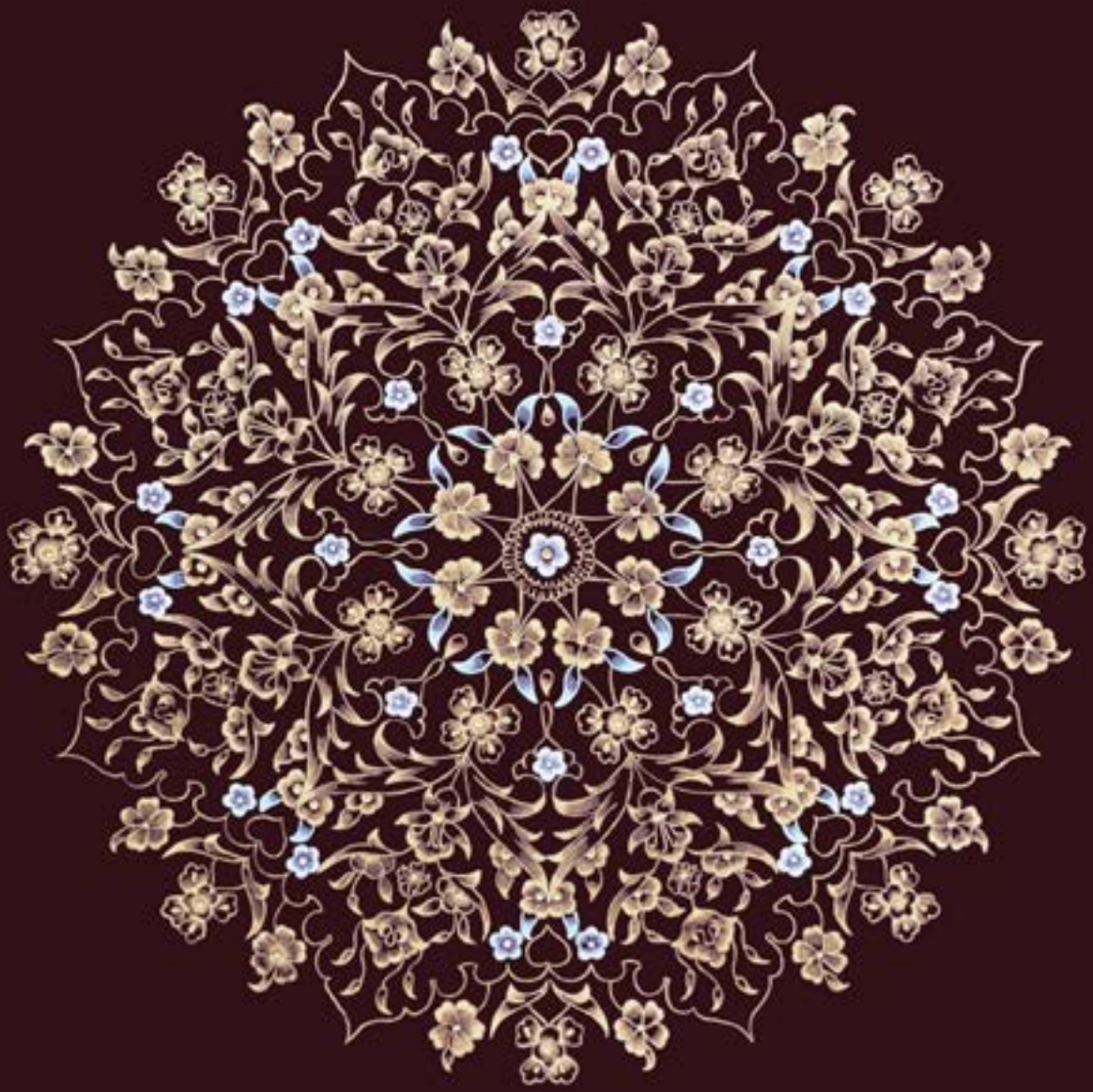
Journal of Traditional Building, Architecture and Urbanism

2 - 2021



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Decorative motif with khatai flowers, **George Chavoutsas**
Halkar technique with 23-carat gold and tempera on mount board
Técnica *Halkar,* con oro de 23 quilates y témpera en papel paspartú
Técnica *Halkar,* com ouro de 23 quilates e têmpera em papel passpartout

Indexes image | Imagen de los índices | Imagem de índices

The Forest, **Jethro Buck** (93x75 cm. 2014)
Hand made paint on hand made paper
Pintura hecha a mano sobre papel hecho a mano
Pintura feita à mão sobre papel feito à mão

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Works | *Obras*

Selas House on Lamu Island, Kenya

La Casa Selas en la isla de Lamu, Kenia

A Casa Selas na ilha de Lamu, Quénia

Urko Sánchez

Introduction

Lamu is a small island off the coast of Kenya. Its chief town, also called Lamu, is the oldest inhabited settlement in East Africa. Founded in the 14th century, it had its heyday in the 17th and 18th centuries on becoming a political, artistic and trading center. Its rich history and the way its culture has been preserved have earned it recognition as UNESCO World Heritage.

This region is where the Swahili culture emerged, with a peculiar mix of Bantu, Arabic, Persian and Indian

Introducción

Lamu es una pequeña isla en la costa de Kenia. Su capital homónima es hoy en día la ciudad habitada más antigua de África Oriental. Fundada en el siglo XIV, tuvo su mayor apogeo durante los siglos XVII y XVIII, cuando se convirtió en un centro político, artístico y comercial. Su rica historia y el modo en que está preservada su cultura le han valido ser reconocida como Patrimonio de la Humanidad por la UNESCO.

Esta región es la cuna de la cultura suajili, que cuenta con una singular mezcla de

Introdução

Lamu é uma pequena ilha na costa do Quénia. A sua capital homónima é atualmente a cidade habitada mais antiga de África Oriental. Fundada no século XIV, teve o seu maior apogeu durante os séculos XVII e XVIII, quando se converteu num centro politico, artístico e comercial. A sua rica história e o modo em que a sua cultura está preservada, valeu-lhe o reconhecimento como Património da Humanidade pela UNESCO.

Esta região é o berço da cultura suaíli, que conta com uma única mistura de

< Patio of Selas House | Patio de la Casa Selas | Pátio da Casa Selas (Javier Callejas)
1, 2: Lamu city environment | 1, 2: 1, 2: Entorno de la ciudad de Lamu | 1, 2: Entorno de Lamu (Blanca Sánchez-Balgoma)


1


2

influences, stretching from southern Somalia to northern Mozambique. Most of its inhabitants are Muslim, so its architecture is informed by Muslim culture while incorporating adaptations to the local climate and Indian characteristics.

The old quarter, known as Lamu Old Town, is a tangle of narrow winding alleys with closely packed houses and elaborate doorways leading into small courtyards with dwellings opening onto them. Usam Ghaidan details the various types of building here in his magnificent book *Lamu: A study in conservation* (East African Literature Bureau, 1975), along with many other aspects illuminating the local architecture.

influencias bantúes, árabes, persas e indias, y que se extiende desde el sur de Somalia hasta el norte de Mozambique. La mayor parte de los habitantes de esta región son musulmanes, por lo que su arquitectura se nutre de su cultura, a la que incorpora diversas adaptaciones climáticas y características de la cultura india.

El casco antiguo de la ciudad, conocido como Lamu Old Town, es una medina de calles estrechas y sinuosas, con casas pegadas unas a otras, que cuentan con elaboradas puertas de acceso que dan paso a los pequeños patios a los cuales se abren las viviendas. Usam Ghaidam explica con gran detalle las distintas tipologías de edificios en su magnífico libro *Lamu: A study in conservation* (East African Literature Bureau, 1975), así como todos aquellos elementos que permiten entender la arquitectura del lugar.

influências bantas, árabes, persas e índias, e que se estende desde o sul de Somália até ao norte de Moçambique. A maior parte dos habitantes desta região são muçulmanos, pelo que a sua arquitetura se nutre da sua cultura, à que se incorpora diversas adaptações climáticas e características da cultura índia.

O casco antigo da cidade, conhecido como Lamu Old Town, é uma almedina de ruas estreitas e sinuosas, com casas pegadas umas às outras, que contam com elaboradas portas de acesso que dão entrada aos pequenos pátios aos quais de abrem as vivendas. Usam Gaidam explica com grande detalhe as distintas tipologias de edifícios no seu magnifico livro *Lamu: study in conservation* (The East African Literature Bureau, 1975), bem como todos aqueles elementos que permitem entender a arquitetura do lugar.

Location plan | Plano de situación | Planta de situação

1

2

1: Aerial view of Lamu city and Selas House 2: Selas House environment | 1: Vista aérea de Lamu y la Casa Selas 2: Entorno de la Casa Selas | 1: Vista aérea de Lamu e da Casa Selas 2: Entorno da Casa Selas (1, 2: Javier Callejas)

Selas House

When I first visited Lamu in the early nineties, I had the feeling of being in a place where time had stood still. Electricity was scarce, boats were propelled by sail and donkeys were the chief means of overland transport. Life in the town went on as it had for centuries, at a slow pace, with hardly anything to tie it to any one age. It had an exotic feel conducive to dreaming. This was one of the reasons why I decided to settle in this spot so remote from the world I knew.

Casa Selas

Cuando visité Lamu por primera vez a principios de los años noventa tuve la sensación de estar en un lugar donde el tiempo se había detenido: la electricidad era escasa, los barcos navegaban a vela y el burro era el principal medio de transporte terrestre. La vida en esta ciudad discurría igual que lo había hecho durante siglos, a un ritmo pausado, sin apenas nada que pudiéramos relacionar con una época concreta. Existía una atmósfera exótica que invitaba a soñar. Esta fue una de las razones por las que decidí instalarme en este rincón tan alejado del mundo que conocía.

Casa Selas

Quando visitei Lamu pela primeira vez a princípios dos anos noventa, tive a impressão de estar num lugar onde o tempo tinha parado: a eletricidade era escassa, os barcos navegavam à vela e o burro era o principal meio de transporte terreste. A vida nesta cidade decorria da mesma forma como nos séculos anteriores, a um ritmo lento, nada com que pudéssemos relacionar a uma época passada. Existia uma atmosfera exótica que convidava a sonhar. Esta foi uma das razões pelas quais me decidi instalar neste espaço tão afastado do mundo que conhecia.

Site plan | Plano del emplazamiento | Planta de localização

When, later on, a childhood friend came to visit, he had a similar experience. So after his third visit, he asked me to help him find a house that he might refurbish as a summer home. We were lucky, as without having to look far, we were offered a ruined dwelling in the old town.

Today the former inhabitants of such traditional houses often prefer to live in recently built neighborhoods in reinforced-concrete buildings with large windows and air-conditioning. Old houses, closed off to the exterior and with their bays arranged around a courtyard, need more maintenance and do not offer the sort of spaces normally sought by younger generations. For these reasons, to which we should add frequent family disputes over the inheritance of such buildings, many houses in the old town have been abandoned. In a derelict state, their floors tend to deteriorate with time and consequently the walls also end up collapsing.

The site bought by my friend was basically a heap of rubble with rubbish on top. The first thing we did was to clear it up and find what remained of the original walls and their fine ornamentation. We also thought it important to preserve the magnificent ficus that had grown up in the middle of the plot.

Cuando, tiempo después, un amigo de la infancia vino a visitarme, le ocurrió algo similar. Así, tras su tercera visita, me pidió que le ayudara a encontrar una casa que pudiera rehabilitar y convertir en su residencia de verano. Tuvimos suerte, ya que sin necesidad de buscar demasiado alguien nos ofreció las ruinas de una vivienda en el casco antiguo.

Es frecuente que, hoy en día, los habitantes originales de aquellas casas tradicionales prefieran vivir en barrios de reciente construcción, en edificios de hormigón armado, con grandes ventanales y aire acondicionado. Las casas antiguas, cerradas al exterior, con sus crujías dispuestas en torno a un patio, con muros gruesos y elaborados forjados, requieren un mayor mantenimiento y no se corresponden con el uso del espacio que las nuevas generaciones comúnmente buscan. Por estas razones, a las que hay que añadir las frecuentes disputas familiares en torno a la herencia de estos inmuebles, muchas casas del casco antiguo han quedado abandonadas. En ese estado de abandono es frecuente que con el paso del tiempo sus forjados se deterioren y, con ello, sus muros terminen también desplomándose.

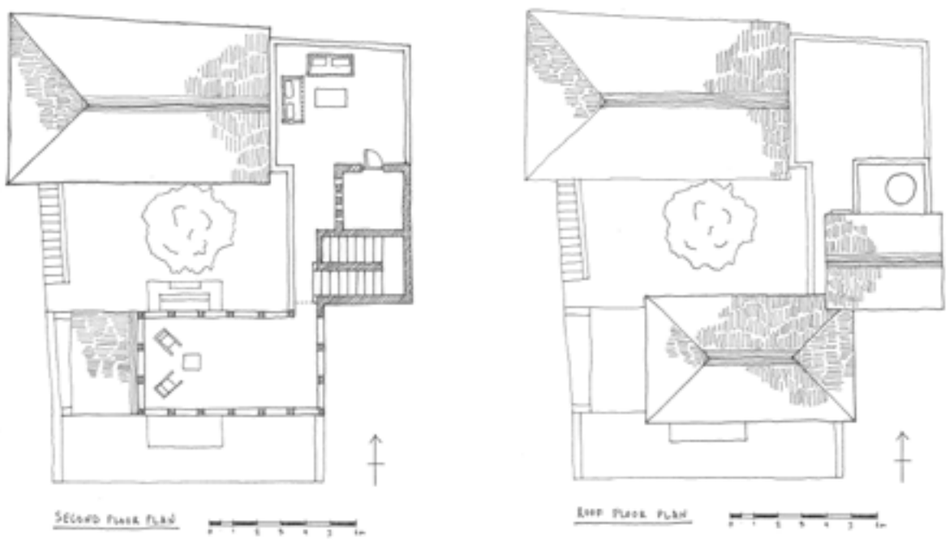
El solar adquirido por mi amigo era, básicamente, una montaña de escombros coronada de basura. Lo primero que hicimos fue limpiarlo y descubrir lo que quedaba de los muros originales y de sus ricos ornamentos. Nos pareció también importante conservar un magnífico ficus que había crecido en el centro del solar.

Quando, tempo depois, um amigo de infância me fez uma visita, também lhe aconteceu algo parecido. Assim, após a sua terceira visita, pediu-me que lhe ajudasse a encontrar uma casa que pudesse reabilitar e convertê-la na sua residência de verão. Tivemos sorte, já que, sem ter sido preciso procurar muito, alguém nos ofereceu as ruinas de uma vivenda no casco antigo.

É frequente que, hoje em dia, os habitantes originais daquelas casas tradicionais prefiram viver em bairros de construção recente, em edifícios de betão armado, com grandes janelões e ar condicionado. As casas antigas, fechadas para o exterior, com as suas galerias dispostas à volta de um pátio com paredes grossas e elaboradas estruturas de madeira horizontais, requerem mais manutenção e não se correspondem com o uso do espaço que as novas gerações comummente procuram. Por estas razões, às que também acrescentamos as frequentes disputas familiares pela herança destes imóveis, muitas casas do casco antigo ficaram abandonadas. Durante esse estado de abandono, é frequente que, com o transcorrer do tempo, as estruturas de madeira se deteriorem e, com elas, as paredes acabem também por desabar.

O solar adquirido pelo meu amigo era, basicamente, uma montanha de escombros coroada de lixo. O primeiro que fizemos foi limpá-lo e descobrir o que restava das paredes originais e dos seus ricos ornamentos. Pareceu-nos também importante conservar um magnífico fícus que tinha crescido no centro do solar.

Original walls of Selas House | Muros originales de la Casa Selas | Paredes originais da Casa Selas



Layout of Selas House | Plantas de la Casa Selas | Plantas da Casa Selas

Design

The design of the new house sought to take advantage of the original structure, so most of the new walls were built over existing ones. But some changes were made to the original floor plan with the aim of distributing the space so as to meet the usual needs of a contemporary European. The most notable change was to leave one of the original bays uncovered so as to create a second courtyard to provide natural light and ventilation on the ground floor.

Diseño

El diseño de la nueva vivienda trata de aprovechar la estructura original, por lo que la mayor parte de los muros se levantan sobre otros existentes. Existen, sin embargo, una serie de variaciones con respecto a la planta original, que ayudaron a distribuir los espacios de manera que respondieran a las necesidades habituales de un europeo contemporáneo. Entre ellas, la más decisiva fue la de no cubrir una de las crujías originales, para crear de esta manera un segundo patio que aportase luz y ventilación naturales a la planta baja.

Desenho

O desenho da nova vivenda trata de aproveitar a estrutura original, pelo que a maior parte das suas paredes se levantam sobre outras existentes. Existem, no entanto, uma série de variações em relação à planta original, que ajudaram a distribuir os espaços de forma a responder às necessidades habituais de um europeu contemporâneo. Entre elas, a mais decisiva foi a de não tapar uma das galerias originais para, desta maneira, criar um segundo pátio que proporcionasse luz e ventilação natural à planta térrea.

1: 1: Ficus seen from the second floor 2: Courtyard with the preserved ficus | 1: Vista del ficus del patio a través de un hueco en la segunda planta 2: Patio con el ficus conservado | 1: Vista do ficus através de um vão no segundo andar 2: Pátio com o ficus conservado (1,2: Alberto Heras)

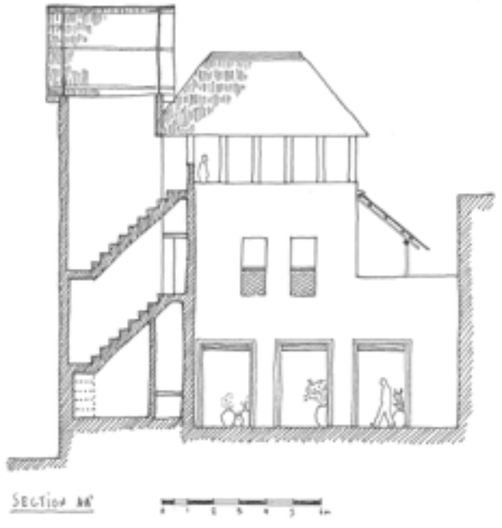
Traditional Lamu houses originally had one or two stories. But as over time further floors were built over them, the old town now has many houses of three or four stories. This has much impaired the interrelations between buildings, upsetting age-old balances, depriving lower floors of natural light and impeding cross ventilation in many spaces. It has thus made what were once the finest floors of houses dark, hot and stuffy. And for these reasons the ground floors have ceased to have a definite use and life tends to carry on in the upper floors, with the advantage of views and the coastal breeze.

Originalmente las casas tradicionales de Lamu eran de una o dos alturas. Debido a que con el tiempo fueron levantándose plantas adicionales en ellas, en la actualidad la ciudad antigua cuenta con muchas casas de tres o cuatro plantas de altura. Esto ha afectado mucho a las relaciones entre los edificios, alterando equilibrios ancestrales, ha reducido la luz natural que llega a las plantas inferiores y ha anulado la ventilación cruzada de numerosos espacios. Ha convertido así las que en su día fueron las plantas más nobles de las viviendas en espacios oscuros, calurosos y mal ventilados. Y estas plantas bajas han dejado de tener, por estas mismas razones, un uso definido, por lo que la vida tiende a hacerse en las plantas superiores, favorecidas por las vistas y la brisa.

Originalmente, as casas tradicionais de Lamu eram de um ou dos pisos. Uma vez que com o tempo se foram levantando pisos adicionais sobre os mesmos, atualmente a cidade antiga conta com muitas casas de três ou quatro pisos de altura. Isto afetou bastante as relações entre os edifícios, alterando equilíbrios ancestrais, reduzindo o alcance da luz natural aos pisos inferiores e anulando a ventilação cruzada de muitos espaços. Converteu assim, o que no seu momento foram os pisos mais nobres das vivendas, em espaços escuros, quentes e mal ventilados. Estes pisos térreos deixaram de ter, por estas mesmas razões, uma utilização definida, pelo que a vida passou a ser feita nos pisos superiores, favorecidos pela vista e pela brisa.

< Ground-floor views of the two courtyards and the pool | Vistas de los dos patios y la piscina en la planta baja | Vista dos pátios e da piscina na planta térrea (Alberto Heras)

> Cross sections of the house | Secciones de la vivienda | Secções da moradia



< Rooms in the covered bay of the ground floor | Estancias en la crujía cubierta de la planta baja | Compartimentos na galeria coberta na planta térrea (Alberto Heras)

> Ground-floor views of the two courtyards and the pool | Vistas de los dos patios y la piscina en la planta baja | Vistas dos dois pátios e da piscina na planta térrea (Alberto Heras)

With the introduction of a second courtyard, the ground floor becomes habitable again, to which effect a small semi-covered pool built in the bay between the two yards also contributes. Given the hot and humid climate, the presence of water in the courtyards does not lower the ambient temperature, but it does give a certain visual freshness and lets the residents cool off in the heat of the day. This design option makes the ground floor a unique space, with a stylish bathing place surrounded by original decoration under richly ornamented ceilings.

We also decided to leave the original recesses and walls unchanged so as to keep a trace of past uses and to allow the facings to be organic, evolving surfaces.

Con la modificación introducida, sin embargo, gracias a este segundo patio, la planta baja puede ser de nuevo vivida, a lo que también contribuye la construcción de una pequeña piscina semi-cubierta en la crujía que separa ambos patios. Debido al clima caluroso y húmedo de esta región, la presencia de agua en los patios no rebaja la temperatura ambiental, pero sí aporta cierto frescor visual y permite a los ocupantes de la vivienda refrescarse en los momentos de más calor. Esta decisión de diseño convierte a la planta baja en un espacio singular, ya que se crea un elegante baño rodeado de decoraciones originales y bajo techos ricamente ornamentados.

Se decidió también dejar los nichos y muros originales inalterados, para de esta manera dejar huella del paso del tiempo y mantener los paramentos como lienzos orgánicos y cambiantes.

Com a modificação introduzida, no entanto, graças a este segundo pátio, o piso térreo pode ser novamente habitado, ao que também contribui a construção de uma pequena piscina semicoberta na galeria que separa ambos pátios. Devido ao clima quente e húmido desta região, a presença de água nos pátios não desce a temperatura ambiental, mas sim proporciona uma certa frescura visual e permite aos ocupantes da vivenda refrescarem-se nos momentos de mais calor. Esta decisão de desenho converte o piso térreo num espaço único, já que cria um elegante espaço balnear rodeado de decorações originais e sob tetos ricamente ornamentados.

Decidiu-se também deixar os nichos e as paredes originais inalteradas para, desta forma, deixar uma marca do transcorrer do tempo e manter os paramentos como lenços orgânicos e cambiantes.

Craftspeople

The renovation of old houses by foreign visitors has helped stimulate and preserve the original local building arts. Luckily there are still many artisans who keep alive a knowledge of building crafts. A great synergy has arisen between traditional craftspeople and foreign clients, turning up with new ideas and needs.

It was not hard to assemble a team of *fundis*, the term used for local workers, coordinated by Mwangi, a foreman from Nairobi used to overseeing worksites in the capital. As in this area there are no qualifications or documents to certify a worker's expertise, the best way of selecting good *fundis* proved to be to ask them to bring their own tools. While inexperienced workers brought just a sledgehammer, a trowel and a wooden float, those with more expertise also brought a measuring tape or rod and a plumb line, and the tools of expert traditional decorators included a few spoons and forks flattened according to their needs.

I was always fascinated to see the skill of these craftspeople in producing exquisite finishes with such basic means. An example of this is *nyerus* (stucco), with its intricate traditional geometric decoration.

All work was paid for in cash at sundown or, as the hadiths say, before the sweat on the worker's brow has dried. Every evening a queue of workers formed at my door to be paid and I dealt with them on my *baraza* (the arched veranda of a typical Swahili house, with a bench on which to sit and conduct business with non-family visitors).

Artesanos

La renovación de casas antiguas llevada a cabo por parte de los visitantes extranjeros ha permitido fomentar y conservar las artes constructivas locales originales. Afortunadamente, todavía hoy, abundan los excelentes artesanos que mantienen vivo el conocimiento de las artes aplicadas a la construcción. Una maravillosa sinergia se ha producido entre los artesanos tradicionales y los clientes venidos de fuera, que han llegado con nuevas ideas y necesidades.

No fue difícil montar un equipo de *fundis*, nombre por el que son conocidos los obreros locales, coordinado por Mwangi, un capataz de Nairobi acostumbrado a dirigir obras en la capital. Como en aquella región no existen títulos ni documentos que certifiquen el conocimiento de un trabajador, la mejor manera de seleccionar a los mejores *fundis* consistía en pedir que trajeran sus herramientas personales. Mientras que aquellos con poca experiencia traían sólo una maza, una paleta y una llana de madera, los más experimentados incluían además un metro y una plomada y los expertos en decoraciones tradicionales contaban entre sus útiles de trabajo con un pequeño número de cucharas y tenedores aplanados y adaptados a sus necesidades.

Siempre me fascinó comprobar la destreza que tienen estos artesanos para producir con medios tan básicos acabados exquisitos. Ejemplo de ello son los *nyerus* (estucos) y las complicadas decoraciones geométricas tradicionales.

Todos los trabajos se pagaban en efectivo a la puesta del sol, o, como se dice en los hadices, antes de que se seque el sudor de la frente del trabajador. Cada tarde, a la puerta de mi casa, se reunía una larga fila de gente esperando cobrar, a quienes atendía desde mi *baraza* (nombre por el que se conoce el soportal típico de la casa suajili, con un banco para sentarse y tratar asuntos con personas extrañas a la familia).

Artesãos

A renovação de casas antigas realizada pelos visitantes estrangeiros permitiu fomentar e conservar as artes construtivas locais originais. Felizmente, ainda hoje, é abundante encontrar excelentes artesãos que mantêm vivo o conhecimento das artes aplicadas à construção. Uma maravilhosa sinergia foi produzida entre os artesãos tradicionais e os clientes oriundos de fora, que chegaram com novas ideias e necessidades.

Não foi difícil formar uma equipa de *fundis*, nome pelo qual são conhecidos os operários locais, coordenado por Mwangi, um capataz de Nairobi habituado a dirigir obras na capital. Como naquela região não existem cédulas nem documentos que certifiquem o conhecimento de um trabalhador, a melhor forma de selecionar os melhores *fundis* consistia em pedir que trouxessem as suas ferramentas pessoais. Enquanto que aqueles com pouca experiência traziam consigo apenas uma maça, uma colher e uma talocha de madeira, os mais experientes incluíam uma fita métrica e um prumo; e os expertos em decorações tradicionais tinham entre as suas ferramentas de trabalho um pequeno número de colheres e garfos aplanados e adaptados às suas necessidades.

Sempre me impressionou comprovar a destreza que têm estes artesãos para produzir com meios tão básicos um acabamento refinado. Exemplo disso são os *nyerus* (estuques) e as complicadas decorações geométricas tradicionais.

Todos os trabalhos se pagavam em numerário ao pôr-do-sol, ou como diz o Alcorão, antes de que o suor da testa do trabalhador secasse. Cada tarde, à porta da minha casa, reunia-se uma longa fila de pessoas à espera de receber, que eram atendidos na *baraza* (nome pelo qual se conhece o alpendre típico da casa suaíli, com um banco para as pessoas se sentarem e tratarem de assuntos com pessoas alheias à família).

Craftsman applying stucco (*nyeru*) | Artesano aplicando estuco (*nyeru*) | Artesão a aplicar estuque (*nyeru*)

Building of Selas House | Construcción de la Casa Selas | Construção da Casa Selas

Building techniques

We used mostly local building techniques in every phase of construction, with materials such as coral stone, lime and timber, though the traditional techniques were sometimes adjusted where we saw advantages in doing so.

One such adjustment was in the construction of the floor slabs. So we used the traditional wooden beams, but only as permanent formwork for a self-supporting concrete slab. We decided on this because the bearing walls are strong enough to withstand the extra load entailed by the concrete, and the floor's stability is thus made independent of the state of beams which, among so many derelict buildings, are often attacked by wood-eating insects. Once the slab had set, we finished the ceilings traditionally with cornices decorated with geometric or floral motifs, carved in lime mortar with very fine aggregate, and timbers with thin parallel grooves filled with lime, along with a few coats of paint or linseed oil.

Técnicas constructivas

Utilizamos principalmente técnicas locales de construcción durante todas las fases del proceso constructivo, y empleamos como materiales la piedra de coral, la cal y la madera, si bien algunos cambios fueron introducidos en las técnicas tradicionales, por considerar que aportaban una serie de ventajas.

Uno de estos cambios se introdujo en la manera de construir los forjados. Así, utilizamos las tradicionales vigas de madera, pero sólo como encofrados perdidos de una losa de hormigón autoportante. Esta decisión se adoptó porque los muros de carga tienen capacidad suficiente para resistir la carga adicional que el hormigón supone, mientras que se logra desvincular la estabilidad del forjado del estado de las vigas, que, al existir tantos edificios abandonados, frecuentemente sufren el ataque de insectos xilófagos. Una vez que el forjado hubo fraguado, rematamos los techos a la manera tradicional, con cornisas decoradas con motivos geométricos o florales, labradas en mortero de cal de árido muy fino, y maderas surcadas con finas líneas paralelas rellenas de cal, con unas manos de pintura o aceite de linaza.

Técnicas construtivas

Utilizámos principalmente técnicas locais de construção durante todas as fases do processo construtivo, e empregamos materiais como a pedra de coral, a cal e a madeira, ainda que tenham sido introduzidas algumas alterações nas técnicas tradicionais por terem sido consideradas vantajosas.

Uma destas alterações foi introduzida na forma de construir as estruturas de madeira. Assim, utilizamos as tradicionais vigas de madeira, mas só como encofrados perdidos de uma laje de betão autoportante. Esta decisão foi adotada porque as paredes de carga têm capacidade suficiente para resistir à carga adicional que supõe o betão, ao mesmo tempo que se consegue desvincular a estabilidade da estrutura de madeira do estado das vigas, que, ao existirem tantos edifícios abandonados, frequentemente sofrem o ataque de insetos xilófagos. Após a presa da estrutura, rematamos os tetos da forma tradicional, com cornijas decoradas com motivos geométricos ou florais, lavradas com argamassa de cal de inerte muito fino, e madeiras sulcadas com finas linhas paralelas preenchidas com cal, com umas mãos de pintura ou óleo de linhaça.

Floor structures with wooden beams and cornice decoration | Forjados con vigas de madera y cornisas decoradas | Estrutura com vigas de madeira e cornijas decoradas

1

2

Traditionally decorated wooden beams | Vigas de madera con decoración tradicional | Vigas de madeira com decoração tradicional

We also used regular blocks of coral stone for the walls rather than traditional masonry, as they can be laid much more quickly and efficiently.

Except for these updatings of traditional technique, the house was built as it would have been hundreds of years ago. All the processes were manual, with barely any use of machinery of any kind.

Sand was carried in small feluccas or boats with lateen sails. They are known as *dhows* and come round from the far side of the island. The wilier skippers often try to sell you beach sand rather than river sand, as the former is easier to obtain in the vicinity. The only way to tell between the two types, indistinguishable to the naked eye, is by their smell and taste.

También utilizamos bloques regulares de piedra de coral para los muros, en vez de la mampostería tradicional, ya que su colocación es mucho más rápida y eficaz.

Exceptuando estas actualizaciones de la técnica tradicional, la casa se construyó de la misma manera que como se hubiera hecho hace cientos de años. Todos los procesos se realizaron de manera manual, sin utilizar prácticamente maquinaria de ningún tipo.

Para transportar la arena se utilizan pequeños faluchos o embarcaciones de vela latina conocidos como *dhows,* que llegan desde el otro lado de la isla. Es frecuente que los capitanes más avezados de estas embarcaciones traten de vender arena de playa en lugar de arena de río, cuya obtención es más sencilla por encontrarse en zonas más cercanas. La única manera de distinguir ambos tipos de arena, cuyas diferencias son imperceptibles a simple vista, es por su sabor y su olor.

Também utilizamos blocos regulares de pedra de coral para as paredes em vez da pedra tradicional, já que a sua colocação é muito mais rápida e eficaz.

Excetuando-se estas atualizações da técnica tradicional, a casa foi construída da mesma forma como tivesse sido construída há centenas de anos. Todos os processos foram realizados manualmente, sem a necessidade de usar praticamente qualquer tipo de máquina.

Para transportar a areia, utilizaram-se pequenos faluchos ou embarcações de vela Latina, conhecidos como *dhows,* provenientes do outro lado da ilha. É frequente que os capitães mais avezados destas embarcações tratem de vender areia de praia em vez de areia de rio, uma vez que o processo de obtenção é mais simples por se encontrar nas zonas mais próximas. A única forma de distinguir ambos tipos de areia, cujas diferenças são imperceptíveis à simples vista, é pelo seu sabor e pelo seu odor.

1

2

1: Unloading a *dhow* with palm baskets 2,3: Carrying building materials on donkeys | 1: Descarga de un *dhow* con cestos de palma 2,3: Transporte del material en burros | 1: Descarga de um *dhow* com cestos de palma 2,3: Transporte do material em burros

Traditionally each *dhow* would dock at the Lamu seafront with the tides. It would be unloaded by sailors in large palm baskets carried on their heads. A small improvement was introduced with the building of a 1m³ box so that the baskets could be emptied into it and the boatload thereby measured. Sand previously had to be purchased by bargaining roughly over the load with the skipper.

Tradicionalmente cada *dhow* llegaba al malecón de Lamu en función de las mareas. Allí era descargado por los marineros con grandes cestos de palma que transportaban sobre sus cabezas. Una pequeña mejora que fue introducida fue la de construir una caja de 1m³ con el fin de que los estibadores pudieran verter los cestos dentro y medir así la carga del barco. Hasta entonces era necesario, para adquirir la arena, regatear el precio del cargamento "a ojo" con su capitán.

Tradicionalmente, cada *dhow* chegava ao paredão de Lamu em função da maré. Ali, era descarregado pelos marinheiros com grandes cestos de palmeira que transportavam sobre as suas cabeças. Uma pequena melhoria que foi introduzida foi a de construir uma caixa de 1 m³ a fim de que os estivadores pudessem verter os cestos dentro e medir assim a carga do barco. Até então, para adquirir a areia, era necessário regatear o preço do carregamento "a olho" com o seu capitão.

Once the sand had been measured, its transportation to the site had to be arranged with one of the donkey-handlers. It was important to check the number of donkeys collecting sand against the number offloading on site, as otherwise a few would often go astray and end up at someone else's house. It is quite a sight to see strings of donkeys loaded with sand or other goods filing wearily through the town's narrow streets, causing anyone coming the other way to shelter in the porch arcades to let them by.

The stone quarries on the nearby island of Manda have been supplying this material to Lamu for centuries. It is coral stone, from fossilized coral reefs. It is quarried by the Luo tribe, from a region hundreds of miles away near Lake Victoria, using only rudimentary mechanical means, such as short picks and machetes. Once extracted, it is loaded onto donkeys or into wooden carts with car wheels and human traction, carried to the village and transferred to *dhows*, which ship it to

Una vez medida la arena, había que encargar el transporte hasta la obra con alguno de los hombres que manejaban los burros. Era importante contrastar el número de burros que recogían arena con el de los que la descargaban en obra, pues de lo contrario era frecuente que unos cuantos se desviasen y acabasen en la casa de un tercero. Impresiona ver las columnas de burros cargados de arena, u otros materiales, discurrir en fila a paso cansino por las estrechas calles de la ciudad, lo que además obliga a todos aquellos que vienen de frente a buscar cobijo en los soportales para permitirles el paso.

Las canteras de piedra, situadas en la cercana isla de Manda, han suministrado este material de construcción a Lamu desde hace siglos. Se trata de piedra de coral, procedente de arrecifes coralinos fosilizados. Es extraída por la tribu de los Luo, que proviene de una región situada a cientos de kilómetros, cerca del Lago Victoria. Para la obtención de la piedra sólo se usan medios manuales rudimentarios, como picos cortos y

Uma vez medida a areia, tinha-se de encarregar o transporte até à obra com algum dos homens que manobravam os burros. Era importante contrastar o número de burros que recolhiam a areia com o número que a descarregavam na obra, caso contrário, era frequente que uns quantos fossem desviados e acabassem em casa de um terceiro. É impressionante ver as colunas de burros carregados de areia, ou qualquer outro material, a percorrerem em fila a passo lento pelas ruas estreitas da cidade, obrigando a todos aqueles que viessem em sentido contrário a procurarem abrigo nos alpendres para que lhes seja permitida a passagem.

As canteiras de pedra, situadas na ilha vizinha de Manda, têm proporcionado este material de construção a Lamu desde há séculos. Trata-se de pedra de coral, proveniente de recifes coralinos fossilizados. É extraída pela tribo dos Luo, que provém de uma região situada a centos de quilómetros, perto do Lago Vitória. Para a obtenção da pedra apenas se usam meios manuais rudimentares, como picaretas curtas e machetes. Uma

Coral stone quarry | Cantera de piedra de coral | Canteira de pedra de coral



Building of Selas House | Construcción de la Casa Selas | Construção da Casa Selas

Lamu. Thus the carbon footprint of all this transport is zero.

