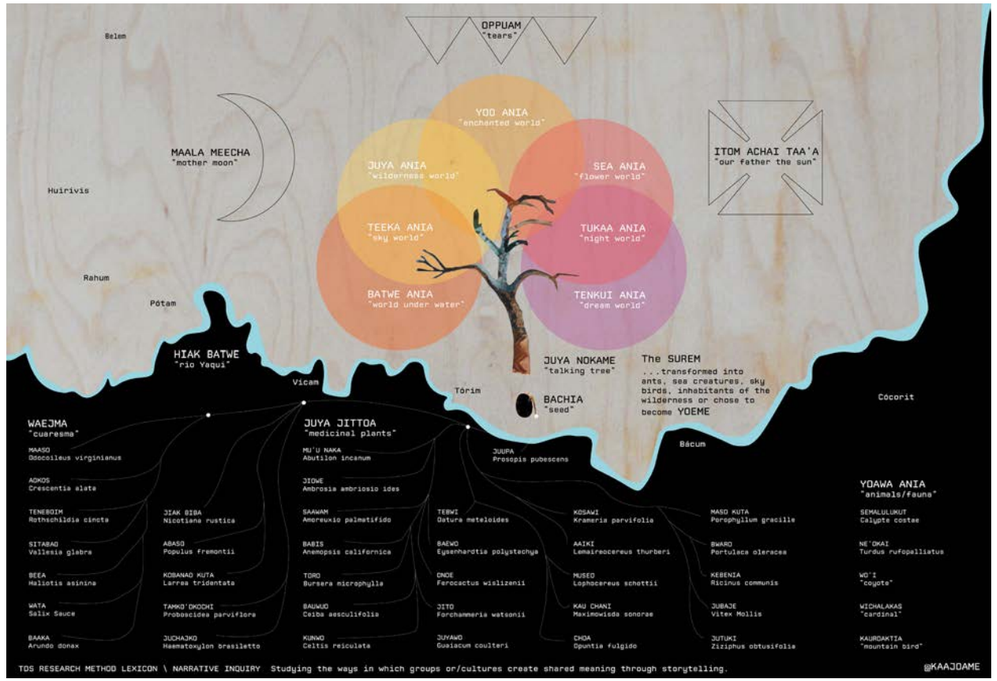

Figure 1: *Bachia Yaqui Emergence Story Diagram* Courtesy: Selina Martinez
This storytelling diagram displays the interconnected relationship between the Yaqui emergence story, Rio Yaqui in Sonora Mexico and the cultural keystone species the environment supports. Cultural keystone species are exemplified in a culture's life-ways, food-ways, ceremony, and world views and often contextualize the roots of one's indigeneity through nature.

Figure 2: *Bachia Rain Garden* Courtesy: Selina Martinez
Yaqui elders in Guadalupe, AZ have expressed it would be an asset for the community to have a public space for children to play during the times they babysit. A sunken garden would allow water to drain into a zone that can be utilized as a water catchment system and reused for a splash pad for children to play in during the summer months. The rain garden would support restoration of sacred medicines in an urban setting and accessibility to lush desert environments.

Figure 3: *Bachia Mariposario.* Courtesy: Selina Martinez
Establishing a butterfly habitat to provide an environment for 'teneboim' cuatro espejos (Rothschildia cinca) a silk moth species. The moth cocoon is utilized as ankle rattles in the Yaqui deer dancers regalia and is imported from the Yaqui homelands in Sonora, Mexico for ceremonies taking place in the United States. This moth species population is currently being affected in the Yaqui homelands due to diversion of waterflow into the Rio Yaqui that supports the ecosystem these moth cocoons are typically harvested from. Inspired by the Yo'o Juara mariposario in Cócorit, one of the original Yaqui villages, this space hopes to provide ecological education around the cultural keystone species of the Yaqui people in Guadalupe, Arizona.

