

The background of the entire poster is a photograph of dark, silhouetted tree branches against a bright, cloudy sky. The branches are thick and gnarled, with some smaller, thinner branches extending from them. The sky is filled with soft, white clouds, creating a high-contrast scene.

MADE TO MOVE

AFRICAN NOMADIC DESIGN

Risham Majeed

with contributions by
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for

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sam roche
linda seidel
susan vogel

and
lubna majeed

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Fig 1. Borana or Rendille tents on the move. Photo by Paul Baxter, Kenya, c. 1950s. Copyright Pitt-Rivers Museum, 2008_2_2_442-0, University of Oxford

Front cover: Rendille Tent Armature. Detail of side wall showing carbon crystals formed by the hearth smoke. Photo: Risham Majeed, 2013



INTRODUCTION

MADE TO MOVE

AFRICAN NOMADIC DESIGN

Risham Majeed

When you build something,
people see that you've done
something that works, so
why can't you do it again...
you don't have to reinvent
the wheel again everyday.

—Dame Zaha Hadid (1950–2016)

Women have built tents throughout the world for millennia. Nomadic women invented tensile structures, one of the three archetypal methods of spanning space, thousands of years before they were implemented in Europe and America in the 19th century. Our exhibition and the essays in this catalogue highlight this originality, rewriting a portion of architectural history by recognizing the contribution of women's work to engineering and design.¹ The solutions to desert life that these tents represent have endured for a long time; their unchanged qualities are a testament to how well problems have been solved.

One of the cave paintings at Tassili n'Ajjer (c.5,000–2,000 B.C.E.) in the Sahara portrays nomads engaged in herding, hunting—and tent making.² Labelle Prussin, an architect and important scholar of African art, recognized that the woman on the far left is holding an arch made of bent wood, the salient structural member of many East African armature tents.³ The woman lifts the rib above her so that it frames and contains her body in a commanding gesture that at once expresses the function of the raised form and her unique ability to control it. The three figures are conceptually related to one another through their proximate placement and visual consonance between the arc of the tent rib, the swerve of the cattle's horns and the bent bow in the hunter's hand. These three circles define each member's role in the community: women are builders in symbiosis with the herd, the mediating figure that unites the two

Fig 2. Rendille Tent Armature
The mats have been removed revealing the skeleton of the self-supporting armature. Two arches anchor the two different shapes and support systems used in the front lean-to entrance and the bent ribs of the back dome.
Photo by Amyas Naegele, Marsabit, Kenya, 2013

genders. The ancient wall paintings also demonstrate a long-established division of labor according to gender: women are identified with making the home while men are shown with their herds. But precisely because men are so closely identified with the herd, the role of women in the transformation of animal products into building materials has remained insufficiently recognized.

In her pioneering work, *African Nomadic Architecture: Space, Place, and Gender*, Prussin gave an entirely new language to materials that had previously been limited to the diminutive domain of domestic crafts. She also championed women as the builders of the most important element of daily life: the nomadic home, which was the key to survival in the desert. Her insistence on a “nomadic aesthetic” defined by collective creativity and poetic balance struck between the infinite expanse of the desert and the comforting enclosure of the tent, is an aesthetic formulated by women.

Nomadic dwellings and their furnishings are, for the most part, indisputably women’s architecture, so the elements of the nomadic aesthetic that have been addressed in the pages of this anthology are essentially a woman’s aesthetic.⁴

Her terminology emphasizes the role of women as designers and engineers conditioned by their peripatetic existence to solve problems generated by the desert environment and its limited resources. By regarding the aesthetic as an integral part of structure, we understand that tents are cumulative solutions to a set of common conditions. Prussin’s decision to characterize the aesthetics of tents as “nomadic” rather than “feminine” is a more authoritative representation that transcends gender even as it celebrates women. “Nomadic” as opposed to “feminine” is an important distinction since tents are architecture made by women for an entire culture and way of life, so nomad women’s work has implications beyond women’s worlds and enables nomadism as a way of life (see Chapter 3).

Just as nomadic communities achieved a delicately

calibrated balance between nature and nurture, so the internal divisions of labor were also similarly precise in their allocation of duties according to gender. Men spent long periods of time away from the camp engaged in the caravan trade and in search of pasture in the vast, spare expanse of the desert. For most of the time, women had complete control over the household and were unfailingly identified with protected spaces that they fabricated and maintained.⁵

Even though men provided the hides from *their* herds, women depilated and tanned the hides for productive use in their tents. The bright red velum of the Tuareg tent, easily its most commented upon feature, results from the multi-stepped work of women: grinding the bark of the acacia tree into tannin, which was applied to both sides of the velum to soften as well as stain helping transform the interior into a warm sumptuous space (see figs. 4, 11, 12).⁶

Women were the primary occupants of the tent, and the spaces that they designed were naturally tailored to their own needs. A useful contrast can be made with the typical plan of an American home from the first half of the twentieth century. As designed by men, the layout of the household favored the public, living areas, traditionally considered masculine spaces, and accorded men an exclusive private space such as a library or den.⁷ This ordering of the household was not merely a reflection of societal roles but an integral and important strategy for constructing and sustaining hierarchies.

The division of the interior of a nomadic tent, repeated precisely each time it was erected, was a strong visualization of nomadic social order, at once reinforcing existing norms and ensuring that they were continued from generation to generation. At the same time, however, in the nomadic context where women designed spaces for their own use—that is to say, where the user is also the maker—they apportioned interiors according to their daily needs. The tent was a gendered space but one where the internal spatial hierarchies determined by women became emblematic of the work and priorities of their makers.