This type of stone is an excellent material, as it is light, malleable and highly insulating, both thermally and acoustically. Coral stone can have various consistencies according to the strata, though it may generally be divided into white (lighter) or yellowy (denser and heavier).

Irregular stones can also be extracted at the quarry, usually from near the surface. These are orangey in color and normally used for foundations or, when very small and packed into sacks called *kokoto*, for concrete and facing tiles.

Coral stone is also used to produce lime, which is the staple of building in the region. It has always been used as a mortar binder for walls and as rendering and *nyeru* (stucco) in finishes. This material can still be found albeit with increasing difficulty, in various qualities.

machetes. Una vez extraída, se carga sobre burros o carros de madera con ruedas de coche tirados por personas y es llevada hasta el pueblo, donde se transfiere a los *dhows*, que la transportan hasta Lamu. De esta manera, la huella de carbono de todo este transporte es nula.

Este tipo de piedra es un material fantástico, ya que es ligero, maleable y extremadamente aislante, tanto térmica como acústicamente. La piedra de coral puede tener distintas consistencias, que varían según los estratos, aunque en general se puede distinguir entre el blanco (más ligero) y el amarillento (más denso y pesado).

De las canteras también pueden extraerse piedras irregulares, que proceden normalmente de la parte más superficial del terreno. Tienen un color más anaranjado y se suelen usar para las cimentaciones, o, cuando son muy pequeñas y vienen empacadas en sacos llamados *kokoto*, para los hormigones en masa y los aplacados.

De la piedra de coral también se obtiene la cal, que es la base de la construcción en esta región. Se ha utilizado siempre como mortero de agarre para muros y como revoco y *nyeru* (estuco) en acabados. Aunque cada día es más difícil, aún hoy puede conseguirse este material, del que existen calidades distintas.

vez extraída, é carregada sobre burros ou carroças de madeira com rodas de carro puxados por pessoas e é transportada até à aldeia, onde se transfere aos *dhows*, que a transportam até Lamu. Desta forma, a pegada de carbono de todo este transporte é nula.

Este tipo de pedra é um material fantástico, pois é leve, maleável e extremamente isolante, tanto térmica como acusticamente. A pedra de coral pode ter distintas consistências, que variam de acordo com os estratos, ainda que no geral seja possível distinguir entre a branca (mais leve) e a amarelenta (mais densa e pesada).

Das pedreiras também se pode extrair pedras irregulares, que provêm normalmente da parte mais superficial do terreno. Têm uma cor mais alaranjada e costumam ser usadas para as fundações, ou, quando são muito pequenas e vêm empaquetadas em sacos chamados *kokoto*, para o betão em massa e forros.

Da pedra de coral também se obtém a cal, que é a base da construção nesta região. Utilizou-se sempre como argamassa ligante nas paredes, e o revoco e *nyeru* (estuque) nos acabamentos. Embora seja cada vez mais difícil, ainda hoje é possível conseguir este material, do qual existem qualidades diferentes.

In Swahili culture, houses traditionally belonged to women, so whenever a man had a daughter the first thing he did was make lime. This lime was slaked and stashed away, gaining in quality until the daughter reached marrying age, for use in building the new family home.

Although lime is still produced locally, it is not of good quality. On one hand, the traditional method of burning stone in the open air on a bed of firewood does not give a uniform combustion temperature. On the other, the lack of fresh water in many places results in lime being slaked with sea water. Both practices greatly impair its quality. And sadly, no one today keeps their slaked lime for long enough, as was done of old, for the tradition of doing so for daughters has been lost.

For all these reasons, cement is often used today and is ubiquitous in new buildings and often even in renovations. Its use has become widespread given its apparent short-term advantages, with little thought being given to the grave problems that it generates in the medium and long term.

For want of lime of better quality, at Selas House we used a mixed mortar with a 1/3/8 ratio (cement/lime/sand) in the inner and facing walls. Nor for stucco finishes on walls (*nyeru*) could we find good-quality lime putty, so we used a calcium hydroxide mortar mixed with water and left to stand in a barrel for at least a week, mixed with one-tenth of white cement and a pinch of local clay as a colorant.

En la cultura suajili las casas pertenecían tradicionalmente a las mujeres, por lo que cuando un hombre tenía una hija lo primero que hacía era producir cal. Esta cal se conservaba apagada y a buen recaudo, ganando calidad hasta que su hija llegase a la edad de casarse y se construyera con ella la casa de la nueva pareja.

Aunque se sigue produciendo cal localmente, ésta no es de buena calidad. Por un lado, la forma tradicional de quemar la piedra al aire libre sobre un lecho de leña no produce una temperatura de combustión uniforme. Por otro lado, la escasez de agua dulce en muchos lugares hace que la cal se apague con agua de mar. Ambas prácticas alteran considerablemente su calidad. Finalmente, por desgracia, ya nadie conserva la cal apagada durante suficiente tiempo, como se hacía antaño, ya que la tradición de hacerlo para las hijas se ha perdido.

Por todas estas razones, hoy en día, se recurre con frecuencia al uso de cemento, material omnipresente en las nuevas construcciones y con frecuencia también en las rehabilitaciones. Su uso se ha extendido por sus aparentes ventajas a corto plazo, sin tener en cuenta los graves problemas que genera a medio y largo plazo.

En ausencia de cal de mejor calidad, en la Casa Selas usamos un mortero bastardo de proporción 1/3/8 (cemento/cal/arena) en muros y paramentos. Para los acabados estucados de las paredes (*nyeru*) no pudimos contar tampoco con pasta de cal de calidad, por lo que utilizamos un mortero de hidróxido de calcio mezclado con agua y reposado en un bidón durante al menos una semana, mezclado con una décima parte de cemento blanco y una pizca de arcilla local como colorante.

Na cultura suaíli, as casas pertenciam tradicionalmente às mulheres, pelo que, quando um homem tinha uma filha, o primeiro que fazia era produzir cal. Esta cal era conservada apagada e bem guardada, ganhando qualidade até que a sua filha alcançasse a idade do casamento e se construísse a casa com esta cal para o novo casal.

Ainda que se continue a produzir cal localmente, esta não é de boa qualidade. Por um lado, a forma tradicional de queimar a pedra ao ar livre sobre um manto de lenha não é efetuada a uma temperatura de combustão uniforme. Pelo outro, a escassez de água doce em muitos lugares faz com que a cal se apague com água do mar. Ambas práticas alteram consideravelmente a sua qualidade. Por último, infelizmente, já ninguém conserva a cal apagada durante tempo suficiente, como se fazia doutrora, já que a tradição de o fazer para as filhas se perdeu.

Por todas estas razões, hoje em dia, recorre-se com frequência ao uso de cimento, material omnipresente nas novas construções e com frequência também nas reabilitações. O seu uso estendeu-se pelas suas aparentes vantagens a curto prazo, sem se ter em conta as graves consequências que causa a médio e a longo prazo.

Ante a ausência de cal de melhor qualidade, na Casa Selas usamos uma argamassa bastarda de proporção 1/3/8 (cimento/cal/areia) nas paredes e paramentos. Para os acabamentos estucados das paredes (*nyeru*) também não pudemos contar com pasta de cal de qualidade, pelo que utilizamos uma argamassa de hidróxido de cálcio misturada com água e repousada num bidão durante pelo menos uma semana, misturado com uma décima parte de cimento branco e uma pitada de argila local como colorante.

As to wood, the Lamu archipelago has large areas of mangrove forest from which timber is harvested for building houses and boats. Logs of basically three sizes are used: *boritis*, 10 to 15 cm in diameter, for floors and scaffolds; *pau*, some 5 cm in diameter and 3 m long, for railings, fencing and palm-leaf ceilings; and *fito*, the smallest ones, for uses such as shading in pergolas.

The age-old timber harvesting methods still employed guarantee a sustainable use of wood, and along with a ban on exports, this means that no forest cover on the island has been lost. Here again we find an example of balance between development and sustainability.

The usual practice is to use *boriti* as beams in floors, though those who can afford it prefer to use 15 x 15 cm square beams of a very hard wood known in the vernacular as *mwangati* (*Terminalia spinosa*), also often used for lintels. This wood, so dense that it will not even float, has the advantage of being immune to termites and white ants. Irrespective of the type of wood used, the largest span achievable with such beams is some 3.6 m.

In building the house we opted to use *mwangati* in the ground floor, as it is more exposed to wood-eating insects and there we had kept some of the original floor structures. *Boriti* logs were used on the upper floor, as they are more affordable.

For making doors and windows, hardwoods such as *bambakofi* (*Afzelia quanzensis*) or *mvule* (iroko) are widely used. Such timber was once plentiful in the forests of the hinterland, but sadly these have been overharvested.

Palm trees are also vital to Swahili culture and important in housebuilding. There are many palm plantations in the region and the trees and their fruit have diverse uses: culinary, as coconut is served with rice and curry dishes; medicinal, for producing oils; and in building, where palm leaves are interwoven to make *makuti*, used in the thatched gable roofs of the same name. Palm fronds are also used to make ropes, baskets and mats. Coconut fiber is used to make other more decorative and rougher ropes. But palm timber is rarely used.

Respecto a la madera, el archipiélago de Lamu cuenta con grandes extensiones de bosques de manglar, de los cuales se extrae madera para la construcción de edificios y barcos. Se emplean básicamente rollizos de tres tamaños distintos: *boritis*, de 10 a 15 centímetros de diámetro, que se usan en forjados y andamios; *pau* de aproximadamente 5 centímetros de diámetro y 3 metros de largo, que se utilizan en cercas, vallas y techos de hoja de palma; y *fito*, los más pequeños, que se utilizan, por ejemplo, para generar sombra en una pérgola.

Los métodos primitivos de obtención de madera que se siguen utilizando en esta actividad garantizan un uso sostenible de este material, lo que, unido a la prohibición de su exportación, hace que la superficie de bosques no haya disminuido en la isla. De nuevo encontramos aquí una muestra de equilibrio entre desarrollo y sostenibilidad.

Lo más frecuente es usar *boriti* como vigas en los forjados, aunque aquellos que tienen medios para ello prefieren utilizar vigas de sección cuadrada de unos 15 x 15 centímetros de una madera muy dura, llamada en lengua local *mwangati* (*Terminalia spinosa*), que también utilizan frecuentemente en la construcción de cargaderos. Esta madera, de tal densidad que ni siquiera flota, cuenta con la ventaja de no ser atacada por las termitas ni por las hormigas blancas. Independientemente del tipo de madera que se utilice, la luz máxima que se alcanza con ellas es de alrededor de 3,6 metros.

En la construcción de la casa decidimos usar *mwangati* en la planta baja, por estar más expuesta a los xilófagos y porque en ella mantuvimos algunos forjados originales. Se utilizó *boriti* en la planta alta, por resultar más económico.

Para construir puertas y ventanas se suelen usar maderas nobles como el *bambakofi* (*Afzelia quanzensis*) o el *mvule* (iroco). Estas fueron maderas muy comunes en los bosques del interior, pero desgraciadamente han sido víctimas de la sobreexplotación.

La palmera es otro árbol clave en la cultura suajili, también importante en la construcción de casas. Hay muchísimas plantaciones de palmeras en la región y sus hojas y sus frutos tiene usos muy variados: culinario, ya que los cocos se utilizan para acompañar arroces y curris; medicinal, para producir aceites; y en la construcción, ya que las hojas se entretejen para hacer *makuti*, que se utilizan para hacer los techos a dos aguas del mismo nombre que se colocan sobre las cubiertas. También con las hojas de palmera se hacen cuerdas, cestos y esteras. Con las fibras del coco, además, se produce otro tipo de cuerda más decorativo y de textura más áspera. La madera de la palmera, sin embargo, apenas es utilizada.

Em relação à madeira, o arquipélago de Lamu conta com grandes extensões de bosques de mangues, dos quais se extrai a madeira para a construção de edifícios e barcos. Basicamente, são empregados rolos de três tamanhos diferentes: *boritis*, de 10 a 15 centímetros de diâmetro, que se usam em estruturas e andaimes; *pau* de aproximadamente 5 centímetros de diâmetro e 3 metros de comprimento, que se utilizam para cercas, vedações e tetos de folha de palma; e *fito*, os mais pequenos, que se utilizam, por exemplo, para criar sombra numa pérgula.

Os métodos primitivos de obtenção da madeira que continuam a ser utilizados nesta atividade garantem uma utilização sustentável deste material, o que, junto com a proibição da sua exportação, fez com que a superfície do bosque não tivesse diminuído na ilha. Novamente, encontramos aqui uma demonstração de equilíbrio entre desenvolvimento e sustentabilidade.

O mais frequente é usar *boriti* ccomo vigas nas estruturas, ainda que aqueles que têm os meios para isso prefiram usar vigas de secção quadrada de uns 15 x 15 centímetros de uma madeira muito dura, denominada na língua local *mwangati* (*Terminalia spinosa*), que também utilizam frequentemente na construção de travessas. Esta madeira, com uma densidade que nem sequer flutua, tem a vantagem de não sofrer ataques de térmitas nem de formigas brancas. Independentemente do tipo de madeira que se utilize, a luz máxima que se alcança com estas é de aproximadamente 3,6 metros.

Para a construção da casa decidimos usar *mwangati* na planta térrea, por estar mais exposta aos xilófagos e porque nela mantivemos algumas estruturas de madeira originais. Utilizou-se *boriti* na planta alta por ser mais económico.

Para construir portas e janelas costuma-se usar madeira nobre como o *bambakofi* (*Afzelia quanzensis*) ou o *mvule* (iroco). Estas madeiras foram bastante comuns nos bosques do interior, mas infelizmente foram vítimas de sobre-exploração.

A palmeira é outra árvore chave na cultura suaíli, também importante na construção de casas. Há muitas plantações de palmeiras na região e as suas folhas e os seus frutos têm usos bastante variados: culinário, já que os cocos são utilizados para acompanhar o arroz e o curri; medicinal, para produzir óleos; e na construção, já que as folhas são entrelaçadas para fazer *makuti*, que são utilizadas para fazer os tetos a duas águas do mesmo nome que são colocadas as cobertas. Também com as folhas da palmeira são feitas cordas, cestos e esteiras. Com as fibras do coco, também se produz outro tipo de corda mais decorativa e de textura mais áspera. A madeira da palmeira, porém, raramente é utilizada.

Makuti (Alberto Heras)

Houses in Lamu were not originally roofed with large surfaces of *makuti*. This thatch was employed occasionally for covering kitchens but its use was normally confined to simpler structures in the countryside. Once again, with the advent of outsiders and their preference for higher floors with views and fresh air, the use of *makuti* spread all over Lamu. It is a feature easy to add to a flat roof on a traditional house, as it is light and flexible, giving shelter from rain as well as much-appreciated shade. For these reasons it has become common and today *makuti*-covered terraces are often favorite spaces in refurbished houses.

The great enemy of *makuti* is fire, as it burns easily. This may be why *makuti* was uncommon in urban areas. If we recall that these Indian Ocean islands were historically often at war, the fire risk would have been high. Even so, I have seen *makuti* burn a few times and the fact is that, like a match, it flares up and then goes out quite quickly. I have seen great *makuti* thatches burn on various houses in the old town, and the next day only a few of the facade windows were charred and the fire had barely found its way indoors. In any case it may be a matter of time until there is a big fire in Lamu that does away with much of the town's *makuti*.

At Selas House we installed *makuti* over two terraces, helping to cool the lower floors and providing open, airy spaces suitable for various uses.

Originalmente las casas en Lamu no tenían grandes estructuras de *makuti* sobre sus cubiertas. Este material se utilizaba ocasionalmente para la cubrición de la cocina, ya que normalmente su uso se relegaba a estructuras más simples en el campo. Una vez más, debido a la llegada de extranjeros, con su afán por hacer uso de las plantas más altas en busca de vistas y ventilación, se ha extendido el uso de *makuti* por todo Lamu. Se trata de un elemento fácil de añadir a la cubierta plana de una casa tradicional, por ser ligero y flexible, y aporta protección frente a la lluvia, además de proporcionar una sombra muy apreciada. Por estas razones su uso se ha extendido mucho, y, hoy en día, es frecuente que las terrazas cubiertas por *makuti* sean los espacios más usados de las casas rehabilitadas.

El gran enemigo del *makuti* es el fuego, ya que arde con facilidad. Tal vez por ello no era común en zonas urbanas. Si tenemos en cuenta que estas islas del Índico estuvieron históricamente guerreando entre ellas, el riesgo habría sido alto. Pese a ello, he tenido alguna vez la ocasión de ver estos *makuti* arder y lo cierto es que se comportan de manera semejante a una cerilla y producen una enorme llama que se apaga más bien rápido. He visto arder enormes *makuti* en las cubiertas de distintas casas de la ciudad vieja, y al día siguiente he podido comprobar que sólo una pequeña porción de las ventanas de la fachada se había quemado, y que el fuego a duras penas había llegado al interior del edificio. De cualquier manera, es posiblemente cuestión de tiempo que en Lamu se produzca un gran fuego que arrase con una buena parte de los *makuti* de la ciudad.

En la Casa Selas incorporamos *makuti* en dos de sus terrazas, lo que contribuyó a refrescar los pisos inferiores y proporcionó unos espacios diáfanos bien ventilados que permiten múltiples usos.

Originalmente, as casas em Lamu não tinham grandes estruturas de *makuti* sobre as suas cobertas. Este material era utilizado ocasionalmente para cobrir a cozinha, já que normalmente o seu uso se relegava a estruturas mais simples no campo. Uma vez mais, devido à chegada de estrangeiros, com o seu afã por fazer uso dos pisos mais altos à procura de vistas e de ventilação, o uso de *makuti* estendeu-se por todo Lamu. Trata-se de um elemento fácil de acrescentar à cobertura plana de uma casa tradicional, por ser leve e flexível, e proporciona proteção contra a chuva, para além de proporcionar sombra bastante apreciada. Por estas razões o seu uso estendeu-se muito, e, hoje em dia, é frequente que os terraços cobertos por *makuti* sejam os espaços mais usados das casas reabilitadas.

O grande inimigo do *makuti* é o fogo, pois arde facilmente. Talvez por isso não fosse comum nas zonas urbanas. Se tivermos em conta que estas ilhas do Índico estiveram historicamente guerreando-se entre si, o risco teria sido alto. Apesar disso, nalguma ocasião, tive a oportunidade de ver estes *makuti* a arder e a verdade é que se comportam de forma semelhante a um fósforo e produzem uma chama enorme que se apaga bastante rápido. Vi enormes *makuti* a arder nas cobertas de distintas casas da cidade velha, e no seguinte dia pude comprovar que apenas uma pequena porção das janelas da fachada se tinha queimado, e que o fogo dificilmente tinha chegado ao interior do edifício. De qualquer forma, é possivelmente uma questão de tempo que em Lamu se produza um grande incêndio que arrase com uma boa parte dos *makuti* da cidade.

Na Casa Sela incorporamos *makuti* nos seus dois terraços, o que contribuiu para refrescar os pisos inferiores e proporcionou uns espaços diáfanos bem ventilados que permitem multiplex usos.

Water and sanitation

The town of Lamu stands over a rain-fed freshwater aquifer. Traditional houses used to have a well for domestic use. Dry latrines were used and the waste streams from cooking, washing and cleaning, along with urine from lavatories, ran directly through ground-level channels in the streets to the sea. The flow in this network of channels was assisted by the terrain, as the town lies on a gently sloping hillside.

The town community thus lived for centuries in accordance with its resources. But with the advent of foreigners and their preference for flush toilets, this balance was upset. In many refurbished houses the latrine was replaced by a toilet without considering that the sewage would run straight to the old cesspit, from which it leaks, polluting the groundwater. For this reason houses in Lamu depend today on water supply from the municipal network, which does not always work.

In this house, to avoid any undue contamination of subsoil, we opted to install a septic tank. For running water, a 5 m^3 underground cistern accumulates what the municipal network supplies from time to time. This water is then pumped to another tank on the top part of the roof, which dispenses it by gravity throughout the house and thereby ensures that there is water supply even during power cuts, which in former times were quite common.

Agua y saneamiento

La ciudad de Lamu se asienta sobre una reserva de agua dulce abastecida por las lluvias. Las casas tradicionales solían tener un pozo de agua del que sus habitantes hacían uso. Se utilizaban letrinas secas y el agua sucia empleada para fregar, cocinar y lavarse, junto con el orín de los baños, discurría directamente por los canales superficiales de las calles hasta el mar. Esta red de canales se veía favorecida por la topografía de la ciudad, asentada sobre una colina con una suave pendiente.

La comunidad que habitaba esta ciudad vivió de esta manera en consonancia con sus recursos naturales durante siglos. Sin embargo, con la llegada de los extranjeros y su gusto por los inodoros con cisterna, este equilibrio se ha roto. Muchas casas renovadas han sustituido la letrina por un inodoro, sin tener en cuenta que las aguas negras van directas al antiguo pozo de descarga, filtrándose después y contaminando las aguas del nivel freático. Por esta razón, hoy en día las casas en Lamu dependen del suministro de agua de la red municipal, que no siempre funciona.

En esta casa, con el fin de evitar la excesiva contaminación del subsuelo, se decidió construir una fosa séptica. Respecto al agua corriente, un depósito enterrado de 5 m^3 acumula lo que la red municipal suministra de cuando en cuando. Este agua se bombea posteriormente a un segundo depósito situado en la parte más alta de la cubierta, que suministra por gravedad el agua a toda la casa, y asegura de esta manera el abastecimiento de este recurso incluso cuando hay cortes de electricidad, algo bastante frecuente en esos tiempos.

Água e saneamento

A cidade de Lamu situa-se sobre uma reserva de água doce abastecida pela água da chuva. As casas tradicionais costumavam ter um poço de água do que os seus habitantes faziam uso. Utilizavam-se latrinas secas e a água suja utilizada para lavar a loiça, cozinhar e para tomar banho, em conjunto com a urina das casas de banho, discorria diretamente pelos canais superficiais das ruas até ao mar. Esta rede de canais estava favorecida pela orografia da cidade, situada sobre uma colina com uma suave pendente.

A comunidade que habitava esta cidade viveu desta forma em consonância com os seus recursos naturais durante séculos. No entanto, com a chegada dos estrangeiros e o seu gosto pelas sanitas com autoclismo, este equilíbrio desfez-se. Muitas casas renovadas substituíram a latrina por uma sanita, sem terem em atenção à água fecal que vai direta para o poço de descarga, filtrando-se depois e contaminando a água do nível freático. Por esta razão, hoje em dia, as casas em Lamu dependem do abastecimento de água da rede municipal, que nem sempre funciona.

Nesta casa, a fim de evitar a excessiva contaminação do subsolo, decidiu-se construir uma fossa séptica. Em relação à água corrente, um depósito enterrado de 5 m^3 acumula o que a rede municipal abastece de quando em quando. Esta água é bombeada posteriormente a um segundo depósito situado na parte mais alta da coberta, que abastece pela força da gravidade a água a toda a casa, e garante desta forma o abastecimento deste recurso inclusive quando há cortes de eletricidade, algo bastante frequente nestes tempos.

Conclusion

Although Lamu is gradually ceasing to be the place lost in time that it once was, it still holds enough charm to fascinate many travelers. The more tenacious ones still dream of buying a house on the island, often unaware of the difficulties involved.

Conclusión

Aunque Lamu poco a poco va dejando de ser aquel lugar perdido en el tiempo, sigue teniendo un atractivo que fascina a muchos viajeros. Los más tenaces siguen soñando con comprarse una casa en la isla, a menudo inconscientes de las dificultades que esto lleva aparejado.

Conclusão

Ainda que Lamu pouco a pouco vá deixando de ser aquele lugar perdido no tempo, continua a ter uma atração que fascina a muitos viajantes. Os mais tenazes continuam a sonhar com a compra de uma casa na ilha, frequentemente inconscientes das dificuldades que implica.

Lighting detail | Detalle de la iluminación | Pormenor da iluminação

Thus in the case of the house for my friend, we finally had to cut down the great ficus, whose roots were spreading out of control, damaging the pool and undermining other parts of the house. Its fruits were also a favorite food of bats, whose droppings stained the house's floors and walls.

In any event, renovating houses in Lamu was a highly enriching experience and much influenced my professional practice.

Today, rather than a summer home as first intended, the house is used to accommodate volunteers working with the development NGO ANIDAN (www.anidan.org), founded and run by my friend and his family, which comes to the aid of hundreds of marginalized children in the region.

En el caso de la vivienda para mi amigo, por ejemplo, tuvimos que cortar finalmente el gran ficus, cuyas raíces crecían descontroladas, destrozando con ello la piscina y amenazando otras partes de la casa. Su fruto era también el plato favorito de los murciélagos, cuyas heces teñían los suelos y las paredes de la vivienda.

En cualquier caso, rehabilitar casas en Lamu fue una experiencia extremadamente enriquecedora, que ha tenido importantes repercusiones en mi vida profesional.

Esta casa, hoy en día, más que una residencia de verano, como había sido concebida, es utilizada para el alojamiento de los voluntarios que colaboran con la ONGD ANIDAN (www.anidan.org), que se encarga de dar asistencia a cientos de niños marginados de la región, y que fundaron y gestionan mi amigo y su familia.

No caso da vivenda para o meu amigo, por exemplo, tivemos que decidir-nos por cortar o grande fícus, cujas raízes cresciam descontroladamente, destroçando com elas a piscina e ameaçando outras partes da casa. O seu fruto era também o prato favorito dos morcegos, cujas fezes tingiam o solo e as paredes da vivenda.

Em qualquer caso, reabilitar casas em Lamu foi uma experiência extremamente enriquecedora, que teve importantes repercussões na minha vida profissional.

Esta casa, hoje em dia, mais do que uma residência estival, como tinha sido concebida, é utilizada para alojar voluntários que colaboram com a ONG ANIDAN (www.anidan.org), que é a encarregada de prestar assistência a centenas de crianças marginalizadas da região, e que fundaram e dirigem o meu amigo e a sua família.

Biography | Biografía | Biografia

Urko Sánchez

Urko Sánchez qualified as an architect at the School of Architecture of the Universidad Politécnica de Madrid (ETSAM-UPM) over 20 years ago. After travelling and working around the world, in 2003 he set up a practice on the Island of Lamu in Kenya. He is currently based in Nairobi and Madrid and works in East Africa and the Middle East. The connection of a building to a particular culture and its linkage to a clan, tribe or place are aspects that he studies closely on undertaking a project. He works closely with each community, using local materials and techniques and seeking generally to respect and allow for each setting, so his buildings are designed to belong in a particular place. He has received various international awards: Baku International Architectural Competition, Young Architects in Africa, AAK Awards of Excellence, Archmarathon, Architecture for Social Gain, or International Property Awards Africa, and has been a finalist in the Aga Khan Award for Architecture, among others.

Urko Sánchez es arquitecto por la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid (ETSAM-UPM) desde hace más de 20 años. Después de viajar y trabajar por el mundo, en 2003 estableció su propio estudio en la isla de Lamu, Kenia. Actualmente está asentado en Nairobi y Madrid y desarrolla su trabajo en África del Este y el Medio Oriente. La pertenencia de un edificio a una determinada cultura, su vinculación a un clan, una tribu o un lugar, son temas que estudia en profundidad al enfrentarse a un proyecto. Trabaja muy de cerca con cada comunidad, emplea materiales y técnicas locales y busca en general respetar y atender a lo que le rodea, por lo que sus edificios son concebidos de forma que pertenezcan a un determinado entorno. Su trabajo ha sido galardonado con diferentes premios internacionales: Baku International Architectural Competition, Young Architects in Africa, AAK Awards of Excellence, Archmarathon, Architecture for Social Gain, International Property Awards Africa y ha sido finalista del Aga Khan Award for Architecture, entre otros.

Urko Sánchez é arquiteto pela Escola de Arquitectura da Universidade Politécnica de Madrid (ETSAM-UPM) há mais de 20 anos. Depois de viajar e trabalhar pelo mundo, em 2003 estabeleceu o seu próprio gabinete na ilha de Lamu, Quénia. Atualmente está estabelecido em Nairobi e Madrid e desenvolve o seu trabalho em África Oriental e no Médio Oriente. A pertença de um edifício a uma determinada cultura, a sua vinculação a um clã, uma tribo ou um lugar são temas que estuda mais a fundo quando tem um projeto. Trabalha de perto com cada comunidade, emprega materiais e técnicas locais e procura no geral respeitar e atender ao que lhe rodeia, pelo que os seus edifícios são concebidos de forma a pertencerem a um determinado entorno. O seu trabalho foi galardoado com diferentes prémios internacionais: Baku International Architectural Competition, Young Architects in Africa, AAK Awards of Excellence, Archmarathon, Architecture for Social Gain, International Property Awards Africa e foi finalista da Aga Khan Award for Architecture, entre outros.

Makoto Fukada

A Traditional Japanese House with a Jointed Wooden Frame and Tsuchikabe *Walls: the Kamogawa House in Chiba*

Una casa japonesa tradicional con armazón de madera ensamblada y muros tsuchikabe*: la Casa Kamogawa en Chiba*

Uma casa tradicional japonesa com uma armação de madeira articulada e paredes tsuchikabe*: a Casa Kamogawa em Chiba*

This house in Kamogawa, in the prefecture of Chiba, is a single-story wooden dwelling with a total floor area of 59.5 m². It was begun in April 2010 and completed in October 2011. As the clients were a couple with two young children, we designed the house with a view to creating a family home.

Esta casa en Kamogawa, en la prefectura de Chiba, es una vivienda de madera de una planta con una superficie total de 59,5 m². Se comenzó en abril de 2010 y se terminó en octubre de 2011. Como los clientes eran una pareja con dos niños pequeños, diseñamos la casa con la intención de crear un hogar familiar.

Esta casa em Kamogawa, na província de Chiba, é uma habitação de madeira de um andar, com uma área total de 59,5 m². A construção foi iniciada em Abril de 2010 e concluída em Outubro de 2011. Como os clientes eram um casal com dois filhos pequenos, concebemos a casa com vista à criação de um lar familiar.

<*Tokonoma* (alcove) in the Kamogawa House | *Tokonoma* (nicho) en la Casa Kamogawa | *Tokonoma* (alcova) da Casa Kamogawa

> Exterior of the Kamogawa House | Exterior de la Casa Kamogawa | Exterior da Casa Kamogawa (Masao Nishikawa, Jutaku-Kenchiku, 2011)

Assembly of rafters on the Kamogawa House | Montaje de pares en la Casa Kamogawa | Montagem dos caibros na Casa Kamogawa (Ken Kusakari)

The couple wanted a home where their children could grow up in close contact with nature. After choosing a location on a hill on the outskirts with a splendid view, quiet ambience, and natural feel, they opted for a traditional Japanese-style house that would evoke the former way of life that they both cherished as well as harmonizing with its natural setting.

Japan has a mostly temperate and humid climate, with frequent earthquakes and typhoons. Over the centuries, housebuilders have developed unique structures and forms to suit this context, offering sturdiness, durability, and habitability. And while modern building approaches have largely displaced older methods in Japan, a few builders still adhere to tradition. I am one of them. After learning basic techniques from my mentor, I extended my knowledge of building techniques by working on demolitions of old Japanese folk houses, exploring other sources of knowledge and carefully studying the structures and forms I encountered.

I love Japanese traditional architecture and have a profound respect for traditional building methods, which represent the wisdom of our forebears crystallized in a tangible heritage. I work to keep that legacy alive through

La pareja quería una casa en la que los niños pudieran crecer en estrecho contacto con la naturaleza. Después de elegir la ubicación en una colina a las afueras con unas vistas espléndidas, un ambiente tranquilo y una sensación natural, se decidieron por una casa de estilo japonés tradicional que evocara la antigua forma de vida que ambos valoraban y que estuviera en armonía con el paraje natural.

El clima de Japón es predominantemente templado y húmedo, con terremotos y tifones frecuentes. Durante siglos, los constructores de casas han desarrollado estructuras y formas únicas que se adaptan a este contexto y ofrecen solidez, resistencia y habitabilidad. Y, si bien los sistemas de construcción modernos han desplazado en gran medida a los métodos más antiguos en Japón, algunos constructores todavía siguen fieles a la tradición. Yo soy uno de ellos. Tras aprender los rudimentos con mi mentor, amplié mis conocimientos sobre técnicas constructivas trabajando en la demolición de antiguas viviendas populares japonesas, explorando otras fuentes de conocimiento y estudiando atentamente las estructuras y formas que encontraba.

Me gusta la arquitectura tradicional japonesa y siento un profundo respeto por los métodos de construcción tradicionales, que representan la sabiduría de nuestros antepasados cristalizada en un

O casal queria um lar onde os seus filhos pudessem crescer em estreita ligação com a natureza. Depois de escolherem um local numa colina na periferia com uma vista esplêndida, ambiente tranquilo e um toque natural, optaram por uma casa de estilo Japonês tradicional que evocasse o antigo estilo de vida que ambos apreciavam, bem como a harmonização com o contexto natural.

O Japão tem um clima maioritariamente temperado e húmido, com frequentes terramotos e furacões. Ao longo dos séculos, os construtores de casas desenvolveram estruturas e formas únicas adaptadas a este contexto, que ofereciam robustez, durabilidade e habitabilidade. E embora no Japão as abordagens de construção moderna tenham em grande parte posto de parte os métodos mais antigos, alguns construtores ainda aderem à tradição. Eu sou um deles. Após ter aprendido técnicas básicas com o meu mentor, expandi os meus conhecimentos sobre técnicas de construção, trabalhando em demolições de antigas casas populares Japonesas, explorando outras fontes de conhecimento e estudando cuidadosamente as estruturas e formas que encontrei.

Adoro a arquitectura tradicional Japonesa e tenho um profundo respeito pelos métodos tradicionais de construção, que representam a sabedoria dos nossos predecessores, cristalizada num património

Erection of the framework of the Kamogawa House | Construcción del entramado de la Casa Kamogawa | Montagem da armação da Casa Kamogawa (Ken Kusakari)

my building company, Seyseysha, which has completed seven original homes and restored three existing structures using traditional wood-building methods in both interiors and construction.

Traditional Japanese building techniques involve a framework combining traditional *shikuchi* (angle joints) and *tsugite* (straight joints where timbers are placed end to end for greater length) with *tsuchikabe* (wattle and daub walls of mud plaster mixed with straw), *ishibadate* (pillars standing freely on stones rather than driven into the ground), and other components to create a structure that harnesses the qualities of wood for optimal structural integrity. We used the same formal approach for the Kamogawa House, with a structural design – and also a floor plan and aesthetic – embracing methods that date back centuries.

patrimonio tangible. Trabajo para mantener vivo este legado con mi empresa de construcción, Seyseysha, con la que hemos realizado siete viviendas originales y restaurado tres estructuras existentes utilizando métodos de construcción en madera tradicionales tanto en interiores como en la obra.

Las técnicas de construcción japonesas tradicionales se basan en un armazón que combina las típicas *shikuchi* (juntas de ángulo) y *tsugite* (juntas rectas donde las maderas se colocan extremo con extremo para tener mayor longitud) con *tsuchikabe* (tabiques encestados o encañizados revestidos con barro), *ishibadate* (pilares apoyados sobre piedras en lugar de anclados en el terreno) y otros elementos para crear una estructura que aprovecha las cualidades de la madera para conseguir una integridad estructural óptima. Utilizamos el mismo planteamiento formal para la Casa Kamogawa, con un diseño estructural –así como una planta y una estética– para el que adoptamos métodos centenarios.

tangível. Eu trabalho para manter esse legado vivo através da minha empresa de construção, Seyseysha, que concluiu sete casas originais e restaurou três estruturas existentes utilizando métodos tradicionais de construção em madeira, tanto em interiores como na construção.

As técnicas de construção tradicional Japonesa baseiam-se numa estrutura que combina as *shikuchi* (juntas angulares) e *tsugite* (juntas rectas onde as madeiras são colocadas umas no seguimentos das outras para se obter uma maior envergadura) tradicionais com as *tsuchikabe* (paredes de taipa com argamassa de barro misturado com palha), *ishibadate* (pilares que se posicionam livremente sobre pedras em vez de serem introduzidos no chão), e outros componentes para criar uma estrutura que aproveite as qualidades da madeira para uma integridade estrutural óptima. Utilizámos a mesma abordagem formal na Casa Kamogawa, com um desenho estrutural - e também uma planta e estética - que inclui métodos que remontam a séculos atrás.

1: Prepared beams and *sashigamois* for the Kamogawa House 2: Assembling a *kanawatsugi* joint at the Kamogawa House 3: Log beam and pillar forming an *aigaki-watariago/jyuhozo* joint in the Kamogawa House | 1: Vigas y *sashigamois* preparados para la Casa Kamogawa 2: Ensamblaje de una *kanawatsugi* en la Casa Kamogawa 3: Viga de rollizo y poste de rollizo formando una junta *aigaki-watariago/jyuhozo* en la Casa Kamogawa | 1: Vigas e *sashigamois* preparados para a Casa Kamogawa 2: Montagem de uma junta *kanawatsugi* na Casa Kamogawa 3: Viga de tronco e pilar formando uma junta *aigaki-watariago/jyuhozo* na Casa Kamogawa (1-3: Ken Kusakari)


1


2


3

Erection of the framework of the Kamogawa House | Construcción del entramado de la Casa Kamogawa | Montagem da armação da Casa Kamogawa (Ken Kusakari)

Among the various traditional Japanese building methods, Seyseysha's approach centers on three elements:

1. A structure comprising *nuki* (interlocking tie beams), or a *nuki* framework.

2. A *sashimono* structure featuring *sashigamoi* (thick lintels) and *ashigatame* (horizontal ties interconnecting the pillar bases and providing lateral load resistance).