I got deeper into my exploration of my identity in relation to architecture through my thesis project titled *Bachia*, meaning "seed" in Yaqui, which had a program focused on Yaqui culture and identity and how to reestablish our connection to this concept of cultural keystone species—the species that are embedded in our practices, in our regalia, in our food, and in everything that is connected to our emergent story and cultural practices. These species illuminate our innate relationality to nature. Because of colonization, my culture has been heavily influenced by Catholicism; I went to Catholic school growing up and have always been taught that Catholicism is the way. But I began to realize that it's not the *only* way to connect to our Yaqui identity—or to my Xicana identity. Mexican culture has also been hugely influenced by Catholicism. I think that's okay. Everybody has the right to their own worldview, but I also know that this next generation is beginning to deconstruct what that identity means—and create new ways of doing things that are still connected to our ancestry and who we were before colonization. Architecture helps me visualize what that future looks like. One of the concepts I like to explore in my work more currently is Indigenous futurity—along with the concept of plurality. There are many worlds and worldviews within this one world, and *all* should be validated—and are often *in*validated within institutions and universities.

TSC: I'm interested in the work that you're doing with Design Empowerment Phoenix, and in particular the extension of the Sagrado Galleria, where you're connecting with the earth through excavating the ground, sifting the dirt for a series of adobe block making workshops, and transforming the site into a meditation space. How did you arrive at the idea of excavating the site and using the dirt to make adobe blocks? Were members of the local community involved in the ideation process? What were the conversations you were having surrounding the process of unearthing the backyard and using what is typically considered construction "waste" to instead build a space for healing and reflection?

SM: Design Empowerment Phoenix came out of a request from a community member within South Phoenix, the owner of the Sagrado Galleria. His name is Sam Gomez and I met him at one of the Yaqui

Figure 4: *Alma Nacer.* Courtesy: Selina Martinez for Design Empowerment Phoenix
Alma Nacer is a project that hopes to transform an existing building, previously a liquor store, in the South Phoenix community into a cafe, community kitchen, artisan studios, regenerative garden, and eventually a location to develop affordable housing prototypes.

Figure 5: *Sagrado Galleria Healing Garden.* Courtesy: Selina Martinez for Design Empowerment Phoenix
The Sagrado backyard will include a sunken, stepped adobe space, a shade structure, and a surrounding healing garden for medicinal and herbal species. Stepped adobe space that will be plastered with natural pigments and include additional design features from local artists who have been exploring natural pigments. The moveable shade structure will allow people to adjust the shading to the path of direct sun and use it as shelter when it rains to drain the water into the gardens.

Figure 6: *Sagrado Futuro Garden.* Courtesy: Selina Martinez for Design Empowerment Phoenix. A vision created was to inspire the potential future of The Sagrado galleria evolution through new infrastructure and programming. Expanding on the existing building to provide indoor/outdoor gallery spaces post covid, showcase local plant species, and strong connection to green space to promote healing and well-being

ceremonies that we were having in Guadalupe, which is not too far from South Phoenix, where the gallery is. He is a friend of my brother-in-law and he invited me into the community to create this design workshop, which was first offered in the spring of 2019. Through his vision I was able to assist with design visualization tools to further what he would call conscious development from the perspective of a community member that integrates culture with people's wants and needs. It had similar values to those of the ASU Indigenous Design Collaborative.

In this past year, our team was introduced to some elders in the community who had been building with adobe for most of their careers. They also do straw bale. We visited their house, and it was so beautiful. They were—right at that moment—building an adobe wall and they invited us into their space and had us do the whole process with them. We were introduced first to the mixing, and then putting it into the forms, then pulling the forms. They already had some dried bricks, so we even got the chance to lay the bricks with the adobe mortar to see if this was something that we would be able to bring to the Sagrado Galleria backyard redesign, which we hadn't even considered excavating at that point.

The excavation was something that I initially suggested because we were thinking of putting a shade structure back there. I started to think about my experience working with tribes like Gila River and my understanding of the indigenous history of Arizona. The canal system is very extensive and is what our current SRP canal systems have been based on, which is the ingenuity of the Indigenous people who were here before us—and we're still utilizing that system! It's a history that is often forgotten about. And so, I would bring this history up every time people asked why we chose to excavate. We then reused the earth to create the adobe blocks.