One of the central imperatives of nomadism was the omission of superfluity in nearly every aspect of life. This principle was applied equally to people and to raw materials, and it ensured that women were essential to the upkeep of nomadic life. Studies of East African pastoralists have documented that while men spent over fifty percent of their time engaged in leisure activities such as board games throughout the day, only thirty-five percent of a Rendille woman’s day was expended on pursuits unrelated to the maintenance of the tent, its furnishings, or the herds.⁸ The domestic space of the tent was the key to the family’s survival in the harsh desert landscape and that key was firmly in the grasp of the women.

In all nomadic communities women were intimately related to the tent. In Tuareg culture, the word for “tent” and the word for “marriage” are the same because a tent came into being as the future home of a newly married woman.⁹ Marriage was a contractual transaction that carried the expectation of starting a family in a tent. As etymology suggests, the woman’s skill as the architect of the tent was conflated with her reproductive ability.

In both Tuareg and Gabra cultures, a mother used elements of her tent to construct her daughter’s nuptial tent. Over time her tent continued to shrink in size paradoxically announcing her enviable status as the mother of many married daughters. The physical integration of a portion of her home into her daughter’s is a visualization of the mnemonics of nomadic architecture which were transmitted from mothers to daughters on a regular basis since the tent was raised and struck as often as every few days. The art of memory is reliant on repetition and modularity, which is itself based on the incremental replication of a unit. Rendille tents use concentric arcs tied together with a single rope running the circumference of the perimeter; their basketry cradles used to protect containers are assembled in the same way and all the tents of the community are also arranged in concentric circles.

From a very young age, girls helped their mothers with the assembly of the household and this

learning was further reinforced through toys. Just as young American girls imitated their mother’s responsibilities in the microcosm of a dollhouse, little Gabra girls emulated their mother’s occupations as architects by assembling and packing miniaturized versions of tents. Reiteration of form and technique imprints the method of assembly on the mind in a tactile manner.

Tents are a type of architecture whose permanence and stability are inscribed in the process of their construction rather than in the final structure. A tent perished with the last member of the family it protected and its parts were absorbed into other tents. A new one was made for a new marriage. For this reason, attempts to trace a linear development, or even a genealogy of nomadic architecture, is at odds with the principles of its production even though tents represent solutions to environmental conditions that were achieved centuries ago.

For example, the Rendille substituted mats woven from vegetal fibers with mats fabricated from tin lids. In the earlier tents, older frayed mats were tied to the lowest point of the armature where they were subjected to the harshest use. These metal screens, which are far less labor intensive than woven mats but still lightweight, serve the same purpose while the raffia mats are reserved to cover the higher portions of the tent. The form remains the same but component parts are updated, reflecting regional changes in trade, commerce and socio-economic conditions. Yet, such interstitial shifts and adaptations in ancient forms are difficult to trace historically; any linear developmental account of a form that is constantly changing internally but fundamentally remains the same is near impossible.

Unlike other art forms, architecture’s fundamental purpose is utilitarian; the guiding brief of architecture is to enclose space and to create an inhabitable environment. The search for origins has affected the way tensile architecture is positioned in relation to other essential engineering solutions. Thus the origins of architecture are always traced to the first “homes” made by man—or woman. Whether these first abodes were “primitive huts”—fabricated post and beam structures with tree

trunks and branches—, as Marc-Antoine Laugier argued in 1753, or whether they were tents made from sewn hides or woven hair is almost immaterial.¹⁰ What is important is that tensile support systems are one of the oldest and most efficient engineering solutions ever invented to span and enclose space. While the efficiency and antiquity of tensile principles is widely recognized by engineers and contemporary architects, this catalogue is the first to identify this feat of engineering as the accomplishment of women working together to build homes in the desert.

- 1 Architectural historians widely accept that tensile structural principles were invented long ago. For example, in the *Encyclopedia of Architectural and Engineering Feats* (Santa Barbara: ABC-Clio, 2001), Donald Langmead and Christine Gamaut maintain that the Bedouin tent is one of the oldest manifestations of tensile structure, "Because durable tensile materials like steel and reinforced concrete were not developed until after 1865, and synthetic membranes, like fiberglass-Teflon laminate and Kevlar, until more than a century later, tensile technology was limited to buildings not considered "proper" architecture. But despite the denial of *means*, the *method* of creating them has been understood, refined, and applied from ancient times. Purest among such applications are the tents of the Bedouin. Their origins are lost, but they are indeed architectural feats for their structural economy, functionality, and environmental sustainability," p. 35. However, they do not take this observation to its logical conclusion; namely that since tents are made and put up by women, it is also women who devised and developed their engineering solutions and accompanying design.
- 2 Though Prussin does not offer a date for this image in *African Nomadic Architecture*, this painting is from a series at Sefar that has been dated to the "cattle style" also called the "pastoralist period" of Saharan rock art which lasted from 5000–2000 B.C.E. See Karl Heinz Striedter, *Felsbilder der Sahara* (Munich: Prestel-Verlag, 1984), p. 42.
- 3 Labelle Prussin, *African Nomadic Architecture: Space, Place, Gender* (Washington D.C.: Smithsonian Institution Press; National Museum of African Art 1995), p. 4.