3. A horizontal structure where *aigaki-watariago* (a type of *shikuchi*, or angle joint) is the primary means of connecting the horizontal members.

Entre los diferentes métodos constructivos tradicionales de Japón, el planteamiento de Seyseysha se centra en tres elementos:

1. Una estructura formada por *nuki* (vigas de atado trabadas), o un armazón *nuki*.

2. Una estructura *sashimono* con *sashigamoi* (dinteles gruesos) y *ashigatame* (tirantes horizontales que conectan entre sí las bases de los pilares y proporcionan resistencia a las cargas laterales).

3. Una estructura horizontal donde *aigaki-watariago* (un tipo de *shikuchi*, o junta de ángulo) es la forma principal de conectar los elementos horizontales.

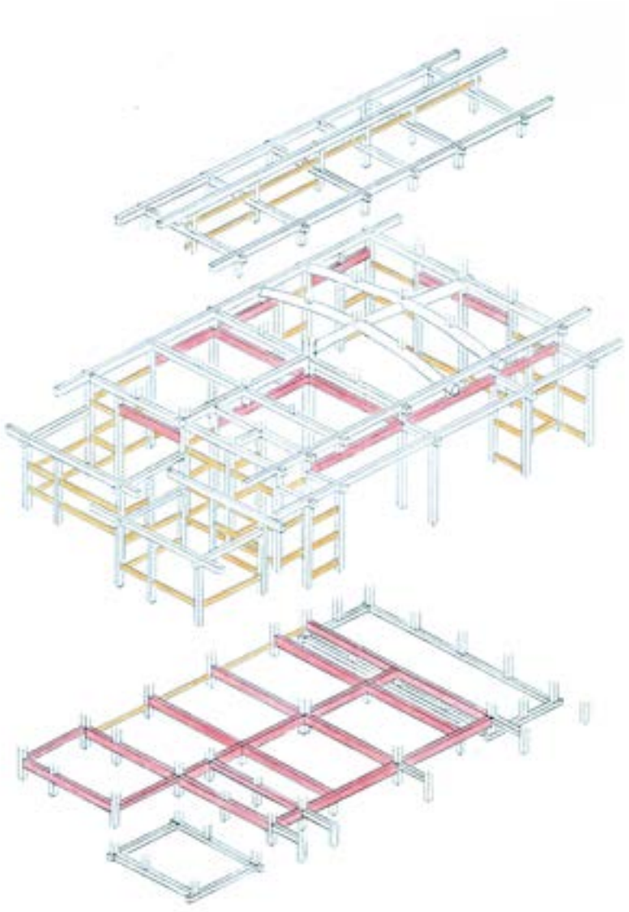
Entre os vários métodos de construção tradicional Japonesa, a abordagem da Seyseysha centra-se em três elementos:

1. Uma estrutura que contém uma armação *nuki* (vigas entrecruzadas).

2. Uma estrutura sashimono com *sashigamoi* (lintéis grossos) e *ashigatame* (tirantes que interligam as bases dos pilares e proporcionam resistência à carga lateral).

3. Uma estrutura horizontal em que a *aigaki-watariago* (um tipo de *shikuchi*, ou junta angular) é o principal meio de ligação dos membros horizontais.

Framework of the main body of the Kamogawa House | Entramado del cuerpo principal de la Casa Kamogawa | Armação do corpo principal da Casa Kamogawa (Ken Kusakari)



(Figure 1) Exploded view of the Kamogawa House's wooden structure as designed | (Figura 1) Vista despiezada de la estructura de madera de la Casa Kamogawa según fue diseñada | (Figura 1) Vista explodida da estrutura de madeira da Casa Kamogawa assim como foi desenhada

The various components of the jointed wooden frame, including the pillars, horizontal members, *nuki*, *sashigamoi*, and *ashigatame*, are intricately interlaced with joints. The result forms a whole that stands up to external loads with a kind of flexible resilience, not unlike the way an organism inhabits its environment. The wooden structure rests on cornerstones, but the two are structurally separate – the absence of a bond between the frame and the stones is a key feature of the traditional style.

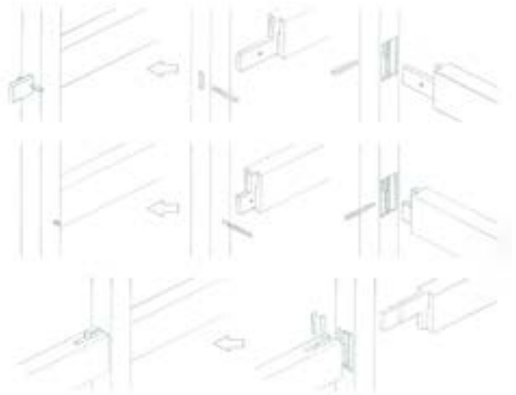
Figure 1 shows a plan view the Kamogawa House's wooden structure (the *nuki* are in orange and the *sashigamoi* and *ashigatame* in red).

Los diversos componentes del armazón de madera ensamblada, incluidos los pilares, los elementos horizontales, *nuki*, *sashigamoi*, y *ashigatame*, están estrechamente entrelazados mediante juntas. El resultado forma un conjunto que soporta las cargas externas con una especie de resiliencia flexible, no muy distinta de la forma en que un organismo habita en su entorno. La estructura de madera se apoya en piedras angulares, pero ambas son estructuralmente independientes: la ausencia de unión entre el armazón y las piedras es una característica fundamental del estilo tradicional.

La figura 1 muestra una vista en planta de la estructura de madera de la Casa Kamogawa (las *nuki* aparecen en naranja y los *sashigamoi* y *ashigatame* en rojo).

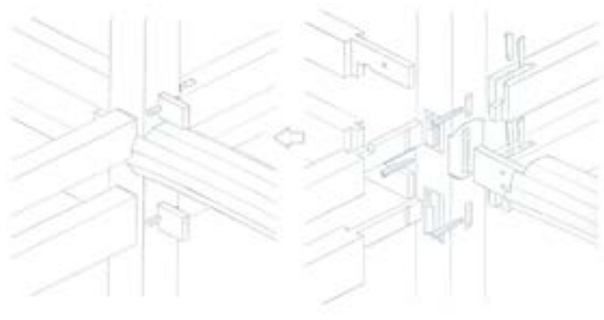
Os vários componentes da armação de madeira articulada, incluindo os pilares, membros horizontais, *nuki*, *sashigamoi*, e *ashigatame*, são intrincadamente entrelaçados com juntas. O resultado forma um todo que resiste às cargas externas com uma espécie de resiliência flexível, não muito diferente da forma como um organismo habita o seu ambiente. A estrutura de madeira assenta em pedras angulares, mas os dois elementos estão estruturalmente separados - a ausência de uma ligação entre a armação e as pedras é um elemento chave do estilo tradicional.

A figura 1 mostra a planta da estrutura de madeira da Casa Kamogawa (as *nuki* estão em laranja e os *sashigamoi* e *ashigatame* em vermelho).

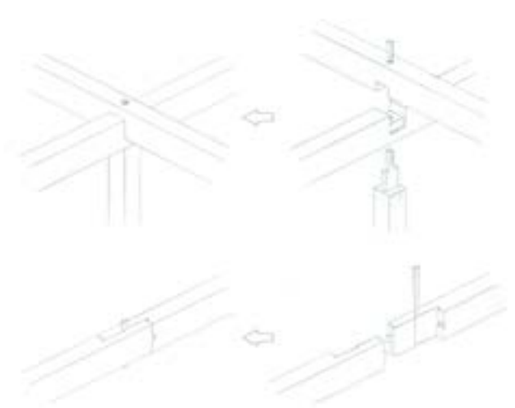


(Figure 2) *Shikuchi* joints used for *sashigamoi, ashigatame*, etc. *Konehozo-hanasenjime/Oire, Konehozo-komisenjime/Oire, Konehozo-shachisenjime/Oire* | (Figura 2) Juntas *Shikuchi* utilizadas para *sashigamoi, ashigatame*, etc. *Konehozo-hanasenjime/Oire, Konehozo-komisenjime/Oire, Konehozo-shachisenjime/Oire* | (Figura 2) Juntas *Shikuchi* usadas nos *sashigamoi, ashigatame*, etc. *Konehozo-hanasenjime/Oire, Konehozo-komisenjime/Oire, Konehozo-shachisenjime/Oire*

(Figure 3) *Shikuchi* joints used for *nuki. Ryodo-kaikusabijime, Sagekama-kaikusabijime* | (Figura 3) Juntas *Shikuchi* utilizadas para *nuki. Ryodo-kaikusabijime, Sagekama-kaikusabijime* | (Figura 3) Juntas *Shikuchi* usadas nas *nuki. Ryodo-kaikusabijime, Sagekama-kaikusabijime*



(Figure 4) Timber joinery at the central pillar of the Kamogawa House | (Figura 4) Carpintería de madera en el pilar central de la Casa Kamogawa | (Figura 4) Trabalho de carpintaria no pilar central da Casa Kamogawa



(Figure 5) *Shikuchi* and *tsugite* joints used for horizontal members and uprights. *Aigaki-watariago/Jyuhozo-warikusabijime, Kanawatsugi* | (Figura 5) Juntas *Shikuchi* y *tsugite* utilizadas para elementos horizontales y pies derechos. *Aigaki-watariago/Jyuhozo-warikusabijime, Kanawatsugi* | (Figura 5) Juntas *Shikuchi* e *tsugite* usadas nos membros horizontais e verticais. *Aigaki-watariago/Jyuhozo-warikusabijime, Kanawatsugi*

All of the structure's components play a role in connecting the pillars: the *nuki* provide a framework chiefly for the walls; the *sashigamoi* span openings, and the *ashigatame* form ties under the floors. And beyond their structural role, the *nuki*, *sashigamoi* and *ashigatame* also buttress the building against lateral loads resulting from earthquakes and typhoons.

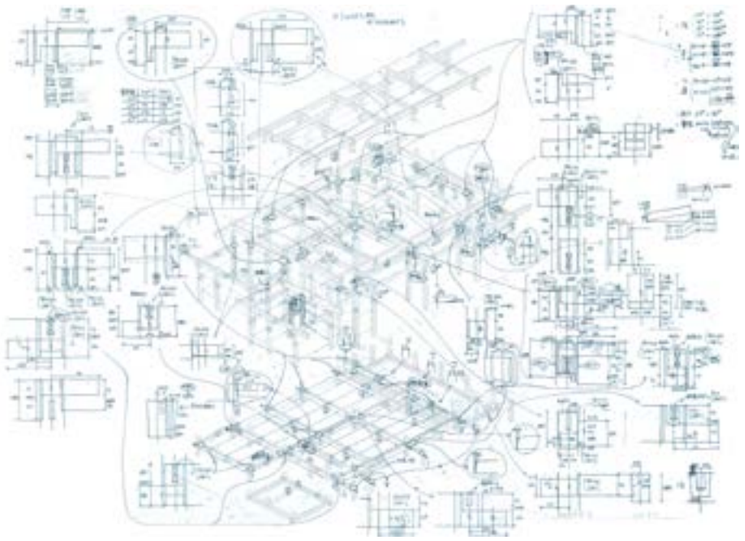
Todos los elementos estructurales tienen su función a la hora de conectar los pilares entre sí: las *nuki* proporcionan un armazón principalmente para los muros, los *sashigamoi* atraviesan los vanos y los *ashigatame* forman tirantes bajo los suelos. Y más allá de su función estructural, las *nuki*, los *sashigamoi* y los *ashigatame* también refuerzan el edificio contra las cargas laterales que provocan los terremotos y tifones.

Todos os componentes da estrutura desempenham um papel na ligação dos pilares: as *nuki* fornecem uma estrutura sobretudo para as paredes; os vãos dos *sashigamoi* e os *ashigatame* formam tirantes sob os pisos. E para além do seu papel estrutural, as *nuki*, os *sashigamoi* e *ashigatame* também reforçam o edifício contra as cargas laterais resultantes de terramotos e furacões.

The separation between the wooden structure and the cornerstones is vital when a building is subject to significant lateral load, as the frame can move atop the stones – this detachment keeps the frame free of lateral stress from below and thereby spares the house itself from strain. Figs. 2–5 show a standard *shikuchi* and *tsugite* arrangement, a traditional Japanese timber building technique.

La separación entre la estructura de madera y las piedras angulares es vital cuando un edificio está sometido a una carga lateral importante, puesto que el armazón puede desplazarse sobre las piedras: con esta separación el armazón no sufre esfuerzos laterales desde abajo y, por consiguiente, evita deformaciones a la propia casa. Las figuras 2–5 muestran una disposición típica de *shikuchi* y *tsugite*, una técnica constructiva con madera japonesa tradicional.

A separação entre a estrutura de madeira e as pedras angulares é crucial quando um edifício está sujeito a cargas laterais significativas, uma vez que a estrutura pode mover-se sobre as pedras - este desprendimento mantém a estrutura livre de tensões laterais inferiores, poupando assim a própria casa de tensão. As figuras 2-5 mostram uma disposição *shikuchi* e *tsugite* padrão, uma técnica tradicional Japonesa de construção em madeira.



< Exploded view of the Kamogawa House's wooden structure as built | Vista despiezada de la estructura de madera de la Casa Kamogawa tal como fue construida | Vista explodida da estrutura de madeira da Casa Kamogawa assim como foi construída

> Erection of the framework of the Kamogawa House | Construcción del entramado de la Casa Kamogawa | Montagem da armação da Casa Kamogawa (Ken Kusakari)

All the walls are *tsuchikabe*. The first coating of *tsuchikabe*, a thick layer of mud plaster, also has a major structural role. Made with a kneaded mixture of earth, rice straw, and water, fermented for more than six months, this plaster makes the walls more robust and reinforces the framework's overall bearing capacity.

After applying this plaster to the bamboo laths forming the house's walls, we let the wall dry out and then began the finishing process: multiple coats of an earth, straw-fiber, sand, and water mixture, using a different blend each time so as to vary the textures and create a subtle, good-looking finish. For the outer finish we used a mix of lime plaster and water to enhance the surface's water resistance.

Todos los muros son *tsuchikabe*. El primer revestimiento de *tsuchikabe*, una espesa capa de barro, también tiene una importante función estructural. Elaborado con una mezcla de tierra, paja de arroz y agua amasada, fermentada durante más de seis meses, este enlucido hace los muros más robustos y refuerza la capacidad de carga total del armazón.

Tras aplicar este enlucido a las tiras de caña bambú que forman los muros de la casa, se deja secar y entonces comienza el proceso de acabado: numerosas capas de una mezcla de tierra, fibra de paja, arena y agua cada vez en proporciones distintas para alternar las texturas y crear un acabado sutil y bonito. Para el acabado exterior utilizamos una mezcla de agua y mortero de cal para mejorar la resistencia al agua de la superficie.

Todas as paredes são de *tsuchikabe*. O primeiro revestimento de *tsuchikabe*, uma espessa camada de argamassa de barro, tem também um papel estrutural importante. Feita com uma mistura amassada de terra, palha de arroz e água, fermentada durante mais de seis meses, esta argamassa torna as paredes mais robustas e reforça a capacidade global de suporte da armação.

Depois de aplicar esta argamassa nas ripas de bambu que formam as paredes da casa, deixamos a parede secar e depois começamos o processo de acabamento: múltiplas camadas de uma mistura de terra, fibra de palha, areia e água, utilizando uma mistura diferente de cada vez, de forma a variar as texturas e criar um acabamento subtil e bonito. Para o acabamento exterior, utilizámos uma mistura de argamassa de cal e água para aumentar a resistência da superfície à água.

One of the defining features of traditional Japanese-style houses is that they reflect harmony and oneness with climate and their natural setting – a conscious embrace of humanity with nature. Traditional approaches require readily available, easily accessible materials. All the wood, earth, bamboo, rice straw, and stone that Seyseysha used for the Kamogawa House was sourced in Japan.

As to allowing for climatic conditions, traditional methods feature a range of techniques for enhancing comfort during the hot, humid summers – perhaps the chief consideration in our approach. All the various natural materials used in the structure, from the wood and *tsuchikabe* to the Japanese paper in the fittings, have properties that help keep interiors dry and comfortable in the muggy summer months and retain moisture in the dry chill of winter.

Una de las características que definen las casas de estilo japonés tradicional es que reflejan armonía y unidad con el clima y su entorno natural: una convivencia consciente del ser humano con la naturaleza. Los sistemas tradicionales requieren materiales fáciles de conseguir y asequibles. Toda la madera, tierra, bambú, paja de arroz y piedra que utilizó Seyseysha para la Casa Kamogawa procedía de Japón.

Para adaptarse a las condiciones climáticas, los métodos tradicionales cuentan con una serie de técnicas que mejoran la comodidad durante los veranos cálidos y húmedos, quizá la principal consideración de nuestro planteamiento. Todos los materiales naturales utilizados en la estructura, desde la madera y *tsuchikabe* hasta el papel japonés de las lámparas, tienen propiedades que ayudan a mantener los interiores secos y confortables en los bochornosos meses de verano y preservan de la humedad durante el invierno frío y seco.

Uma das características que definem as casas tradicionais Japonesas é que reflectem harmonia e unidade com o clima e o seu ambiente natural - um abraço consciente da humanidade à natureza. As abordagens tradicionais requerem materiais facilmente disponíveis e de fácil acesso. Toda a madeira, terra, bambu, palha de arroz, e pedra que a Seyseysha utilizou para a Casa Kamogawa foi obtida no Japão.

Quanto à climatização, os métodos tradicionais apresentam uma gama de técnicas para aumentar o conforto durante os verões quentes e húmidos - talvez o principal aspecto considerado na nossa abordagem. Os diversos materiais naturais utilizados na estrutura, desde a madeira e o *tsuchikabe* até ao papel Japonês, têm propriedades que ajudam a manter os interiores secos e confortáveis nos meses abafados de Verão e a reter a humidade no frio seco do Inverno.

1: Construction of the *tsuchikabe*: lattice of bamboo laths at the Kamogawa House 2: Result of the first mud-coating process for *tsuchikabe* 3: Applying the second mud coating for *tsuchikabe* | 1: Construcción del *tsuchikabe*: celosías de tiras de bambú en la Casa Kamogawa 2: Resultado del primer proceso de revestimiento de barro para *tsuchikabe* 3: Aplicación de la segunda capa de barro para *tsuchikabe* | 1: Construção da treliça *tsuchikabe* de ripas de bambu na Casa Kamogawa 2: Resultado do primeiro processo de revestimento de barro da *tsuchikabe* 3: Aplicação da segunda camada de barro na *tsuchikabe*

1

2

3

These traditional techniques also enhance air circulation, another vital factor in overall comfort. By employing thick, sturdy *sashigamoi* over wall openings to bolster the structure against lateral loads, we can reduce the number and span of load-bearing walls. Less partitioning means more spatial breadth, helping air circulate from the larger wall openings and making the interiors cool havens from the summer heat.

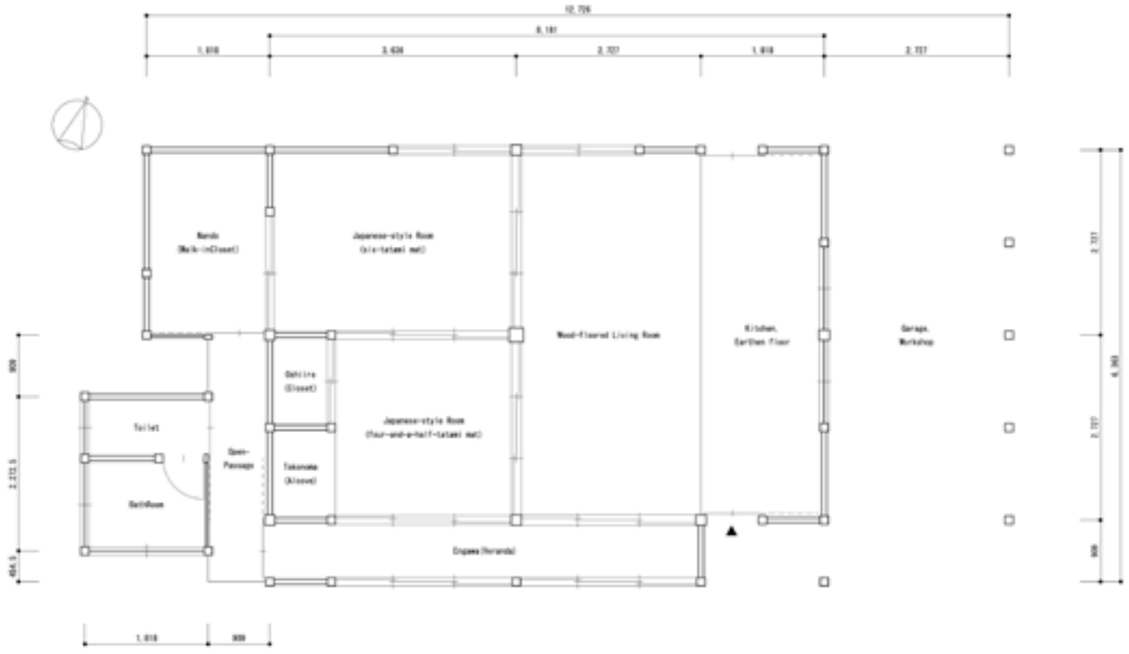
By leaving a larger gap between the floor and the ground (with a higher floor), the design favours underfloor airflow, keeping the wood of the substructure dry through greater air exposure and thereby extending the house's lifespan.

Estas técnicas tradicionales también mejoran la circulación del aire, otro factor decisivo para el confort general. Al utilizar *sashigamoi* gruesos y resistentes en todos los vanos de los muros para reforzar la estructura contra las cargas laterales, podemos reducir el número y la longitud de los muros portantes. Menos divisiones significa más amplitud espacial, lo que ayuda a que el aire circule desde las aberturas más grandes en los muros y a convertir a los interiores en frescos refugios durante el tórrido verano.

Al dejar un hueco mayor entre la planta y el terreno (elevando el suelo), el diseño favorece el flujo de aire por debajo de este, lo que mantiene seca la madera de la subestructura gracias a la mayor exposición al aire y, por consiguiente, amplía la vida útil de la casa.

Estas técnicas tradicionais também melhoram a circulação do ar, outro factor essencial em termos de conforto geral. Ao utilizar *sashigamoi* espessos e robustos sobre as aberturas das paredes para reforçar a estrutura contra as cargas laterais, podemos reduzir o número e os vãos das paredes de carga. Menos divisórias significa uma maior amplitude espacial, ajudando o ar a circular a partir das maiores aberturas nas paredes e transformando os interiores em abrigos frescos face ao calor do Verão.

Ao deixar um espaço maior entre o piso e o terreno (com um piso mais alto), este design favorece o fluxo de ar sob o pavimento, mantendo a madeira da subestrutura seca devido a uma maior exposição ao ar, prolongando assim a vida útil da casa.



Floor plan of the Kamogawa House | Planta de la Casa Kamogawa | Planta da Casa Kamogawa

Long eaves give shelter from rain, but their benefits go beyond shielding the dwelling from the elements, as eaves also help control indoor temperature. When the sun is high in the sky in summer, they cast cool shade; when it is low in winter, they deflect its slanting rays into the house, giving warmth.

For the layout of the Kamogawa House we made a compact adaptation of the floor plans common in traditional Japanese farmhouses. At the entrance is an earthen floor, extending into a kitchen on the same level. One step above that is a wooden-floored living room – a place for the family to enjoy time together. Slightly higher are two *tatami* rooms, and an *engawa* (veranda) stretches along the south side.

Los largos aleros protegen de la lluvia, pero sus ventajas van más allá de resguardar a la vivienda de los elementos, ya que ayudan a controlar la temperatura interior. Cuando el sol está alto en verano proyectan una sombra refrescante y cuando está bajo en invierno desvían los rayos inclinados hacia el interior de la casa, calentándola.

Para el diseño de la Casa Kamogawa condensamos las plantas típicas de las casas de campo japonesas tradicionales. En la entrada hay un suelo de tierra que llega hasta la cocina, que está en el mismo nivel. Un escalón por encima está el salón con suelo de madera, un lugar para que la familia disfrute de los momentos que pasan juntos. Un poco más arriba hay dos habitaciones de *tatami* y un *engawa* (porche) ocupa toda la fachada sur.

Os beirais longos abrigam da chuva, mas os seus benefícios vão além de proteger a habitação das intempéries, já que os beirais também ajudam a controlar a temperatura interior. Quando o sol está alto no Verão, eles lançam uma sombra fresca; quando está baixo no Inverno, desviam os seus raios oblíquos para dentro da casa, dando calor.

Para o traçado da Casa Kamogawa fizemos uma adaptação compacta das plantas baixas que são comuns nas fazendas tradicionais Japonesas. À entrada encontra-se um chão de terra, que se estende até à cozinha no mesmo nível. Um degrau acima encontra-se uma sala de estar com chão de madeira - um lugar para a família desfrutar de tempo em conjunto. Um pouco mais acima encontram-se duas salas com *tatami*, e uma *engawa* (varanda) que se estende ao longo do lado sul.

Interior of the Kamogawa House | Interior de la Casa Kamogawa | Interior da Casa Kamogawa

Interior of the Kamogawa House | Interior de la Casa Kamogawa | Interior da Casa Kamogawa

Both the wooden flooring and the Japanese-style flooring are designed to be sat on; no chairs are needed. The rooms can serve as drawing room, *chanoma* (Japanese living room), children's room or bedroom. Versatility is the defining quality of traditional Japanese rooms – and that inherent variety, with a single room having diverse functions, is a product of sparse interior design. The rooms of a traditional Japanese dwelling are almost free of furniture, with a characteristic minimal aesthetic. The floors of the Japanese-style rooms are covered with *tatami* mats. Of bundled straw wrapped in woven rush, 60 mm thick, *tatami* offers firm, supple cushioning, ideal for Japan's floor-oriented domestic life.

The *tokonoma* (alcove) is slightly above floor level, highlighting its unique role as a shady space, a threshold between this realm and the spirit world. Often featuring calligraphy scrolls, craftwork, flower arrangements, and religious offerings, the *tokonoma* is a sacred recess that helps balance everyday actuality with a spiritual dimension and gives the dwelling a living heart.

Just as the *tokonoma* has deep significance, the *engawa* veranda is also more than a place of passage. In traditional Japanese-style homes, the *engawa* is a place to bask in the sun, chat with guests, put fruit and vegetables out to dry for preserves or do handicrafts. Most importantly, the *engawa* is the interface between indoors and outdoors, human domesticity and nature, one world and another, at once separating and uniting the two realms so that they can intermingle. When you sit on a *tatami* mat and gaze over the *engawa*, through the shady recesses under the eaves and out to the garden or countryside, the moment resonates with dynamic energy; the appeal of the scenery is stronger even than in the finest landscape painting. The *engawa* makes this magical interface possible.

Tanto el suelo de madera como el de estilo japonés están pensados para sentarse sobre ellos, por lo que no hacen falta sillas. Las habitaciones pueden servir de sala de estar, *chanoma* (salón japonés), cuarto de niños o dormitorio. La versatilidad es la cualidad que define a las habitaciones japonesas tradicionales y esa variedad inherente en la que un solo espacio tiene diversas funciones es producto del parco diseño interior. Las estancias de una vivienda tradicional japonesa apenas tienen muebles y se caracterizan por su estética minimalista. Los suelos de las habitaciones de estilo japonés están cubiertos con esteras *tatami*. Realizado con manojos de paja recubiertos con juncos entrelazados y un grosor de 60 mm, un *tatami* ofrece un acolchado firme y flexible, ideal para la vida doméstica japonesa, que se desarrolla en el suelo.

El *tokonoma* (nicho) está ligeramente elevado sobre el suelo para subrayar su función única como lugar apartado, un umbral entre el mundo material y el espiritual. En él se suelen exponer rollos de caligrafía, centros de flores y ofrendas religiosas. El *tokonoma* es un nicho sagrado que ayuda a mantener el equilibrio entre la rutina diaria y una dimensión espiritual y es el corazón del hogar.

Así como el *tokonoma* tiene un significado profundo, el porche *engawa* también es algo más que un lugar de paso. En las casas de estilo japonés tradicional, el *engawa* es un lugar para tomar el sol, charlar con los invitados, poner a secar frutas y verduras para hacer conservas o realizar manualidades. Ante todo, el *engawa* es la conexión entre interior y exterior, la vida doméstica y la naturaleza, este mundo y otro, y une y separa a la vez los dos ámbitos para que puedan entremezclarse. Cuando uno se sienta sobre una estera de *tatami* y dirige la mirada por encima del *engawa*, a través de las sombras de los aleros y hacia el jardín o el horizonte, el momento está lleno de energía dinámica y la escena es mucho más seductora que la de la mejor pintura de paisajes. El *engawa* hace posible esta conexión mágica.

Tanto o soalho de madeira como o soalho de estilo Japonês foram concebidos como assentos; não são necessárias cadeiras. Os quartos podem servir como sala de visitas, *chanoma* (sala de estar Japonesa), quarto das crianças ou quarto de dormir. A versatilidade é a qualidade que define os quartos tradicionais Japoneses - e essa variedade inerente, com um único quarto tendo funções diversas, é o resultado do design interior esparso. Os quartos de uma habitação tradicional Japonesa quase não têm mobiliário, e têm uma estética minimalista característica. Os soalhos das salas de estilo Japonês são cobertos com tapetes de *tatami*. Feitos de palha embrulhada num tecido de junco-solto, com 60 mm de espessura, o *tatami* oferece um amortecimento firme e flexível, ideal para a vida doméstica Japonesa, orientada para o chão.

A *tokonoma* (alcova) encontra-se ligeiramente acima do nível do chão, destacando o seu papel único como um espaço sombroso, um limiar entre este reino e o mundo dos espíritos. Contendo frequentemente pergaminhos caligráficos, artesanato, arranjos florais e oferendas religiosas, a *tokonoma* é um recanto sagrado que ajuda a equilibrar a actualidade quotidiana com uma dimensão espiritual, e dá à habitação um coração vivo.

Tal como a *tokonoma* tem um significado profundo, a varanda *engawa* é mais do que um local de passagem. Nas casas tradicionais de estilo Japonês, a *engawa* é um lugar para tomar banhos de sol, conversar com os hóspedes, colocar fruta e legumes a secar para fazer conservas, ou fazer artesanato. Mais importante ainda, a *engawa* estabelece a ligação entre o interior e o exterior, a domesticidade humana e a natureza, um mundo e outro, separando e unindo simultaneamente os dois reinos para que se possam misturar. Quando nos sentamos num tapete de *tatami* e olhamos para as *engawa*, através dos recantos sombrosos debaixo dos beirais, na direcção do jardim ou do campo, o momento ressoa com energia dinâmica; o apelo do cenário é mais forte do que o da melhor pintura paisagística. A *engawa* torna possível esta ligação mágica.

1: *Amaochi* (gravel strip onto which rain drops from the eaves) and *engawa* (veranda) 2: *Engawa* (veranda) | 1: *Amaochi* (franja de grava en la que cae la lluvia desde los aleros) y *engawa* (porche) 2: *Engawa* (porche) | 1: *Amaochi* (faixa de gravilha onde cai a chuva dos beirais) e *engawa* (varanda) 2: *Engawa* (varanda)

As one of the defining features of a traditional Japanese dwelling, thresholds add a touch of depth to the *tokonoma*, *engawa*, and many other elements. The *fusuma* (sliding doors) and *shoji* (sliding screens) in the Kamogawa House also have this borderline quality. *Fusuma* are thin, interlocking lattices of wood between multiple layers of Japanese paper on either side, while *shoji* have similar latticework but just one sheet of Japanese paper on one side. Both slide along grooved tracks and are removable; just pull a *fusuma* or *shoji* out of its grooves and you can turn what were separate rooms into a larger space. *Fusuma* mark spatial divisions whereas *shoji* filter light for softer, subtler partitioning.

Tokonoma, *engawa*, *fusuma*, and *shoji* all mark boundaries – but rather than simply demarcating spaces, they also join the worlds on either side. In that ambivalence lies their power to foster a unique connection, transcending spaces and worlds.

Como una de las características que definen a la vivienda japonesa tradicional, los umbrales añaden un toque de profundidad al *tokonoma*, el *engawa* y muchos otros elementos. Las *fusuma* (puertas correderas) y las *shoji* (mamparas correderas) de la Casa Kamogawa también tienen esta cualidad de línea divisoria. Las *fusuma* son finas celosías de madera dispuestas entre varias capas de papel japonés por ambas caras, mientras que las *shoji* tienen una celosía parecida pero solo están cubiertas con papel japonés en un lado. Ambas se deslizan por carriles ranurados y son desmontables; solo hay que sacar las *fusuma* o *shoji* del carril y las estancias separadas se convierten en un único espacio más amplio. Las *fusuma* marcan las divisiones espaciales, mientras que las *shoji* filtran la luz consiguiendo una separación más suave y sutil.

Tokonoma, *engawa*, *fusuma*, y *shoji* marcan límites, pero en lugar de tan solo demarcar espacios, también unen los mundos a ambos lados. En esa ambivalencia radica su capacidad para favorecer una conexión única que trasciende espacios y mundos.

Como uma das características definidoras de uma habitação tradicional Japonesa, os umbrais acrescentam um toque de profundidade à *tokonoma*, *engawa*, e muitos outros elementos. As *fusuma* (portas deslizantes) e os *shoji* (painéis deslizantes) na Casa Kamogawa têm também esta qualidade de fronteira. As *fusuma* são treliças finas cruzadas de madeira, com várias camadas de papel Japonês de cada lado, enquanto os *shoji* têm uma treliça semelhante, mas apenas uma folha de papel Japonês de um dos lados. Ambas deslizam ao longo de ranhuras e são removíveis; basta retirar uma *fusuma* ou um *shoji* das suas ranhuras e pode-se transformar o que eram salas separadas num espaço maior. As *fusuma* marcam divisões espaciais enquanto que os *shoji* filtram a luz para a criação de uma divisão mais suave e subtil.

As *tokonoma*, *engawa*, *fusuma*, e os *shoji* delimitam fronteiras - mas em vez de simplesmente demarcarem espaços, estes elementos também fazem parte dos mundos em ambos os lados. Nessa ambivalência reside o seu poder de fomentar uma ligação única, transcendendo espaços e mundos.

Interior of the Kamogawa House | Interior de la Casa Kamogawa | Interior da Casa Kamogawa (Masao Nishikawa, Jutaku-Kenchiku, 2011)

Exterior of the Kamogawa House | Exterior de la Casa Kamogawa | Exterior da Casa Kamogawa

Echoing the way that traditional forms define houses in terms of structure, floor plan, and design, these forms also pervade Japanese culture as a whole. They are rooted in Japan's animistic, nature-focused worldview. For our forebears, cultivating natural forms was a means of subduing the self and freeing the mind from the ego – a yielding that allows us to commune with nature, with others and with the spirit world. Rather than binding us, these forms guide us into an inner realm where we are free to explore that world and experience its mysteries, undistracted by self.

Como reflejo de la manera en la que las formas tradicionales definen las casas en cuanto a su estructura, su planta y su diseño, estas formas impregnan la cultura japonesa en su conjunto. Están enraizadas en la cosmovisión de Japón, animista y centrada en la naturaleza. Para nuestros antepasados, cultivar las formas naturales era una manera de liberar la mente del ego y dominar el yo: un sometimiento que nos permite comulgar con la naturaleza, con los otros y con el mundo espiritual. En lugar de obligarnos por la fuerza, estas formas nos guían hacia una esfera íntima en la que somos libres de explorar y experimentar sus misterios sin que el yo nos distraiga.

Reiterando o modo como as formas tradicionais definem as casas em termos de estrutura, planta e design, estas formas também permeiam a cultura Japonesa como um todo. Têm as suas raízes na visão do mundo Japonesa, animista e centrada na natureza. Para os nossos antepassados, cultivar formas naturais era um meio de subjugar o eu e libertar a mente do ego - uma cedência que nos permite comungar com a natureza, com os outros e com o mundo espiritual. Em vez de nos limitar, estas formas guiam-nos para um reino interior onde somos livres de explorar esse mundo e experimentar os seus mistérios, sem nos distrairmos com nós próprios.

In a traditional house, structure and design are one and the same. The wood and *tsuchikabe* forming the house's structure also constitute its aesthetic, as is plain to see in the finishes. Whenever we design a house, we believe we must take what nature offers; instead of just using natural resources and manipulating them into forms of our own, we see nature as something to listen to and learn from. If we are open and receptive, we can sense what will suit trees and earth and stone. Natural materials are free to inhabit their spontaneous, intrinsic shapes, harmonizing easily in a composite whole.

Our forebears firmly believed that they were merely occupying the world within a natural order. Whatever they did – whether making things or simply going about day-to-day life – they did it with a sense of respect and awe for the natural world. And though that value system has over time lost its hold, a few of us still adhere to its time-honored spirit.

