

Material Conscience as a Multivalent Instrument of Empowerment, Aspiration, and Identity for a New University Library in Malawi, Africa

KEVIN JONES

Virginia Tech

In December of 2015, a fire destroyed the campus library at Mzuzu University (Mzuni) in northern Malawi, Africa. The entire collection of nearly 50,000 volumes, much of the university's computing infrastructure, and an irreplaceable archive of Malawi heritage artifacts were lost. In a resource-limited context where reliable access to books and data resources is scarce, the Mzuni library was a cherished repository of knowledge and a symbol of self-reliance for students, faculty, and the greater Mzuzu community. Since the fall of 2017, a team of students and faculty from the Virginia Tech Center for Design Research in the United States has been working to design a new library in support of the national, regional, and global aspirations of Mzuzu University. The design team began the project by visiting Malawi, where they defined essential goals and parameters through contextual immersion and stakeholder meetings with Mzuni, national building officials, local architects, and members of the U.S. Embassy. This trip raised critical awareness of the very real social, cultural, and practical issues associated with pursuing international impact projects in resource-limited countries. Most importantly, the experience grounded the team in a shared set of architectural and material strategies that would go on to define the various design propositions, including the selected "Portal" scheme. Currently, the Portal is being further developed in collaboration with architects from Malawi, with construction slated to begin in 2019. This paper seeks to document and interrogate the design of the new Mzuzu University library by positioning material conscience as a multivalent instrument of empowerment, aspiration, and identity for resource-limited countries.

"To gain an existential foothold, man has to be able to *orientate* himself; he has to know where he is. But he also has to *identify* himself with the environment, that is, he has to know *how* he is in a certain place."¹

In Malawi and other resource-limited areas in the world, brick masonry defines the building culture of place and contributes to the sense of *identity* suggested above by Christian Norberg-Schulz. With the exception of a few 'modern' commercial buildings – typically rendered in glass and metal and almost always built by foreign investors – the language of architecture in Malawi is that of lightweight tectonic roofs above heavy, stereotomic masonry walls. The urban fabric of village and city alike are further defined by low walls which create nested and layered boundary conditions within an often undifferentiated agricultural landscape (figure 1). The majority of buildings are

constructed of ubiquitously available, so-called 'burnt bricks.' These bricks are fashioned from clay dug and shaped on site using local labor and fired for up to 24 hours using extensive amounts of firewood. The firing renders the brick more resilient, a physical property that has taken on significant cultural importance as a marker of stability and wealth in even the tiniest of rural villages. The production of fired brick has also served an important economic role in the country, providing employment opportunities for a population largely dependent on subsistence agriculture.

However, the extensive use of this material has come at a high cost for Malawi, contributing to widespread deforestation and environmental degradation across the country. Recently, the use of fired bricks was made illegal² by the government and there has been a concerted push to deploy more environmentally-friendly materials, such as stabilized soil bricks (SSB), as replacements for fired brick. But while some inroads have been made, there remains a deeply held belief that these 'new bricks' just don't measure up – a reminder that material conscience must be considered through both *performative* and *perceptual* lenses.

The history of fired brick in the cultural and architectural fabric of Malawi is intertwined with its colonial past going back to the late 1800's. Christian missionaries arriving from Scotland brought with them a new religion, a new language, and a new material culture which they used to build churches. As in other countries, even decades after independence, the toolmarks of colonialism are still legible. Writing recently about the state of design in Africa, author, academic, and architect Lesley Lokko noted that:

"The colonial encounter...fundamentally altered the way Africans express themselves, both in spoken and written language and in the built environment alike... the intertwined relationship between people and place (which is the life force of cultural production in its broadest sense) has been permanently compromised, even wounded. The implications for African cultural identities are immense."³

It is within this context—and with a complex program and numerous stakeholders—that the design for the new Mzuni library seeks nascent architectural and material possibilities; strategies that offer new insights into Malawi's changing building culture by posing critical questions: When the