- 4 Ibid, p. 200. Prussin is careful to qualify her statement because women did not carve the wooden elements used in some tents (the carved wooden posts used to hold up the mat in a Tuareg tent, for example, were made by Tuareg men).
- 5 In the seemingly infinite breadth of the desert, boundaries are constituted through behavior. In an extension of this observation Susan Rasmussen argues that in Tuareg culture the further one moves away from ordered space of the tent, the more likely an individual is to breach decorum, "there is the belief that one's character changes on travel, and that evil spirits of the wild can seize the unwary travel and transform the victim, since one is far from the maternal tent and its restraining influence," in "Within the Tent and at the Crossroads: Travel and Gender Identity among the Tuareg of Niger," *Ethos* 26 (1998), p. 164.
- 6 Alonzo Pond traveling with the Tuareg in 1925 wrote, "None of us could stand erect at the center of the tent. Even bent over as we moved around, we were constantly bumping the roof and rubbing off the red powder that covered the skins," in *Veiled Men, Red Tents, and Black Mountains: The Lost Tomb of Queen Tin Hinan* (2003) pp. 121–22.
- 7 On this point see Leslie Kanes Weisman, "Women's Environmental Rights: A Manifesto," (1981).
- 8 "Women have significantly less rest or leisure time than the men in the pastoral community, with women spending 35% of their daytime hours resting, compared to men who spend 52.4% of their day in rest or leisure activities, such as playing the *mbau* board game in the men's shade area outside the village," Elliot Fratkin and Kevin Smith, "Women's Changing Roles with Pastoral Sedentarization: Varying Strategies in Alternate Rendille Communities," *Human Ecology* 4 (1995), p. 443.
- 9 Prussin notes, "The woman is said to be the 'tent-custodian,' and sometimes she is also called 'a tent,'" Ibid, p. 92. See also Dominique Casajus, *La tente dans la solitude: la société et les morts chez les Touaregs Kel Ferwan* (Paris: Editions de la Maison des sciences de l'homme, 1987); "La tente tournée vers le couchant," *L'Homme* 183 (2007), pp. 163–184.
- 10 Marc-Antoine Laugier, *Essai sur l'architecture* (Paris, 1753). The "primitive hut" appears as the frontispiece to the second edition published in 1755.

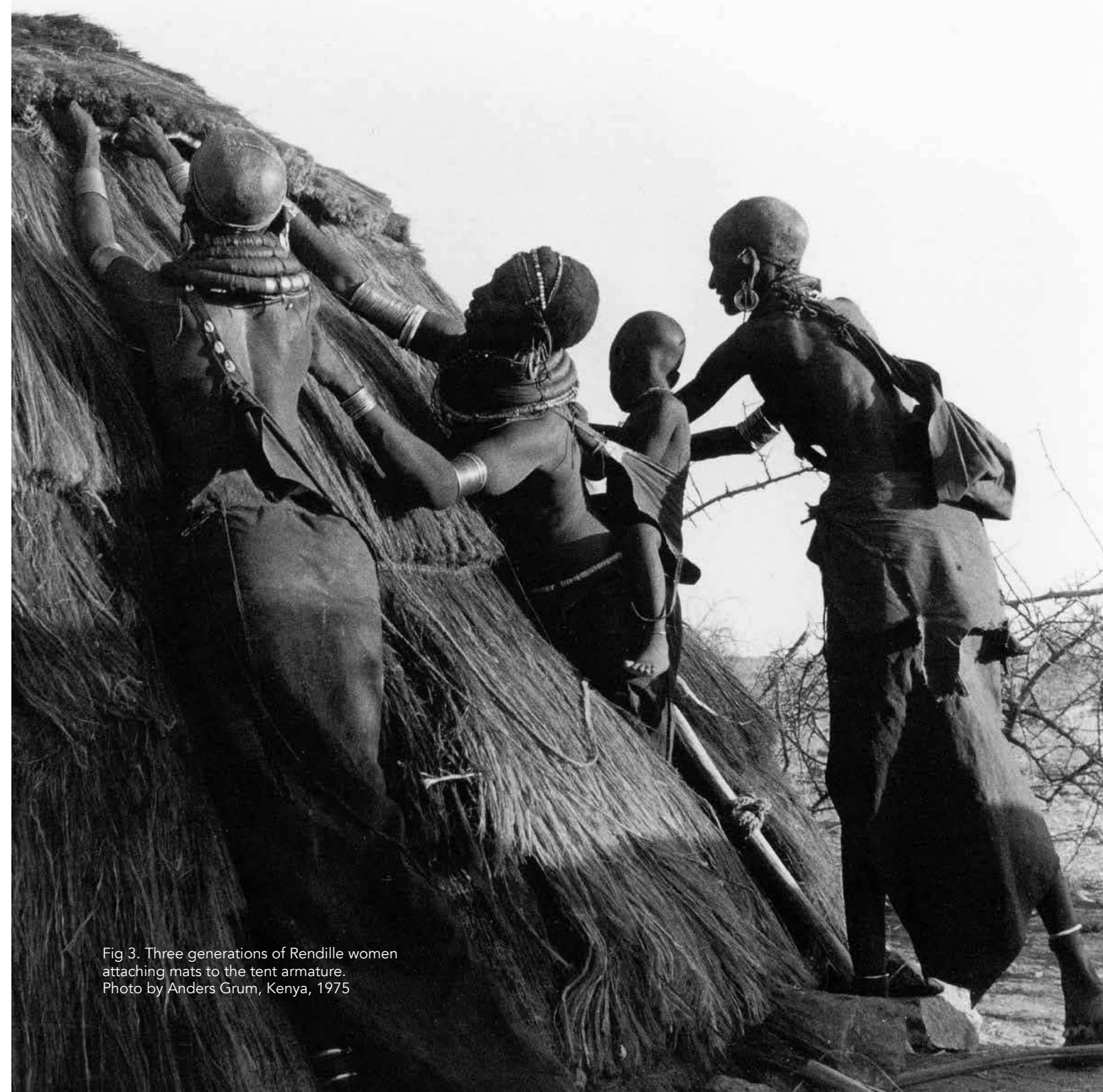


Fig 3. Three generations of Rendille women attaching mats to the tent armature. Photo by Anders Grum, Kenya, 1975

MODERNISM AND NOMADISM

TENTS AND WESTERN ARCHITECTURAL HISTORY

Isabella Ionni, Risham Majeed,
Vin Manta, and Lisa Peck

In this essay we examine the place of the tent and collective creativity in the Euro-American imagination. Western misinterpretations of the function and form of nomadic tents arise from our conceptualization of tents as temporary dwellings used for short periods of time and then abandoned. On the other hand, the nomadic tent serves as the only home for its family, providing lifelong comfort and sustenance.