Seyseysha holds those beliefs dear. Seeing traditional Japanese houses not just as places to live in but also as ways of reconnecting with age-old insights about dwelling in harmony with the environment, we will continue to draw on the past to craft homes for the future.

En una casa tradicional, estructura y diseño son una misma cosa. La madera y el *tsuchikabe* que forman la estructura de la casa también constituyen su estética, como se puede comprobar fácilmente en los acabados. Siempre que diseñamos una casa creemos que debemos tomar lo que nos ofrece la naturaleza: en lugar de limitarnos a usar los recursos naturales y manipularlos a nuestro antojo, vemos la naturaleza como algo a lo que escuchar y de lo que aprender. Si estamos abiertos y somos receptivos, podemos sentir qué es lo que conviene a los árboles, la tierra y las piedras. Los materiales naturales tienen libertad para habitar sus formas intrínsecas y espontáneas y componen con facilidad un conjunto armonioso.

Nuestros antepasados creían firmemente que tan solo ocupaban el mundo dentro de un orden natural. Cualquier cosa que hicieran –ya fuera fabricar objetos o vivir el día a día– lo hacían con respeto y fascinación por el mundo natural. Y aunque ese sistema de valores haya perdido hace tiempo su ascendiente, algunos todavía permanecemos fieles a su espíritu de larga tradición.

Seyseysha da mucha importancia a estas creencias. Consideramos que las casas tradicionales japonesas no son simplemente lugares donde vivir, sino formas de reencontrarse con conocimientos seculares sobre la vida en armonía con el entorno, y seguiremos aprovechando las enseñanzas del pasado en la creación de hogares para el futuro.

Numa casa tradicional, a estrutura e o design são uma e a mesma coisa. A madeira e o *tsuchikabe* que formam a estrutura da casa também fazem parte da sua estética, como se pode ver nos acabamentos. Sempre que projectamos uma casa, acreditamos que devemos aproveitar o que a natureza nos oferece; em vez de apenas utilizarmos os recursos naturais e manipulá-los em formas ditadas por nós, vemos a natureza como algo a ouvir e com que aprender. Se formos abertos e receptivos, podemos sentir o que se adequa às árvores, à terra e à pedra. Os materiais naturais são livres de habitar as suas formas espontâneas e intrínsecas, harmonizando-se facilmente num todo composto.

Os nossos antepassados acreditavam firmemente que estavam meramente a ocupar o mundo dentro de uma ordem natural. Fizessem o que fizessem - quer construíssem coisas, ou simplesmente vivessem a sua vida quotidiana - faziam-no com um sentido de respeito e de admiração pelo mundo natural. E embora esse sistema de valores tenha perdido a sua força ao longo do tempo, alguns de nós ainda aderimos ao seu espírito honrado pelo tempo.

A Seyseysha tem em grande estima essas crenças. Vendo as casas tradicionais Japonesas não só como lugares para viver, mas também como formas de restabelecermos a ligação com os conhecimentos antigos sobre como viver em harmonia com o ambiente, continuaremos a recorrer ao passado para criar casas para o futuro.

References | Referencias | Referências

Group of "Toryo-ni-manabu-ie". 2003. T*oryo-ni-manabu-ie Zukai Mokuzo-dento-koho kihon-to-jissen (The house of learning from the master builder. The Illustration of Traditional Wooden Construction Method Basics and Practice)*. Tokyo: Shokokusha Co., Ltd.

Fukaya, Motohiro; and Suzuki, Hiroko. 2001. *Zukai Mokuzo-kenchiku Dento-giho-jiten (The Illustrated Dictionary of Traditional Wooden Building Techniques)*. Tokyo: Shokokusha Co., Ltd.

Aoki, Shigeru, et al. 1995. *Kenchiku Daijiten (Encyclopedia of Architecture and Building)*. Tokyo: Shokokusha Co., Ltd.

Makoto Fukada (Ken Kusakari)

Biography | Biografía | Biografia

Makoto Fukada

He is the master carpenter behind the firm Seyseysha, which uses traditional Japanese construction methods for a variety of building projects. Working with his apprentices, he fully oversees every project, from design and carpentry to on-site coordination, as a primary contractor. His experience in the field goes back to 1988, when he was apprenticed to the master joiner and tea-utensil craftsman Kahei Yamada. Since founding his own company in 1997, he has continued to visit classical Japanese buildings across Japan and has studied traditional structures, floor plans and designs, building exquisite homes with these time-honored techniques.

Maestro carpintero y director de la empresa Seyseysha, que utiliza métodos tradicionales japoneses para diferentes proyectos de construcción. Trabaja con sus aprendices y supervisa en su totalidad cada proyecto –desde el diseño y la carpintería hasta la coordinación de la obra– como contratista principal. Su experiencia en este campo se remonta a 1988, cuando era aprendiz de Kahei Yamada, maestro carpintero y artesano de utensilios para el té. Desde que fundó su propia empresa en 1997 no ha dejado de visitar edificios clásicos por todo Japón y ha estudiado las estructuras, las plantas y los diseños tradicionales para construir hogares exquisitos con estas técnicas ancestrales.

Mestre carpinteiro por detrás da firma Seyseysha, que usa métodos de construção tradicional Japonesa para uma variedade de projectos de construção. No trabalho com os seus aprendizes, ele supervisiona inteiramente cada projecto, desde a concepção e carpintaria até à coordenação no local, como empreiteiro principal. A sua experiência na área remonta a 1988, quando foi aprendiz do mestre carpinteiro e artesão de utensílios de chá Kahei Yamada. Desde a fundação da sua própria empresa em 1997, continuou a visitar edifícios Japoneses clássicos por todo o Japão e estudou as estruturas tradicionais, plantas e desenhos, construindo casas requintadas com estas técnicas consagradas pelo tempo.

The Restoration and Construction of Can Ferrereta, Mallorca

La restauración y la construcción de Can Ferrereta, Mallorca

A restauração e a construção de Can Ferrereta, Maiorca

Sergi Bastidas,
Gerard Bastidas Caldentey,
Boris Bastidas

The current Hotel Can Ferrereta was from the 18th century one of this town's great stately houses. Such was its importance that the street where it stands adopted its name. It is in the town of Santanyí, on the south-east coast of Mallorca, a stone's throw from the old town wall enclosing a bustling market area and assorted shops, cafés and restaurants. The characteristic golden light reflected by the Santanyí stone (a local sandstone) and the atmosphere of the place have in recent years led the town to attract artists and other creative professionals.

The Soldevila-Ferrer family, owner of the Sant Francesc Hotel in the historic center of Palma, was seeking a site on the island to recreate its business model in a rural setting. The aim of the project was thus to restore the main house and turn it into a 32-room hotel. As well as this house, on a site of 3,232 m2, the family bought a further plot of some 1,610 m^2 behind it as a site for a new building. This was to be integrated so that there would be a smooth transition from the original building to the new facilities. With this addition, the plot has a built area of 4,800 m^2 and a further 500 m^2 of terraces.

El actual hotel Can Ferrereta fue desde el siglo XVIII una de las grandes casas señoriales del pueblo. Tal era su importancia que la calle donde se encuentra tomó prestado el nombre de la casa. El edificio está en el pueblo de Santanyí, situado en la costa sureste de Mallorca, y a sólo unos pasos de las antiguas murallas de la localidad, que encierran una bulliciosa zona de mercado y gran variedad de tiendas, cafés y restaurantes. La característica luz dorada reflejada por la piedra de Santanyí, una piedra arenisca local, y el ambiente de este lugar han convertido durante los últimos años a esta población en un imán para artistas y otros profesionales creativos.

La familia Soldevila-Ferrer, responsable del hotel Sant Francesc en el casco antiguo de Palma, buscaba un lugar en la isla donde poder recrear en un entorno rural su modelo de negocio. El objetivo de este proyecto fue por ello restaurar la casa principal para convertirla en un hotel de treinta y dos habitaciones. Además de esta casa, asentada sobre un terreno de 3.232 metros cuadrados, se adquirió en su parte trasera otra parcela de aproximadamente 1.610 metros cuadrados con el fin de construir un edificio de nueva planta. Este debía estar bien integrado, de forma que se generara una buena transición desde el edificio original a las nuevas zonas. Con este añadido, la parcela cuenta con un total de 4.800 metros cuadrados de superficie construida y otros 500 metros cuadrados de terrazas.

O atual hotel Can Ferrereta é, desde o século XVIII, uma das grandes casas senhoriais da localidade. Tal era a sua importância que a rua onde se encontra, pediu emprestado o nome da casa. O edifício fica na localidade de Santanyí, situado na costa sudeste de Maiorca, e a apenas a uns passos das antigas muralhas da localidade, que fecham uma buliçosa zona de mercado e uma grande variedade de lojas, cafés e restaurantes. A típica luz dourada reflexada pela pedra de Santanyi, uma pedra arenisca local, e o ambiente deste lugar têm convertido nos últimos anos esta localidade num íman para artistas e outros profissionais criativos.

A família Soldevila-Ferrer, responsável pelo hotel Sant Francesc no casco antigo de Palma, procurava um lugar na ilha que recriasse um ambiente rural no seu modelo de negócio. O objetivo deste projeto era por isso restaurar a casa principal para reconvertê-la num hotel de trinta e dois quartos. Para além desta casa, situada num terreno de 3232 metros quadrados, também se adquiriu na sua parte traseira outro lote de aproximadamente 1610 metros quadrados com o objetivo de contruir um edifício com uma planta nova. Este devia estar bem integrado, de forma a criar uma boa transição desde o edifício original até às zonas novas. Com esta adição, o lote conta com uma superfície total de 4800 metros quadrado e outros 500 metros quadrados de terraços.

< Orthophoto of Can Ferrereta within the urban fabric of Santanyí | Ortofoto de Can Ferrereta dentro de la trama urbana de Santanyí | Ortofotografia de Can Ferrereta dentro do tecido urbano de Santanyí (Nando Esteva)

Previous state of the plot and staking out at the start of building work | Estado previo de la parcela y replanteos al comienzo de las obras | Estado prévio da parcela e traçados no início das obras

The family decided to hire our architecture firm, Bastidas Architecture, as they appreciated our work for its engagement with traditional architecture and the simple and timeless character of our projects. Based in Palma, the firm is run jointly by Sergi Bastidas and his sons, Gerard and Boris Bastidas. Gerard practices as an architect alongside his father and Boris looks after management and marketing. The Soldevila-Ferrer family trusted the Bastidas team to be able not just to faithfully restore this stately house but also to reproduce its qualities in the new-built areas, so that these would be fully integrated with the original property.

As soon as we first visited the building we had a clear vision of how the project would take shape. Both the initial concept and the preliminary drawings closely reflect the outcome as built.

The aim was to create a large house that would retain the original mansion's rural character, with a look including features from the local countryside. The idea was that the original parts of the building and the new structures would be merged in a smooth blend using high-quality natural and craft materials, in some cases salvaged from other buildings.

La familia decidió contratar a nuestro estudio de arquitectura, Bastidas Architecture, cuya obra admiraban por su relación con la arquitectura tradicional y por el carácter sencillo y atemporal de sus proyectos. Dicho estudio, con sede en Palma, está codirigido por Sergi Bastidas y sus hijos, Gerard y Boris Bastidas. Gerard ejerce de arquitecto junto a su padre y Boris de gerente y responsable de marketing. La familia Soldevila-Ferrer confiaba en que el equipo Bastidas no sólo sería capaz de restaurar fielmente la casa solariega, sino también de reproducir sus cualidades en las nuevas zonas construidas, de forma que quedaran bien integradas en la finca original.

Desde el momento en que visitamos el edificio por primera vez tuvimos una visión clara de cómo acabaría siendo el proyecto. Tanto en el concepto inicial como en los dibujos preliminares puede encontrarse un reflejo preciso de lo finalmente construido.

El objetivo era crear una gran casa que mantuviera el carácter rural de la edificación original y que incorporara al aspecto general del edificio algunos de los elementos del campo cercano. Las premisas eran fundir en una mezcla homogénea las partes originales del edificio y las nuevas construcciones, y utilizar materiales naturales y artesanales de gran calidad, en algunos casos recuperados de otros edificios.

A família decidiu contratar o nosso gabinete de arquitetura, Bastidas Architecture, cuja obra admiravam pela sua relação com a arquitetura tradicional e pela simplicidade e atemporalidade dos seus projetos. Este gabinete, com sede em Palma, está codirigido por Sergi Bastidas e os seus filhos, Gerard e Boris Bastidas. Gerard exerce de arquiteto em conjunto com o seu pai, e Boris o de gerente e responsável de marketing. A família Soldevila-Ferrer confiava que a equipa de Bastidas não só seria capaz de restaurar fielmente a casa solarenga, como também seria capaz de reproduzir as suas qualidades nas novas zonas construídas, de forma a que ficassem bem integradas no terreno original.

A partir do momento em que visitamos o edifício pela primeira vez tivemos uma visão clara de como seria o projeto. Tanto no conceito inicial como nos desenhos preliminares pode encontrar-se um reflexo preciso do foi finalmente construído.

O objetivo era criar uma grande casa que mantivesse o carácter rural da edificação original e que incorporasse ao aspeto geral do edifício alguns dos elementos do campo próximo. As premissas eram fundir numa mistura homogénea as partes originais do edifício e as novas construções, e utilizar materiais naturais e artesanais de grande qualidade, nalguns casos recuperados de outros edifícios.

We were able to create a distinct atmosphere – discreet and authentic – in the various spaces of the hotel with the help of our clients who, working as part of the team, were keenly, constantly and supportively involved through every phase of the work.

In the project design it was vital to convey that shade may be more important even than light, as it contributes to the creation of welcoming ambiences and spaces. Also vital in the design were the transitions, as the building was to be discoverable little by little, avoiding full views.

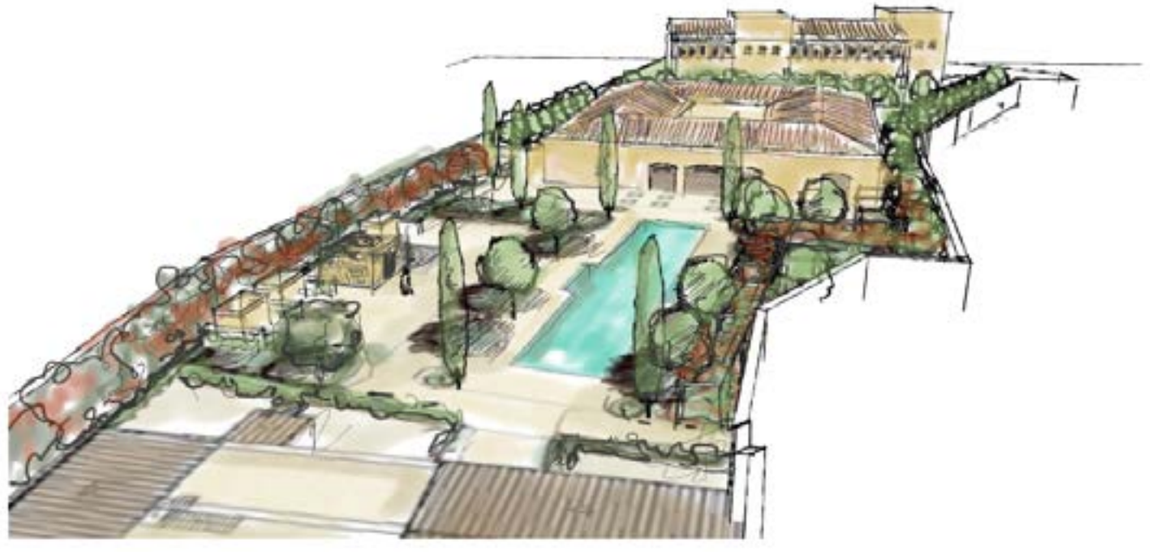
La obtención en todos los espacios del hotel de una atmósfera específica – discreta y auténtica– fue posible gracias a la colaboración de los clientes, quienes, trabajando como parte del equipo, tuvieron una participación constante, solidaria y entusiasta durante todas las fases de la obra.

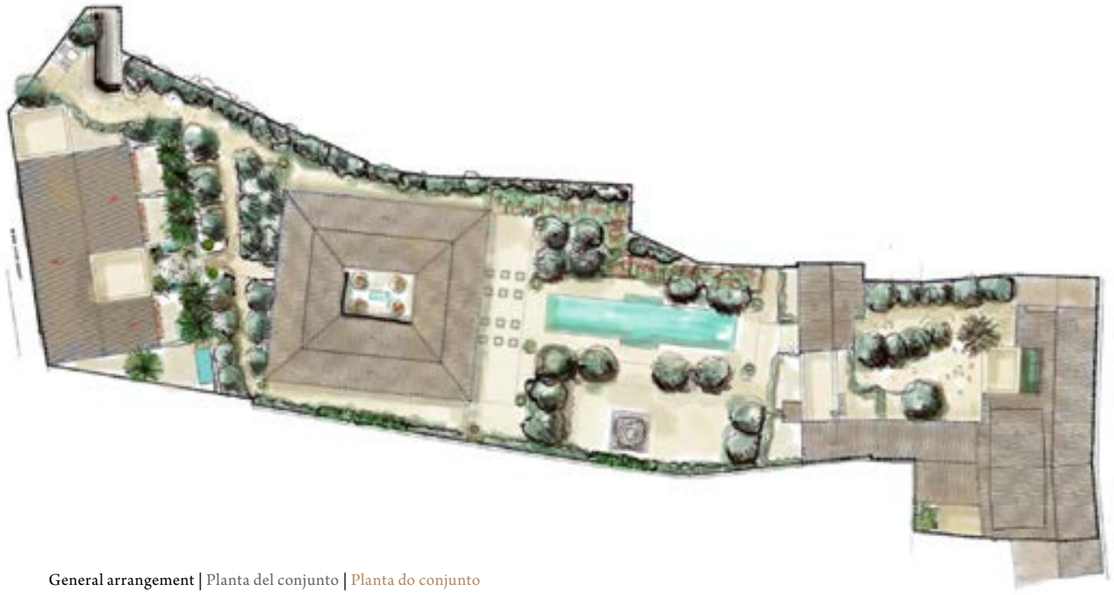
A la hora de concebir el proyecto fue importante transmitir que la sombra puede ser aún más importante que la luz, ya que contribuye a la creación de atmósferas y espacios más acogedores. Igualmente importante para el proyecto eran las transiciones de unos espacios a otros, ya que el edificio debía poder descubrirse poco a poco, evitando las vistas generales.

A obtenção de uma atmosfera específica – discreta e autentica – em todos os espaços do hotel foi possível graças à colaboração dos clientes, que, ao trabalharem como parte da equipa, tiveram uma participação constante, solidária e entusiasta durante todas as fases da obra.

Aquando da conceção do projeto foi importante transmitir que a sombra pode ser ainda mais importante que luz, pois contribui para a criação de atmosferas e espaços mais aconchegadores. Igualmente importante para o projeto eram as transições de um espaço ao outro, já que o edifício devia poder descobrir-se pouco a pouco, evitando as vistas gerais.

Overview | Vista del conjunto | Vista do conjunto





General arrangement | Planta del conjunto | Planta do conjunto

Construction phases

The project had two main phases. The first was the full restoration of the existing house, an imposing mansion originally built in 1774 which had not been lived in for many years and had become totally derelict. In the second phase, the acquisition of the adjoining plot allowed us to locate the other necessary hotel facilities, including a 25 m swimming pool, a spa, a gym and a new building with extra hotel rooms.

In the first phase, involving rebuilding work, all of the house's structural elements were dismantled except for the main walls, and the existing beams were salvaged. Next we restored the walls and refitted the original wooden beams, keeping their natural color in keeping with the house's tradition. To comply with fire regulations, we also had to make new concrete joists, to which we added decorative beams retrieved from the original building.

Fases de construcción

El proyecto contó con dos fases principales. La primera fue la restauración completa de la casa existente, una imponente casa solariega construida originalmente en 1774 que no había sido habitada durante muchos años y que se encontraba en un estado de abandono absoluto. En una segunda fase, la adquisición de la parcela adyacente permitió emplazar el resto de las instalaciones necesarias para el hotel, lo que incluye una piscina de veinticinco metros de largo, un spa, un gimnasio y un nuevo edificio con habitaciones adicionales.

En la primera fase, en la que se llevaron a cabo las tareas de reconstrucción, se desmontaron todos los elementos estructurales de la casa excepto los muros principales y se recuperaron las vigas existentes. Posteriormente, se restauraron los muros y se recolocaron las vigas de madera originales. En estas últimas

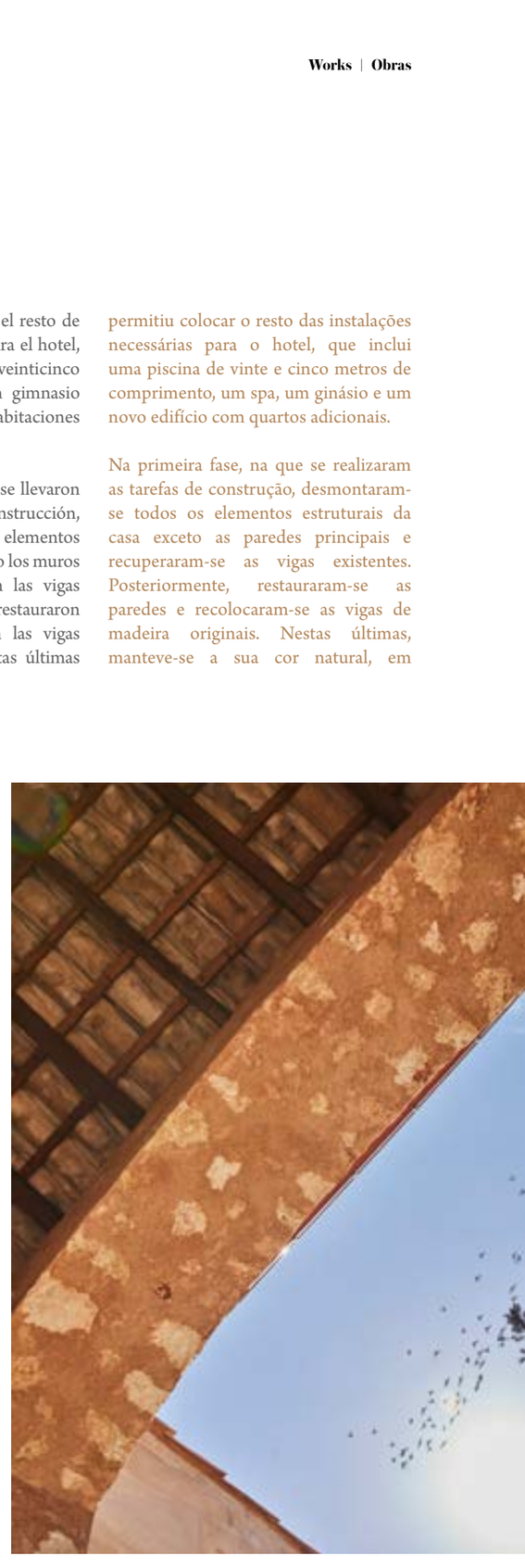
Fases da construção

O projeto contou com duas fases principais. A primeira foi a restauração completa da casa existente, uma imponente casa solarenga construída originalmente em 1774 que não tinha sido habitada durante muitos anos e que se encontrava num estado de abandono absoluto. Numa segunda fase, a adquisição do lote adjacente permitiu colocar o resto das instalações necessárias para o hotel, que inclui uma piscina de vinte e cinco metros de comprimento, um spa, um ginásio e um novo edifício com quartos adicionais.

Na primeira fase, na que se realizaram as tarefas de construção, desmontaram-se todos os elementos estruturais da casa exceto as paredes principais e recuperaram-se as vigas existentes. Posteriormente, restauraram-se as paredes e recolocaram-se as vigas de madeira originais. Nestas últimas, manteve-se a sua cor natural, em

North facade of the ensemble | Fachada norte del conjunto | Fachada norte do conjunto

Traditional ceilings | Techos tradicionales | 1,2: Tetos tradicionais (Nando Esteva)



We sought at all times to respect the stately house's original proportions, so the windows and doors were kept at the same size and also restored to their former state. The mansion facade had a degree of heritage protection (category C), so it was important to retain historic characteristics such as its distinctive ocher color.

In the course of these tasks we formed a good working relationship with the local town council, which supported us throughout. The council recognized that this was a significant project for Santanyí and also shared the view that Can Ferrereta should be restored with utmost care and respect so as to maintain the building's former identity.

se ha mantenido su color natural, en consonancia con la tradición de la casa. El cumplimiento de la normativa contra incendios impuso construir también nuevas vigas de hormigón y añadir vigas decorativas recuperadas del edificio original.

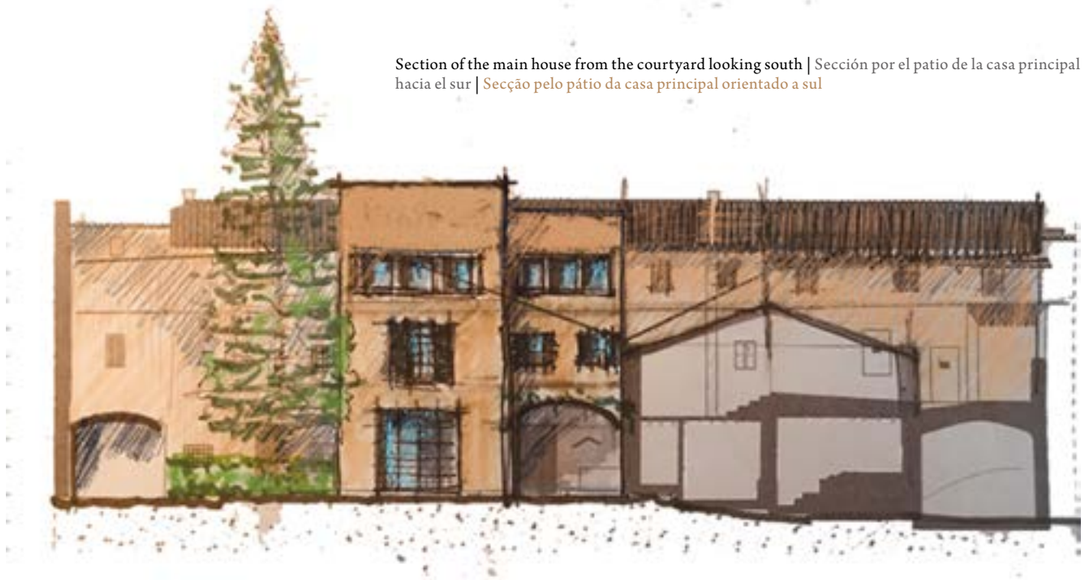
En todo momento se buscó dar continuidad a las proporciones originales de la casa solariega, por lo que se mantuvieron los tamaños de las ventanas y de las puertas, que además se restauraron respetando su estado original. La fachada de la casa estaba sometida a un cierto grado de protección patrimonial (categoría C) y era importante mantener las características históricas de la fachada, incluido su distintivo color ocre.

Durante el desarrollo de todas estas tareas se construyó una sólida relación de trabajo con el ayuntamiento local, del que se recibió apoyo en todo momento. El ayuntamiento no sólo reconoció que éste era un proyecto importante para Santanyí, sino que también compartía la idea de que Can Ferrereta debía ser restaurado con gran cuidado y respeto para así mantener la identidad original del edificio.

consonância com a tradição da casa. O cumprimento da norma contra incêndios impôs construir também novas vigas de betão e acrescentar vigas decorativas recuperadas do edifício original.

Procurou-se sempre dar continuidade às proporções originais da casa solarenga, pelo que se mantiveram os tamanhos das janelas e das portas, que também foram restauradas respeitando o seu estado original. A fachada da casa estava submetida a um certo grau de proteção patrimonial (categoria C) e era importante manter as características históricas da fachada, incluindo a sua cor distintiva ocre.

Durante o desenvolvimento de todas estas tarefas, contruiu-se uma sólida relação de trabalho com a autarquia local, da que se recebeu apoio em todo o momento. A autarquia não só reconheceu que este era um projeto importante para Santanyí, como também partilhava a ideia de que Can Ferrereta devia ser restaurada com muito cuidado e respeito para assim manter a identidade original do edifício.



Section of the main house from the courtyard looking south | Sección por el patio de la casa principal hacia el sur | Secção pelo pátio da casa principal orientado a sul

Use of natural materials and local building systems

One key aspect of the building is the materials used, typical of the area and as used in the original mansion, including the distinctive Santanyí sandstone and lime paint.

El uso de materiales naturales y sistemas constructivos locales

Un aspecto clave del edificio se encuentra en los materiales empleados, los típicos de la zona, que ya habían sido utilizados en la construcción original, incluyendo la distintiva piedra arenisca de Santanyí y la pintura de cal.

O uso de materiais naturais e sistemas construtivos locais

Um aspeto chave do edifício encontra-se nos materiais empregados, os típicos da zona, que já tinham sido utilizados na construção original, incluindo a distintiva pedra arenisca de Santanyí e a pintura de cal.

Detail of carved stonework | Detalle de una pieza de cantería labrada | Pormenor de uma peça de cantaria lavrada (Nando Esteva)

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1: Detail of a corner of ashlar masonry 2: Wall of rendered masonry 3: Opening in a stone wall | 1: Detalle de esquina de sillería 2: Muro de mampostería revocado 3: Conformación de un hueco en un muro de piedra | 1: Pormenor da esquina de silharia 2: Parede de alvenaria rebocada 3: Conformação de um vão numa parede de pedra (1-3: Nando Esteva)

Lime was used for wallcoverings not just for its environmental performance, as it allows walls to "breathe", which is important in traditional houses, but also because lime paint was used originally on this and all the neighboring period houses.

To carry out the work we formed a team of trusted craftspeople. The use of local materials required qualified artisan labor so as to assure the quality and authenticity sought while not exceeding the project budget. This was not easy but we were fortunately able to assemble a team of excellent professionals, including highly qualified stonemasons, many from Morocco and masters of the trade. We also had master carpenters and blacksmiths for the intricate work with wood and iron.

La cal fue utilizada para el revestimiento de las paredes no sólo por sus propiedades ecológicas, ya que permite que las paredes "respiren", algo importante en las casas tradicionales, sino también porque esta pintura es la que se había utilizado originalmente en esta y en todas las casas vecinas de la época.

Para llevar a cabo estas obras reunimos a un equipo de artesanos de confianza. La utilización de materiales locales requería una mano de obra artesanal cualificada que pudiera garantizar conseguir la calidad y autenticidad buscadas sin exceder el presupuesto de la obra. Aunque no fue una tarea fácil, afortunadamente se pudo reunir un excelente equipo de profesionales, entre los que se encontraban pedreros altamente cualificados, muchos de ellos procedentes de Marruecos y con un gran dominio del oficio. También se contó con maestros carpinteros y herreros para los intrincados trabajos de madera y hierro.

A cal foi utilizada para o revestimento das paredes não só pelas suas propriedades ecológicas, pois permite que as paredes "respirem", algo importante nas casas tradicionais, como também porque esta pintura é a que se tinha utilizado originalmente nesta casa e em todas as casas vizinhas da época.

Para efetuar estas obras reunimos uma equipa de artesãos de confiança. A utilização de materiais locais requereria uma mão de obra artesanal qualificada que pudesse garantir o logro da qualidade e autenticidade procuradas sem exceder o orçamento da obra. Ainda que não fosse uma tarefa fácil, felizmente foi possível reunir uma excelente equipa de profissionais, entre os quais se encontravam pedreiros altamente qualificados, muitos deles proveniente de Marrocos e com um grande domínio do ofício. Também se contou com a presença de mestres carpinteiros e ferreiros para os intrincados trabalhos de madeira e ferro.

Description of the works

Some of the apparently simpler aspects of the building turned out to be the hardest to bring off, requiring hours of reflection, research and execution. These notably included the entrance to the house, which was originally a gate for animals through which donkeys and horses would enter the house on typical stone paving. We felt it important to maintain what remained, restoring and protecting it.

The main ovate staircase, an organic structure connecting the ground floor with the two upper floors, was also hard to get right. The stairs are now one of the most notable features of the whole building, lit by natural light coming in from a skylight at the top of the house.

Descripción de la obra

Algunos de los aspectos aparentemente más sencillos del edificio resultaron ser los más complicados de conseguir, y pudieron ser obtenidos sólo tras horas de reflexión, investigación y ejecución. Entre estos puede destacarse la construcción de la entrada a la casa, que originalmente era el paso de animales, por el que los burros y los caballos entraban a la vivienda a través de un suelo típico de piedra. Se consideró importante mantener lo que había, restaurarlo y protegerlo.

La escalera principal ovalada, una estructura orgánica que conecta la planta baja con las dos plantas superiores, fue otro de los elementos difíciles de afinar. La escalera es ahora uno de los elementos más destacados de todo el edificio, iluminada por la luz natural que llega desde el lucernario de la parte superior de la casa.

Descrição da obra

Alguns dos aspetos aparentemente mais simples do edifício resultaram ser os mais complicados de conseguir, e apenas puderam ser obtidos após horas de reflexão, investigação e execução. Entre estes, pode-se destacar a construção da entrada à casa, que originalmente era uma passagem de animais, pela qual burros e cavalos entravam na moradia através de um pavimento típico de pedra. Considerou-se importante manter o que havia, restaurá-lo e protegê-lo.

A escada principal ovalada, uma estrutura orgânica que conecta a planta térrea com as duas plantas superiores, foi outro dos elementos difíceis de afinar. A escada é agora um dos elementos mais destacados de todo o edifício, com a escada iluminada pela luz natural que chega desde a lucerna na parte superior da casa.

New *barraca de roter* | Nueva *barraca de roter* | Nova *barraca de roter* (Nando Esteva)

1: First flights of the main stairs 2: Stairwell lit by a skylight | 1: Arranque de la escalera principal de la casa 2: Hueco de la escalera iluminado por un lucernario | 1: Arranque da escada principal da casa 2: Vão da escada iluminado por uma lucerna (1, 2: Nando Esteva)

Integrating the pool, gardens and terraces into the built ensemble was also quite a challenge. The building between the main restored house and the newly built structure contains the spa, gym, changing rooms, equipment room and kitchen and is inspired by traditional sheep sheds known as *estadors*, originally designed for these animals.

By the pool area there is a *barraca de roter*, a domed stone structure characteristic of the island of Mallorca, built with the traditional dry-stone technique. These structures abound in the nearby countryside, and the idea was to build one by the hotel to give it a more rural feel. This stone hut functions as a lavatory and houses the external showers linked to the pool.

La integración de la piscina, los jardines y las terrazas en el conjunto edificado fue también un reto importante. El edificio situado entre la casa principal restaurada y el edificio de nueva construcción es el lugar donde se ubicaron el spa, el gimnasio, los vestuarios, la sala de máquinas y la cocina, y está inspirado en los tradicionales establos de ovejas, conocidos como *estadors*.

Junto a la zona de la piscina hay una *barraca de roter*, una estructura abovedada de piedra, característica de la isla de Mallorca, construida con la técnica tradicional de la piedra seca. Estas estructuras abundan en los campos cercanos, por lo que se quiso construir una junto al hotel para dotarlo de un carácter más rural. La barraca funciona como aseo y alberga las duchas exteriores vinculadas a la piscina.

A integração da piscina, dos jardins e dos terraços no conjunto edificado foi também um reto importante. O edifício situado entre a casa principal restaurada e o edifício de nova construção é o lugar onde se localizam o spa, o ginásio, os vestuários, a sala de máquinas e a cozinha, e está inspirado nos tradicionais estábulos de ovelhas, conhecidos como *estadors*, que se destinava originalmente a estes animais.

Junto à zona da piscina há uma *barraca de roter*, uma estrutura abobadada de pedra, característica da ilha de Maiorca, construída com a técnica tradicional da pedra seca. Estas estruturas abundam nos campos cercanos, pelo que se quis construir uma junto ao hotel para dotá-lo com um carácter mais rural. A barraca funciona como casa de banho e alberga os duches exteriores vinculados à piscina.

One of our main aims was to carry out the building and restoration with meticulous care over each detail so as to create an ensemble that was exceptional and at the same time functional and homely. The idea was to build a hotel in which the guests might appreciate the local character, simple and unpretentious, with spaces allowing them to enjoy this unique setting.

Uno de los objetivos principales que perseguimos fue el de llevar a cabo una construcción y una restauración en las que se cuidara la ejecución de cada detalle, para crear así algo que, siendo singular, fuera a la vez práctico y confortable. La idea era construir un hotel desde el que los huéspedes pudieran apreciar el carácter del lugar, sencillo y sin grandes pretensiones, con espacios que permitieran disfrutar de este contexto único.

Um dos objetivos principais que perseguimos foi o de efetuar uma construção e uma restauração nas que se cuidava a execução de cada detalhe, para criar assim algo que, sendo único, fosse ao mesmo tempo prático e confortável. A ideia era construir um hotel desde o qual os hóspedes pudessem apreciar a personalidade do lugar, simples e sem grandes ostentações, com espaços que permitissem disfrutar deste contexto único.