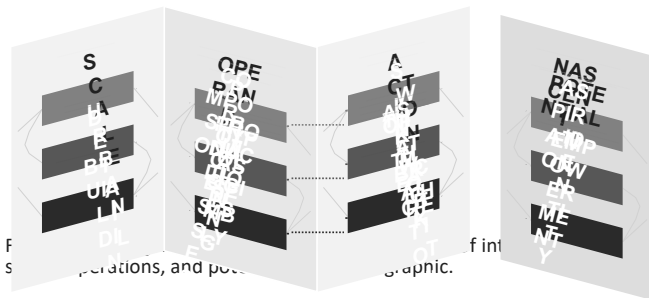


Figure 1: The constructive landscape of Malawi. First photo courtesy Dhawal Jain, others by author.

material that defines your sense of place is no longer available, how can you empower communities to harness limited existing resources in new ways? How can reconsideration of construction technologies open new territories of cultural identity? Can this reformulation of architectural expression be imbued with the environmental and educational aspirations of a country and its people?

For the Mzuni library, the design team engaged these questions across multiple scales by positioning material conscience as a multivalent instrument of empowerment, aspiration, and identity. Reconsidering the typologies, processes, and details of traditional masonry (figure 2) created architectural possibilities that were both rooted in place and forward-looking. And beyond this particular project, these new futures engage questions of *how*, *for whom*, and *by whom* the building culture of place can be shaped in resource-limited countries like Malawi.

by far the most common sight throughout the villages and cities in Malawi. The morphologies of the compounds vary in size, shape, and relationship to each other and the landscape. During the visit to Malawi in September, 2017, the design team was struck by the prevalence of this condition, where arriving at one’s destination was precluded by arriving at a wall, followed by transitioning through a gated threshold. It is worth noting that while the team experienced these typological conditions all over Malawi in a variety of contexts, the possibility of ‘inhabiting the wall’ as an architectural strategy crystallized after surveying the environs from above using a drone. Experienced from a car, one gets the sense that the boundary walls belong to the road, simple apurtenances to the transportation infrastructure. When studied from above, one quickly realizes that the network of walls extends far back from the main roads, creating an ad hoc patchwork of buildings, trees, and infrastructure.



URBAN SCALE: INHABITING THE WALL

The architecture of the new library engages the question of identity and materiality at an urban scale by reconsidering a key typological manifestation of masonry: the wall. As noted, the constructed landscape of Malawi is ordered by continuous walls into spatial compounds. These walls are occasionally made of wood or reeds, but brick masonry is

The discovery of this fundamental organizational motif, and its relationship to the culture of place in Malawi, provided a crucial point of entry for developing the urban response and architectural identity of the new Mzuni library. By reappropriating existing contextual elements and transforming them, the team was able to leverage the familiarity and significance of ‘the wall’ towards the creation of an inhabitable edge condition—a ‘wall building.’ Sited at the existing main entry to Mzuni, the library replaces the existing campus entry and security gate, taking the form of a long bar situated in response to the existing fabric of campus as well as the sun, wind and other environmental criteria (figure 3). This ‘thickening’ of the edge of campus creates a new threshold between the city and the campus and presents a new institutional identity for Mzuzu University. Symbolically passing through the university’s repository of knowledge, visitors arrive at a campus green anchored by a new auditorium building and a generous shade canopy. The siting of the new library and auditorium further establishes an academic quadrangle and sets the stage for planned campus expansion.

In the design of the new library, the architectural response and the urban response are rendered as one. Returning to Norberg-Schulz's postulations about the meaning of place, the boundary conditions which conceptually underpin the new Mzuni library can be read as contributing to both the "spatial structure which facilitates orientation" and the "concrete objects of identification."⁴ By merging form, program, structure, architecture, and urban response, the library becomes one of Aldo Rossi's "highly precise" dynamic urban elements – an artifact, derived from preexisting conditions, that facilitates continuity and evolution of the built environment.⁵ Reappropriating and recontextualizing existing material typologies created an evolving identity for Mzuzu, grounded in cultural roots, but responsive to new conditions allowing, as Rossi put it, "great ideas [to] flow through the history of the city and give shape to it."⁶