Our understanding of tents is rooted in Western historical narratives and ethnographic accounts. The tent as a living structure has a history thousands of years old, with the first evidence of a tent dated to 1,500 B.C.E, based on materials found in an Egyptian tomb. Some of the earliest recorded tents, found on relief panels from the Roman column of Trajan (c. 113 C.E.), are military tents. These tents, called *papillo*, were comprised of a rectangular leather velum stretched over a center pole and attached to stakes around the perimeter. The ensemble of *papillo*, each with the same footprint and modular structure, projected power and organization that was intimidating to enemies. However, Roman soldiers at the end of their service abandoned these tents to return to their sedentary homes.

In Europe and America, the tent is still seen as a symbol of transience. Tents are used as provisional



Fig 4. Tuareg Leather Velum c. 1970s. Detail of the supple leather velum of the Tuareg tent made from squared goats' skins. The membrane is treated with butter, which allows water to skate off its surface. Photo by Risham Majeed, Burkina Faso, 2013

lodging in many ways—for camping, large-scale events, and housing refugees—basically, anything requiring short-term accommodation. In some cases, the reality of a tent as a disposable, temporary shelter has become unmanageable. For example, in the UK, following overnight concerts, “17% of UK festival waste is [sic] going to landfill results from abandoned tents.”¹ In our culture, tents are disposable and discarded after their period of utility has expired but for nomads they are indispensable and vital to life in the desert.

For this reason, tents are not broadly recognized as architecture. Beginning in the 1970s, scholars considered them as “vernacular” architecture, the diminutive cousin of “real” architecture.² Only now are they being celebrated as architecture designed *and* engineered

by women (see Introduction). Several factors have contributed to this neglect, many of which are intertwined with the biases of Western architectural theory. For theorists such as Eugène-Emmanuel Viollet-le-Duc (1814–1879) architecture was the highest expression of style because its forms were the ultimate synthesis of structure and function. For the same reason, European thinkers used architecture to calibrate the relative degree of civilization of different societies throughout history. For Viollet-le-Duc and his contemporaries, buildings achieved a higher spiritual expression only when they transcended base needs for shelter and became representative of a unified, sedentary, urban population. Permanence, or the survival of a monument long after its makers had perished, was a defining characteristic

of architecture; relatively fragile structures made from organic materials such as wood were considered “primitive” predecessors of what would subsequently be built in stone.³

A notable exception to this widely held assumption was the innovative analysis of the relationship between textiles, hides, and architecture in the work of Gottfried Semper (1803–1879). Unlike Viollet-le-Duc, who located the origins of stone architecture in rudimentary wood structures, Semper argued that architecture was like our own skin, a primary barrier against nature. He posited that the “first” architecture was likely made from the same material used to clothe the body, cured and tanned animal hides or textiles,

...the need for protection, cover, and spatial enclosure supplied some of the earliest inspiration for industrial invention....The concepts of covering, protecting, and enclosing are indissolubly connected with those natural and synthetic covers and dressings that have become the sensible sign for those concepts.⁴

Semper was ahead of his time in understanding the symbiotic and organic mutuality between architecture and nature. “Protection, cover and spatial enclosure,” are his fundamental tenets of architecture and, although he did not explicitly say so, he was, in effect, describing tents.

In 1851, Semper had encountered examples of architecture and design from Africa and elsewhere at the World’s Fair held at the Crystal Palace in London. Examining the products from societies that at that time were all considered “primitive” (including tents), he realized common material needs resulted in an astonishing variety of aesthetic and functional solutions. This insight led Semper to argue that architecture does not have the same origin for all of humanity, as his contemporaries contended, because the immaterial or spiritual needs of cultures precede their material manifestations.

Semper’s notion of “architectural skin” was subsumed into an abstract Formalist debate in the first half

of the twentieth century, in which skin and structure were separated. Formalism in architecture, concerned primarily with the visual rather than the structural, resulted in a division of labor that separated architecture from engineering.⁵ For subsequent Modernists, such as Le Corbusier, the task of architecture was now to return to functionalism.

When Corbusier argued that a “house is a machine for living in,” he was referencing the ability of machines to reliably manufacture identical products, which by their very sameness, embodied their success as useful products that delivered the same solution repeatedly. Modernists wanted to make architecture that worked, and worked well, and they recognized the solutions of other non-western ways of building: structures that were then not even considered architecture. Louis Kahn, upon his return from West Africa in the early 1960s, remarked with reference to local mud architecture,

I saw many huts that the natives made. They were all alike, and they all worked. There were no architects there. I came back with the impressions of how clever was man who solved problems of sun, rain, wind.⁶

Celebrating similarity goes against the grain of a western conception of history that identifies moments of rupture; specific times and places that did something different, confirming the notion of time as progress. Western history does not chronicle sameness. On the other hand, traditional cultures and European artists of an earlier time knew they were successful when they were called upon to reproduce or copy their own same much-in-demand models.

Western architecture thus tends to pay attention primarily to great individuals and the works they designed or commissioned. We often look at architects as innovators who pave new pathways for creativity. Historically we have romanticized the notion of individual artists with untapped abilities waiting to be handed a brush or chisel. Many theorists have considered an architect’s work to be an expression of a personal

feeling or emotion. When we think of a great building or artwork we think of the man behind it, not those who labored to construct it. Architecture, once understood as collective work, is now seen as an individual expression. This dislocation between architect, mason, and finished product has been pervasive.

On the surface Modernism seems to be the furthest departure from any idea of collective work. Yet, this alienation is what Le Corbusier and others attempted to reconcile. Le Corbusier identified a symbiotic relationship between the engineer and the architect. The separation of the two, Corbusier argued, results in bad architecture, with a profusion of superfluously applied ornament and waste. He showed that it was engineers rather than architects who produced an aesthetic grounded in efficiency, and that harmony was what contemporary architecture lacked. He advocated for a solution-based form, which often arises from collective creativity, that is of course the essence of nomadic architecture.