There are also cooling factors. When you're submerged into the ground, there is a slight temperature change. And I think the process of excavating, for some people, can be a healing process. So we were also trying to rethink ways of doing things. How can various parts of this backyard redesign help people heal? We're in this time of COVID, and it's very stressful. We wanted to create a COVID-friendly space.

This adobe workshop has actually been the biggest thing that people have been interested in and engaged in. Residents from South Phoenix, artists, a lot of different people keep requesting us to offer them, and it's limited by our capacity as a group to continue them.

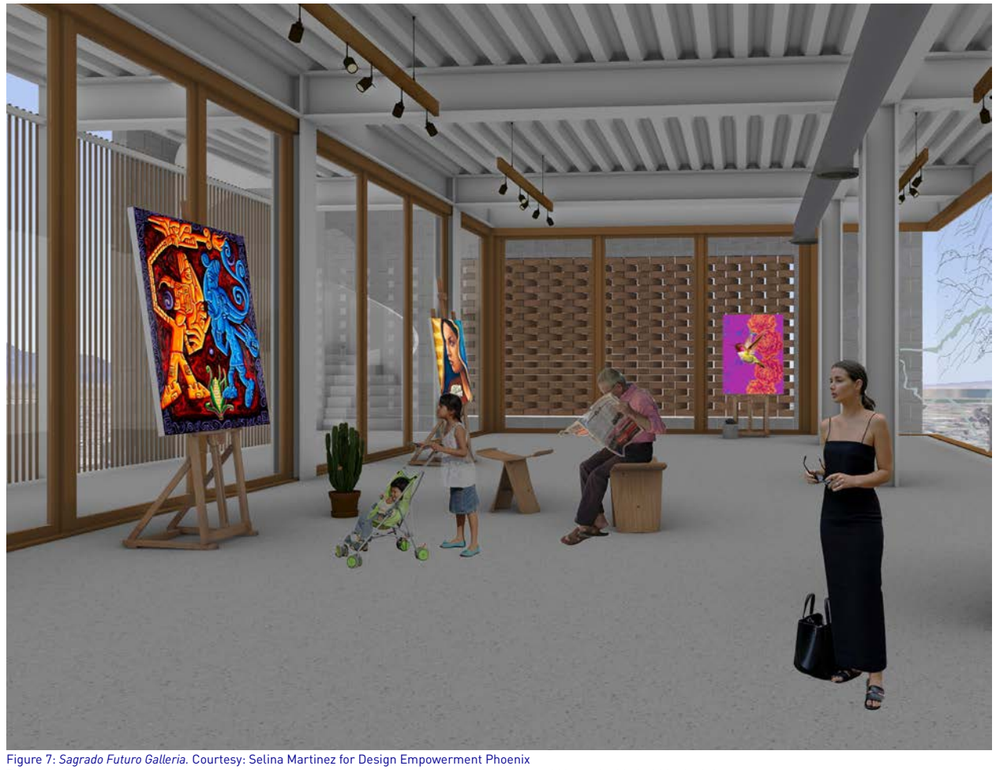

Figure 7: *Sagrado Futuro Galleria.* Courtesy: Selina Martinez for Design Empowerment Phoenix
The Sagrado Futuro would be a place where physical representation and references of culture could be embedded within the infrastructure.

We are very passionate about finishing the space and collaborating with all these different experts from the community. Without the elders who taught us the whole process and gave us some of the supplies and the frames to do it, we would probably not have even started.

For me, this has been something that I've always wanted to do. And I feel like we should be doing it in architecture school, especially in a desert that often has just a bunch of glass buildings. It's completely unsustainable and I don't know why that is the norm to be pushed within the context of the Sonoran Desert. It's horrible. This is another way to begin to discuss and even celebrate the vernacular intelligence that has been here and will continue to be here because earth is a resource that is readily available. I think a lot of people are ready to get their hands dirty. It brings value and community when you're doing the process together. It's really fun and I feel like everybody, whether they are heavily involved in the design process or not, is excited to contribute a piece. They know once the space is finished that they will remember creating it together.