BUILDING SCALE: TECTONIC SWITCH

A transition of scale affords an opportunity to discuss the degree to which the architecture of the new library can be shaped by—and give shape to—the academic aspirations of Mzuzu University. For this, we must clarify the way imported Western ideals of 'modernity' influence the architectural aspirations of Malawi. Again, Professor Lokko's sharp criticism serves us well:

"..contemporary Africans live in an uneasy truce between tradition and modernity, suspended somewhere between aspiration and alienation."⁷

The design team has observed this tension first-hand throughout the design process. For the members of the Mzuni community, progressive educational and institutional dreams call for an architecture that is modern in the Western sense: boasting glass, metal, air conditioning, high-tech computing, and contemporary form-making. Given the ability of architecture to embody the motivations and beliefs of those who commission the work, this is a perfectly understandable position—dematerialization, transparency, and rejection of material tradition have often been used as signifiers of 'looking to the future.' The task then becomes the development of strategies that satisfy this desire for 'modernity' but in a language that feels authentic and appropriate to Malawi.

In resource-limited countries with challenging climates, one must balance aspirations and image with environmental performance and material availability. To that end, the team immersed themselves in the study of Malawian vernacular, in the hopes of identifying new methods to help bridge the 'uneasy truce' embedded in the Mzuni library project. Architectural theorist Amos Rapoport has argued that the 'folk tradition' as he called it is:

"..the direct and unselfconscious translation into physical form of a culture, its needs and values — as well as the desires, dreams, and passions of a people."⁸

As noted previously, the 'folk' architecture of Malawi is defined by heavy, stereotomic mass walls and lightweight, tectonic

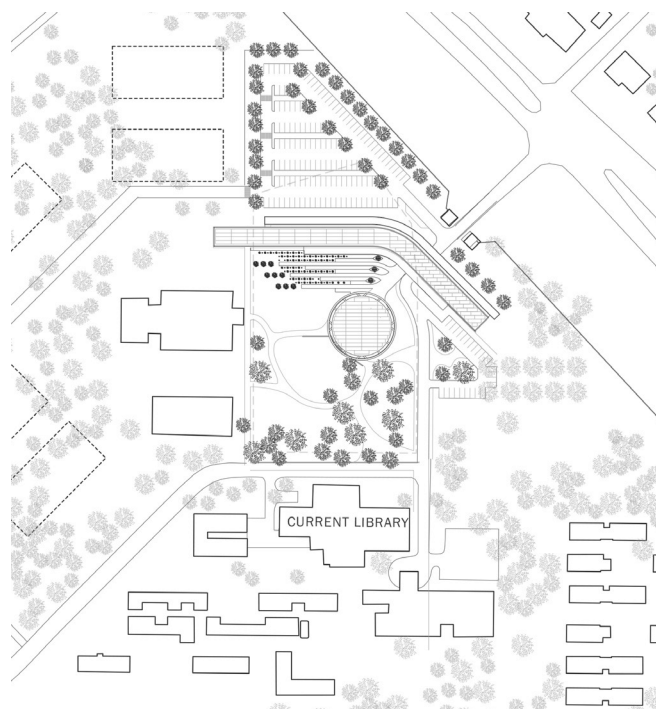
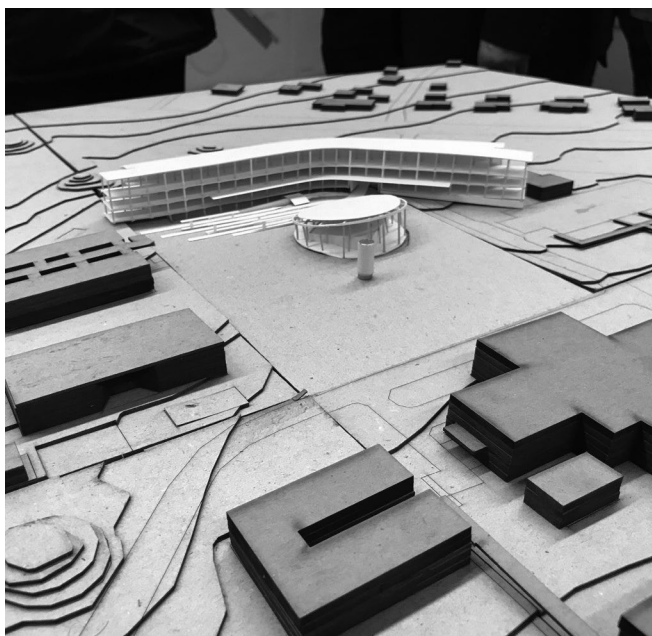