From ancient Egypt through the Renaissance the production of architecture was celebrated as a communal process. Friezes on medieval churches often depict the collective labor involved in their construction: individuals with different sets of skills working together to create something greater than what they alone could manage. Craft guilds would train apprentices and help them learn the skills necessary to rise to become journeymen and eventually masters of their trade. In a very similar manner, during the process of building tents, Tuareg and Rendille mothers guide daughters in the construction, deconstruction, storage and repairs of tents. Born out of necessity, collective work emerges from the practice of sharing information and developing a compendium of that knowledge, available to all.

The marriage of engineering and architecture can be seen in both Tuareg and Rendille architecture. The construction of these tents begins with the exigencies of the harsh desert environment, so there is a satisfying harmony between function and design in their overall aesthetic. Tents have not changed drastically through the ages the way western architecture has, because

there is no need to alter a solution that is successful, sustainable, and aesthetically pleasing. Here innovation manifests itself as a willingness to abandon what does not work. The very fact that these tents have endured, mostly unchanged, is a testament to how well they work—perhaps the premier example of what Corbusier termed, “machines for living.”

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- 1 Stephen Henderson and James Musgrave, “Changing Audience Behaviour: Festival Goers and Throwaway Tents,” *International Journal of Event and Festival Management* 5 (2014), p. 224.
 - 2 In publications such as Bernard Rudofsky, *Architecture without Architects: an introduction to nonpedigreed architecture* (New York: Museum of Modern Art, 1964).
 - 3 Viollet-le-Duc, *Histoire d’habitation humaine* (Paris, 1875). Nomads are mentioned in the context of “semitic” habitation, a reference to the Old Testament origins of nomadism. They are described as the uncivilized occupants that were conquered by the Aryans who introduced wooden architecture to the Middle East, “The emigrants had found races already settled in this country: some of them were living in caverns, hollowed out by natural causes....the others, who kept to the plains, lived in tents, were nomad in their habits, and possessed numerous flocks and herds on which they subsisted...they were daring and predatory and followed no industrial pursuits,” p. 123. Viollet’s text became the basis for the display of domestic abodes in the Universal Exposition of 1889 held in Paris.
 - 4 In “Style” (1853/4), p. 123. Semper’s theories were formulated based on a “Caribbean hut” he saw at the Great Exhibition at the Crystal Palace in 1851. Working from a highly abstract concept of architecture as covering (what would become Modernist “skin”), he recognized that animal skin and tree bark were intimately linked since tree bark was used to tan leather, an insight that nomadic cultures had long exploited.
 - 5 On the integration of design and engineering through history see Angus J. McDonald, *Structure and Architecture* (London and New York: Routledge, 2001).
 - 6 Louis Kahn quoted by Amos Rappoport, *House Form and Culture* (1969), p. 84.



CHAPTER 2

GENDER AND NOMADIC ARCHITECTURE

Geneva Bielenberg, Risham Majeed,
and Nicholas Posloski

The life of a nomad requires a significant amount of labor, and an intimate understanding of the landscape he or she inhabits. Nomadic women foster a unique visual environment that is in harmony with a migratory way of life and which the pioneering architectural historian Labelle Prussin identified as a “nomadic aesthetic.”¹ In the past, ethnographers have presented an inaccurate picture of the role of women in nomadic cultures because they had limited access to and interest in women’s worlds. When women were acknowledged as the builders of tents, the design was characterized first as vernacular and then as “feminine,” terms that lessened the significance of their achievements. In this essay, we examine the notion of gender in relation to the practices of the nomadic community.

In Rendille (Kenya) and Tuareg (Niger, Mali) cultures, gender plays an instrumental role in the division of labor and of space. Men own the herd and are tasked with caring for it. Women create the home with the products sourced from the herd. They are the architects and engineers of the tents and are responsible for its maintenance. Thus, they are its owners. Although gender boundaries in nomadic societies are important, they are very different from those that we are familiar with in Western society. In nomadic cultures, the gender binary is predicated on this division of labor; however, the gender identity that is produced for women in this

Fig 5. Rendille woman unties the armature of her tent.
Photo by Amyas Naegele, Marsabit, Kenya, 2013



Fig 6. Borana woman packing a camel (with armature tents in the background). Photo by Paul Baxter, Kenya, c. 1950s. Copyright Pitt Rivers Museum, 2008_2_2-424-0, University of Oxford

context contrasts sharply with the idea of “feminine” used to marginalize women in Europe and America.

After the tents have been unpacked from the backs of the camels, women work with precise synchronicity to build the tent as expediently as possible (see Chapters 3 and 4). All the while, their daughters watch and help with the assembly. Since no written instructions exist for this process, collective memory is of paramount importance for nomadic architecture (fig. 3). The wood is lightweight and flexible to facilitate easy transport, and assembled with ropes for efficient disassembly. Every element of architecture and furnishings can be repaired, from containers to the armature and membrane of the tent itself, because of their modular construction.

Contained space is a woman’s domain, while infinite space is a man’s, which references the gendered divide between labor related to the home and the herd. The allocation of space in the tent is not reified through physical boundaries but rather implied through the placement of gendered tools. For example, in Gabra cultures, the finely braided leather ropes that men use for herding camels are tied to the outside of the tent, whereas the intricately woven containers that women make and use are secured to the back of the tent where the hearth is located. Space is also ordered into a front public area and a back private area of the tent, which also have respectively male and female associations.

To those who have never traversed it as nomads have, the desert seems like a vast, uncharted space in which nothing can exist without perishing quickly. However, in order to make the most of the sparse resources available to fabricate tents, women must *remember* the location of resources required for repairs and renewals. The anonymity of the desert is counteracted with the creation of a home in which the placement of every element has a prescribed position, a map of sorts, that is repeatedly followed in every home. As Prussin explains, “the more featureless the context of topographic or territorial space, the greater the psychological need to articulate the enclosure and to emphasize the containment.”² Many of the objects that

dominate nomadic African cultures, from containers to the tents themselves, are embedded with numerous signifiers that communicate their hierarchical position in their assembly, disassembly, and proprietary use.