Outer facade of the main building rendered with lime mortar | Fachada exterior del edificio principal revocada con mortero de cal | Fachada exterior do edifício principal rebocada com argamassa de cal (Nando Esteva)

Swimming pool with the *barraca de roter* and native vegetation used in the garden | Vista de la piscina con la *barraca de roter* y la vegetación autóctona utilizada para el jardín | Vista da piscina com a *barraca de roter* e a vegetação autóctona utilizada para o jardim (Nando Esteva)

One of the features regarded as most significant was the main facade, presenting the building to the outer public domain. Special care was also given to the transition areas between the courtyard and the pool area, beyond the *estador* at the end of the hotel. Now Can Ferrereta, which took two years to complete, has become an integral part of the town and blends nicely with its built surroundings.

One essential part of the project was the landscape design, devised and supervised by us. We sought to bring the countryside into the hotel's exterior areas and to evoke the look and scent of the island's landscape. We took the local environment as a reference and used native plants, especially those requiring little water, such as rosemary and lavender, and trees such as olive or mastic trees. We also preserved a great araucaria already growing in the main courtyard. This is one of the tallest trees in the town and has become one of the new hotel's most recognizable features, and still has a striking presence in the vicinity.

Entre los elementos que fueron considerados más relevantes se encuentra la fachada principal, como representación del edificio hacia el espacio público. También se puso especial cuidado en los espacios de transición entre el patio y la zona de la piscina, más allá del *estador* que se encuentra en el extremo del hotel. Ahora, Can Ferrereta, que ha tardado dos años en completarse, se ha convertido en una parte integral del pueblo, y se encuentra perfectamente integrado entre los edificios circundantes.

Un elemento esencial de esta obra ha sido el proyecto de paisajismo, concebido y supervisado por nosotros. Se buscó trasladar el campo a las zonas exteriores del hotel y evocar el aspecto y la fragancia de los paisajes de la isla. Se tomó como referencia el entorno del lugar y se utilizaron las plantas autóctonas de la región, especialmente aquellas que requieren poca agua, como el romero y la lavanda, y árboles como el olivo o el llamado pistacho lentisco. Se ha conservado además una gran araucaria ya existente en el patio principal. Se trata de uno de los árboles más altos del pueblo, que se ha convertido en uno de los elementos más reconocibles del nuevo hotel y que sigue teniendo una importante presencia en el exterior.

Entre os elementos que foram considerados mais relevantes, encontra-se a fachada principal, como representação do edifício face ao espaço público. Também se pôs especial cuidado nos espaços de transição entre o pátio e a zona da piscina, mais além do *estador* que se encontra no extremo do hotel. Agora, Can Ferrereta, que demorou dois anos para ser completada, converteu-se numa parte integral da localidade, e encontra-se perfeitamente integrada entre os edifícios circundantes.

Um elemento essencial desta obra foi o projeto paisagístico, concebido e supervisionado por nós. Procurou-se deslocar o campo às zonas exteriores do hotel e evocar o aspeto e a fragância das paisagens da ilha. Tomou-se como referência o entorno do lugar e usaram-se as plantas autóctones da região, especialmente aquelas que requereriam pouca água, como o romeiro e a lavanda, e árvores como a oliveira ou o chamado pistacho lentisco. Conservou-se também uma grande araucária já existente no pátio principal. Trata-se de uma das árvores mais altas da localidade, que se converteu num dos elementos mais reconhecível do novo hotel e que continua a ter uma importante presença no exterior.

With the use of natural materials, we produced a building fully integrated with the local architecture, maintaining the essence of traditional building in this part of the Mediterranean. The work was done always with this maxim in mind: "Once we have gone, no one should even know we were here".

Gracias al uso de los materiales naturales se ha construido un edificio plenamente integrado en la arquitectura local, que mantiene la esencia de la arquitectura tradicional de esta zona del Mediterráneo. En todo momento se trabajó con la siguiente máxima en mente: "que, cuando nos hayamos ido, ni siquiera sepan que hemos estado allí".

Graças ao uso de materiais naturais, construiu-se um edifício plenamente integrado na arquitetura local, que mantém a essência da arquitetura tradicional desta zona do Mediterrâneo. Em todo o momento trabalhou-se com a transmitir seguinte ideia: "terminar o serviço sem que se percebam que metemos mãos à obra".

Can Ferrereta from the north | Vista de Can Ferrereta desde el norte | Vista de Can Ferrereta a norte
(Nando Esteva)

Biographies | Biografías | Biografias

Sergi Bastidas

Was born in Barcelona, and founded his first studio in 1979, "BB-Architects" (currently Bastidas Architecture). He started his professional career in Barcelona, where he worked with Enric Franch Miret (his mentor), with whom he collaborated in several ADI-FAD competitions. During his career, of almost 40 years, he has worked in the Balearic Islands, Barcelona, Paris, New York and Marrakech. His projects are mainly new construction works but also renovations, always using traditional materials and techniques. He also has a special interest in integrating in his buildings the identity of the places they belong to. After many years collaborating, in 2020 finally his two sons, Gerard and Boris Bastidas, joined him in the management team of Bastidas Architecture.

Nacido en Barcelona, fundó en 1979 su primer estudio de arquitectura, BB-Architects, conocido en la actualidad como Bastidas Architecture. Inició su carrera profesional en Barcelona, donde trabajó con Enric Franch Miret, su mentor, y con quien colaboró en varios concursos de ADI-FAD. Durante sus casi 40 años de carrera ha trabajado en las Islas Baleares, Barcelona, París, Nueva York y Marrakech. Ha realizado trabajos tanto de obra nueva como de rehabilitación y ha utilizado siempre materiales y técnicas tradicionales. Tiene también un interés especial por integrar en sus edificios la identidad de los lugares a los que pertenecen. Después de varios años colaborando con sus hijos Gerard y Boris, desde el año 2020 ambos han pasado a formar parte del equipo directivo de Bastidas Architecture.

Nascido em Barcelona, fundou em 1979 o seu primeiro gabinete de arquitetura, BB-Architects, atualmente conhecido como Bastidas Architecture. Iniciou a sua carreira profissional em Barcelona, onde trabalhou com Enric Franch Miret, seu mentor, e com quem colaborou em vários concursos de ADI-FAD. Durante os seus quase 40 anos de carreira trabalhou nas Ilhas Baleares, Barcelona, Paris, Nova Iorque e Marraquexe. Realizou trabalhos tanto de obra nova, como de reabilitação, utilizando sempre materiais e técnicas tradicionais. Tem também um interesse especial por integrar nos seus edifícios a identidade dos lugares onde pertencem. Depois de vários anos a colaborar com os seus filhos Gerard y Boris, desde 2020 que ambos formam parte da equipa diretiva de Bastidas Architecture.

Gerard Bastidas Caldentey

Was born in Capdepera, Mallorca, in 1980 and he graduated as an architect in Barcelona (ESARQ, Universidad Internacional de Catalunya). After working in architecture offices in Barcelona, Berlin and Palma de Mallorca, where he finally started his own office. The collaboration with his father has been intermittent since he started his career and was reactivated more continuously after the joint construction of the Hotel Can Ferrereta.

Nació en Capdepera, Mallorca, en 1980 y se graduó como arquitecto en Barcelona (ESARQ, Universidad Internacional de Catalunya). Después de haber trabajado en estudios de arquitectura en Barcelona, Berlín y Palma de Mallorca, abrió allí su propio estudio. Desde el inicio de su carrera ha trabajado intermitentemente con su padre, el arquitecto Sergi Bastidas. Esta colaboración se ha intensificado tras la construcción del Hotel Can Ferrereta.

Nasceu em Capdepera, Maiorca, em 1980 e graduou-se como arquiteto em Barcelona (ESARQ, Universidade Internacional de Catalunha). Depois de ter trabalhado em gabinetes de arquitetura em Barcelona, Berlim e Palma de Maiorca, abriu ali o seu próprio gabinete. Desde o início da sua carreira tem trabalhado intermitentemente com o seu pai, o arquiteto Sergi Bastidas. Esta colaboração intensificou-se após a construção do Hotel Can Ferrereta.

Boris Bastidas

Was born in Mallorca in 1985 and graduated in International Commerce and Business Studies in Barcelona, in the International Business School-Pompeu Fabra University (ESCI-UPF). After working in Bastidas Architecture during five years as marketing manager, he started his own independent career in real estate consulting, both as a freelancer and collaborating with top agencies in the Balearic islands. From the beginning of 2020 he returned to the family business, getting together with Sergi and Gerard as partners at Bastidas Architecture, where he is in charge of management and marketing.

Nacido en Mallorca en 1985, se graduó en comercio internacional y ciencias empresariales en Barcelona, en la Escuela Superior de Comercio Internacional-Universidad Pompeu Fabra (ESCI-UPF). Después de haber trabajado en el estudio Bastidas Architecture durante cinco años como director de marketing, se independizó y comenzó su carrera en el mundo de la consultoría inmobiliaria, trabajando por cuenta ajena y con diversas agencias de las Islas Baleares.. A principios de 2020 volvió a la empresa familiar y se convirtió, junto a Sergi y Gerard, en socio de Bastidas Architecture, donde se encarga de la gerencia y del marketing.

Nascido em Maiorca em 1985, graduou-se em comércio internacional e ciências empresariais em Barcelona, na Escola Superior de Comércio Internacional-Universidade Pompeu Fabra (ESCI-UPF). Depois de ter trabalhado no gabinete Bastidas Architecture durante cinco anos como diretor de marketing, independentizou-se e começou a sua carreira no mundo da consultadoria imobiliária, trabalhando por conta de outrem e com diversas agências das Ilhas Baleares. No início de 2020 regressou à empresa familiar e converteu-se, juntamente com Sergi e Gerard, em sócio de Bastidas Architecture, onde se encarrega da gerência e do marketing.

Stone-Slab Roofs. Two Recent Restorations in the Alto Gállego District of Huesca Province

Cubiertas de losas de piedra. Dos restauraciones recientes en la comarca del Alto Gállego, Huesca

Coberturas de lajes de pedra. Duas restaurações na Comarca del Alto Gállego, Huesca

Jesus García Mainar

In the first few months of 2021 we had the opportunity to restore the slabbed roofs of two small folk architecture buildings located in the Alto Gállego district of the north of Huesca province in Spain.

In Barbenuta, municipality of Biescas, the restoration involved the complete rebuilding of the roof of a shelter covering that village's fountain and washhouse, including its timber truss. Buildings of this type were used traditionally for laundering domestic linen and clothes.

In Allué, municipality of Sabiñánigo, we also dismantled and rebuilt the roof of a small building that had served traditionally as a bakehouse. This roof is supported partly by a simple wooden truss and also by the house's rounded oven vault.

In both cases we were alerted to the need for restoration, before the deterioration became irreversible, by the inhabitants of each village. In both cases the buildings were also designed and built in their day with a view to what in those years was essential to the economy and the traditional way of life in these mountains, i.e. 'not spending',

En los primeros meses del 2021 tuvimos la oportunidad de desarrollar los trabajos de restauración de las cubiertas de losas* de dos pequeños edificios de arquitectura popular situados en la Comarca Alto Gállego, al norte de la provincia de Huesca, en España.

En Barbenuta, municipio de Biescas, la restauración se ha centrado en la reconstrucción completa, incluyendo su estructura de madera, de la cubierta de un edificio que alberga la fuente y lavadero de dicho pueblo. Esta tipología de edificio se utilizaba tradicionalmente para lavar la ropa doméstica y la vestimenta, y para hacer la colada.

En Allué, municipio de Sabiñánigo, se ha intervenido también en la cubierta, desmantelándola por completo, de un pequeño edificio utilizado tradicionalmente como horno de pan. Esta cubierta es sustentada en parte por una sencilla estructura de madera y en el resto del edificio por la propia bóveda semiesférica del horno.

En ambos casos la llamada de alerta para su restauración fue promovida por las personas vecinas de cada pueblo, antes de que su deterioro llegara a un punto irreversible. También en ambos casos los

Nos primeiros meses de 2021 tivemos a oportunidade de desenvolver os trabalhos de restauração de coberturas de lajes dos pequenos edifícios de arquitetura popular localizados na Comarca Alto Gállego, a norte da província de Huesca, em Espanha

Em Barbenuta, município de Biescas, a restauração centrou-se na reconstrução total, incluindo a sua estrutura de madeira, da cobertura de um edifício que alberga a fonte e o lavadouro dessa localidade. Esta tipologia de edifício era tradicionalmente utilizada para lavar a roupa doméstica e o vestuário, bem como para deixar a roupa de molho.

Em Allué, município de Sabiñánigo, também se interveio na cobertura, desmantelando-a por completo, de um pequeno edifício utilizado tradicionalmente como forno de pão. Esta cobertura é sustentada em parte por uma estrutura de madeira simples e no restante edifício pela própria abóbada semiesférica do forno.

Em ambos casos, a chamada de atenção para a sua restauração foi promovida pelos cidadãos de cada localidade, antes de que a sua deterioração chegasse a um ponto irreversível. Tanto num caso como no outro, os dois edifícios foram con-

Aerial view of a section of a road in the Sierra de Tramuntana | Vista aérea de un tramo de carretera de la Sierra de Tramuntana | Vista aérea de um troço da estrada da Serra de Tramuntana (Born To Sea Media)

on one hand, and on the other, reaching a high level of self-sufficiency.

Baking one's own bread or more conveniently meeting the need for cleanliness and hygiene as regards both clothes and linen were part of this economic model.

edificios fueron diseñados y construidos en su momento para conseguir lo que en esos años era fundamental para la economía y la forma de vida tradicional en estas montañas: el "no gastar", por un lado, y el alcanzar unos altos niveles de autosuficiencia, por otro.

El hacer su propio pan o el resolver de una manera más cómoda su necesidad de limpieza e higiene, tanto de las ropas de vestir como las utilizadas en el hogar, respondían a este modelo de economía.

cebidos e construídos no seu momento para conseguir o que naqueles tempos era fundamental para a economia e para a forma de vida tradicional nestas montanhas: o "não gastar", por um lado, e o alcançar um nível de autossuficiência alto, pelo outro.

O ato de confecionar o seu próprio pão ou o modo de resolver de uma forma mais cómoda a sua necessidade de limpeza e higiene, tanto das peças de roupa como das peças utilizadas no lar, respondiam a este modelo de economia.

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1: Building of a house in Sabiñánigo, 1934 2: Building of a house in Sabiñánigo, 1934. Detail of the finished roof with the piqueros | 1: Casa en construcción en Sabiñánigo, año 1934 2: Casa en construcción en Sabiñánigo, año 1934. Detalle de la cubierta terminada y de los piqueros | 1: Casa em construção Sabiñánigo, ano 1934 2: Casa em construção em Sabiñánigo, ano 1934. Pormenor da cobertura terminada e dos piqueros (Family archive of Rosa Pueyo)

Bakehouse in Allué

Allué is a village on the left side of the river Basa in what is known as the Basa valley, at an altitude of 860 m within the municipality of Sabiñánigo. Despite having several ruined buildings (houses and also sheep sheds), it is quite well preserved. In the last few decades some of the village's houses have been restored and several new residents and families have settled here. Two houses are worth noting in terms of traditional architecture: Casa Bergua and Casa Bara, for their size and variety and wealth of features, and above all for their tapered chimneys. Also worthy of note is the Romanesque Church of San Juan Bautista, situated on the approach to the village and restored in successive interventions by the association Amigos de Serrablo.

Horno de hacer pan en Allué

Allué es un pequeño pueblo situado en el lado izquierdo del río Basa, en el llamado valle del Basa, a 860 metros de altitud, que forma parte del municipio de Sabiñánigo. A pesar de tener varios edificios caídos, tanto viviendas como bordas, su estado de conservación es bastante aceptable. En las últimas décadas está viviendo un proceso de recuperación de sus edificios y de repoblación con nuevos vecinos y varias familias asentadas. A destacar por su interés, desde el punto de vista de la arquitectura tradicional, dos de sus casas: Casa Bergua y Casa Bara, por sus dimensiones, la variedad y la riqueza de sus elementos constructivos, y sobre todo por sus chimeneas troncocónicas. También destaca la iglesia románica de San Juan Bautista, situada a la entrada del pueblo y restaurada en sucesivas intervenciones por la Asociación Amigos de Serrablo.

Forno para a elaboração de pão em Allué

Allué é uma pequena localidade situada no lado esquerdo do rio Basa, no chamado vale do Basa, a 860 metros de altitude, que forma parte do município de Sabiñánigo. Apesar de ter vários edifícios em ruínas, quer sejam moradias quer sejam bordas, o seu estado de conservação é bastante aceitável. Nas últimas décadas, tem-se presenciado a um processo de recuperação dos seus edifícios e a um processo de repovoação com novos habitantes e várias famílias estabelecidas na área. Destacam-se pelo seu valor, desde o ponto de vista da arquitetura tradicional, duas das suas casas: a Casa Bergua e a Casa Bara, pelas suas dimensões, variedade e riqueza dos seus elementos construtivos, e sobretudo pelas suas chaminés troncocónicas. Também se destaca a igreja românica de São João Baptista, situada à entrada da localidade e restaurada em sucessivas intervenções pela Associação Amigos de Serrablo.

The restoration of the slab roof of this small freestanding building containing a traditional baking oven was made possible by the interest shown by the locals and also the activity of the Amigos de Serrablo association, responsible for channeling that interest and organizing the restoration as a workshop on slabbed roofing.

Decades ago the bakehouse may have been linked to the abbey house – an annex to the church that served as the priest's dwelling. With the restoration of the church roofs in 2005, this house, by then ruined, was finally demolished and its plot, along with the 'priest's garden', was turned into a green space for community use around the bakehouse, for residents' and visitors' leisure and recreation. The restoration of the bakehouse means that it too can

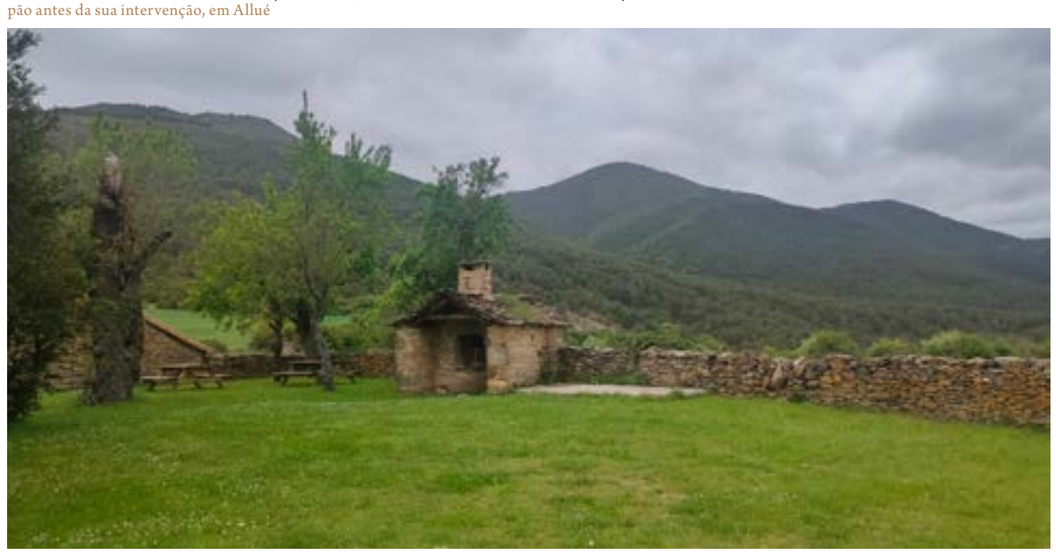
La restauración de la cubierta de losa de este pequeño edificio exento que alberga un horno tradicional de hacer pan ha sido posible gracias al interés mostrado por los vecinos y a la actividad de la Asociación Amigos de Serrablo, que se encargó de canalizar dicha inquietud y organizar la acción restauradora en forma de *Taller formativo sobre cubiertas de losa.*

Es posible que este horno décadas atrás estuviera vinculado a la casa abadía, edificio anexo a la iglesia que servía de vivienda al cura. Con la restauración de las cubiertas de la iglesia en el año 2005, la casa, ya en ruinas, terminó de demolerse y su solar pasó, junto al "huerto del cura", a crear en torno al horno un espacio verde de uso colectivo para el ocio y el esparcimiento de vecinos y visitantes.

A restauração da cobertura de laje de pedra deste pequeno edifício independente que alberga um forno tradicional de elaboração de pão foi possível graças ao interesse mostrado pelos cidadãos e à atividade da Associação Amigos de Serrablo, que se encarregou de canalizar essa inquietude e de organizar a ação de restauração sob a forma de *Taller formativo sobre cubiertas de losa.*

É possível que este forno, décadas atrás, estivesse vinculado à casa abadia, edifício anexo à igreja que servia de moradia ao padre. Com a restauração das coberturas da igreja em 2005, a casa, já em ruinas, acabou por ser demolida e o seu terreno, juntamente com a "Horta do padre", for-

Bakehouse before restoration in Allué | Horno de pan antes de su intervención, en Allué | Forno de pão antes da sua intervenção, em Allué



Roof of the bakehouse | Cubierta del horno de pan | Cobertura do forno do pão

be used again, thereby helping turn this landscaped area into a common, convivial venue.

The bakehouse may have been built by taking advantage of a pre-existing farm outhouse adaptable to this new use. Inside, on a floor of stone slabs bedded in mud, a rounded stone vault was built with an opening to the east in the front wall (the *boquera**), giving access to the oven for lighting and controlling the furnace as well as for cleaning, putting in and taking out loaves, etc. Over the *boquera*, the *chaminera** flue goes up through the wall, and outside, on the roof, it becomes a prism-shaped chimney of porous stone known as *tosca**, capped with a stone slab.

La restauración del edificio del horno permite ahora que pueda también ser utilizado de nuevo y se potencia así el uso de este nuevo espacio ajardinado como lugar de uso colectivo y convivencial.

En la construcción de este horno posiblemente se aprovechó un pequeño edificio de uso agrícola ya existente que se adaptó para este nuevo uso. En su interior, sobre un solado de losas de piedra asentadas con barro, se construyó una bóveda semiesférica de piedra en la que se dejó un vano hacia el este en el muro frontal, la *boquera**, que permitía el acceso al horno tanto para encender y controlar el fuego en su interior, como para limpiarlo, meter y sacar los panes, etc. Sobre la *boquera*, la *chaminera**, que asciende por el interior de ese muro y que conforma en el exterior, sobre el tejado, un elemento constructivo de forma prismática, de poco alzado, construido con piedra porosa, la denominada *tosca**, y rematado con una losa de piedra.

mou um espaço verde à volta do forno de uso coletivo para o ócio e o espairecimento de cidadãos e visitantes. A restauração do edifício do forno permite agora que este possa ser também utilizado novamente, potenciando assim o uso deste novo espaço ajardinado como local de uso coletivo e convivencial.

Para a construção deste forno provavelmente se tenha aproveitado um pequeno edifício de uso agrícola já existente que se adaptou para este novo uso. No seu interior, sobre um pavimento de lajes de pedras assentadas com barro, contruiu-se uma abóbada semiesférica de pedra na que se deixou um vão orientado a este na parede frontal, a *boquera**, para permitir o acesso ao forno, ora para acender e controlar o fogo no seu interior, ora para limpá-lo, pôr e tirar os pães, etc. Sobre a *boquera*, a *chaminera**, que ascende pelo interior dessa parede e que confirma no exterior, no telhado, um elemento construtivo de forma prismática, de pouco alçado, construído com pedra porosa, a denominada *tosca**, e rematado com uma laje de pedra.

As the oven was not in a regular house as it would normally have been, it lacks the premises known as *masadería**, where flour would be sifted, dough kneaded and loaves shaped. But this oven building does have a small canopy-like roof extension resting on the side walls, sheltering the *boquera* opening to the interior from wind and rain.

The displaced, broken or charred slabs no longer served their weather-proofing function and rain had been getting through to the interior in several places, causing a progressive deterioration that was also starting to affect the oven vault's stability.

The workshop was held with a view to the rebuilding of the bakehouse's gable slab roof. It combined various contributions. On one hand, the involvement in the restoration of the participants, some from the village itself. On the other, the participation of Sabiñánigo town council, which supplied the materials required for the work. Organization and publicity were taken care of by the association Amigos de Serrablo, as was the funding of the professional help needed at some stages. Finally, the pro bono contribution of the person in charge of the training and the restoration process was also essential.

With the workshop participants (about six each weekend), several restoration tasks were undertaken: erection of scaffolding, dismantling of the existing roof, transporting and selecting of slabs, clearing and removal of all the existing fill over the oven vault, and cleaning of the upper side of the oven stones left visible.

Al estar el horno fuera de la casa, dentro de la que solía encontrarse, no cuenta con el espacio denominado *masadería**, que era donde se cernía la harina, se preparaba la masa, se amasaba y se daba forma a los panes. Sí cuenta este horno con una pequeña prolongación de la cubierta a modo de visera que apoyada en los muros laterales, protege de la lluvia o el viento el acceso por la *boquera* al interior del horno.

Las losas desplazadas, rotas o quemadas ya no cumplían su función de impermeabilizar y la entrada de agua en el edificio a través de varias zonas había ido provocando un creciente deterioro del edificio que empezaba a afectar también a la estabilidad de la propia bóveda del horno.

El taller realizado tenía como objetivo reconstruir la cubierta de losa a dos aguas del edificio del horno. Aunaba en su planteamiento varios esfuerzos. Por un lado, la colaboración de las personas participantes, algunas del propio pueblo. Por otro, la participación del Ayuntamiento de Sabiñánigo, qué aportó los materiales que se precisaron para la intervención. La organización y la difusión corrieron a cargo de la Asociación Amigos de Serrablo, así como la financiación de las intervenciones profesionales que fueron necesarias en algunas fases. Finalmente, fue también fundamental nuestra colaboración desinteresada como responsables de la formación y del proceso de restauración.

Con las personas asistentes al taller, en torno a seis cada fin de semana, se acometieron diversos trabajos del proceso de restauración: el montaje del andamio, el desmantelamiento de la cubierta, el traslado y la selección de las losas, el vaciado y la retirada de todo el material de relleno existente sobre la cúpula del horno, y la limpieza en su cara superior de las piedras del horno que quedaron a la vista.

Como o forno está fora da casa, dentro da que se costumava encontrar, não está provido com o espaço denominado *masadería**, que era onde se peneirava a farinha, se preparava a massa, se amassava e se dava forma aos pães. Este forno conta sim com uma pequena prolongação da cobertura a modo de pala que, apoiada nas paredes laterais, protege o acesso pela *boquera* ao interior do forno da chuva ou do vento.

As lajes descolocadas, partidas ou queimadas já não cumpriam com a função de impermeabilização e a entrada de água no edifício através de várias zonas tinha provocado um aumento da deterioração do edifício que já começava a afetar também a estabilidade da própria abóbada do forno.

O *workshop* realizado tinha como objetivo a reconstrução da cobertura de laje a duas águas do edifício do forno. A sua abordagem requereria vários esforços. Por um lado, a colaboração de pessoas participantes, algumas da própria localidade; e pelo outro, a participação da Câmara Municipal de Sabiñánigo mediante a contribuição de materiais necessários para a intervenção. A organização e a divulgação, bem como o financiamento das intervenções profissionais que foram necessárias nalgumas fases ficaram sob a responsabilidade da Associação Amigos de Serrablo. Por último, foi também fundamental a colaboração desinteressada do responsável pela formação e processo de restauração.

Com os participantes do *workshop*, aproximadamente seis em cada fim de semana, realizaram-se diversos trabalhos do processo de restauração: a montagem dos andaimes, o desmantelamento da cobertura, o transporte e a seleção de lajes, o vazamento e a retirada de todo o material de enchimento existente na cúpula do forno, e a limpeza no lado superior das pedras do forno que ficaram expostas.

Following these tasks, our firm, specialized in such work, continued with the clearing and cleaning of the vault's extrados and the task of adding materials to fill in the volume required to form the roof's two slopes. In areas needing greater volume, this fill was made with lime mortar and stones taken from the original infill. Where the layer needed was thinner, we used a mixture of mortar and expanded clay pebbles.

After leaving this to set for several days, we restored the wooden structure supporting the roof extension beyond the bakehouse itself and waterproofed the whole roof surface.

Tras estas actuaciones, nuestra empresa, especializada en este tipo de trabajos, continuó con la limpieza y el saneado del trasdós de la bóveda y con la labor de reposición de nuevo material para recuperar el volumen necesario para la formación de ambas pendientes del tejado. Este relleno se realizó con mortero de cal y las propias piedras extraídas del relleno original en las zonas que necesitaban un mayor volumen. En aquellas donde la capa requerida era de menor entidad, se utilizó una mezcla de mortero con bolas de arcilla expandida.

Tras varios días de fraguado, se procedió a la restauración de la estructura de madera que sustentaba la prolongación del tejado fuera del horno en sí y a la impermeabilización de toda la superficie de la cubierta.

Após estas ações, a nossa empresa, especializada neste tipo de trabalhos, continuou com a limpeza e a reparação do tardoz da abóbada e com o labor de reposição de novo material para recuperar o volume necessário para a formação das duas pendentes do telhado. Este enchimento foi realizado com argamassa de cal e com as próprias pedras extraídas do enchimento original nas zonas que precisavam mais volume. Naquelas onde a camada requerida era de menor importância, foi utilizada uma mistura de argamassa com bolas de argila expandida.

Após vários dias de presa, procedeu-se à restauração da estrutura de madeira que sustentava a prolongação do telhado fora do forno em si e à impermeabilização de toda a superfície da cobertura.

1: Removal of infill over the vault with workshop participants 2: Full dismantling of the roof | 1: Retirada del material de relleno sobre la cúpula con los asistentes al taller 2: Desmontaje completo de la cubierta | 1: Retirada do material de enchimento sobre a cúpula com os participantes do workshop 2: Desmontagem completa da cobertura

1

2

Restoration of the wooden roof structure and formation of its two slopes with new materials | Restauración de la estructura de cubierta en madera y formación de las dos aguas con el nuevo material | Restauração da estrutura da cobertura em madeira e formação das duas águas com o novo material

Before stone slabs or flagstones are laid, the question always arises of whether waterproofing is needed or can be done without. And also of whether the use of present-day materials is compatible with traditional building. In the past, roofs were not waterproofed as such and water was kept out by the roofing materials themselves – in this case stone slabs, which, properly laid, had to keep rainwater out of the building. Nor did roofers have the waterproofing materials that we have today. And the use made of buildings (houses, sheep sheds, stables, bakehouses, etc.) was also very different from what it is today, as our ways of living in and with them have changed a lot in a short time.

This debate needs to be had, but suffice it to note in our case that, as in many other spheres, each of the two options has advantages and also drawbacks. Personally I feel that waterproofing this type of roof is not indispensable, although we do so quite regularly. The choice will also depend on the use to be made of the building: whether it is a dwelling to be lived in continuously or sporadically, whether it is for religious or secular use, etc. What matters is that if we opt for waterproof sealing,

A falta básicamente de la colocación de las losas o lajas de piedra, siempre surge la pregunta acerca de si la impermeabilización es necesaria o si podemos prescindir de hacerlo. Y también sobre si la utilización de nuevos materiales es compatible con la construcción tradicional. En el pasado no impermeabilizaban las cubiertas, ya que tradicionalmente la impermeabilización se conseguía con el propio material de cubrición, en este caso las losas de piedra, que, debidamente colocadas, tenían que impedir que el agua penetrara en el interior del edificio. Tampoco tenían los materiales que ahora existen precisamente para este fin. Y el uso que se hacía de los edificios (viviendas, bordas, cuadras, hornos, etc.) era, por otro lado, muy distinto del actual, pues las formas de vivir y de convivir con ellos han cambiado mucho en poco tiempo.

Se trata de un debate necesario, pero que podemos zanjar en este caso señalando que, como en otras muchas cosas, cada una de las dos opciones tiene sus ventajas a la vez que genera inconvenientes. Personalmente considero que no es imprescindible la impermeabilización de este tipo de cubiertas, aunque lo hacemos con cierta normalidad. En

À falta basicamente da colocação da lousa ou laje de pedra, surge sempre a questão sobre se a impermeabilização é necessária ou se se pode prescindir da mesma; e também sobre se a utilização de novos materiais é compatível com a construção tradicional. Dantes não se impermeabilizavam as coberturas, já que tradicionalmente a impermeabilização era conseguida com o próprio material de cobrição, neste caso as lajes de pedra, que, devidamente colocadas, impediam a penetração de água no interior do edifício. Também não se dispunham dos materiais que agora existem precisamente para este fim. E o uso que se fazia dos edifícios (moradias, bordas, estábulos, fornos, etc.) era, por outro lado, muito diferente ao atual, pois as formas de viver e de conviver com eles mudaram muito em pouco tempo.

Trata-se de um debate necessário, mas que neste caso podemos resolver indicando que, como noutras muitas coisas, cada uma das duas opções tem ao mesmo tempo as suas vantagens e os seus inconvenientes. Pessoalmente considero que não é imprescindível a impermeabilização deste tipo de coberturas, embora a façamos com certa normalidade. Nesta decisão influi a

we should forget this seal when laying the slab roof. Only in this way will we build a roof that properly performs its main function of shedding water from the building, to which end we must take care in choosing how many slabs to use, their size, their gradient, their inclination, etc.

esta decisión influye el uso que se vaya a hacer del edificio: si es una vivienda de uso continuado o se habitará de forma esporádica, por ejemplo, o si el uso del edificio es religioso o civil. Lo fundamental es que, si optamos por impermeabilizar, procuremos olvidarnos de que está impermeabilizada al realizar la cubierta de losas. Sólo así es posible realizar una cubierta que cumpla de forma óptima con su función principal: expulsar el agua hacia el exterior del edificio, para lo que es fundamental cuidar la cantidad de losas que se utilice, su tamaño, su pendiente, su inclinación, etc.

utilização que se vai dar ao edifício: se se trata de uma moradia de uso habitual ou de uso temporário, por exemplo, ou se o uso do edifício é para fins religiosos ou civis. O importante é, se nos decidimos pela impermeabilização, procurar esquecer que está impermeabilizada ao realizar a cobertura de lajes. Só assim é possível realizar uma cobertura que cumpra de forma ótima com a sua função principal: expulsar a água para o exterior do edifício, pelo que é importante atender à quantidade de lajes que se vai utilizar, ao seu tamanho, à sua pendente, inclinação, etc.

1: Laying of leras and beginning of the eave 2: Laying of slabs over the mud bedding and a waterproof membrane | 1: Colocación de leras e inicio del alero 2: Colocación de losas sobre una cama de barro y la lámina de impermeabilización | 1: Colocação de leras e início do beiral 2: Colocação das lajes sobre uma camada de barro e a lâmina de impermeabilização

1

2

With our experience of some 31 years of making this type of roof, in which we have tried introducing the modern waterproofing concept into traditional slabbed roofing with various membranes and other materials, we normally use the following system – which works well enough, though it also has drawbacks. We set the *leras**, the larger slabs used for forming the eave, in their final position. On the substrate, normally of wooden planks, we spread a sheet of geotextile. Over this, parallel to the eave and about 35 cm apart, we tack on wooden battens with a cross-section of some 30 x 15 mm, after sanding their edges and treating them with borax, linseed oil and turpentine. We lay the sheet of geotextile so that it covers the whole roof surface with a little overlap on the *lera* slabs. The battens both hold down the geotextile and perform the vital function of breaking up the planks' smooth incline, creating the necessary irregularity. They also pin down the first strip of synthetic rubber (EPDM) sheeting. We lay this sheeting in strips 1.5 m wide, parallel to the eave, over the geotextile and the other battens. The sheets totally cover the *lera* eave slabs. We lay a second sheet of EPDM over the first one with an overlap of some 12 cm so that the batten holding down the first sheet is covered, and the two are joined with adhesive. We follow the same process until the whole roof surface is sheeted over. Then, once the *cuchillo** and *contracuchillo* *joint slabs have been laid, we trim and remove the visible portions of sheeting, uncovering the *leras*.

Thus if water gets in through the slabs at any point, it will drain out over the *leras* without wetting the walls. As the sheeting is trimmed to the shape of the slabs, at no point of the roof is it visible from the exterior.

Con nuestra experiencia de unos treinta años realizando este tipo de cubiertas, que nos ha llevado a probar diferentes láminas y materiales para introducir ese nuevo concepto de impermeabilización en cubiertas tradicionales de losa, el sistema que utilizamos normalmente y que, aunque funciona bien, también genera algún inconveniente, es el siguiente: dejamos colocadas de manera definitiva las *leras**, las losas de mayor tamaño que se utilizan para conformar el alero. Sobre el soporte, normalmente de tablas de madera maciza, extendemos una lámina de geotextil. Sobre ella, paralelos al alero, y separados unos 35 centímetros entre sí, clavamos rastreles de madera de sección próxima a 30 x 15 milímetros, lijadas sus aristas y tratados con sales de bórax, aceite de linaza y esencia de trementina. El geotextil lo colocamos de forma que cubre toda la superficie del tejado con algo de solape sobre las *leras*. Los rastreles, además de sujetar el geotextil, tienen la importante función de romper el plano inclinado y liso del tablero y generar el relieve necesario. Sujetan también la primera tira de una lámina de caucho sintético (EPDM). Esta lámina la colocamos en tiras de un metro y medio de ancho, en paralelo al alero, sobre el geotextil y el resto de rastreles. Con estas tiras cubrimos en su totalidad las *leras* del alero. La segunda tira de EPDM la colocamos con un solape de unos doce centímetros sobre la primera, de forma que quede tapado el rastrel que sujeta la primera tira y que quede unida a ésta con adhesivo. Seguimos este mismo proceso hasta cubrir con ellas toda la superficie del tejado. Luego, una vez colocados los *cuchillos** y *contracuchillos**, recortamos y retiramos los trozos de lámina que quedarían a la vista y dejamos visibles las *leras*.