TSC: Why do you think it's important to preserve and perpetuate earthen building traditions as a practice? What are ways that you imagine earthen construction being reinterpreted, re-valorized, or adapted to contemporary practice, which has pushed efficiency, performance, automation, modernist aesthetics, and globalization over community connection, local tradition, cultural expression, and hands-on engagement in spatial production?

SM: Adobe is a connection to nature, which is why I think it's attractive to people. Adobe construction is exciting because it can be messy. It doesn't need to be perfect or standardized. You can have a lot of flexibility with how you create the frames for the adobe. As far as where I would like to see this process going, we're already exploring the potential in single-story housing prototypes. There's a huge housing crisis, not only in Indian country but also in places like my homelands, Río Yaqui, where there are government programs that are building brick houses—but it's at the bottom of the Sonoran Desert. So it's very humid, but they're building these block and concrete houses. I think having the option to replace certain materials such as block, which is so heavily used in Mexico and other places, is important. Adobe has always had a stigma by the dominant society that it is for poor people, and that it is actually a bad thing, when in reality, there is a reason why people were building with mud and it's for cooling effects, air quality, and resource availability.

TSC: Do you see vernacular, low-tech building practices as an effective way to include non-experts in the design process? Or does it serve a different role? What is the importance of teaching communities the tools of building? I think we often conflate participatory design with participation in the building process. And design professionals have a history of limiting the community's participation to labor under the paradigm of harnessing local knowledge, sweat equity, or demonstrating the accessibility of low-tech solutions. But I think it is equally important to empower communities by teaching them design thinking and planning principles and giving them the tools and inspiration to design themselves out of their own challenges. As I'm talking to you, though, I wonder if it is more fluid. Maybe authorship in design is not so separate from authorship through the building process.

SM: When we do these types of workshops, it's all about autonomy and ownership for the community. And when you have those two things, it not only brings the community together, but it also creates empowerment for people to feel like they can actually do something about their situation. Even if it's just adobe blocks, they can utilize what is already in their backyard, or within the desert, to create something out of nothing, essentially. One of the main reasons we created Design Empowerment was because we wanted community to not only participate in the development happening in the community, but also to have control over the direction that development will be going.

The support that we've been able to gather through these workshops has shown that people are looking for alternative ways to live in the desert and to interact with the desert. Right now, the way that we interact with nature and the desert is not reflected in the way that we build our houses. It's not responsive to our climate and it's not a priority for the people developing our communities. The climate approach has always been really big for me. Responding to our bioclimatic situation is the best argument adobe brings to the conversation. Why are we utilizing materials and building in these ways that are completely unsustainable for the place that we live, and expecting everybody to relate to that? I think a lot of people feel limited by the current market and the status quo as far as development and construction goes.

Our hopes and goals are to find not only more adobe experts, but also more experts in the community who are open to exploring a different direction that is a mix of modern construction along with vernacular construction. Once again, due to colonization, we have a gap in the development of Indigenous architecture. Who knows what we could have developed in response to our environment? All the things that we learn from traditional architecture come from nature and our environments, and from the specific site that we are retrieving resources and materials from. I think that has been lost over time—maybe purposefully. That's what I want people to connect to, because that brings up the history of this place and a lot of these injustices. Although we can acknowledge these injustices, decolonizing—or deconditioning—our mindset from what has to be the status quo can change. And I think it's really about exposing those other ways of doing things, those other worldviews, and learning from each other. Because I think the people who live in these communities, and the ones who are affected by architecture and development, are the experts of their communities.

TSC: Colonial ideas of what is and is not "architecture" have placed earthen buildings in association with "primitive" and "substandard" housing, earning validation primarily through notions of heritage and romanticized ideas of preindustrial purity. The dichotomization of traditional and modern and rural and urban is also a common theme in settler colonial nations. Many Indigenous design professionals who are working in community-based contexts have shared with me that one of the greatest challenges they have experienced in perpetuating earthen building traditions is overcoming post-colonial attitudes and resistance from tribal leadership and communities, who may associate earthen architecture with "backwardness" due to the legacies of our settler colonial history. Have you observed or experienced this tension while advocating for earthen construction? How have you grappled with it?