Nevertheless, when such traditional gendered practices are analyzed within a Eurocentric framework, the architectural labor and knowledge of nomadic women are not visible as such. Women are not identified intellectually with devising the structural solutions that comprise the discipline of engineering. Earlier accounts of tent construction, chiefly by male ethnographers, assumed that it was the men who had formulated the solutions and instructed the women how to carry them out. Indeed, anthropological studies of women engineers working today continue to reveal a pervasive bias. It likely has its roots in the physicality associated with actual “building,” which underpins the stereotypes of the masculine builder even though today the heavy lifting is chiefly carried out by machines. There are several historical examples of women’s roles in the construction of the built environment that challenge these stereotypes.³

Among the first to address this discrepancy was the architect Anni Albers, who had close ties to the Bauhaus through her husband Josef Albers and who published a little known article on the relationship between textiles and architecture. Her thought originated from Semper’s notion, outlined in Chapter 1, that the first architecture was closely tied to textiles used as portable shelters by itinerant hunter-gatherer societies. Albers extended Sempers’ arguments and argued for the parallels between building and weaving. She was also the first to identify the prevailing gender bias that precluded women from the domain of structural considerations: “when we realize that weaving is primarily a process of structural organization this thought is startling, for today thinking in terms of structure seems closer to the inclination of men than women.”⁴ (fig. 9) As a textile designer herself, Albers argued for the protective role of clothing and its close functional relationship to architecture, “And if we think of clothing as a secondary skin we might enlarge on this formulation

and realize that the enclosure of walls in a way is a third covering, that our habitation is another ‘habit’.”⁵ Rather than being prescriptive, Albers outlines the similarities in structural composition and purpose between textiles and architecture. In so doing, she seeks to revivify the practice of architecture by harnessing the pliability, economy, and efficiency of cloth, which nomadic women have been doing for centuries.

In the light of the gendered biases that create a willful blindness to women’s architectural work, the idea of labeling anything produced by a woman (from a thought to a tent) as “feminine,” appears dubious, and arguably stems from the idea that women, as creators, are lesser than men. On a fundamental level, branding things with the label “feminine” perpetuates the silent notion that anything a man creates is the standard or the norm, since it does not require (or acquire) the label “masculine”, but if created by a woman, it is automatically gendered. This becomes especially strange in a culture that has no “masculine” reference point for architecture. Nomadic women are the sole architects, so labeling their aesthetic as feminine becomes unnecessary.

- 1 Labelle Prussin, *African Nomadic Architecture: Space, Place, Gender* (Washington D.C.: Smithsonian Institution Press, 1995), p. 186.
- 2 Labelle Prussin, “Gabra Containers,” *African Arts* 20 (1987), p. 44.
- 3 See especially Chandra Mukherji, “Women Engineers and the Culture of the Pyrenees: Indigenous Knowledge and Engineering in Seventeenth-Century France,” in *Making Knowledge in Early Modern Europe: Practices, Objects, and Texts, 1400–1800*, edited by Pamela H. Smith and Benjamin Schmidt (Chicago: University of Chicago Press, 2007), p. 19–44.
- 4 Anni Albers, “The Pliable Plane; Textiles in Architecture,” *Perspecta* 4 (1957): p. 37.
- 5 Ibid.



CHAPTER 3

RENDILLE TENTS

Risham Majeed

DIMENSIONS

(of a typical tent c. 1970)

Length 4.7m

Width (entrance) 4.7m

Width (back) 3.9m

Height 2.1m

MATERIALS

acacia wood, pre-bent and straight, sisal rope, raffia mats, cow hides, leather

GEOGRAPHICAL ORIGIN

Kenya

SALIENT FEATURES

self-supporting armature, fused dome-sphere and cone geometry, flexible joints, shaggy exterior

ANALYSIS

The Rendille tent is an armature tent made from bent ribs and straight poles sourced from the acacia tree that are tied together using long ropes made from the sisal plant. In plan it is a fusion of a half dome with a lean-to entrance (fig. 7). The entire cage-like armature is covered with mats knotted together with wild sisal roots (fig. 9). Specially cut and stitched cowhides are used to line the interior back wall and flank either side of the entrance corridor.

Upon selection of a new campsite, women first unpacked the lofty arcs that together formed the central vaults of the tent (fig. 1). The front and back arches were the most important structural members of the armature and the first to be erected. Each consists of two to four pre-bent sticks tied together forming an apex that becomes the highest point of the tent (1.5–2m). The back arch went up first, and, if the ground was not too hard, the ribs were stabilized by burying them 0.5–1m into the earth. When the ground was too firm to be broken the back ribs were steadied with stones found on site. The front arch was reinforced with the addition of the two central straight poles that demarcate the entrance. Women alternated working between the front lean-to and the back half dome. Once the concentric ribs that form the lattice-work dome between the front and back

Fig 7. Rendille woman untying mats from the armature.
Photo by Amyas Naegele, Marsabit, Kenya, 2013



Fig 8. Rendille Mat. Detail of the exterior cladding of a Rendille tent. Note the knotted grid underlying the pile built up by sisal fibers. Photo by Risham Majeed, 2013

arches were secured with ropes, the remaining straight poles were attached to the entrance arch.