De esta manera, si entra agua en algún punto a través de las losas, ésta saldrá por encima de las *leras* sin humedecer los muros. Al recortar la lámina de forma que se adapte el corte a la forma de las propias losas, la lámina no es visible desde el exterior en ningún punto de la cubierta.

A nossa experiência de uns 30 anos a realizar este tipo de coberturas levou-nos a testar diferentes tipos de lâminas e materiais para introduzir esse novo conceito de impermeabilização em coberturas tradicionais de laje. O sistema que habitualmente usamos, ainda que funcione bem, também gera algum inconveniente, e é o seguinte: deixamos colocadas de forma definitiva as *leras**, as lajes de maior tamanho que se utilizam para conformar o beiral. Sobre o suporte, normalmente de tábuas de madeira maciça, estendemos uma lâmina de geotêxtil. Sobre esta, paralelamente ao beiral, e separados por uma distância de uns 35 centímetros entre si, pregamos ripas de madeira de secção próxima a 30 x 15 milímetros, uma vez lixadas as suas arestas e tratadas com sais de bórax, óleo de linhaça e essência de trementina. O geotêxtil foi colocado de forma a cobrir toda a superfície do telhado com alguma sobreposição sobre as *leras*. As ripas, para além de fixarem o geotêxtil, cumprem com a importante função de romper o plano inclinado e liso da placa e criar o alivio necessário. Também seguram a primeira faixa de uma lâmina de borracha sintética (EPDM). Esta lâmina foi colocada em faixas de um metro e meio da largura, paralelamente ao beiral, sobre o geotêxtil e as restantes ripas. Com estas faixas cobrimos completamente as *leras* do beiral. A segunda faixa de EPDM foi colocada com uma sobreposição de uns doze centímetros sobre a primeira, de forma a ficar tapada a ripa que segura a primeira faixa e que fique unida a esta com adesivo. Continuamos com este mesmo processo até cobrir toda a superfície do telhado. Depois, uma vez colocados os *cuchillos** e *contracuchillos**, recortamos e retiramos os pedaços de lâmina que ficariam à vista, deixando as *leras* visíveis.

Desta maneira, se a água entrar nalgum ponto através das lajes, esta sairá por cima das *leras* sem humedecer as paredes. Ao recortar a lâmina com a mesma forma que a própria laje, esta não é visível desde o exterior em nenhum ponto da cobertura.

Laying of slabs | Colocación de las losas | Colocação das lajes

In laying the slabs on a bed of mud mortar we were assisted by the workshop participants up to the roof's completion. The result of this is good and nice-looking. Those taking part were able to knead and spread the mud, to handle and feel the slabs, seeking the right size, shape and thickness, to learn to cut them and to take off surplus parts. Every slab is different, but they are progressively fitted together, overlapping where necessary. Once they have all been laid, they can cover the roof surface with no gaps or chinks for rain to get through. The technique is simple but needs practice, as with any craft trade.

Para la colocación de las losas sobre una capa de mortero de barro se contó con la colaboración de las personas asistentes al taller, hasta finalizar la cubierta. El resultado es bueno y agradable. Los participantes pudieron amasar el barro y extenderlo; coger las losas, sentirlas, buscar su tamaño, su forma y su grosor adecuados...; aprender a cortarlas, a eliminar las partes sobrantes. Todas las losas son diferentes, pero van encajando unas con otras, unas sobre otras, solapándose donde es necesario. Una vez que todas han sido colocadas, permiten cubrir la superficie de la cubierta sin dejar huecos o agujeros por donde pueda colarse el agua. La técnica es sencilla pero requiere práctica, como cualquier oficio artesanal.

Para a colocação das lajes sobre uma camada de argamassa de barro, contámos com a colaboração dos participantes do *workshop*, até finalizar a cobertura. O resultado é bom e agradável. Os participantes puderam amassar o barro e estendê-lo; segurar as lajes, senti-las, procurar o seu tamanho, a sua forma e espessura adequadas…; aprender a cortá-las, a eliminar as partes sobrantes. Ainda que todas as lajes sejam diferentes, estas vão-se encaixando umas com as outras, umas sobre outras, sobrepondo-as onde fosse necessário. Após terem sido todas colocadas, estas permitem cobrir a superfície da cobertura sem deixar aberturas ou orifícios por onde a água se possa infiltrar. A técnica é simples, mas requer prática, como qualquer outro ofício artesanal.

But the theory is straightforward and the workshop participants were able to put it in practice. They all had the opportunity to take part in an essentially collaborative activity and to be involved in the building of a unique structure, basically replicating a pre-existing roof, in an easy-going atmosphere with no pressure beyond that inherent in the work.

La teoría, sin embargo, es básica y los asistentes al taller pudieron llevarla a la práctica. Todos tuvieron la oportunidad de participar en una actividad esencialmente colaborativa y pudieron formar parte de la construcción de un elemento singular, en el que se replicó en esencia la cubierta preexistente, en un ambiente relajado y libre de presiones externas a la propia obra.

A teoria, porém, é básica e os participantes do workshop puderam pô-la em prática. Todos tiveram a oportunidade de participar numa atividade essencialmente colaborativa e puderam formar parte da construção de um elemento único, no que se replicou na sua essência a cobertura pré-existente, num ambiente relaxado e sem pressão externa da própria obra.

Bakehouse with its roof restored | Horno de pan, con la cubierta restaurada | Forno de pão, com a cobertura restaurada

Barbenuta fountain and washhouse building

Barbenuta is located in a high valley (Val Menuta) perpendicular to the river Gállego, above Orós Alto and Orós Bajo, at an altitude of 1185 m, in the municipality of Biescas. It is notable for its interesting and well-preserved folk architecture, including especially its main square, in the middle of which is an unusual communal water well on a hexagonal plan.

The interest shown by local people in restoring the roof of the little building sheltering the village fountain and

Edificio de la fuente y el lavadero en Barbenuta

Barbenuta está situado en un alto valle, la Val Menuta, perpendicular al río Gállego, por encima de Orós Alto y Orós Bajo, a una altitud de 1185 metros, que forma parte del municipio de Biescas. Se caracteriza por el buen estado de conservación de su interesante arquitectura popular, entre la que puede destacarse su gran plaza, en cuyo centro se ubica un curioso pozo de agua de uso comunitario de planta hexagonal.

El interés mostrado por los vecinos y vecinas de este núcleo por la restauración

Edifício da fonte e o lavadouro em Barbenuta

Barbenuta localiza-se no vale alto, o Val Menuta, perpendicularmente ao rio Gállego, acima de Orós Alto e Orós Bajo, a uma altitude de 1185 metros, e forma parte do município de Biescas. Caracteriza-se pelo bom estado de conservação da sua interessante arquitetura popular, entre os quais destacamos a sua grande praça, em cujo centro de encontra um curioso poço de água de uso comunitário de planta hexagonal.

O interesse mostrado pelos cidadãos deste núcleo a favor da restauração da

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1, 3: Washhouse building before restoration, in Barbenuta 2: 2: Fully dismantled roof | 1, 3: Edificio del lavadero antes de la restauración, en Barbenuta 2: Cubierta completamente desmantelada | 1, 3: Edifício do lavadouro antes da restauração, em Barbenuta 2: Desmantelamento total da cobertura

washhouse, given its state of disrepair and partial collapse, led the Biescas town council to commission a costed brief for the project and to set aside a budget for it.

On a rectangular plan and located on the outskirts of the village some 100 m from the church, the site is covered by a gable roof built with pine timbers and *recha** planks, surfaced with stone slabs.

The two walls flanking the fountain and washhouse support the roof, along with a stone column at the corner, and also have the function of retaining the soil of the field located behind at a higher level than the spring fountain in this little traditional system of water use and management. The system was in use until a few decades ago, when a municipal water supply with mains pipes was installed under the village streets.

de la cubierta del pequeño edificio que cobija la fuente y el lavadero del pueblo, debido a su acusado estado de deterioro y al hundimiento parcial de ciertos elementos, llevó al Ayuntamiento de Biescas a encargar una memoria valorada que permitiera acometer dicha actuación y reservar una partida económica para hacer frente a su coste.

El edificio, de planta rectangular y situado a las afueras del pueblo, a unos cien metros de distancia de la iglesia, se protege con una cubierta a dos aguas armada con maderos y *recha** de pino. Su cubierta está formada por losas de piedra.

Los dos muros que rodean a la fuente y el lavadero, y que junto a un pilar de piedra en una esquina actúan como muros de carga para la cubierta, cumplen también la función de contener el terreno y el campo situados a un nivel superior de la salida de la surgencia que forma parte de este pequeño sistema de uso y gestión tradicional del agua. Este sistema estuvo en activo hasta hace unas pocas décadas, cuando se instaló la acometida de agua y la red de distribución por las calles del pueblo.

cobertura do pequeno edifício que abriga a fonte e o lavadouro da localidade, motivado pelo seu avançado estado de deterioração e de ruina parcial de certos elementos, levou a Câmara Municipal de Biescas a encarregar um relatório de avaliação que permitisse efetuar tal ação e reservar uma partida económica para fazer face ao seu gasto.

O edifício, de planta retangular e situado nas redondezas da localidade, a uns cem metros de distância, está protegido com uma cobertura a duas águas armada com madeiramentos e *recha** de pinho. A sua cobertura está formada por lajes de pedra.

As paredes que rodeiam a fonte e o lavadouro, e que junto a um pilar de pedra numa esquina atuam como paredes de carga para a cobertura, cumprem também a função de conter o terreno e o campo situados a um nível superior da saída da nascente que forma parte deste pequeno sistema de uso de gestão tradicional da água. Este sistema esteve ativo até há algumas décadas, quando se instalou o ramal de água e a rede de distribuição pelas ruas da localidade.

Through the fountain the spring feeds a water trough used by cattle and horses as well as supplying the washhouse, in which clothes and linen were traditionally laundered. The surplus water was also used, channeled through irrigation ditches and *sorrigo** conduits to fill ponds in various plots downstream for watering kitchen gardens.

The first step taken was to completely dismantle the partially collapsed roof, with reusable slabs being picked out from the debris, and then the timbers of the old roof structure were transported to the workshop where the new truss was to be made.

For this new structure we also used timbers salvaged by us from other roofs we had taken down in various local villages. Once all the timbers to be used had been sanded, we set about assembling the new truss in our workshop, with the necessary joints, bonds and connections. We also applied a preventive treatment against wood-eating insects with borax and a 50% mix of linseed oil and turpentine.

El manantial, a través de la fuente, alimenta el abrevadero, usado por el ganado y las caballerías, así como el lavadero, en el que tradicionalmente se lavaba la ropa y se hacía la colada. El agua sobrante también se utilizaba, y era canalizada por acequias y *sorrigos** para rellenar las balsas que, dispuestas aguas abajo en diferentes terrenos, permitían el riego de los huertos domésticos.

La primera actuación consistió en el desmantelamiento completo de la cubierta, parcialmente hundida, para lo que se retiró y seleccionó la losa aprovechable del escombro, y se trasladaron los maderos que constituían la vieja estructura de la cubierta al lugar de trabajo donde se iba a rehacer la nueva estructura.

Para esta nueva estructura se utilizaron también maderos recuperados por nosotros de cubiertas que hemos desmantelado en pueblos de la zona. Una vez lijados todos los maderos a utilizar, se procedió a montar en nuestro taller la nueva estructura, realizando los encajes, encuentros y ensambles necesarios. También allí aplicamos

O manancial, através da fonte, alimenta o bebedouro usado pelo gado e cavalaria, bem como o lavadouro onde tradicionalmente se esfregava e se deixava a roupa de molho. A água sobrante também era utilizada, sendo canalizada por acéquias e *sorrigos** para encher as poças que, dispostas água abaixo nos diferentes terrenos, permitam a rega das hortas domésticas.

A primeira ação consistiu no desmantelamento completo da cobertura, parcialmente em ruinas, tendo-se retirado e selecionado a laje aproveitável do escombro, e tendo-se transportado o madeiramento que constituía a velha estrutura da cobertura para o local de trabalho onde se iria refazer a nova estrutura.

Para esta nova estrutura também utilizamos madeiramentos, que foram recuperados por nós, de coberturas desmanteladas nas localidades da zona. Depois de lixar todos os madeiramentos que iam ser utilizados, procedeu-se à montagem da nova estrutura na nossa oficina, realizando os encaixes e as uniões necessários. Também ali

Once finished, the structure was disassembled and transported to the washhouse, where it was fitted onto the already prepared masonry.

Before dismantling the old roof we had taken various measurements of the building and the roof structure for use later in making the new one. We also checked the gradients of the two slopes. What is the right gradient for such roofs? In our region it is an incline of some 33º, or 66%. Though there are a few degrees of latitude either way in which slabs may still be laid, this is the ideal value.

And how did these gradients use to be calculated? I was told about this by Ángel Gracia Sampietro, a mason born actually in Barbenuta and now deceased, with whom I had the fortune to work as I was starting in the trade. What they did was to stretch a thin rope from one wall to the other and then fold it into three, and that measure, a third of the rope's length, was the height to be given to the roof ridge. They needed no measuring tape or mathematical calculations.

un tratamiento preventivo contra los xilófagos a base de sales de bórax y una mezcla al 50% de aceite de linaza y de esencia de trementina. La estructura, una vez acabada y desmontada, se trasladó al lavadero, donde se incorporó a la obra ya preparada.

Antes de desmantelar la cubierta tomamos diferentes medidas del edificio y de la estructura, que utilizamos posteriormente para realizar la nueva. También comprobamos las pendientes de ambas aguas. ¿Cuál es la pendiente adecuada para este tipo de cubiertas? En nuestra zona es una inclinación de unos 33º, o de un 66%. Aunque hay una horquilla de algunos grados por arriba o por abajo, en la que todavía es posible la colocación de la losa, esta es la medida ideal para ello.

¿Cómo se calculaban antes estas pendientes? Esto me lo explicó Ángel Gracia Sampietro, *piquero** ya fallecido nacido en el propio Barbenuta, con el que tuve la suerte de trabajar cuando me iniciaba en el oficio. Para ello, extendían una cuerda fina de muro a muro, la doblaban en tres partes iguales y, esa medida, la tercera parte de la cuerda, les indicaba la altura que tenían que dar a la parte alta del tejado terminado. No necesitaban cinta métrica ni hacer cálculos matemáticos.

aplicamos um tratamento preventivo contra xilófagos à base de sais de bórax e uma mistura de 50 % de óleo de linhaça e de essência de trementina. A estrutura, uma vez terminada e desmontada, foi transportada para o lavadouro, onde foi incorporada à obra já preparada.

Antes de desmantelar a cobertura, tomamos diferentes medidas do edifício e da estrutura, que utilizamos posteriormente para realizar a nova. Também comprovamos as pendentes de ambas águas. Qual é a pendente adequada para este tipo de coberturas? Na nossa zona é uma inclinação de uns 33º, ou de 66 %. Ainda que haja uma diferença de alguns graus acima ou abaixo, na que ainda é possível a colocação da laje, esta é a medida ideal para isso.

Como se calculavam antes estas pendentes? Isto foi-me explicado por Ángel Gracia Sampietro, um *piquero** - já falecido - nascido na própria localidade de Barbenuta, com quem tive a sorte de trabalhar quando comecei o ofício. Para isso, estendia-se uma corda fina de parede a parede, dobrava-se a corda em três partes iguais, e, essa medida, a terça parte da corda, indicava a altura que se devia dar à parte alta do telhado terminado. Não era necessária fita métrica nem efetuar cálculos matemáticos.

Over the wooden framework we used salvaged *rechas*, cleaned and treated in the first layer, which is visible from inside. The term *recha* denotes a plank that is split off rather than sawn, obtained by driving wedges lengthways into pine logs with few knots and a length of no more than 1.20 m. This first layer would be used as a substrate for spreading the mud bedding required for laying the slabs. As the *rechas* came directly from logs, they retained their irregular shape, their cavities and above all their distinct grain. All this made them an ideal material for ensuring that the mud bedding, on entering the cavities and irregularities and interlocking with the *recha*'s live texture, would adhere nicely to its substrate, preventing any risk of slippage.

Utilizamos *rechas* recuperadas, limpias y tratadas para la primera capa, visible desde el interior, sobre la estructura de madera. Por el nombre de *recha* se conoce a la tabla desgajada, no aserrada, que se obtenía abriendo con cuchillas de forma longitudinal trozos de pino con pocos nudos y de un máximo de 1,20 metros de longitud. Esta primera capa se utilizaba como tablero de soporte sobre el cual se extendía la capa de barro necesaria para la colocación de la losa. La *recha*, al provenir directamente del tronco, mantenía su forma irregular, sus huecos, sus nudos, y, sobre todo, sus marcadas vetas. Todo ello la convertía en un material ideal para que la capa de barro, al penetrar por los huecos e irregularidades, adaptándose a la textura viva de la *recha*, se agarrara perfectamente al soporte, evitando así la posibilidad de cualquier deslizamiento.

Utilizamos *rechas* recuperadas, limpas e tratadas para a primeira camada, visível desde o interior, sobre a estrutura de madeira. *Recha* é a nome pelo qual se denomina a tábua arrancada, não serrada, que se obtinha abrindo com lâminas de forma longitudinal pedaços de pinheiro com poucos nós e um máximo de 1,20 metros de comprimento. Esta primeira camada era utilizada como tabuleiro de suporte sobre o qual se estendia a camada de barro necessária para a colocação da laje. A *recha*, como provinha diretamente do tronco, mantinha a sua forma irregular, os orifícios, nós, e, sobretudo, o seu marcado veio. Tudo isto, convertia-a num material ideal para que a camada de barro, ao penetrar pelos orifícios e irregularidades, adaptando-se à textura viva da *recha*, agarrava-se perfeitamente ao suporte, evitando assim a possibilidade de qualquer deslizamento.

1: Cleaning of salvaged *rechas* 2: Assembly of the timber framework | 1: Limpieza de la *recha* recuperada 2: Montaje de la estructura de madera | 1: Limpeza da *recha* recuperada 2: Montagem da estrutura de madeira

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Waterproofing and laying of slabs | Impermeabilización y colocación de las losas | Impermeabilização e colocação das lajes

Roof structure from inside | Detalle interior de la estructura de la cubierta | Pormenor interior da estrutura da cobertura

Traditionally both mud and *tasca** turf were used as bearing materials between the *rechas* and the slabs. The slabs simply rested on them unattached, not fixed with mortar or any other binder. But the slabs thus had a soft substrate able to accommodate their shape and thickness and which hardened on drying. These are properties of both mud and *tasca*. The latter consists of earth and roots and is cut out with a hoe from a field or threshing ground, with mowed grass and compacted soil. It is sliced into sods two or three fingers thick and about two palms wide and long. These are laid on the *recha* planks with the roots facing up, overlaid so as to make a continuous bedding for the slabs to rest on. On such a roof, after the waterproofing described above, we seated the slabs also using mud.

The slabs we used were also salvaged from previously dismantled roofs. Such slabs were traditionally extracted from quarries with fine rock strata or in rocky areas known as loseras, where the blocks would naturally split or separate into layers of variable thickness. The stone blocks were exposed to the elements and the effects of weather, facilitating the task of splitting the layers into slabs or flagstones. The *piquero** masons knew the best strata for slabs and how to split them and extract them, using iron wedges or chisels. They would mark the points where the slabs were to be split and tap at them until a slab or flagstone came away from the block.

No working *loseras* remain. For 30 years we have sifted manually through any roofs to be dismantled or rebuilt so as to salvage the slabs, timbers, *rechas*, boards and *toscas* which, if well preserved, we then reuse to make other structures and slab roofs. Thus we keep them from ending up in a tip. Indeed, folk building has always been like this. 'Sustainability' was practiced before that term was even coined. The lifecycle of the materials used was spun out as far as possible, so that they might serve several generations. Many of the concepts we now use in seeking to define a way of life and of living on our planet regarded as necessary, urgent and now even inevitable were already an integral part of the folk wisdom and culture that had developed in harmony with the natural environment.

Traditional building always used materials and resources from its immediate environs, along with what we now call local or 'zero mile' products. The reuse and recycling of materials were also common practice. Building generated hardly any emissions, rubbish or debris and a new life was given to all waste, which also allowed jobs to be created and kept the local economy going. This way of working also encouraged public involvement.

Tradicionalmente se utilizaba tanto el barro como la *tasca** como material de apoyo entre la *recha* y la losa. Esta última simplemente se apoyaba, quedando suelta, ya que no se fijaba con mortero u otros sistemas de agarre. La losa se apoyaba así sobre un material blando, que podía adaptarse a su forma y grosor, y que, cuando secaba, se endurecía. Tanto el barro como la *tasca* cumplen con estos requisitos. La *tasca* está formada por tierra y raíces. Se extrae con la azada, de la superficie de un campo o de una era, con la hierba cortada y el terreno compactado. Se extraen trozos de dos o tres dedos de grosor y unos dos palmos en cualquiera de sus direcciones. Después se colocan esos trozos sobre la recha con las raíces hacia arriba, y se van solapando entre sí para hacer una cama continua sobre la que apoyar las losas. En esta cubierta, tras los trabajos de impermeabilización ya descritos, también utilizamos el barro para asentar la losa.

Las losas que utilizamos también fueron recuperadas de cubiertas previamente demolidas. Tradicionalmente, estas losas se extraían en canteras de estratos delgados, o en zonas rocosas conocidas como *loseras*, donde los bloques, por su naturaleza, se abrían o se separaban en capas de diferente grosor. Al quedar a la intemperie, los bloques de roca quedaban expuestos a los efectos climatológicos, lo que facilitaba la labor de separación de estas capas de roca en losas o losones*. El *piquero* conocía los bancos de losa adecuados y la forma de separar y extraer estas capas de la roca. Para ello se servía de cuñas de hierro o cinceles. Se marcaban los puntos por dónde se iba a abrir la losa, se colocaban las cuñas, y se iban golpeando éstas poco a poco hasta que la laja* o la losa se desprendía del bloque.

Ya no quedan *loseras* en activo. Desde hace treinta años desmontamos a mano aquellas cubiertas que van a ser demolidas o reconstruidas con la intención de recuperar las losas, los maderos, las *rechas*, las tablas y las *toscas* que, si están en buen estado de conservación, luego utilizamos para realizar otras estructuras y cubiertas de losa. De esta manera evitamos que acaben en la escombrera. De hecho, así ha sido siempre la construcción popular. Se practicaba la "sostenibilidad" antes incluso de que el término se inventara. Se ampliaba todo lo posible el ciclo de vida de los materiales utilizados, que daban así servicio a varias generaciones. Muchos de los conceptos que ahora utilizamos para intentar definir una forma de vida y de habitar el planeta que es considerada necesaria, urgente y ahora ya ineludible, ya estaban integrados y asimilados en los saberes populares y en las culturas que se desarrollaron de manera armónica con el medio natural.

En la construcción tradicional siempre se han utilizado los materiales y recursos del entorno más inmediato, así como los ahora llamados productos locales o de "kilómetro cero". La reutilización y el reciclaje de los materiales también eran prácticas comunes. Se construía sin apenas generar emisiones, desechos o escombros, y se daba una nueva vida a cada residuo, lo que por añadidura permitía crear empleo y favorecer la economía local. Estas actividades potenciaban además la colaboración ciudadana.

Tradicionalmente, utilizava-se tanto o barro como a *tasca** como material de apoio entre a recha e a laje. Esta última simplesmente se apoiava, ficando solta, já que não era fixa com argamassa ou outros sistemas de aderência. A laje apoiava-se assim sobre um material mole, que podia adaptar-se à sua forma e espessura, e que, quando secava, se endurecia. Tanto o barro como a *tasca* cumprem com estes requisitos. A *tasca* está formada por terra e raízes. É extraída com a enxada, da superfície de um campo ou de uma eira, com a erva cortada e o terreno compactado. Extraem-se pedaços de dois ou três dedos de espessura e de uns dois palmos em qualquer das suas direções. Depois estes pedaços são colocados sobre a *recha* com as raízes viradas para cima, e vão-se sobrepondo-se entre si para fazer um leito contínuo sobre o que apoiar as lajes. Nesta cobertura, após os trabalhos de impermeabilização já descritos, também utilizamos o barro para assentar a laje.

As lajes utilizadas também foram recuperadas de coberturas previamente demolidas. Tradicionalmente, estas lajes eram extraídas em pedreiras de estratos finos, ou em zonas rochosas conhecidas como *loseras*, onde os blocos, pela sua natureza, se abriam ou se separavam em camadas de diferente espessura. Como estão expostos à intempérie, os blocos de rocha ficavam à mercê dos efeitos climatológicos, o que simplificava o labor de separação destas camadas de rocha em lajes ou lousões. O *piquero* conhecia os bancos de laje adequados e a forma de separar e extrair estas camadas de rocha. Para isso, servia-se de cunhas de ferro ou cinzéis. Marcavam-se os pontos por onde se ia abrir a laje, colocavam-se as cunhas, e ia-se golpeando nelas pouco a pouco até que a laje ou lousa se desprendia do bloco.

Já não há *loseras* em funcionamento. Há trinta anos que desmontamos à mão aquelas coberturas que vão ser demolidas ou reconstruídas com a intenção de recuperar as lajes, o madeiramento, as *rechas*, as tábuas e as *toscas* que, se estão em bom estado de conservação, serão depois utilizadas para realizar outras estruturas e coberturas de laje. Desta maneira evitamos que terminem no entulho. Aliás, a construção popular foi sempre assim. Praticava-se a "sustentabilidade" ainda antes de este termo ter sido inventado. Ampliava-se ao máximo possível o ciclo de vida dos materiais utilizados, que davam assim utilização a várias gerações. Muitos dos conceitos que agora utilizamos para tentar definir uma forma de vida e de habitar o planeta que é considerada necessária, urgente e agora já inevitável, já estavam implementados e assimilados na sabedoria popular e nas culturas que se desenvolveram de forma harmónica com o meio natural.

Na construção tradicional sempre se utilizaram materiais e recursos do entorno imediato, bem como os contemporaneamente denominados de produtos locais ou de "quilómetro zero". A reutilização e a reciclagem dos materiais também eram práticas comuns. Construía-se quase sem gerar emissões, refugos ou escombros, e dava-se uma nova vida a cada resíduo, o que, por conseguinte, permitia criar emprego e favorecer a economia local. Estas atividades também potenciavam a colaboração cidadã.

All these values were part of traditional culture and the rural way of life of those dwelling in our mountains. When we speak of traditional building, whether in restoration or new construction, we should look not just at material or technical matters but also all these other aspects that enrich the building process.

Our work at the washhouse building, as well as recovering a public asset of great material, heritage and social value, has allowed us to reconnect with the history of those who frequented this place of old. It has allowed us to recover a site for leisure, play and conviviality – and also health and enjoyment, whether on using the fountain or on hearing the sound of naturally running water. This is a place in which to learn from our forebears about how to manage and use water, an element so vital to life. All this is also part of the building and restoration process.

Today building has become a mere economic activity. Indeed, it is industrial building, whose chief object is economic gain, that has done away with many traditional trades (*piquero* masons, artisan builders, *paretero** wallers or *losero* slab-layers) and with whole fields of building art and science. It has also swept away other time-honored trades and allied occupations: lumbermen, woodcutters, carpenters, stoneworkers, blacksmiths, tilers, plasterers, lime-makers, stuccoists, glaziers, etc.

We have allowed a great deal of knowledge linked to traditional ways of living and building to be lost, to the point of confusing the concept of progress with mere economic growth. But today we have no choice but to embrace degrowth, to learn to return to former ways. And it is on this return journey that craft trades and traditional culture may show us the way.

Todos estos valores estaban integrados en la cultura tradicional y en la forma de vida rural de las personas que habitaban nuestras montañas. Cuando hablamos de construcción tradicional, ya sea en obras de restauración o de obra nueva, no debemos fijarnos exclusivamente en las cuestiones materiales o técnicas, sino también en todos estos otros aspectos que enriquecen el propio proceso constructivo.

La intervención en el edificio del lavadero, además de permitir la recuperación de un bien común de gran valor material, patrimonial y social, nos brinda la posibilidad de conectar de nuevo con la historia de las gentes que allí acudían. Permite recuperar un espacio para el ocio, el juego y la convivencia; para la salud y el disfrute personal, tanto al hacer uso de la fuente como al escuchar el agua natural en movimiento; y también se convierte en un lugar donde aprender de nuestros antepasados cómo gestionar y hacer uso de un elemento tan esencial para la vida como es el agua. Todo esto forma también parte del proceso de construcción y recuperación.

Hoy en día la construcción se ha convertido en una actividad económica, sin más. Es precisamente la construcción industrial, cuyo primer objetivo es el beneficio económico, la que ha acabado con gran parte de los oficios tradicionales (*piqueros*, albañiles, *pareteros**, *loseros*) y con gran parte del arte y la ciencia de construir. Esto ha arrastrado consigo a otros nobles oficios y actividades relacionadas: maderistas, aserraderos, carpinteros, canteros, herreros, tejeros, yeseros, caleros, estucadores, cristaleros...

Hemos dejado que se pierdan muchos conocimientos vinculados con la manera tradicional de vivir y construir, hasta el punto de haber confundido el concepto de progreso con el mero crecimiento económico. Hoy, sin embargo, no nos queda más remedio que aprender a decrecer; que hablar de regreso y aprender a regresar. Y es en este camino de regreso donde los oficios artesanos y la cultura tradicional pueden señalarnos los pasos a seguir.

Todos estes valores estavam integrados na cultura tradicional e na forma de vida rural das pessoas que habitavam as nossas montanhas. Quando falamos de construção tradicional, seja em obras de restauração, seja de obras novas, não devemos atender exclusivamente às questões materiais ou técnicas, mas também em todos estes outros aspetos que enriquecem o próprio processo construtivo.

A intervenção no lavadouro, para além de permitir a recuperação de um bem comum de grande valor material, patrimonial e social, também nos brinda a possibilidade de conectar novamente com a história das pessoas que usufruíam daquele espaço. Permite recuperar um espaço para o ócio, o jogo e a convivência; para a saúde e o desfrute pessoal, não só pelo facto de usar a fonte, como também pelo facto de poder escutar a água natural em movimento; e também se converte num lugar onde aprender com os nossos antepassados a gerir e utilizar um elemento tão essencial para a vida como é a água. Tudo isto forma também parte do processo de construção e recuperação.

Hoje em dia, a construção converteu-se nada mais nada menos do que uma atividade económica. É precisamente a construção industrial, cujo objetivo principal é o benefício económico, a que acabou com grande parte dos ofícios tradicionais (*piqueros*, pedreiros, *pareteros**, *loseros*) e com grande parte da arte e ciência de construir. Isto arrastou consigo outros nobres ofícios e atividades relacionadas: madeireiros, serradores, carpinteiros, canteiros, ferreiros, telheiros, gesseiros, caleiros, estucadores, vidraceiros...

Permitimos a perda de muito conhecimento vinculado à forma tradicional de viver e construir, até ao ponto de confundir o conceito de progresso com o mero crescimento económico. Hoje, no entanto, não temos outro remédio senão aprender a decrescer; falar de regressão e aprender a regressar. E é neste caminho de regresso onde os ofícios artesãos e a cultura tradicional podem indicar-nos os passos a seguir.

Pine *rechas* and pegs | *Rechas* y clavijas de pino | *Rechas* e cavilhas de pinheiro

References | Referencias | Referências

Elvira Tejedor, Laura. 2021. *Las cubiertas de laja en Navarra* (Trabajo Fin de Máster inédito). Universidad Politécnica de Valencia.

Garcés Romeo, José; Gavín Moya, Julio; y Satué Oliván, Enrique. 1983. *Artesanía de Serrablo*. Sabiñánigo: Amigos de Serrablo.

Garcés Romeo, José; Gavín Moya, Julio; y Satué Oliván, Enrique. 2000. *Arquitectura popular de Serrablo*. Sabiñánigo: Amigos de Serrablo.

García Baños, Eva. 2019. *Propuesta para la viabilidad de la técnica de construcción de cubiertas tradicionales de losa del pirineo aragonés* (Trabajo Fin de Máster inédito). Universidad de Granada.

* Glossary | Glosario | Glossário

Boquera:
opening or gap left in the structure of a rounded oven vault as an entrance for lighting it or putting it out and for inserting or arranging loaves.
vano o hueco que se deja sin cerrar en la construcción de la bóveda semiesférica del horno para permitir el acceso tanto para encenderlo y apagarlo como para meter y colocar los panes.
vão ou orifícios que se deixam sem fechar na construção da abóbada semiesférica do forno para permitir o acesso, tanto para acender e apagar, como para introduzir e pôr os pães.

Chaminera:
exterior chimney feature, normally on a roof, conveying and releasing smoke from a hearth or wood stove.
elemento constructivo exterior, normalmente sobre el tejado, que conduce y da salida al humo procedente del hogar o de la cocina de leña.
elemento construtivo exterior, normalmente sobre o telhado, que conduz e dá saída ao fumo procedente la casa ou da cozinha a lenha.

Contracuchillos:
slabs laid over the *leras* between two *cuchillos.*
losas que se ponen encima de las *leras* entre dos *cuchillos.*
lajes que se poem em cima das *leras* entre os *cuchillos.*

Cuchillos:
roughly triangular slabs laid over the join between two *leras.*
losas con forma ligeramente triangular que se colocan cubriendo la unión o junta entre dos *leras.*
lajes com forma ligeiramente triangular que se colocam cobrindo a união ou junta entre duas *leras.*

Leras:
larger slabs that are the first and most prominent ones on a roof. They rest on the wall and form the eave or *alerao*, where the roof begins.
losas grandes que son las primeras y más salientes del tejado. Se apoyan sobre el muro y conforman el alero o *alerao*, sobre el cual se inicia el tejado.
lajes grandes que são as primeiras e as mais salientes do telhado. São apoiadas sobre o muro e conformam o beiral ou *alerao*, sobre o qual se inicia o telhado.

Losa o laja:
thin, flat stone slab used as roofing material. Also used in flooring.
piedra delgada y plana que se usa como material de cubrición en los tejados. También es utilizada en los suelos.
pedra delgada e fina que se usa como material de cobertura nos telhados. Também é utilizada para pavimento.

Losones:
larger and thicker slabs or flagstones used in balconies and windows.
losas de mayor tamaño y grosor, utilizadas como *solaretes* en balcones y ventanas.
lajes de maior tamanho e espessura, utilizadas nas varandas e janelas.

Masadería:
covered area by a bakehouse where flour would be sifted, dough kneaded and loaves shaped.
espacio cubierto anexo al horno donde se cernía la harina, se preparaba la masa y se daba forma al pan.
espaço coberto anexo ao forno onde se peneirava a farinha, se preparava a massa e se dava forma ao pão..

Pareteros:
craftsman who builds walls using dry stones without mortar.
persona que, mediante el uso de piedras y sin utilizar argamasa, construye paredes y muros.
pessoa que, mediante o uso de pedras e sem utilizar argamassa, constrói paredes e muros.

Piquero:
local name for a mason.
denominación local del albañil.
denominação local de pedreiro.

Recha:
plank split from a log in lengths of no more than 120 cm and laid as a substrate on a roof's timber truss.
tabla desgajada del tronco en tramos no superiores a los 120 centímetros. Se coloca como soporte sobre la estructura de madera de la cubierta.
tábua arrancada do tronco em porções não superiores a 120 centímetros. É colocada como suporte sobre a estrutura de madeira da cobertura.

Sorrigo:
covered channel used to drain off water from the ground floors of houses. Also a covered channel used to convey water to irrigate vegetable gardens.
canalización cubierta, utilizada para extraer el agua proveniente de las filtraciones de las plantas bajas de las viviendas. También se conoce así a las canalizaciones cerradas utilizadas para llevar el agua de riego a los huertos.
canalização coberta, utilizada para extrair a água proveniente das filtrações das plantas térreas das moradias. Também se conhecem assim as canalizações fechadas utilizadas para levar a água de rega às hortas.

Tasca:
sod of turf, with roots and earth, about two fingers thick and two palms wide and long, used over the *recha* planks for seating the slabs.
trozo de hierba corta, con sus raíces y tierra, de aproximadamente dos dedos de grosor y un par de palmos en cualquier dirección. Se utiliza sobre el soporte de *rechas* para dar apoyo a la losa.
pedaços de erva curta, com as suas raízes e terra, de aproximadamente dois dedos de espessura e um par de palmos em qualquer direção. É utilizado sobre o suporte de *rechas* para dar apoio à laje.

Tosca:
porous stone formed in hard-water ravines as lime particles are deposited on organic matter. It can be worked easily.
piedra porosa formada en barrancos de aguas duras al depositarse partículas de cal sobre materia orgánica. Puede trabajarse fácilmente.
pedra porosa formada em barrancos de água duras quando as partículas de cal se depositam sobre a matéria orgânica. Pode ser lavrada facilmente.