Figure 3: Portal Scheme – site model and plan. Images courtesy the VT Center for Design Research

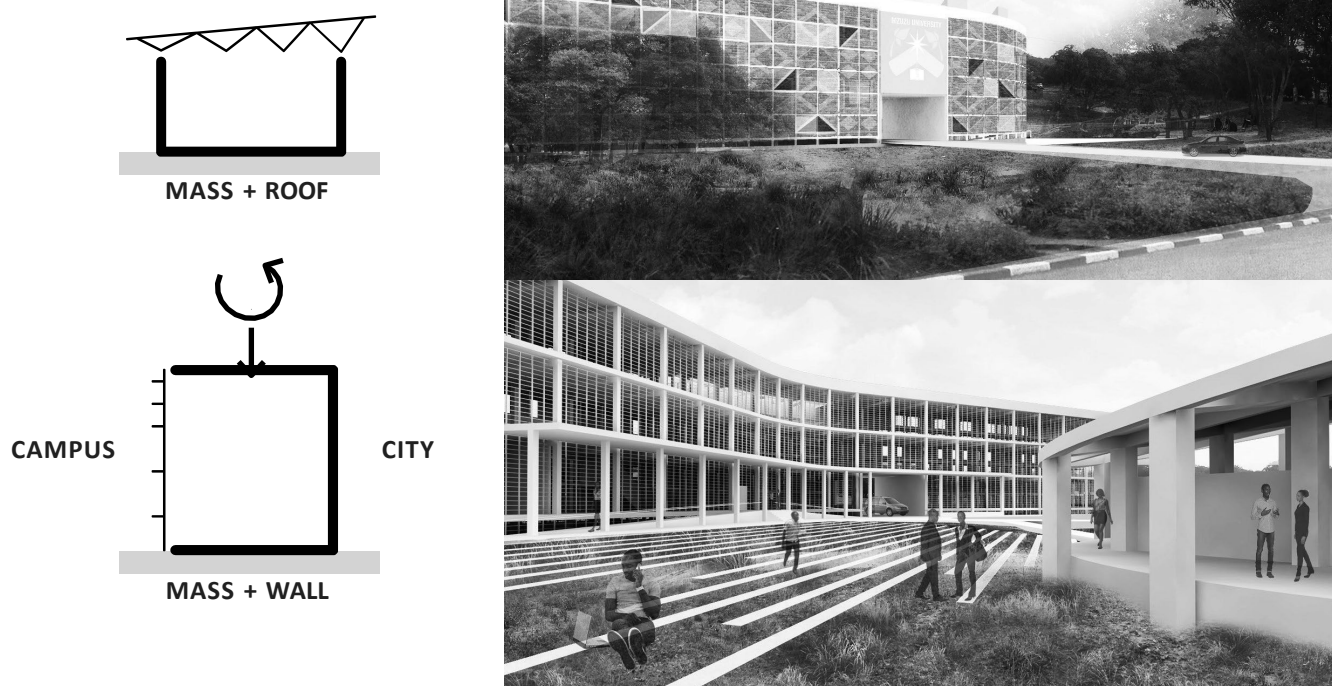


Figure 4: Tectonic switch diagram, view of the new library from the city, view of the new library from campus. Author's graphic, renderings courtesy the VT Center for Design Research.

roofs. For the library, rethinking the compositional parameters of the vernacular and re-assigning the roles of 'heavy' and 'light' to different architectural elements opened several key doors in the design. This 'tectonic switch' establishes a duality in the building that bridges tradition and modernity: to the outside world, the library presents a tapestry of masonry—a new take on traditional Malawian building culture—while to the campus, expanses of glass read as an open book and put the knowledge of the library and the activity of the students on display (figure 4). Beyond image, the aggregation of mass to the north addresses issues related to solar gain and ventilation while also providing fire-resistance for circulation routes and book storage. This latter outcome being of particular importance to the project, given the way this story started.