SM: Outside of Design Empowerment and more on the Indigenous Design Collaborative side, through work with some clients like Gila River, there have been conversations where people do want to return to those traditional ways, but then the next generation is not, I would say, educated about why. I think there is automatic resistance—probably due to colonization—about what the status quo is, and what wealth looks like as far as housing goes. I think that we probably cannot return to the traditional ways of building, but I think we *can* integrate some of those traditional ways into the way that we design and create architectures. When we are able to integrate those kind of vernacular responses, or climatic responses, and have that understanding, that is one way to practice your culture—or understand culture, even if you're not from this place. Adobe is appropriate within the Sonoran Desert because it is a material that is heavily utilized here historically. We can see it in all the different ruins that exist in Arizona. I think that is one way to also illuminate the histories that were here before us, and people want to erase that—or have erased that. As far as the controversy over "do we return or do we not return," there will always be a spectrum of what appeals to people and what they relate to. Generationally that has different perspectives as well, which means a plurality of different ways of living in the world. So I think one of the things that we're going to explore through these prototypes is how we can create these different variations that can be appealing to many generations, to many people, to different lifestyles.

We can still have modern amenities, but also utilize a practice that is traditionally important to the life ways of the people in the desert. I think that would help people relate to their environment a little better and remember that they're in a desert. There's never going to be one way. There are many ways to do things. Not everybody is going to be satisfied with living in an adobe house. Not everybody's going to want to maintain an adobe house. But luckily, we have different mixtures of mud as well. So maybe somebody would like to live in a mixed mud house that has some concrete so there is less maintenance. Maybe somebody would like to live in a fully raw adobe house that is very traditional.

Those are all possibilities that we can create—luckily—with modern technology. The technology of 3D printing mud houses is another way to connect to the next generation.

TSC: I'm curious to learn about your relationship with the tools of architecture. Representational techniques have been known to destroy and erase differences in race, culture, gender, and ability in pursuit of legibility and neutrality. Construction methods have pushed efficiency, progress, and standardization over local materials, place-based practices, and idiosyncrasies of the human hand. Even the process of licensure requires a level of assimilation into a profession shaped by Western value systems. Have you found conventional architectural tools and technologies to be limiting or even harmful? Have you reappropriated them, or even invented new ones to better resonate with your practice? Do you see architecture itself as capable of becoming a tool for delivering cultural sovereignty?

SM: I had a weird journey after I graduated from my undergrad. I ended up working for an eclectic developer artist named Michael Levine in Phoenix, who I was also ironically introduced to by my brother-in-law. He was very influential in saving many properties in the downtown warehouse district. Others were trying to just delete all those buildings. He exposed me to 3D scanning. I had never even measured a building in my life, and I used a 3D scanner! I was immediately spoiled.

He has a super eclectic style and approach to the way he does his work, and I've learned the most about architecture from him. That says a lot about our architecture school at ASU and it's not to say that the professors are inadequate. I think it's more about the real experience of working with him and being able to capture technical data from a 3D scanner in an actual building that I can see in person, and then seeing that in a 3D model space, and understanding all the post-production that happens. It was really appealing to me because it was reality and not these line drawings that don't show the inconsistencies of what existing buildings look like, and what actual buildings become when they're constructed.