Biography | Biografía | Biografia

Jesús García Mainar

Self-taught, he has for 25 years been professionally engaged in traditional and green building in the Alto Gállego district in the north of Huesca province. For 10 years he worked as a founder partner of the company Mallata S. Coop., a cooperative of allied trades arising from and closely linked to the local rural environment. He currently heads the company. Since the foundation 35 years ago of the association Artiborain, he has been actively involved in a project for rebuilding and repopulating four publicly owned abandoned villages. In recent years he has also collaborated in the interdisciplinary 'Muretes de Arte' project, combining wall restoration and the dry-stone technique with artwork.

Autodidacta, lleva veinticinco años dedicado profesionalmente a la construcción tradicional y ecológica en la Comarca del Alto Gállego, al norte de la provincia de Huesca. Durante diez años ha trabajado como socio trabajador y fundador de la empresa Mallata S. Coop., una cooperativa de trabajos asociados surgida y vinculada estrechamente con el territorio y el mundo rural. Actualmente se encuentra al frente de la empresa. Desde la fundación, hace treinta y cinco años, de la asociación cultural Artiborain, participa de manera activa en el proyecto de reconstrucción y repoblación de cuatro pequeños pueblos deshabitados, propiedad de la administración pública. En los últimos años colabora también en el proyecto "Muretes de Arte" que de manera interdisciplinar aúna la recuperación de muros y la técnica de la piedra seca, mediante intervenciones artísticas.

Autodidata com 25 anos dedicados profissionalmente à construção tradicional e ecológica na Comarca del Alto Gállego, a norte da província de Huesca. Durante 10 anos trabalhou como sócio trabalhador e fundador da empresa Mallata S. Coop., uma cooperativa de trabalho associado surgida e vinculada estreitamente com o território e o mundo rural. Atualmente, dirige a empresa. Desde a fundação, há trinta e cinco anos, da associação cultural Artiborain, participa de forma ativa no projeto de reconstrução e repovoação de quatro pequenas localidades desabitadas, propriedade da administração pública. Nos últimos anos, também tem colaborado no projeto "Muretes de Arte" que de forma interdisciplinar unifica a recuperação de muros e da técnica da pedra seca, mediante intervenções artísticas.

Recuperación de la Real Fábrica de Paños de Brihuega, Guadalajara

Recovery of the Real Fábrica de Paños de Brihuega, Guadalajara

Recuperação da Real Fábrica de Paños de Brihuega, Guadalajara

Juan de Dios
de la Hoz Martínez

The town of Brihuega, with 2,400 inhabitants, is located at the center of the province of Guadalajara, thirty kilometers from the capital of the province and one hundred kilometers from Madrid. It is a typical Alcarria town, with the peculiarity that a high percentage of its buildings are listed as part of the Historic Artistic Heritage Catalog and, consequently, are highly protected. The most relevant elements of its built heritage are the walls, the Arch of Cozagón, the churches of San Felipe, San Miguel and Santa María de la Peña, the castle of Spanish-Muslim origin, which houses the cemetery, and the Bullfighting Arena. The Village has

Brihuega, que cuenta con cerca de 2.400 habitantes, se encuentra en el centro de la provincia de Guadalajara, a poco más de treinta kilómetros de la capital de la provincia y a cien kilómetros de Madrid. Se trata de un típico pueblo alcarreño, con la particularidad de que un elevado porcentaje de sus edificios forman parte del Catálogo de Patrimonio Histórico Artístico y, en consecuencia, cuentan con un elevado nivel de protección. Los elementos más destacados de su patrimonio construido son las murallas, el Arco de Cozagón, las iglesias de San Felipe, San Miguel y Santa María de la Peña, el castillo de origen hispano-musulmán, que alberga en su interior el

Brihuega, com aproximadamente 2400 habitantes, encontra-se no centro da província de Guadalajara, a pouco mais de trinta quilómetros da capital da província e a cem quilómetros de Madrid. Trata-se de uma localidade típica de Alcarraria, com a particularidade de que uma elevada percentagem dos seus edifícios forma parte do Catálogo do Património Histórico Artístico e, consequentemente, contam com um elevado nível de proteção. Os elementos mais destacados do seu património construído são as muralhas, o Arco de Cozagón, as igrejas de San Felipe, San Miguel e Santa María de la Peña, o castelo de origem hispano-muçulmano,

< Orthophoto of the restored roofs | Ortofoto de las cubiertas restauradas | Ortofotografia das coberturas restauradas (Joaquín Zamora)

> Photo of the lavender fields of Brihuega | Fotografía de los campos de lavanda briocenses | Fotografia dos campos de lavanda de Brihuega (Juan Carlos Gómez, http://www.turismobrihuega.com/index.php/lavanda)

become famous in recent years thanks to its spectacular lavender fields and its annual festival.

The Real Fábrica de Paños, built under the reign of Carlos III, is located on the highest part of the Village, dominating the old quarter and surrounded by gardens, on a terrace overlooking the Tajuña Valley. It is one of several textile factories promoted by King Carlos III. It reached its highest production during the 18th Century, and subsequently fell into decline. The complete state of abandonment and deterioration in which it finds itself today has accelerated the need for an intervention to avoid its complete ruin. For this reason, the City of Brihuega acquired the property early in 2017

cementerio, y la Plaza de Toros. La Villa ha alcanzado gran fama en los últimos años por sus espectaculares campos de lavanda y el festival que se celebra anualmente.

La Real Fábrica de Paños, construida durante el reinado de Carlos III, se encuentra situada en la parte más alta de la Villa, dominando el conjunto del casco antiguo y rodeada de jardines, sobre una terraza que domina el valle del Tajuña. Se trata de una de las varias fábricas textiles promovidas por el Rey Carlos III. Alcanzó su mayor nivel de producción durante el siglo XVIII y cayó posteriormente en decadencia. El completo abandono y el deterioro con que llegó a nuestros días aceleraron la necesidad de intervenir sobre ella para

que alberga no seu interior o cemitério, e a Plaza de Toros. A Villa alcançou grande fama nos últimos anos pelos seus espetaculares campos de lavanda e o festival que se celebra anualmente.

A Real Fábrica de Paños, construída durante o reinado de Carlos III, encontra-se situada na parte mais alta da Villa, dominando o conjunto do casco antigo e rodeada de jardins, sobre um terraço que domina o vale do Tajuña. Trata-se de uma das várias fábricas têxteis promovidas pelo Rei Carlos III. Alcançou o seu maior nível de produção durante o século XVIII e caiu posteriormente na decadência. O completo abandono e o deterioro com que chegou aos nossos dias aceleraram a necessidade de intervir sobre a fábrica

Panoramic view of Brihuega; close up, the Church of Santa María, in front of the Castle. Bottom right, after the line of cypress trees, the Cloth Factory can be glimpsed | Imagen panorámica de la Villa de Brihuega; en primer plano, la Iglesia de Santa María, delante del Castillo. Al fondo a la derecha, tras la hilera de cipreses, se intuye la Fábrica de Paños | Imagem panorâmica da Villa de Brihuega; em primeiro plano, a Igreja de Santa María, à frente do Castelo. Ao fundo à direita, depois da fila de ciprestes, pensa-se que seja a Fábrica de Paños (Joaquín Zamora)

State of conservation of the interior of the first floor before the intervention | Estado de conservación del interior de la primera planta previo a la intervención | Estado de conservação do interior da planta primeira antes da intervenção

in order to undertake an integral conservation, and the functional revitalization and enhancement of the building to be enjoyed as a Heritage Asset by the inhabitants of the town and all its visitors.

In 1750, during the reign of Fernando VI, the decision was made to build a Royal Cloth Factory in Brihuega, as a branch of the Guadalajara factory. Brihuega was considered an ideal location due to the presence of the Tajuña River and the abundance of natural resources such as water and wood, and the availability of skilled labor. Construction started one year later, under the direction of architect Manuel de Villegas. Shortly before its completion, twenty looms were already in operation, distributed along several houses in the Village.

evitar su ruina completa. Por este motivo el Ayuntamiento de Brihuega adquirió la propiedad a principios de 2017, con el fin de llevar a cabo una conservación integrada, así como la revitalización funcional y la puesta en valor del edificio para su disfrute como Bien Patrimonial por parte de los habitantes del pueblo y de cuantos lo visiten.

Fue en 1750, durante el reinado de Fernando VI, cuando se decidió ubicar en Brihuega una Real Fábrica de Paños como sucursal de la ya existente en Guadalajara. Brihuega se consideró un lugar idóneo debido a la presencia del río Tajuña y a la abundancia de recursos naturales como agua y leña, así como por su fácil acceso a mano de obra especializada. Un año más tarde, bajo la dirección del arquitecto Manuel de Villegas, comenzaron las obras de construcción. Poco tiempo después, antes de su finalización, ya estaban en funcionamiento veinte telares repartidos por diversas casas de la Villa.

para evitar a sua ruina total. Por este motivo, a Câmara Municipal de Brihuega adquiriu a propriedade no principio de 2012 a fim de efetuar uma conservação integrada, bem como a revitalização funcional e a valorização do edifício para usufruto como Bem Patrimonial por parte dos habitantes da localidade e de todos que a visitem.

Foi em 1750, durante o reinado de Fernando VI, quando se decidiu instalar em Brihuega uma Real Fábrica de Paños como sucursal da já existente em Guadalajara. Brihuega foi considerada o local idóneo devido à presença do rio Tajuña e à abundancia de recursos naturais como água e lenha, bem como pelo seu acesso fácil à mão de obra especializada. Um ano mais tarde, sob a direção do arquiteto Manuel de Villegas, começaram as obras de construção. Pouco tempo depois, antes da sua finalização, já estavam em funcionamento vinte teares repartidos por diversas casas da Villa.

The activity increased, and early in 1752, the number of looms had increased to thirty, and by mid-1753 there were fifty looms in operation. The number of workers at the time reached 353, including journeymen, masters, weavers and wool workers, among others. During the following years, already under the reign of Carlos III, the factory continued to expand; by 1787, there were a hundred looms in operation at the same time, which made this Factory one of the most prestigious in the country.

La actividad fue creciendo, pues a principios de 1752 los telares en uso aumentaron su número a treinta, y alcanzaron la cifra de cincuenta a mediados de 1753. El número de trabajadores ascendía entonces a 335, entre oficiales, maestros, tejedores y cardadores, entre otros. Durante los años siguientes, reinando ya Carlos III, siguieron ampliando el conjunto, de tal manera que en 1787 ya había hasta cien telares en funcionamiento de manera simultánea, lo que convirtió a esta Fábrica en una de las más prestigiosas del país.

A atividade foi crescendo, pois a princípios de 1752 os teares em uso aumentaram o seu número para trinta, e alcançaram os cinquenta a mediados de 1753. O número de trabalhadores ascendia então a 335, entre oficiais, mestres, tecedores e cardadores, entre outros. Durante os anos seguintes, já no reinado de Carlos III, continuaram a ampliar o conjunto, de tal forma que em 1787 já havia até cem teares em funcionamento de forma simultânea, convertendo esta Fábrica numa das mais prestigiosas do país.

1: State of conservation of the interior of the ground floor before the intervention 2: Recovery of the old ground floor flooring, recovery of the closed openings and new arrangement of the jars | 1: Estado de conservación del interior de la planta baja previo a la intervención 2: Recuperación del antiguo solado de planta baja, apertura de los vanos cegados y nueva disposición de las tinajas | 1: Estado de conservação do interior da planta térrea antes da intervenção 2: Recuperação do antigo lajeado da planta térrea, abertura dos vãos cegos e nova disposição das ânforas (2: Joaquín Zamora)

The Rotonda building after its restoration | Edificio de la Rotonda tras las obras de restauración | Edifício da Rotonda após as obras de restauração (Joaquín Zamora)

Finally, the crisis that struck at the turn of the century brought about a decrease in industrial activity. During the Spanish Independence War, the production of the Factory stopped and started its gradual decline until it was completely abandoned. During its long life, this singular industrial building was the subject of numerous interventions and maintenance works; the latest on record, previous to the one mentioned in this article, was commissioned in 1982 by the Dirección General de Bellas Artes to architects Mª Carmen Mostaza and Andrés Perea, with the purpose of restoring the Rotonda buildings and the chapel. Even though the structure was consolidated and the roofs and façades were repaired, the proposed rehabilitation of the interior of the building was not carried out.

Finalmente, la crisis de final de siglo supuso una reducción de la actividad industrial y durante la Guerra de la Independencia cesó la producción de la Fábrica. A partir de entonces, fue cayendo en declive hasta su completo abandono. Durante su larga vida este singular edificio industrial ha sido objeto de diversas intervenciones y obras de mantenimiento; la última de la que se tiene constancia, previa a la que se refiere este artículo, es la que la Dirección General de Bellas Artes encargó en 1982 a los arquitectos Mª Carmen Mostaza y Andrés Perea, con el objetivo de restaurar los edificios de la Rotonda y la capilla. Aunque se consolidó la estructura y se arreglaron las cubiertas y fachadas, no se llevó a cabo la rehabilitación propuesta para el interior del inmueble.

Finalmente, a crise do final do século implicou uma redução da atividade industrial e durante a Guerra da Independência cessou a produção da Fábrica. A partir de então, foi caindo em declive até ao seu completo abandono. Durante a sua longa vida, este particular edifício industrial foi objeto de diversas intervenções e de obras de manutenção; a última da que se tem conhecimento, prévia à que se refere este artigo, é a que a Dirección General de Bellas Artes encarregou em 1982 aos arquitetos Maria Carmen Mostaza e Andrés Perea, com o objetivo de restaurarem os edifícios da Rotonda (o edifício de planta circular) e a capela. Ainda que se consolidasse a estrutura e se arranjassem as coberturas e fachadas, não se realizou a reabilitação proposta para o interior do imóvel.

Aerial view of the Cloth Factory during the restoration works of the main building roofs | Imagen aérea de la Fábrica de Paños durante las obras de restauración de las cubiertas del edificio principal | Imagem aérea da Fábrica de Paños durante as obras de restauração das coberturas do edifício principal (Luis Fernando Abril)

The Cloth Factory ensemble is composed of several buildings. The main one is the Rotonda, which has a circular floor plan. Two functional linear elements branch out from it, the press and dyeing lines. This arrangement creates an ensemble structured around two interior patios: a rectangular one and a circular one. Around the latter, the Rotonda building is composed by masonry ring-shaped walls with a thickness of 1.60 m at the base, and a central structural ring made up by Alcarria stone pilasters at the lower floor that support a stone arcade. On the next floor, the structure of this central ring is lighter and the pilasters become stone pillars that support double timber beams. Finally the roof structure, also of wood, consists of a radial truss resting on pillars, each formed by an upright with struts on either side.

El conjunto de la Fábrica de Paños lo forman diferentes edificios. El principal es la Rotonda, de planta circular. De ésta nacen dos elementos funcionales lineales, que constituían los ramales de prensa y tintes. Con esta disposición de elementos se conforma un conjunto alrededor de dos patios interiores: uno rectangular y otro circular. En torno a este último patio, el edificio de la Rotonda está conformado por unos muros anulares realizados con mampostería, de 1,60 metros de espesor en su base, y un anillo central estructural formado por pilastras de piedra alcarreña en la planta inferior que soportan una arquería de mampuestos. En la siguiente planta la estructura de este anillo central se aligera y las pilastras pasan a transformarse en pilares de piedra sobre los que apoyan dobles vigas de madera. Finalmente, la estructura de cubierta, también de madera, está constituida por cuchillos radiales que apoyan sobre pilares, cada uno de ellos compuesto por un pie derecho con tornapuntas a ambos lados.

O conjunto da Fábrica de Paños está formado por diferentes edifícios. O principal é a Rotonda, de planta circular. Desta nascem os elementos funcionais lineais, que constituíam os ramais de prensa e tintas. Com esta disposição de elementos forma-se um conjunto à volta dos pátios interiores: um retangular e outro circular. À volta deste último pátio, o edifício da Rotonda está conformado por umas paredes anulares realizadas com alvenaria, de 1,60 metros de espessura na sua base, e um anel central estrutural formado por pilastras de pedra alcarrenha na planta inferior que suportam uma arcaria de blocos de pedra. No segundo piso, a estrutura deste anel central é aligeirada e as pilastras passam a transformar-se em pilares de pedra sobre os que apoiam vigas de madeira duplas. Por último, a estrutura da cobertura, também de madeira, está constituída por asnas radiais que apoiam sobre pilares, cada um deles composto por um pé direito com escoras em ambos lados.

The current restoration works, commissioned by the City Council of Brihuega, were carried out on two consecutive phases: in the first and most urgent one, the restoration of the roofs and La Rotonda and the Dyes and Presses naves were completed. These works started in the last quarter of 2017 and lasted approximately one year. The second phase of interventions focused on the recovery of the lower floor, the access and the central patio of the Rotonda; these works started in February and were completed in October and were partially financed by funds from the Cultural 1.5% Program of the Ministry of Public Works. The company in charge of the execution of all works was Lorquimur S.L., specialized in heritage restoration, which provided the appropriate staff for the execution of all works. Special

Las presentes obras de restauración, encargadas por el Excelentísimo Ayuntamiento de Brihuega, se han realizado en dos fases consecutivas: en la primera y más urgente se llevó a cabo la restauración de las cubiertas de la Rotonda y de las naves de Tintes y Prensas. Estas obras se iniciaron en el último trimestre de 2017 y tuvieron una duración aproximada de un año. La segunda fase de intervenciones se centró en la recuperación de la planta inferior, el acceso y el patio central de la Rotonda; estas obras comenzaron en febrero de 2019 y fueron culminadas en octubre del mismo año. Estos trabajos fueron parcialmente financiados por fondos procedentes del Programa 1,5% Cultural del Ministerio de Fomento. La empresa especializada en restauración del patrimonio encargada de ejecutar todos los trabajos fue Lorquimur S.L.,

As presentes obras de restauração, encarregadas pelo Excelentíssimo Ayuntamiento de Brihuega, foram realizadas em duas fases consecutivas: na primeira e mais urgente foi realizada a restauração das coberturas da Rotonda e das naves de Tintas e Prensas. Estas obras iniciaram-se no último trimestre de 2017 e duraram aproximadamente um ano. A segunda fase de intervenção centrou-se na recuperação da planta inferior, do acesso e do pático central da Rotonda; estas obras começaram em fevereiro de 2019 e culminaram em outubro do mesmo ano. Estes trabalhos foram parcialmente financiados por fundos provenientes do Programa 1,5 % Cultural do Ministerio de Fomento. A empresa especializada em restauração do património encarregada de executar todos os trabalhos foi a Lorquimur S.L., a qual proporcionou pessoal especializado

Archaeological remains of old Factory partitions found after the works | Restos arqueológicos de antiguas particiones de la Fábrica encontrados tras las obras | Restos arqueológicos de antigas frações da Fábrica encontrados após as obras (Joaquín Zamora)

mention must be made of the handicraft work needed on the timber beams; the work of the carpenters made it possible to recover most of the existing beams through detailed and precise work on each of them.

The most appropriate methodology for intervening in this type of historical projects is always based on a prior exhaustive process of historical research, followed by field work necessary to draw up the planimetric survey and the pathological study. The main goal of this restoration was to bring back the identity of the building and to recover the rich spaces that had disappeared under the rubble. Thus, the work carried out was based on reconstruction and not on demolition,

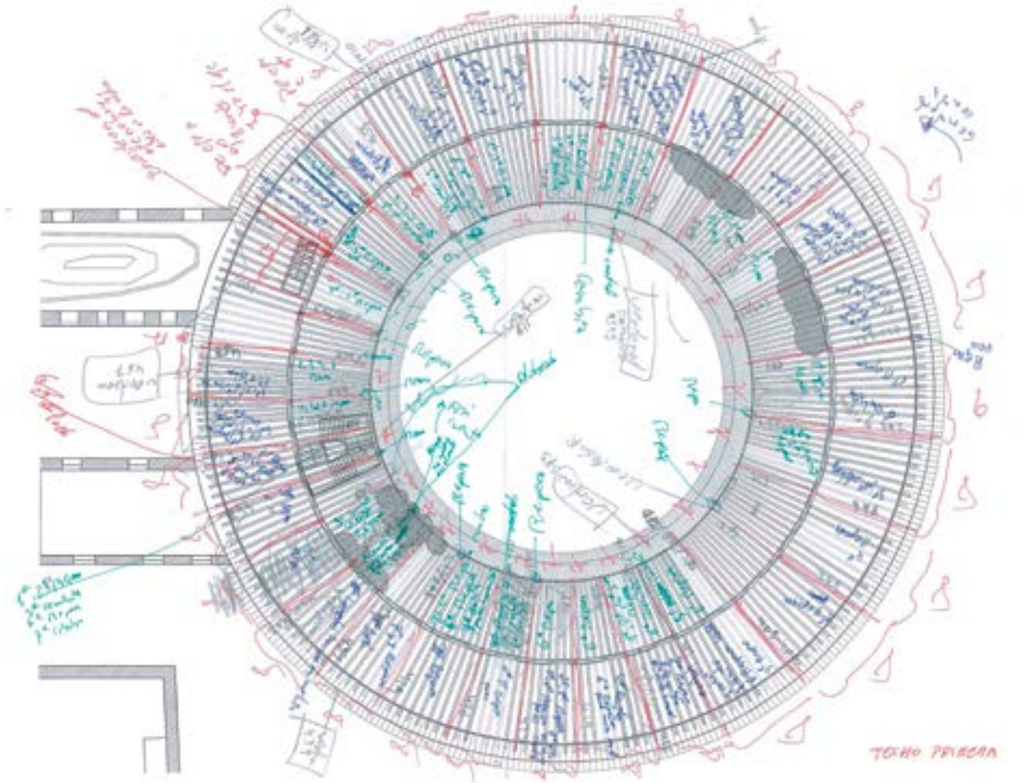
que aportó personal especializado para la ejecución de cada una de las labores. Especial mención merecen los trabajos de artesanía que hubieron de realizarse en las vigas de madera; el trabajo de los carpinteros permitió recuperar la inmensa mayoría de las vigas existentes mediante un preciso trabajo individualizado en cada una de ellas.

La metodología más adecuada para intervenir en este tipo de proyectos de carácter histórico parte siempre de un proceso previo de investigación histórica exhaustiva, al que sigue un trabajo de campo para la elaboración del levantamiento planimétrico y del estudio patológico. El objetivo principal en esta restauración fue devolver la identidad al edificio y recuperar toda la riqueza

para a execução de cada um dos labores. Especial menção merecem os trabalhos de artesanato que se tiveram que realizar nas vigas de madeira; o trabalho dos carpinteiros permitiu recuperar a imensa maioria das vigas existentes mediante um preciso trabalho individualizado em cada uma delas.

A metodologia mais adequada para intervir neste tipo de projetos de carácter histórico parte sempre de um processo prévio de investigação histórica exaustiva, ao que se lhe segue um trabalho de campo para a elaboração do levantamento planimétrico e do estudo patológico. O objetivo principal nesta restauração era devolver a identidade ao edifício e recuperar toda a riqueza especial que tinha desaparecido entre os

Sketch of the interventions on the roof structure of the Rotonda | Croquis de intervenciones sobre la estructura del techo de la planta primera de la Rotonda | Esboço de intervenções sobre a estrutura do teto da primeira planta da Rotonda



Recovery of the profiles on the deteriorated timber beams | Ejecución de las prótesis en las vigas de madera deterioradas | Execução das próteses nas vigas de madeira deterioradas

on the use of the same constructive systems and traditional materials found in the buildings, and on the integration of the archeological remains that appeared during the works, since they are also part of the history of the building.

el edificio y en la incorporación de los restos arqueológicos que aparecieron durante las obras, pues también forman parte de la historia del edificio.

espacial que havia desaparecido entre os escombros. Por ello, los trabajos llevados a cabo se basaron en la reconstrucción y no en la demolición, además de en el uso de los mismos sistemas constructivos y materiales tradicionales encontrados en

escombros. Por este motivo, os trabalhos realizados basearam-se na reconstrução e não na demolição, para além do emprego dos mesmos sistemas construtivos e materiais tradicionais encontrados no edifício e da incorporação dos restos arqueológicos que apareceram durante as obras, pois também formam parte da história do edifício.

Restored roof structure | Estructura de cubierta restaurada | Estrutura da cobertura restaurada (Joaquín Zamora)

1: Removal of the concrete slab which was presumably added during the works carried out in the 80's 2: Image of the restoration of the Rotonda roof, showing the sequence of the works carried out, from the removal of the concrete slab and the timber remains (right) to the final retiling (left) | 1: Retirada de la losa de hormigón ejecutada presumiblemente durante el transcurso de las obras llevadas a cabo en la década de los años ochenta 2: Imagen de la restauración de la cubierta de la rotonda, donde se aprecia la secuencia de los trabajos realizados, desde la retirada de la losa de hormigón y restos de tabla (derecha) hasta el retejado final (izquierda) | 1: Retirada da laje de betão executada supostamente durante o decorrer das obras efetuadas na década dos anos oitenta 2: Imagem da restauração da cobertura da Rotonda, onde se aprecia a sequencia dos trabalhos realizados, desde a retirada da laje de betão e restos de tábuas (direita) até ao retelhado final (esquerda)

The existing roof was a gable roof with ceramic tiles. Due to the previous interventions, the tiles stood on a reinforced concrete slab that generated excessive load on the load-bearing timber structure, as well as the inappropriate stiffening of the whole constructive system. Numerous timber beams had collapsed as a result of the introduction of this system. This led to the complete disappearance of some areas of the roof that let water come in, seriously damaging the interior of the building.

The current restoration, therefore, started with the removal of this rigid concrete slab that did not fit with the much more flexible timber structure and generated a huge load on the latter, and with the removal of a huge perimeter concrete ring that had caused all the rafters to rot. Once this initial work was completed, the elements that were in a bad condition were repaired and consolidated, the timber structure was restored, and the roof was retiled. The original tiles were reused for that purpose and the original timber structure, as well as the traditional joints were preserved as far as possible. This was a particularly delicate work, for the goal was to preserve as many of the original beams as possible, and to this end an on-site workshop was set up to produce glued wood profiles with a thickness of five centimeters which were used until the missing volumes were filled out.

La cubierta existente estaba construida a dos aguas con teja árabe. A causa de las intervenciones precedentes, esta cubierta se encontraba colocada sobre una solera armada de hormigón que generaba una carga excesiva en la estructura portante de madera, además de una rigidización inapropiada de todo el sistema constructivo. Debido a la introducción de este sistema, muchas de las vigas de madera habían colapsado. Esto había ocasionado la desaparición completa de algunos paños, por cuyos huecos entraba el agua, que provocaba a su paso gravísimos daños en el interior del edificio.

La presente restauración comenzó, por tanto, por la retirada de esa solera de hormigón rígida que no colaboraba con la estructura de madera, mucho más flexible, y que además generaba una carga enorme sobre ésta, así como por la eliminación de un enorme zuncho en los bordes que había provocado la pudrición de todas las vigas de los pares. Completados estos primeros trabajos, se repararon y consolidaron los elementos en mal estado, y una vez restituida la estructura de madera, y se volvió a retejar. Para ello se reutilizaron las tejas existentes y se conservó al máximo posible toda la estructura de madera original, así como los ensambles tradicionales. Esta labor fue especialmente delicada, ya que el objetivo era mantener el mayor número posible de palos originales, por lo que se organizó un taller a pie de obra donde se realizaron prótesis de madera encolada con espesores de unos cinco centímetros hasta completar los volúmenes faltantes.

A cobertura existente estava construída a duas águas com telha árabe. Nas intervenções precedentes, uma placa de betão armado tinha sido colocada sobre esta cobertura, o que gerava uma carga excessiva na estrutura portante de madeira das armações, para além de uma rigidez inapropriada de todo o sistema construtivo. Devido à introdução deste sistema, muitas das vigas de madeira tinham-se desmoronado. Isto provocou a desaparição completa de alguns panos, por cujas aberturas entrava a água, causando durante a sua passagem gravíssimos danos no interior do edifício.

A presente restauração começou, portanto, com a retirada dessa placa de betão rígido que não colaborava com a estrutura de madeira, bem mais flexível, e que também criava uma carga enorme sobre esta, bem como pela eliminação de uma enorme viga nas bordas que tinha provocado o apodrecimento de todas as vigas das varas. Uma vez completado estes primeiros trabalhos, os elementos em mau estado foram reparados e consolidados, e uma vez restituída a estrutura de madeira, voltou-se a retelhar. Para isso, utilizaram-se as telhas existentes e conservou-se ao máximo possível toda a estrutura de madeira original, bem como os ensambles tradicionais. Este labor foi especialmente delicado, já que o objetivo era manter o maior número possível de paus originais, pelo que se organizou uma oficina ao lado da obra onde se realizaram próteses de madeira colada com espessuras de uns cinco centímetros até completar o volume em falta.

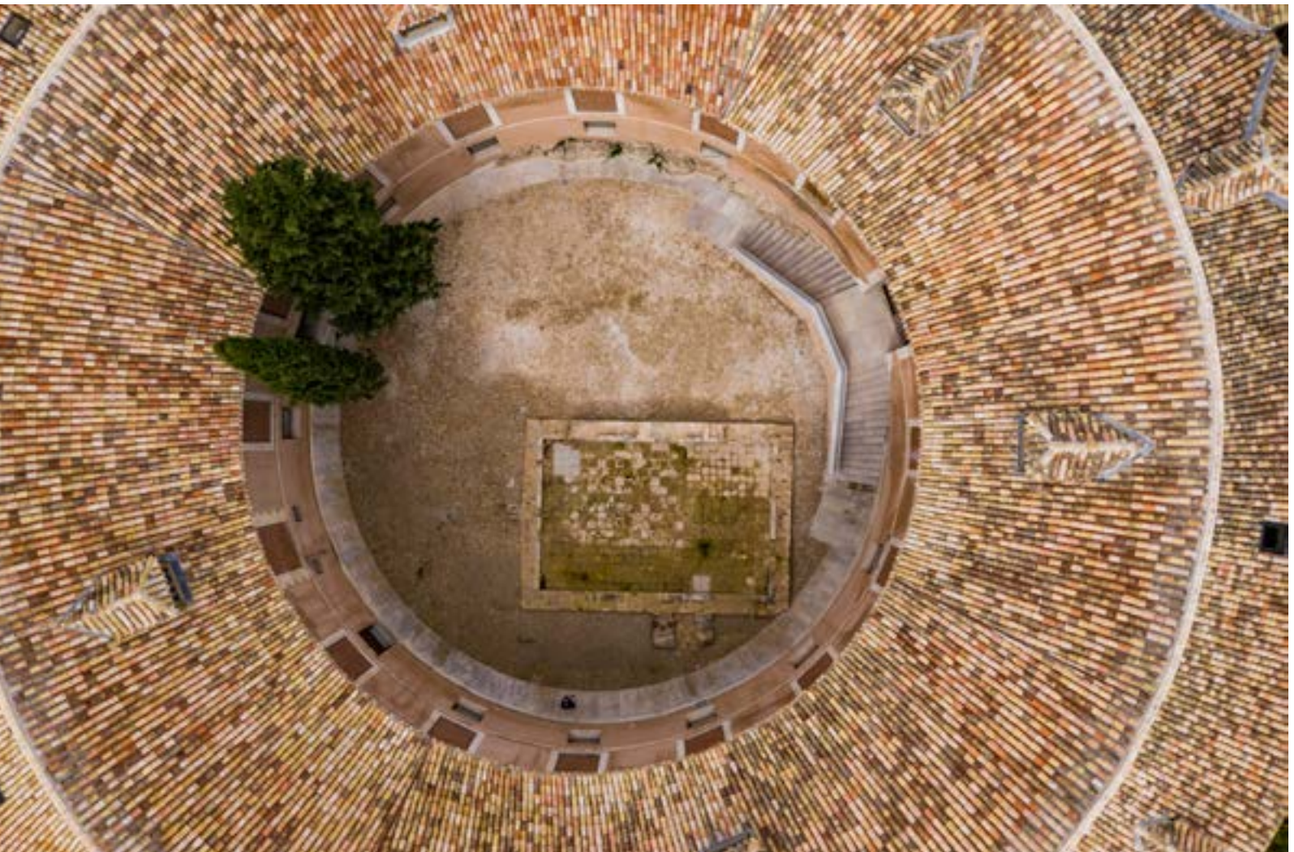
1: Pilasters of the arcades buried under the rubble; state before the second phase 2: Ground floor arcade with its actual scale after restoration works | 1: Pilastras de las arcadas enterradas bajo escombros: estado previo a la segunda fase 2: Arcada de planta baja con su escala real tras las obras de restauración | 1: Pilastras das arcadas enterradas sob os escombros: estado antes da segunda fase 2: Arcadas da planta térrea à escala real após as obras de restauração (Joaquín Zamora)

Once the roofs of the Rotonda building and of the press and dyeing naves were restored, and the progressive deterioration of the ensemble had been contained, the following works, which focused on the ground floors, could be carried out. Large amounts of filling were removed at the lowest floor, which revealed remains of the original structure and partitions of the spaces of the Factory, as well as remains of jars and old stone and ceramic floors. The removal of rubble also allowed the recovery of the actual scale of the arches, whose pilasters were buried under one meter of fillings. The restoration prioritized the use of traditional materials and techniques, and this made it possible to recover the lost ashlars that make up the ground floor arcade and the pillars of the first floor using stonework. Applying the same criteria as that used for the roof, the original timber structure of the floors was preserved as much as possible, and a detailed study was made of the beams that were in poor condition. Thus, it was possible to work on the beams whose ends had been affected by the action of water and reinforced concrete, for which glued timber profiles were made until the deteriorated section was filled in.

Una vez restauradas las cubiertas del edificio de la Rotonda y de las naves de prensa y tintes, y contenido con ello el progresivo deterioro del conjunto, se pudieron ejecutar los trabajos siguientes, centrados en las plantas bajas. En la planta inferior se retiraron primero grandes cantidades de relleno, lo que dejó al descubierto restos de la estructura original y particiones de los espacios que comprendía la Fábrica, así como restos de tinajas y antiguos solados de piedra y cerámicos. La retirada de escombros también permitió recuperar la escala real de los arcos, cuyas pilastras se encontraban enterradas bajo un metro de rellenos. En su restauración primó el empleo de materiales y técnicas tradicionales, por lo que se pudo recuperar íntegramente con cantería la sillería perdida en las pilastras que forman la arcada de la planta baja y los pilares de la planta primera. Con el mismo criterio de actuación que en la cubierta, se conservó lo máximo posible la estructura original de madera de los forjados y se realizó un estudio cuidadoso de las vigas que se encontraban en mal estado. Se pudo intervenir así sobre aquellas cuyas cabezas se habían visto afectadas por la acción del agua o del hormigón armado, para lo que se ejecutaron prótesis de madera encolada hasta completar la sección deteriorada.

Uma vez restauradas as coberturas do edifício da Rotonda e das naves de prensa e tintas, e contido com isso o progressivo deterioramento do conjunto, foi possível executar os trabalhos seguintes, centrados nas plantas térreas. Na planta inferior foram retiradas primeiro grandes quantidades de enchimento, o que deixou ao descoberto restos da estrutura original e partições dos espaços que compreendia a Fábrica, bem como restos de ânforas e antigos pavimentos de pedra e cerâmica. A retirada de escombros também permitiu recuperar a escala real dos arcos, cujas pilastras se encontravam enterradas sob um metro de enchimentos. Na sua restauração primou o emprego de materiais e técnicas tradicionais, pelo que se pôde recuperar integramente com cantaria a pedreira perdida nas pilastras que formam a arcada da planta térrea e dos pilares da primeira planta. Com o mesmo critério de atuação que na cobertura, conservou-se ao máximo possível a estrutura original de madeira das armaçoes e realizou-se um estudo cuidadoso daquelas vigas que se encontravam em mal estado. Foi possível intervir assim sobre aquelas cujas cabeças tinham sido afetadas pela ação da água ou do betão armado, pelo que se executaram próteses de madeira colada até completar a secção deteriorada.

Orthophoto of the Rotonda patio with the restored pool and access staircase | Ortofoto del patio de la Rotonda con la alberca y la escalera de acceso restauradas | Ortofotografia do pátio da Rotonda com a alberca e a escada de acesso restauradas (Joaquín Zamora)



The intervention on the patio included an archaeological dig, which allowed for the recovery of the old pool and the steps and the handrail connecting the different levels, which had disappeared and only a few remains had survived. It is important to note that water was a necessary element inside the building for the manufacture of clothes, and the interior spouts and water canals were also recovered. In order to avoid moisture, traditional lime and plaster coatings were used, and a ventilated floor system was built that allows the building to breathe and avoids the formation of moisture inside it.

La actuación sobre el patio incluyó su excavación arqueológica, lo que permitió recuperar la antigua alberca, así como los peldaños y barandilla de conexión entre los niveles, que habían desaparecido y de los que sólo quedaban huellas. Es importante recordar que el agua era un elemento necesario en el interior del edificio para fabricar las telas, por lo que también se recuperaron las gárgolas y canales interiores por los que discurría. Para evitar la aparición de humedades se utilizaron revestimientos tradicionales de cal y yeso y se realizó un sistema de solera ventilada que contribuye a que el edificio pueda respirar y no se genere humedad en su interior.