In his analysis of the work of Gottfried Semper, Kenneth Frampton noted the importance of the interface between stereotomic and tectonic constructs, suggesting that these "syntactical...transitions constitute the very essence of architecture" and provide "spiritual value."⁹ In the Mzuni library, we might consider this 'spiritual value' to be the manifestation of the aspirations of the Mzuzu community that arise from rethinking compositional relationships in the architecture. The union of evolving local masonry traditions with the inherited global sensibilities of modernity.

DETAIL SCALE: ASK (MORE OF) A BRICK

With the outlaw of fired brick and the rise of more environmentally-appropriate materials like stabilized soil bricks (SSB's), the Mzuni library is destined to serve as a case study for new constructive practices in Malawi. Louis Kahn famously asked 'what do you want, brick?' In considering the role of new technologies in resource-limited countries, we might ask 'can you do more, brick?' A visit to a construction site in Malawi offered insight into emerging masonry practices and suggested territories for innovation and the empowerment of new tradecrafts. For the five buildings under construction, hundreds of thousands of bricks were produced on site by tradespeople using a simple steel mold, cement, and local earth. The ability to customize masonry units and develop new methods of assembly in situ creates environmental, symbolic, and figural possibilities for masonry as powerful tools to empower localized identity and address resource limitation.

For the Mzuni library, the team has begun collaborating with local architects in Malawi to further develop the primary facade of the new library. Taking cues from ritual traditions and craft objects, this new face of Mzuzu is imagined as a tapestry of masonry tailored to address environmental parameters, institutional grandeur and identity, and programmatic variables within the building. With remarkable

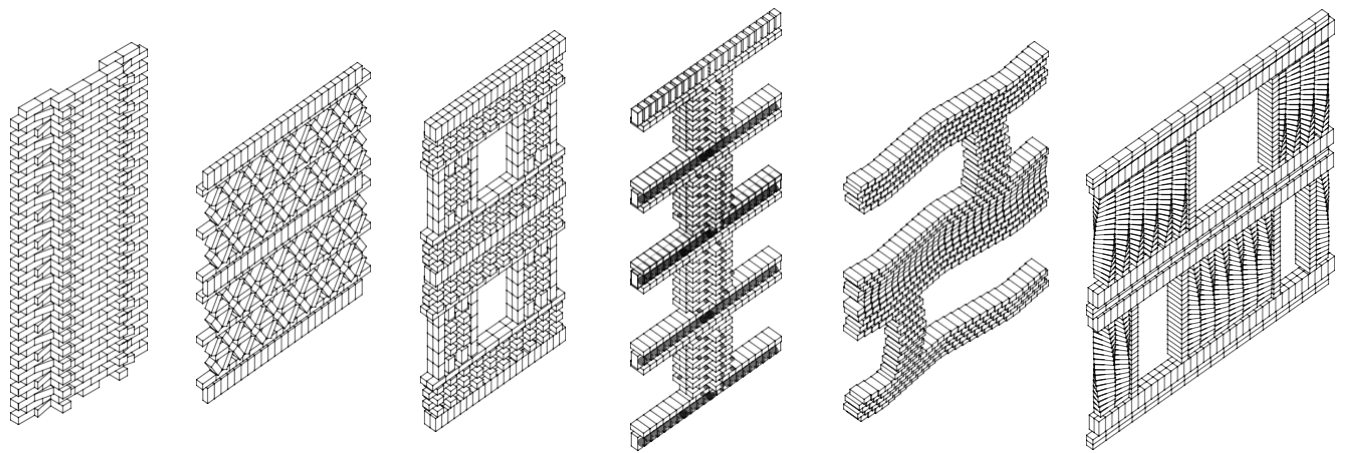


Figure 5: Malawian masonry press and site fabricated bricks, texture studies, rendering of brick tapestry facade. Site photos by author, other images courtesy the VT Center for Design Research.

economy of means, a simple mold can produce thousands of bricks. As the design of the library continues, the team is investigating the performative and expressive possibilities of new modular shapes, with an eye for leveraging the Virginia Tech Center for Design Research's cutting-edge digital fabrication tools to create different masonry presses that could be used on site in Malawi. An example of 'making the thing, that makes the bigger thing possible.' Most recently, the design team has been using wind tunnel and computational flow dynamic simulations to study different fenestration patterns in the masonry in order to optimize natural ventilation. These studies have been completed in collaboration with an architect and Mzuzu University professor currently enrolled in a PhD program at Virginia Tech.