With the armature standing, further reinforcements were applied on the inside and outside. Woven mats were attached like shingles in three distinct tiers to the armature: each mat measures half a square meter in area and an average tent was covered with 40-50 mats. The tops of the mats are straight edges with ropes on either corner used to fasten them to the frame. Exterior surfaces of the mats have pile that hangs as a neat fringe; when tied to the armature the fringes from the mat above sometimes obscure the regularity of the edge below giving the entire exterior a staggered tiered texture. The newest and most attractive mats were used for the roof and the older ragged mats were attached to the lowest regions where they were prone to the most wear. The front half of the tent was covered with mats all the way to the ground whereas the lower portion of the back domed wall was left uncovered (roughly 50cm) to allow for smoke to escape from the area immediately around the hearth. The strong desert winds make fires outside dangerous; the tent's hearth

is the only place where fires are contained. At the same time the dense smoke permeates and blackens the external cladding from the inside.

Specially prepared cowhides lined the interior back wall both as structural reinforcements and as a visual barrier between the lowermost edge of the sleeping spaces and the outside which was not covered with raffia mats. More pliable and mobile than raffia mats, the interior hides allowed ventilation when needed and were put up for privacy from within when desired. Two pieces of leather cut from a single cow hide articulated the entrance corridor and provided shade. A carefully assembled bouquet of plants and flowers crowned the doorway

Seen from afar, with their shaggy organic exterior, Rendille tents could become nearly indistinguishable from the brush around them. The tactility of the bushy pile invited touch up close but blended into the surroundings from a distance. All the tents in a Rendille compound rose as domical mounds with their entrances facing west.

They are some of the most sculptural of African tents since they take on the shape of their ductile yet firm armature. This self-supporting shell flexed in response to changing winds and mats could be added or removed for ventilation or insulation depending on external conditions. It has two silhouettes in diametric opposition to one another: firstly as an intricately ordered web of bent wood that is both a part of and apart from its environment, and secondly as a securely enclosed interior once it received its shaggy mats. There are very few synapses between the outer skin and the inner scaffold. As a result the interior is very dark, only intermittently illuminated by sharp laser like beams of light that pierce through the tight weave of the raffia mats.

The armature was constructed from the pre-bent wood of the acacia tree. These ribs were continually replaceable modules; in fact since each curved pole is one half of the vault, if it breaks it can be replaced as an element of a whole rather than having to replace the entire vault. Modular, sequential, incremental construction preserved the integrity of the whole by limiting



Fig 9. Armature of a Rendille Tent. The frame of the armature in the process of assembly. Note the sturdy straight poles of the lean-to entrance which are not buried but rest directly on the ground. The woman on the bottom right is securing these with rocks. Photo by Anders Grum, Kenya, 1975

damage locally to constituent parts; because they are one element of dozens, their failure cannot bring down the structure as whole. These tents show the evolving ingenuity of the Rendille women who adapted available materials to serve their purposes: single sturdy long branches are scarce and so delicate forked branches are tied together in a way that rivals the strength of a single strong rib.

The slope of the roofing, lowest at the entrance and highest in the domed back, reveals the hierarchical

internal division of space for different functions. The lowest tier of entrance mats are frayed and the pile has fallen off whereas newly made strong mats are placed on the crown of the back dome and the higher tiers of the entrance. This is because the front is the public area reserved for receiving guests, whereas the back is the private area where the entire family sleeps. Tiny black clusters, in fact carbon crystals from the hearth smoke, cling to the ropes of the side wall, as the last vestiges of the activities once conducted therein (see cover image).



CHAPTER 4

TUAREG TENTS

Risham Majeed

DIMENSIONS

(of a typical tent c. 1970)

Length 5.5m

Width 6.4m

Height 1.5–2m

MATERIALS

Goats' skins (96–100 skins), red ochre, acacia wood, woven fibre and leather mats

GEOGRAPHIC ORIGIN

Niger/Mali

SUPPORT SYSTEM

tensile, unstressed leather velum with a center pole, carved and uncarved poles around the perimeter. Side walls are long mats that are removable and adjustable.

SALIENT FEATURES

organic, curvilinear (concave-convex roof), smooth exterior and textured interior, bright red, radial arrangement

ANALYSIS

The Tuareg tent was designed with goat hides and wooden poles. A typical roof velum was made with 96 goat skins sewn together in 12 rows.¹ The skins were prepared by women and made supple through the application of tannin, which they derived from the bark of the acacia tree. This powder is what gives the velum its sumptuous red color. Goat hides are thin but oily, a quality enhanced with the repeated application of butter that kept them pliable and water resistant (fig. 4). The perimeter skins were squared on just three sides leaving the neck to serve as a sturdy leather thong to tie to the posts. Hides that constitute the internal rows were trimmed straight on all four sides by adding patches and strips of leather, where needed, to form a rectilinear row. These rows are prominently visible as modules of roughly the same length and width. They allowed the velum and the tent to be enlarged or reduced over time as life circumstances changed.

Each hide retains the memory of its original three-dimensional form, imparting a subtle unevenness and a lively texture to the surface. Repairs of various sizes and shapes—often small rounds no bigger than a coin

Fig 10. Tuareg Velum, c. 1970s. Note the even rows of squared goats' skins interrupted by circular patches, sewn on to repair holes. Photograph by Risham Majeed, Burkina Faso, 2013

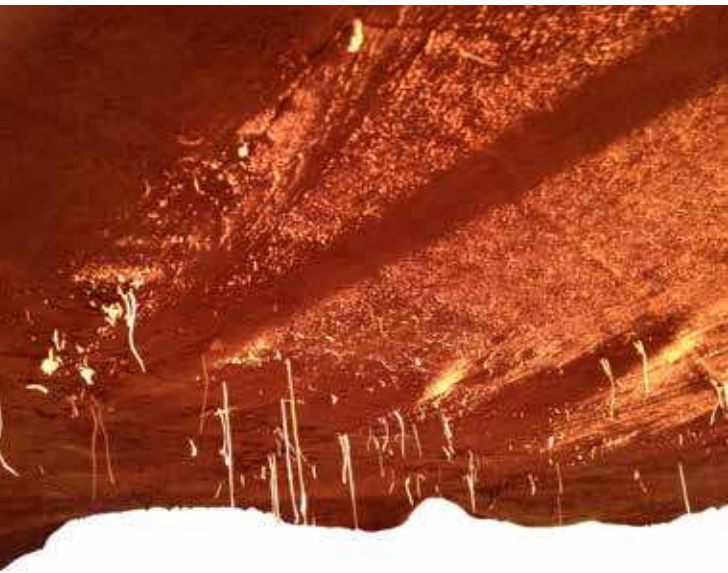


Fig 11. Underside of a Tuareg Tent Velum. c.1970s. Note how threads are left to hang on the underside of the velum for future repairs. Photo by Risham Majeed, Burkina Faso, 2013