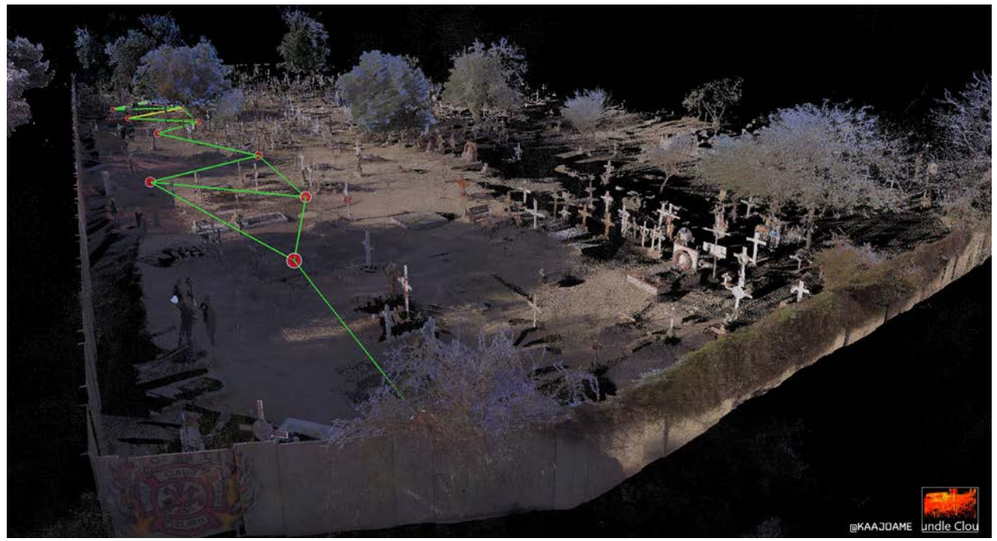

Figure 8: *Guadalupe Yaqui Cemetery 3D Scan.* Courtesy: Selina Martinez for Juebenaria
Juebenaria project has collected and documented 3D scan data of the Yaqui cemetery of the Guadalupe village. This location is the original settlement of the Yaqui's who fled persecution by the Mexican government during the early 1900s. Yaquis were relocated in 1910 to what is the current town of Guadalupe and this cemetery site is surrounded by non-Yaqui residential development.

I also think that understanding the histories of these buildings was a way for me to have a better relationship with those buildings instead of just working for a firm and doing some doorknob drawings in an office or something like that. I skipped that whole part! I was creating as-builts, which helped my 3D modeling skills. I would take the scans, use those as my base, create accurate plans with that real data to understand those inconsistencies and understand the structure. I began to realize that what I was learning in architecture was so conceptual compared to what the actual field was like, even though this was more of a specialized area. I think I was lucky but also spoiled.

At the same time, I was also working with Wanda on various grant projects that included culture and community. Both of those mentorships shaped my trajectory of how I wanted to integrate both of those areas in the future work that I did after grad school. I would say 3D scanning has had a huge impact on the way that I utilize technology in my practice, because I purchased a 3D scanner. I'm probably one of the only women who owns a 3D scanner on this side of the US and it's empowering to know that I have the technical ability and all of the knowledge to be able to do the postproduction and bring that into actual projects for clients.

I have my own business now and 3D scanning is part of my menu of services. As far as how I'm using it, I'm currently capturing assets of my Yaqui community in Guadalupe to collect data on the existing infrastructure and visualize what it could be in the future. I think this is also appealing to the younger generation. I've already trained two of my relatives in how to utilize the scanner—it's very easy. As far as output of visuals, it's such a cool way to merge reality with design concepts for the future.

TSC: This issue of *Dialectic* on decolonizing architectural technologies is a call to action for our field to disentangle itself from colonial tools of power and the supremacy of Western knowledge systems. What would be your call to action in decolonizing architectural technologies towards liberatory ends?

SM: As far as visualizations go, one of the biggest tools for me has been renderings and thinking about how these represent the population and the community that the architecture will be in. A lot of times we see renderings that show one group of people. I'm not sure if that is just because of the libraries that these people are using to create these renderings, but I think the representation of the population that is shown in renderings is very important. Another aspect is the integration of artists as collaborators within the visuals or within the design process, whether it is a security screen in front of a building, or whether it is a mural that's on the building. I think those bring a lot of value and interest to how people will perceive a project. Materiality is also crucial as far as that relationality to the actual context and understanding where we are within the larger context of the world. Is this an architecture that can be anywhere? Or is this an architecture that is rooted in the desert? I think that can be shown in the landscape—through placing native plant species in these renderings. Relationality between the different components within a rendering creates a better story for the community to understand where you're coming from—as a designer—especially if you're an outsider to that community. It really shows your connection to the people of that place.