Beyond mere experimentation, these studies and the plans for the library are grounded in a belief that the introduction of new material and constructive practices can be used to empower Malawians with new skills and a sense of individual agency. Regardless of scope or location, impact oriented projects such as the new Mzuni library are characterized by an engagement with the ever-widening extremes of equity, access, and affordability in the built environment. Considered in this light, the development of new horizons for the humble brick would generate positive outcomes well beyond the construction of a new library in Malawi. As designers, we should take up the challenge of Indian architect Charles Correa:

"Architecture is not just a reinforcement of existing values – social, political, economic. On the contrary. It should open new doors to new aspirations."¹⁰

NASCENT POTENTIALS

Great works of architecture dignify people and place, and careful consideration of materials plays a key role in the development of cultural and architectural sensitivity. Engaging the typologies, compositional processes, and details of masonry construction have proven to be successful strategies for the design of the new library for Mzuzu University. Given the challenging international nature of the project and the expanding field of impact design, it is worth contemplating other nascent material potentials.

How can these strategies be applied or adapted in situations where there are multiple 'material consciences' in play? Is there a role for hybridized or recombinant materials and processes in questions of social justice and cultural identity? How will emergent automated fabrication technologies and artificial intelligence impact the capacity of individuals to impact their environment? As resources become more scarce, what new materials and processes can be brought to bear to address fundamental questions of human occupation and dignity?

In the broadest sense, the reconsideration of material practices in the design and construction of the built environment—especially in resource-limited contexts—opens new territories of impact for architecture. Beyond form, function, beauty, and performance, actively engaging material potentials allows creative practitioners to expand their sphere of influence deep into the social contexts of their projects, supporting more equitable and appropriate architectural propositions and outcomes.

VIRGINIA TECH MALAWI DESIGN STUDIO

Students (alphabetical): Martin Angst, Lindsey Blum, Pablo Cabrera, Cody Dodd, Erik Fendik, Dhawal Jain, Amanda Milella

Faculty (alphabetical): Jack Davis, FAIA, Donna Dunay, FAIA, Robert Dunay, FAIA, Ralph P. Hall, Ph.D, Nathan King, DDes., Kevin Jones, AIA, James Wood

ENDNOTES

1. Christian Norberg-Schulz, "The Phenomenon of Place." in *Theorizing a New Agenda for Architecture: An Anthology of Architectural Theory 1965–1995*, ed. Kate Nesbitt (New York: Princeton Architectural Press, 1996), 423.
2. National Construction Industry Council of Malawi, "Use of Sustainable Construction Materials Regulations," news release, June 18, 2018, <http://ncic.mw/announcements/use-sustainable-construction-materials-regulations/>.
3. Lesley Lokko, "The paradigm of development-aid-charity has come to dominate African architecture to the exclusion of almost everything else," *The Architectural Review* #1441, May 2017.
4. Norberg-Schulz, 21.
5. Aldo Rossi, *The Architecture of the City* (Cambridge: The MIT Press, 1982), 87–92.
6. Rossi, 130.
7. Lokko, #1441.
8. Amos Rapoport, *House Form and Culture* (Englewood Cliffs, NJ: Prentice-Hall, Inc., 1969), 1–3.
9. Kenneth Frampton, "Rappel à l'Ordre: The Case for the Tectonic," in *Labour, Work and Architecture: Collected Essays on Architecture and Design* (New York: Phaidon Press Inc., 2002), 95.
10. Charles Correa, "The New Landscape," in *The Architecture of Empowerment: People, Shelter and Livable Cities*, ed. Ismail Serageldin (London: Academy Group Ltd., 1997), 30–37.