—dot the membrane, a testament to the renewability of building materials that are sourced from the herd. Threads used for these minor mends were uncut on the inside and left to dangle, providing texture and animation to the undulating tent roof.

The assembly of the Tuareg skin tent was almost infinitely variable because the tension holding up the velum is generated through a network of internal and external supports; the membrane is not prestressed or treated to anticipate tension. Since tension is circumstantially self-generated, the wooden elements can be continually reconfigured according to a family's traditions, the availability of resources along with frequency of movement.

The skin is relatively thin and would tear if a few poles concentrated the tension in a small area. A typical tent would be supported by twenty perimeter posts

dispersing the tension, and one taller central pole topped by a carved wooden ridge piece fixed in a socket. The perimeter support system uses three different types of posts: sturdy back posts, notched and short, only 0.7m. high; side posts measuring 1.5m, slender and lightly carved at the top; tall uncarved front poles—saplings or tree branches—sourced on site upon arrival and left there when the group departed. The tallest are equal in height to the center post allowing a maximum flexibility in the degree of opening of the entrance to account for wind and ventilation. The leather can be tied at the top of the pole or near the bottom and could be quickly adjusted when the weather changed.

Upon selection of a new campsite—ideally a place where deep sand will absorb dung and waste—women would unload the pack animals and then clear any stones or brush before erecting the tent. The women buried the each of the cardinal poles around 0.5m deep—or just pounded them into the ground. Then they unfolded the velum lengthwise without spreading it out entirely. They made evenly spaced holes for each of the six back perimeter posts which they planted before tying the velum to them loosely. With the back edge attached, the velum was unfolded toward the middle of the tent, extended over the ridge of the center pole, and incrementally tied to the side poles as it was continuously unrolled to meet the two front cardinal posts. Once the velum was anchored on all four sides, the women pushed the center pole up to distribute tension throughout the membrane and tightened the thongs to transfer that tension evenly among the outer posts. The perimeter walls, consisting of long reed screens, supported by finely carved posts facing inward could then be erected as a wind break, for privacy and to create a complete enclosure.

Seen from afar, the low swells of these shallow domes could almost be mistaken for small dunes in the Sahara, as early twentieth-century travelers reported. The red lustre of the skins could be washed out by the blistering blaze of the desert; but in the deep shade of the interior, colors were intensified amidst contrasting textures and shadows. The reed screen walls filtered the

brightness and created strong silhouettes of people, things and the graphic openwork of the mat supports. The undulating edge of the membrane sometimes folded over the reed screens continued to animate the interior through its fluttering shadows.

The Tuareg tent has a radial footprint, meaning it employs a centripetal building principle that works outward from the center. Traditionally, the bed was the first element to be assembled because it defined the middle of the tent. This was followed by the pair of large V-shaped trestles which held rolled mats and screens and finally a forked bowl stand, placed nearby to hold milk. These three central elements always occupied the center of the tent and guided the erection of the structural members. The single central pole, which simply rests upon the ground, is held in place by the pull of the velum tied down on the perimeter poles. Though

the footprint of the velum is rectangular, the combination of the central pole along with the circular arrangement of the perimeter supports give the Tuareg tent its distinctive oval shape. This curvilinear silhouette is further accentuated by the scalloped edges that rhythmically spike outward at each exterior pole.

Tuareg women create ornament on nearly every element of their tents, contrasting with the more sober exterior. Their mat screen walls are embellished with geometric designs woven with leather, and they hang bunches of bright colored leather bags on elaborately carved posts that cluster near the center. Ornament is concentrated in areas of structural shifts to draw attention to these mediating zones; for example, the ridge piece atop the central pole marks the transition between the vertical force of the pole and the horizontal thrust of the membrane. Its boldly pyro-engraved motifs around the socket emphasize its mediating role between the opposed forces that it stabilizes. In the same way, incised decorations mark the tops of the posts where the horizontal tug of the leather roof is transferred to the vertical poles.



Fig 12. Tuareg Leather Tent, c. 1990s. The tent is open on all sides to allow wind to pass through during the hotter times of the day. The perimeter poles are uncarved acacia saplings that were most likely found on site and not transported from camp to camp. Also note the way the wind leaves patterns like ravines on the desert dunes. Photo by Guenay Ulutuncok

- 1 One of the earliest tents to be collected was by the Danish ethnographer Ole Olufson during his expedition to the Sahara between 1922-3, which is in the collection of the National Museum in Denmark. C.F. Feilberg's description of this skin tent indicates that it was made of around 50 goat's skins and the velum measured 4m x 3.85m. The size of tents varied historically according to the political circumstances of nomads as well as the frequency of drought and its effect on the size of the herd. See C.F. Feilberg, *La Tente Noire* (Copenhagen, 1944), p. 139-141.

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Back cover: Unidentified Artist, Tuareg (Mali, Niger).
Perimeter screen wall (leather, reeds), c. 1970s.
Detail of the leather fringe.



Four East African Nomadic Vessels. Rendille, Borana, or Gabra (Kenya), c. 1970s. Installation of *Made to Move: African Nomadic Design* at the Handwerker Gallery, Ithaca College.



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