Visuals are the main tool that helps people and community begin to advocate for what they want and what they don't want. If we are not creating our own visuals for our own communities, we can complain all we want and have our opinions all we want, but if we're not showing an alternative view, we're not speaking the language of the bureaucratic players making the decisions for our communities. I think that can be empowering, and can help with that decolonization process. I can create something that is status quo as far as renderings go, but that maintains the status quo and does not create a different futurity. I think that is where we have the opportunity as designers to decolonize. Maybe it's not through renderings for everybody. Maybe it's through fly-through videos, or maybe it's through zines or different ways to get information to people in a way that is more approachable and less formal. I would say informality is the way to go as it creates a comfortable atmosphere for all to be experts in a design process.

DIALECTIC X CALL FOR PROPOSALS

DIalectic X: Dearbonizing Design / Mobilizing Agency

> The issue is that accumulation-based societies don't like the answers we come up with because they are not quick technological fixes, they are not easy. Real solutions require a rethinking of our global relationship to the land, water, and to each other. They require critical thinking about our economic and political systems. They require radical systemic change.
>
> *— Leanne Betasamosake Simpson (Michi Saagiig Nichnaabeg)*

It is indisputable that the current practice of architecture is inextricably linked to the climate crisis that we as a society face. Our academy recognizes this. Our profession recognizes this. Yet, architecture as it is organized today—a service-oriented, productivity-obsessed, growth-dependent profession—hasn't proven itself able to support the transformative work that is increasingly necessary for the wellbeing of our shared planet. From positions of privilege, architects and scholars of architecture tend to speak of climate change with a detached perspective of comfort, resulting in a conversation that is often insular and constrained. If real solutions require radical systemic change, what and where are the catalysts for such change?

The editors of *Dialectic X* welcome proposals for personal essays, academic articles, interviews, film, audio, or mixed media submissions that consider how contemporary architects and scholars of architecture are using their tools and training to pursue climate equity and environmental justice. Particularly welcome are submissions that reflect on the trials and tribulations of unconventional, radical, and revolutionary architecture-making.

As *Dialectic* looks towards its next decade in a digital-first format, it is our mission to increase the breadth of our engagement: 1) to highlight the expanding range of research architects and scholars now use to explore contemporary issues and 2) to incorporate the contributions of those working to dissolve disciplinary boundaries to spur systemic change.

Even after the collective realization that the modernist architectural paradigm has supercharged the emission of greenhouse gases and the resultant rise of quantitative building performance standards, architects remain complacent and satisfied with incremental improvements. In the academic realm, divergence and factionalism have made commensurability on issues of environmental responsibility increasingly onerous. Prevailing modernist attitudes prioritized technological solutions and environmental comfort, an insularity that restricts the case studies we learn from. Oftentimes this excludes those directly impacted by our work, including indigenous communities, space-makers, elders, activists or others whose perspectives challenge default architectural "solutions."

An array of questions has emerged for design practitioners in recent years. Can we mobilize the image-making and visualizing capabilities of design to transform the current political economy? How might an evolution in our cultural imaginaries prepare the way for a resilient, sustainable future? If, as the familiar refrain goes, the most sustainable building is one that is already built, how can adaptive reuse amplify or heighten the capabilities of existent architecture? Must architects place climate equity at the center of their practice, or can it be smuggled in through otherwise conventional work? In which ways should the technocratic values of environmental design be recalibrated?

For scholars and activists, contextualizing architecture may require alternative archives as well as alternative epistemologies. Can design grounded in data be understood in ways that are not constrained by analyses of thermodynamic performance? What might indigenous or decolonizing approaches to knowledge and agency have to teach us about building for climate adaptation?

We must actively examine architecture's role in our current state of affairs, as well as its potential to revolutionize ways forward. We are, quite literally, out of time. We hope that this issue of *Dialectic* will foster a dialog that accelerates not only research on these pressing issues, but advances new approaches that can truly reimagine the economic and political systems that constrain us.

Please send proposals of 350 words and two-page CVs to issue editors Michael Abrahamson (abrahamson@arch.utah.edu) and Dwight Yee (dwight.yee@gmail.com) by **September 1, 2021**. Accepted authors will be notified by October 1. Full submissions will be due **January 15, 2022** (including visual material, endnotes, and permissions for illustrations). This issue of Dialectic is expected to be published in digital-first format by late summer 2022.

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