A intervenção no pátio incluiu a sua escavação arqueológica, o que permitiu recuperar a antiga alberca, bem como as escadas e o gradil de conexão entre os níveis que tinham desaparecido e dos que apenas ficaram marcas. É importante recordar que a água era um elemento necessário no interior do edifício para fabricar os tecidos, pelo que também foram recuperadas as gárgulas e os canais interiores por onde fluía. Para evitar o aparecimento de humidade foram utilizados revestimentos tradicionais de cal e gesso, e realizou-se um sistema de placa ventilada que contribui para que o edifício possa respirar e não crie humidade no seu interior.

At the time of writing this article, a final phase of construction is pending, that will restore the first floor and all the façades and existing exterior and interior woodwork, and will provide the building with the appropriate facilities for the use for which it is intended.

En el momento de redacción de este artículo queda pendiente una última fase de construcción, que permita restaurar la planta primera, así como la totalidad de las fachadas y carpinterías exteriores e interiores, y que doten al edificio de unas instalaciones adecuadas al uso al que se destine.

Aquando da redação deste artículo, estava pendente a última fase de construção, que permitisse restaurar a primeira planta, bem como a totalidade das suas fachadas e da carpintaria exterior e interior, e que dotem ao edifício de umas instalações adequadas à utilização que seja destinada.

References | Referencias | Referências

Agustí, Ernesto; Forteza, Cristina; Calvo, Jorge; Morín, Jorge; Cantallops, Laura; López, Francisco; y Hernández, María; 2007. Obras públicas de la Ilustración española. La Real Fábrica de Paños de Brihuega (Guadalajara). *Actas de las II Jornadas de Arqueología de Castilla-La Mancha*. Toledo: Diputación Provincial de Toledo.

Herrera Casado, Antonio. 1995. *Brihuega, la roca del Tajuña* (Colección Tierra de Guadalajara, nº 14). Guadalajara: AACHE.

De la Hoz Martínez, Juan de Dios. 2019. La restauración de la Real Fábrica de paños de Carlos III en Brihuega. *IV Jornadas de Turismo y Patrimonio Industrial*. Área de Turismo del Ayuntamiento de Segovia.

Interior space of the Rotonda after restoration | Espacio interior de la Rotonda tras las obras de restauración | Espaço interior da Rotonda após as obras de restauração (Joaquín Zamora)

Biography | Biografía | Biografia

Juan de Dios de la Hoz Martínez

Architect since 1988. He is specialized in interventions for the recovery of heritage buildings, he has directed more than one hundred restoration projects on different Monuments and Assets of Cultural Interest, such as the Alcalá de Henares, Murcia and Almería Cathedrals and the Metropolitan Cathedral in Panama; the San Jerónimo de Yuste Monastery, the Colegio Español de Santiago y Montserrat in Rome; castles and fortresses such as those of Belmonte (Cuenca), Brihuega (Guadalajara), Caravaca de la Cruz (Murcia), Alcalá de Henares (Madrid), Teguise (Lanzarote) or Tabernas (Almería). He was awarded the Europa Nostra Prize 2016 for his work on the churches of Lorca after the earthquakes in 2011, the European Union Restoration Prize for his intervention at the Alcalá de Henares Cathedral, the Building Quality Prize from the Region of Murcia for the Museum of the Fine Arts of Murcia, the 2016 Culture Prize from the Region of Madrid for his professional career specialized in heritage, and the 2018 Rafael Manzano Prize for New Traditional Architecture for his professional career.

Es arquitecto desde 1988. Está especializado en intervenciones de recuperación de inmuebles integrantes del Patrimonio Histórico y ha dirigido más de un centenar de obras de restauración en diferentes Monumentos y Bienes de Interés Cultural, como las catedrales de Alcalá de Henares, Murcia, Almería o la Metropolitana en Panamá; el Monasterio de San Jerónimo de Yuste o el Colegio Español de Santiago y Montserrat en Roma; y castillos y fortalezas como los de Belmonte (Cuenca), Brihuega (Guadalajara), Caravaca de la Cruz (Murcia), Alcalá de Henares (Madrid), Teguise (Lanzarote) o Tabernas (Almería). Ha recibido el Premio Europa Nostra 2016 por sus actuaciones en las iglesias de Lorca tras los terremotos de 2011, el Premio de restauración de la Unión Europea por su intervención en la Catedral de Alcalá de Henares, el Premio a la Calidad en la Edificación de la Región de Murcia por el Museo de Bellas Artes de Murcia, el Premio de Cultura de la Comunidad de Madrid (2016) por su trayectoria profesional en la especialidad de Patrimonio Histórico, y el Premio Rafael Manzano de Nueva Arquitectura Tradicional (2018) también por el conjunto de su obra.

Arquiteto desde 1988. Especializou-se na intervenção de recuperação de imóveis integrantes do Património Histórico e dirigiu mais de um centenar de obras de restauração em diferentes Monumentos e Bens de Interesse Cultural, como as catedrais de Alcalá de Henares, Múrcia, Almeria ou a Metropolitana em Panamá; o Mosteiro de San Jerónimo de Yuste ou o Colégio Español de Santiago e Monteserrat em Roma; e castelos e fortalezas como os de Belmonte (Cuenca), Brihuega (Guadalajara), Caravaca de la Cruz (Múrcia), Alcalá de Henares (Madrid), Teguise (Lanzarote) ou Tabernas (Almeria). Recebeu o Prémio Europa Nostra 2016 pelas suas ações nas igrejas de Lorca após os terramotos de 2011, o Prémio de restauração da União Europeia pela sua intervenção na Catedral de Alcalá de Henares, o Prémio à Qualidade na Edificação da Região de Múrcia pelo Museu de Belas Artes de Múrcia, o Prémio de Cultura da Comunidade de Madrid (2016) pela sua trajetória profissional na especialidade de Património Histórico, e o Prémio Rafael Manzano de Nueva Arquitectura Tradicional (2018) também pelo conjunto da sua obra.

Greenway House, Coral Gables, Florida

Casa Greenway, Coral Gables, Florida

Casa Greenway, Coral Gables, Flórida

Ana Alvarez,
Frank Martinez

The Greenway House, located in the prominent Garden City of Coral Gables, Florida, is inspired by the foundational architecture of the City. The early works of traditional, domestic architecture in Coral Gables were concerned with the definition of street frontages and faces using an austere palette of compositional elements, simple geometric forms complemented by loggias, garden walls, gable roofs and a primary threshold.

The project began in 2017 and was commissioned by Hank and Margarita Courtney, two patrons of our office in which the relationship goes back twenty-five years with the design of

La Casa Greenway, situada en la distinguida ciudad jardín de Coral Gables, Florida, está inspirada en la arquitectura fundacional de la ciudad. Las primeras obras de arquitectura doméstica tradicional en Coral Gables abordaban la definición de frentes y fachadas a la calle utilizando una austera paleta de elementos compositivos y formas geométricas simples que se complementaban con logias, muros con vegetación, cubiertas de tejas a dos aguas y una entrada principal.

El proyecto se inició en 2017 por encargo de Hank y Margarita Courtney, dos clientes del estudio a quienes conocemos desde hace 25 años, cuando nos encargaron una nueva casa patio

A Casa Greenway, localizada na proeminente Cidade-jardim de Coral Gables, Flórida, foi inspirada pela arquitectura fundacional da Cidade. As primeiras obras de arquitectura tradicional doméstica em Coral Gables visaram a definição das fachadas e faces das ruas utilizando uma paleta austera de elementos composicionais, formas geométricas simples complementadas por lógias, muros de jardim, telhados de duas águas e um entrada principal.

O projecto teve início em 2017 e foi solicitado por Hank e Margarita Courtney, dois patronos do nosso escritório cuja relação remonta há vinte e cinco anos atrás com o desenho de uma nova casa de pátio para a família, subsistindo até

1

2

< Partial Facade of Front Entry | Fachada parcial de la entrada principal | Fachada parcial da entrada principal (Peter Kiliddjian)

1: Bird's Eye View of House & Context 2: Aerial Roof View of Site | 1: Vista de conjunto de la casa y el entorno 2: Vista aérea del emplazamiento | 1: Vista de pássaro da casa e contexto 2: Vista aérea do local (Alex Tarajano)

Raised Horizon Level Street View | Vista elevada desde la calle | Vista elevada da rua, ao nível do horizonte (Peter Kiliddjian)

a new courtyard house for the family to current design work being done for two of their children. Hank and Margarita currently live in a beautiful historically significant Miami Beach courtyard residence from the 1920s. The Greenway House, situated in the garden district of Coral Gables, Florida, was initially designed as a potential family house in the City of Coral Gables, in close proximity to their children and/or the possibility of being a speculative investment.

The City of Coral Gables was originally conceived as a suburb of Miami and attracted investors from across the nation during the South Florida real estate boom of the 1920s. Early architects of the City drew from the Garden City and City Beautiful movements of the 19th and early 20th century to create a vision of a fully-conceived Mediterranean-inspired City, which is now considered one of the first modern planned communities in the United States. Thousands of acres of citrus plantation and native hammock were converted into ornate plazas, grand entrances, small parks, monumental buildings, and tree-shaded streets. The Mediterranean-inspired City harmonizes best with South Florida's history, climate and lifestyle.

Of primary importance was designing a new work of architecture that builds on the traditions and revival traditions of Coral Gables with a more succinct focus on the current subtropical climate of the region. This includes the use of both passive and active cooling and ventilation systems along with maximizing the potential for shade given by both building orientation and

para la familia; actualmente estamos trabajando en un proyecto para dos de sus hijos. Hank y Margarita viven ahora en Miami, en una magnífica casa con patio de importancia histórica que data de los años 20 del siglo pasado. La Casa Greenway, situada en la zona residencial de Coral Gables, Florida, se diseñó inicialmente como posible vivienda familiar para estar cerca de los hijos o bien como potencial inversión especulativa.

La ciudad de Coral Gables se concibió originalmente como urbanización residencial de Miami y en los años 20 atrajo inversores de todo el país durante el *boom* inmobiliario del sur de Florida. Sus primeros arquitectos se inspiraron en el movimiento de la Ciudad Jardín y en el movimiento City Beautiful del siglo XIX y principios del XX para hacer realidad una visión de una ciudad de estilo mediterráneo que ahora se considera una de las primeras comunidades planificadas modernas de Estados Unidos. Miles de acres de plantaciones de cítricos y de bosques autóctonos se convirtieron en plazas ornamentadas, entradas imponentes, pequeños parques, edificios monumentales y calles arboladas. La ciudad de inspiración mediterránea encaja bien con la historia, el clima y el estilo de vida del sur de Florida.

Era de importancia primordial proyectar una obra de nueva planta que se basara en las costumbres y en la recuperación de las tradiciones de Coral Gables con un enfoque más sucinto en el actual clima subtropical de la región. Esto incluye el uso de sistemas de refrigeración y ventilación pasivos y activos, además de aprovechar al máximo la sombra que ofrece la orientación del edificio y el

aos dias de hoje, com o trabalho de desenho que está a ser feito para dois dos seus filhos. Hank e Margarita vivem actualmente em Miami Beach, numa bela casa de pátio dos anos 20 com relevância histórica. A Casa Greenway, situada no bairro dos jardins de Coral Gables, Flórida, foi inicialmente concebida como uma potencial casa de família na Cidade de Coral Gables. em estreita proximidade com os seus filhos e/ou a possibilidade de ser um investimento especulativo.

A Cidade de Coral Gables foi originalmente concebida como um subúrbio de Miami e atraiu investidores de todo o país durante a expansão imobiliária do Sul da Flórida nos anos 20. Os primeiros arquitectos da Cidade inspiraram-se nos movimentos Cidade-jardim e da Cidade Bonita do século XIX e início do século XX para criar a visão de uma Cidade planeada de inspiração mediterrânea, que é agora considerada uma das primeiras comunidades modernas planeadas nos Estados Unidos. Milhares de acres de plantações de citrinos e hammocks nativos (zonas de arborização densa) foram convertidos em praças ornamentadas, grandes entradas, pequenos parques, edifícios monumentais, e ruas arborizadas. A Cidade de inspiração mediterrânea harmoniza-se melhor com a história, clima e estilo de vida do Sul da Flórida.

De primordial importância foi a concepção de uma nova obra de arquitectura que se baseie nas tradições e no revivalismo de Coral Gables, com um enfoque mais sucinto no actual clima subtropical da região. Isto inclui a utilização tanto de sistemas passivos como activos de refrigeração e ventilação, juntamente com a maximização do potencial de sombra dado tanto pela

Garden view from Below Oak Canopy | Vista del jardín desde debajo de la encina | Vista do jardim por baixo da copa do carvalho (Alex Tarajano)

Plan and elevation sketch | Dibujo de la planta y el alzado | Desenho da planta e elevação

the seduction of garden elements and specific species of flora.

The project site is a 100 feet per 100 feet in-fill lot with a protected one hundred-year old oak tree. Given the size and location of the oak tree – its canopy occupies the entire northeastern quadrant of the site – we looked to architectural references that incorporate interior and garden design. In looking to the rich, old traditions in the City (and unlike the more recently built houses in the neighborhood whose massing are parallel to the street with front and rear yards defined by prescribed property setbacks and little activity on the side yards), we chose to use as reference the form of the Charleston Single House. The value and opportunity of the Charleston Single House, also known as the Charleston Side Yard House because of the use of a side yard typology, was appropriate to the site's geographic and urban setting.

The Greenway House, like the historic Charleston Single Houses, has a narrow side façade facing the street and its long side perpendicular to the street. This site composition of the main body of the house along with the Carriage House allows for a generous side yard/courtyard along with integrating the oak tree and the captured space below the oak

atractivo de los elementos del jardín y las especies vegetales específicas.

El emplazamiento del proyecto era una parcela vacante de 30 por 30 metros (100 por 100 pies) con una encina (*Quercus virginiana*) centenaria protegida. Dado el tamaño y la situación de la encina – que ocupa todo el cuadrante nordeste de la parcela– buscamos referencias arquitectónicas que incorporaran tanto el diseño de interiores como el de jardines. Al estudiar las ricas y antiguas tradiciones de la ciudad (y a diferencia de otras casas de construcción reciente en el vecindario cuyas plantas son paralelas a la calle, con patios delanteros y traseros definidos por el retranqueo obligatorio de la propiedad y poca actividad en los patios laterales), decidimos utilizar como referencia la forma de la vivienda exenta de Charleston. El interés y la pertinencia de la vivienda exenta de Charleston, también denominada vivienda con patio lateral de Charleston por el uso de la tipología de patio lateral, se debían a la ubicación geográfica y urbana de la parcela.

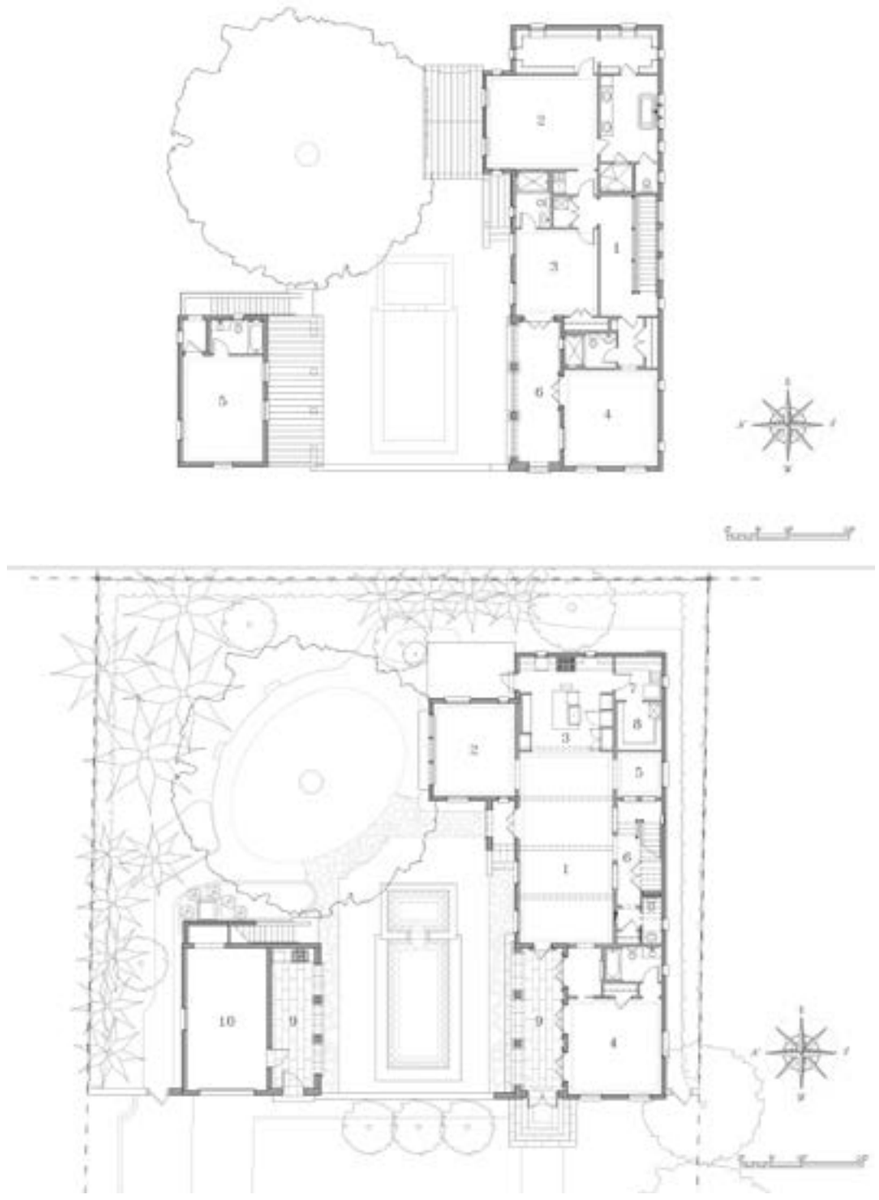
Al igual que las históricas viviendas exentas de Charleston, la Casa Greenway tiene una estrecha fachada lateral que da a la calle, mientras que su lado más largo es perpendicular a la misma. Esta composición espacial del cuerpo principal de la casa junto con la cochera proporciona un patio/atrio lateral de

orientação dos edifícios como pela sedução de elementos de jardim e espécies específicas da flora.

O local do projecto é um lote anteriormente vazio que foi reaproveitado, de 100 pés por 100 pés, com um carvalho (*Quercus virginiana*) protegido de cem anos de idade. Dada a dimensão e localização do carvalho – a sua copa ocupa todo o quadrante nordeste do local - procurámos referências arquitectónicas que incorporem o design de interiores e jardins. Tendo em consideração as ricas e antigas tradições da Cidade (e ao contrário das casas construídas mais recentemente no bairro, cuja estrutura é paralela à rua, com pátios dianteiros e traseiros definidos pelas limitações legais de construção, e pouca actividade nos pátios laterais), escolhemos usar como referência a forma da Charleston Single House. O valor e a oportunidade que representa a Charleston Single House, também conhecida como Charleston Side Yard House devido à utilização de uma tipologia com pátio lateral, foi adequada ao ambiente geográfico e urbano do local.

A Casa Greenway, tal como a histórica Charleston Single House, tem uma fachada lateral estreita virada para a rua e a sua fachada longa situada perpendicular à rua. Esta composição local do corpo principal da casa, juntamente com a casa das carruagens, permite um generoso

North Side Yard Facade of Main House | Fachada del patio norte de la casa principal | Fachada norte do pátio norte da casa principal (Alex Tarajano)



Site/ground plan and second floor plan | Planta baja y planta segunda | Rés-do-chão e segundo andar

Garden Side Yard View Looking West | Vista del jardín mirando al oeste | Vista do jardim do pátio para oeste (Alex Tarajano)

tree as part of the garden. The design essentially understands the project site as a four-quadrant square that has three major components: the main house, the carriage house and the oak tree. Compositionally, the loggia on the ground floor serves as the entry point or the main threshold into the property while fronting (now within

generosas proporciones que integra la encina y el espacio bajo su copa como parte del jardín. El diseño básicamente entiende la parcela como un cuadrado de cuatro cuadrantes en el que hay tres elementos principales: la casa, la cochera y la encina. Desde el punto de vista compositivo, la logia de la planta baja sirve como punto de acceso o

pátio lateral, assim como a integração do carvalho e do espaço capturado por baixo do carvalho como parte do jardim. O desenho compreende essencialmente o local do projecto como uma praça com quatro quadrantes que tem três componentes principais: a casa principal, a casa das carruagens e o carvalho. Em termos de composição, a lógia no rés-do-

the property) the one-story porch of the carriage house. This, with the garden wall that connects both bodies along with the oak tree, defines the courtyard and its pool. The quadrant of the oak and the resultant garden space captured by the great canopy allows for a shady setting supported by the tropical plantings.

The project creates a new architecture which is rich in the architectural traditions of place-making, in the spirit of the original conception of the Garden City of Coral Gables, with respect to both the built environment and the landscape.

The Greenway House is specifically designed as requested by the clients to be at once traditional in terms of place-making, spatial sequences and the making of the rooms that are identifiable, while still considering contemporary, domestic living where

entrada principal a la propiedad y está situada frente al porche de una altura de la cochera (que ahora forma parte de la propiedad). Esto, junto con el muro del jardín que conecta ambos cuerpos y la encina, delimitan el patio con piscina. El cuadrante de la encina y el espacio ajardinado bajo su enorme copa ofrecen una zona sombreada rodeada de plantas tropicales.

El proyecto presenta una nueva arquitectura en la que son patentes las tradiciones arquitectónicas de creación de lugares, fiel a la idea original de la Ciudad Jardín de Coral Gables y que respeta el entorno construido y el paisaje.

A petición de los clientes, el diseño de la Casa Greenway es tradicional en cuanto a su forma de crear un lugar, sus secuencias espaciales y la forma identificable de sus estancias y, sin embargo, tiene en cuenta el estilo de los hogares actuales,

chão serve de ponto de entrada principal de acesso à propriedade, fronteando ao mesmo tempo (agora dentro da propriedade) o alpendre de um andar da casa das carruagens. Este, com o muro de jardim que liga ambos os corpos juntamente com o carvalho, define o pátio e a sua piscina. O quadrante do carvalho e o espaço resultante do jardim capturado pela grande copa, possibilita um ambiente sombreado que é apoiado pelas plantações tropicais.

O projecto cria uma nova arquitectura que é rica nas tradições arquitectónicas de criação de lugares, no espírito da concepção original da Cidade Jardim de Coral Gables, no que diz respeito tanto ao ambiente construído como à paisagem.

A Greenway House foi especificamente concebida de acordo com o pedido dos clientes para ser ao mesmo tempo tradicional em termos de criação de locais, sequências espaciais e construção

1

2

3

1: Second Floor Loggia 2: Stair Hall 3: Great Room | 1: Logia de la segunda planta 2: Distribuidor 3: Salón principal | 1: Lógia do segundo andar 2: Átrio da escadaria 3: Quarto grande (Alex Tarajano)

spaces are visually connected and fairly open. The intent is that the ground floor arrangement of rooms and spaces could be easily adapted for varied use and manner of living. The typical arrangement of living, dining and family room ("Florida room") can be flexible depending on the family preferences, meaning that the exact use of each room can vary depending on the preferences of the occupants and allowing flexibility, that would revolve around furniture placement and relationships to the side yard and garden. All the public rooms open to the side yard and gardens. There is a generous ground floor basement suite, whose location at the front and entry to the house allows for it to be utilized as part of the sequence of public rooms and/or office for the dwelling. The second floor of the main body of the house is composed of three bedrooms. Two bedroom suites share the second floor loggia, which is "stacked" above the ground floor loggia, overlooking the pool/fountain in the side yard. The master bedroom suite occupies the southeastern portion of the main body of the house and property and is nestled under the branches of the existing one hundred-year-old oak tree. It is complemented by a generously-sized bathroom and closets. The rooms upstairs share a long stair hall that can also be flexible and can be used as a social or office space. The definition of both the side yard and garden is completed on the northern front and side edge of the property by the carriage house. The

donde los espacios están visualmente conectados y son bastante abiertos. El propósito es que la disposición de las habitaciones y los espacios de la planta baja pueda adaptarse fácilmente a diferentes usos y formas de vida. La distribución típica de salón, comedor y cuarto de estar ("sala de Florida") puede adaptarse a las preferencias de la familia, es decir, que el uso exacto de cada estancia puede variar dependiendo de lo que quieran sus ocupantes y ofrece una versatilidad que gira en torno a la colocación de los muebles y la relación con el patio lateral y el jardín. Todos los espacios comunes dan al patio y a los jardines. Hay un amplio dormitorio con baño incorporado en la planta baja cuya ubicación en la parte delantera y entrada de la casa permite utilizarlo como parte de la secuencia de espacios comunes o bien como despacho. La segunda planta del cuerpo principal de la casa consta de tres dormitorios. Dos de ellos, con baño incorporado, comparten la galería de la segunda planta que se sitúa sobre la logia de la planta baja, con vistas a la piscina/alberca del patio lateral. El dormitorio principal ocupa la sección sureste del cuerpo principal de la casa y de la propiedad y está cobijado bajo las ramas de la encina centenaria. Este dormitorio se completa con un cuarto de baño y armarios espaciosos. Los dormitorios de la planta superior comparten un largo distribuidor que también es flexible y puede utilizarse como oficina o lugar de reunión. El patio lateral y el jardín quedan delimitados por la cochera tanto en la fachada norte como en el límite lateral de la propiedad . Esta consta de un

das salas que são identificáveis, tendo ainda em consideração a vida doméstica contemporânea, onde os espaços estão visualmente ligados e são bastante abertos. A intenção é que a disposição dos quartos e espaços do rés-do-chão possa ser facilmente adaptada para uma utilização e estilo de vida variados. A disposição típica de sala de estar, sala de jantar e sala familiar ("sala Flórida") pode ser flexível dependendo das preferências da família, o que significa que a utilização exacta de cada sala pode variar dependendo das preferências dos ocupantes e permitindo flexibilidade, que giraria em torno da colocação de mobiliário e das relações com o pátio lateral e o jardim. Todas as salas públicas abrem para o pátio lateral e os jardins. Existe uma generosa suite no subsolo, cuja localização frontal e de entrada na casa permite a sua utilização como parte da sequência de salas públicas e/ou escritório para a habitação. O segundo piso do corpo principal da casa é composto por três quartos. Duas suites partilham a lógia do segundo andar, que é "empilhada" acima da lógia do rés-do-chão, com vista para a piscina/fonte no pátio lateral. A suite principal ocupa a parte sudeste do corpo principal da casa e da propriedade, e está aninhada sob os ramos do carvalho centenário. É complementada por uma casa de banho e guarda-roupa de dimensões generosas. Os quartos no andar de cima partilham um longo átrio com escadaria que também pode ser flexível e ser utilizado como espaço social ou de escritório. A definição tanto do pátio lateral como do jardim é completada na fachada norte e na margem lateral da propriedade pela

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carriage house has a one-car garage on the ground floor with a recreational loggia overlooking the pool and a guest suite with independent access and stair on the second floor.

In terms of material and method of construction, the project is dependent on the contemporary normative South Florida building techniques while harkens back to the early 1920s, to the old Coral Gables use of simple masonry and stucco walls with selective and measured use of wood beam and rafter construction, and clay tile roofs.

garaje para un vehículo en la planta baja, con una logia pensada para actividades recreativas que da a la piscina, mientras que en la segunda planta hay un dormitorio de invitados con acceso, baño y escalera independientes.

En cuanto a los materiales y métodos de construcción, el proyecto responde a la actual normativa de técnicas de edificación del sur de Florida, a la vez que evoca los primeros años 20 de Coral Gables con los sencillos muros de mampostería y estuco y con el uso selectivo y comedido de vigas y pares de madera, y cubiertas de tejas de barro.

casa das carruagens. A casa das carruagens tem uma garagem de um carro no rés-do-chão com uma lógia recreativa com vista para a piscina e uma suite de hóspedes com acesso independente e escada no segundo andar.

Em termos de materiais e métodos de construção, o projecto está dependente das técnicas normativas contemporâneas de construção do Sul da Flórida, enquanto que remonta ao início da década de 1920, ao uso de alvenaria simples e paredes de estuque, com utilização selectiva e ponderada de vigas de madeira e caibros, e telhados de telhas de barro, tradicionais em Coral Gables.

1: Carriage House Porch 2: Beam Detail & Eave at Carriage House Porch | 1: Porche de la cochera 2: Detalle de la viga y alero del porche de la cochera | 1: Alpendre da casa das carruagens 2: Detalhe da viga e do beiral do alpendre da casa das carruagens (Peter Kiliddjian)

The builder, Michael Courtney, is the son of Hank and Margarita Courtney and was using this project as a launching point for his now newly established development and construction company. Michael took great pride in building a new house that has as a main objective the reviving of older building traditions found in the now historic and highly valued works in the City of Coral Gables. Great care was given to finding, for example, stucco, stone and clay roof workers that were equally wanting to both reproduce and imitate the building culture and humble building traditions of the past.

El constructor, Michael Courtney, es hijo de Hank y Margarita Courtney y este proyecto era el punto de partida para su recién creada empresa de construcción y promoción. Michael estaba muy orgulloso de edificar una casa de nueva planta cuyo principal objetivo era recuperar las tradiciones constructivas de las valoradas obras de la ciudad de Coral Gables que ahora tienen categoría histórica. Se puso mucha atención para encontrar, por ejemplo, artesanos que trabajaran el estuco, la piedra y los tejados de barro y que estuvieran dispuestos a reproducir e imitar la cultura constructiva y las humildes tradiciones del pasado.

O construtor, Michael Courtney, é o filho de Hank e Margarita Courtney e utilizou este projecto como ponto de lançamento para a sua empresa recém-criada de desenvolvimento e construção. Michael sentiu um grande orgulho em construir uma nova casa que tem como objectivo principal o reavivar das tradições de construção mais antigas que podem ser encontradas nas agora históricas e altamente valorizadas obras da Cidade de Coral Gables. Teve-se grande cuidado em encontrar, por exemplo, trabalhadores de estuque, pedra e telhado de barro que quisessem tanto reproduzir e imitar a cultura de construção como as humildes tradições de construção do passado.

1: Custom Front Entry Porch 2: Detail | 1: Porche de la entrada principal 2: Detalle | Alpendre personalizado da entrada principal 2: Detalhe (Peter Kiliddjian)

The house is made of stuccoed load bearing walls. The porches have square tapered masonry columns covered in stucco with wood bead board ceilings and exposed wood rafters. The materials selected include coral stone, Cuban tile, gravel paths and crushed shell. But the construction of the project also follows, given local building codes and required material strengths, reinforced concrete, which is both normative and a given in South Florida, based on economic realities. The project deals with the challenges and the limited availability of products and building components that meet the stringent wind and impact requirements for South Florida, while at the same time selecting the palette of required elements and combining them with local and/or regional materials that actually do give character and richness to the design.

The preference for composing with stucco, essentially the most used local material, for primarily vertical surfaces along with local stone and oolitic stone for floors and ornamental surrounds, clay barrel tile roofs and only indigenous plant materials for the garden, both guides and leads the design's search for a character that identifies with Coral Gables' historic past, while delivering a contemporary building.

The project was awarded the 2019 Addison Mizner Award for Residential, Single Family Under 5,000 square feet, by the Florida Chapter of The Institute of Classical Architecture and Art. It has also received numerous accolades from city officials. More importantly, in terms of our office's preferences is the fact that highly experienced and cultured visitors often ask: was it a restoration, or a new construction?

La casa se ha construido con muros portantes estucados. Los porches tienen pilares ahusados de mampostería estucada con techos entablados y con pares vistos de madera. Los materiales elegidos incluyen piedra de coral, baldosa cubana y senderos de grava y conchas machacadas. Pero teniendo en cuenta los códigos de edificación locales y la obligatoria resistencia de los materiales, en la construcción del proyecto también se ha utilizado hormigón armado, que es preceptivo y se da por hecho en el sur de Florida, dada la realidad económica. El proyecto aborda las dificultades y la disponibilidad limitada de productos y componentes constructivos que reúnan los estrictos requisitos de resistencia al viento y al impacto para el sur de Florida, y se selecciona al mismo tiempo una paleta de elementos necesarios que se combinan con materiales locales o de la región que, de hecho, aportan carácter y riqueza al diseño.

La preferencia por el acabado de las superficies verticales con estuco, básicamente el material local más utilizado, así como por la piedra local y la caliza oolítica para suelos y marcos ornamentales, las cubiertas de teja árabe y el uso exclusivo de especies autóctonas para el jardín orienta y dirige la búsqueda de un carácter en el diseño que se identifica con el pasado histórico de Coral Gables y, al mismo tiempo, produce un edificio contemporáneo.

El proyecto obtuvo el premio Addison Mizner 2019 para viviendas unifamiliares de menos de 465 metros cuadrados del Institute of Classical Architecture and Art en Florida. También ha recibido muchos elogios de las autoridades municipales. A nosotros, lo que más nos gusta es que visitantes de gran cultura y experiencia nos pregunten a menudo: ¿fue una restauración o una nueva construcción?

A casa é feita de paredes estruturais estucadas. Os alpendres têm colunas afiladas quadradas de alvenaria cobertas de estuque com tectos em painéis de madeira e caibros expostos. Os materiais seleccionados incluem pedra coral, azulejo cubano, caminhos de gravilha e concha esmagada. Mas a construção do projecto também usa, dadas as normas de construção locais e as resistências requeridas para os materiais, betão armado, que é tanto normativo como um dado adquirido no Sul da Florida, com base nas realidades económicas. O projecto lida com os desafios e a disponibilidade limitada de produtos e componentes de construção que satisfazem os rigorosos requisitos de vento e impacto do Sul da Flórida, ao mesmo tempo que selecciona a paleta de elementos necessários e os combina com materiais locais e/ou regionais que na realidade dão carácter e riqueza ao projecto.

A preferência pela composição com estuque – essencialmente o material local mais utilizado, principalmente para superfícies verticais –, juntamente com pedra local e pedra oolítica para os pavimentos e ambientes ornamentais, telhados de telhas de cerâmica e apenas materiais vegetais de origem indígena para o jardim, orienta e conduz a busca do design por um carácter que se identifique com o passado histórico de Coral Gables, ao mesmo tempo que apresenta um edifício contemporâneo.

O projecto recebeu o Addison Mizner Award de 2019 para Família Única em contexto residencial com menos de 5000 pés quadrados, pela secção da Flórida do Institute of Classical Architecture and Art. Recebeu também inúmeros elogios de funcionários da cidade. Mais importante, em termos das preferências do nosso escritório, é o facto de visitantes altamente experientes e cultos perguntarem frequentemente: foi uma restauração, ou uma nova construção?

Biographies | Biografías | Biografias

Ana Alvarez

She received a Bachelor of Architecture from the University of Miami and a Master in Design Studies from Harvard University. She is a member of the American Institute of Architects, serves on the Board of Architects in Coral Gables and volunteers as a member of several committees at the Sylvester Comprehensive Cancer Center in Miami, Florida. Her work ranges in scale and complexity from new custom homes and historic renovation projects to campus design and institutional buildings. Design Projects include single and multi-family dwellings in the New Urban Towns of Windsor and Alys Beach in Florida, and Tannin in Alabama; custom homes in Coral Gables and the Miami area; as well as renovation of historic and architecturally significant buildings in Miami Beach, Edgartown, Martha's Vineyard and Boston, Massachusetts.

Licenciada en Arquitectura por la Universidad de Miami y Máster en Estudios de Diseño por la Universidad de Harvard. Miembro del American Institute of Architects, pertenece a la Junta directiva del Colegio de Arquitectos de Coral Gables y es voluntaria en varios comités del Sylvester Comprehensive Cancer Center de Miami, Florida. Su trabajo es variado en escala y complejidad y abarca desde nuevas viviendas por encargo y proyectos de rehabilitación del patrimonio hasta el diseño de campus y edificios institucionales. Entre sus proyectos de diseño hay viviendas uni y plurifamiliares en las nuevas ciudades de Windsor y Alys Beach, Florida, y Tannin, Alabama; casas por encargo en la zona de Coral Gables y Miami, así como la rehabilitación de edificios de importancia histórica y arquitectónica en Miami Beach, Edgartown, Martha's Vineyard y Boston, Massachusetts.

Recebeu um Bacharelato em Arquitectura pela Miami University e um Mestrado em Estudos de Design pela Harvard University. É membro do American Institute of Architects, faz parte do Board of Architects de Coral Gables e é membro voluntário de vários comités no Sylvester Comprehensive Cancer Center em Miami, Flórida. O seu trabalho varia em escala e complexidade, desde novas casas personalizadas e projectos históricos de renovação até à concepção de campus e edifícios institucionais. Os seus projectos de design incluem habitações unifamiliares e multifamiliares nas Novas Cidades Urbanas de Windsor e Alys Beach na Flórida, e Tannin no Alabama; casas personalizadas em Coral Gables e na área de Miami; bem como a renovação de edifícios históricos e arquitectonicamente significativos em Miami Beach, Edgartown, Martha's Vineyard e Boston, Massachusetts.

Frank Martinez

He is an Associate Professor at the University of Miami, School of Architecture. He received a Bachelor's Degree in Architecture from the University of Miami, School of Architecture in 1987 and the degree of Master in Architecture in 1991 from Princeton University. His teaching focuses on courses in Design, History/Theory and Drawing in the core of both undergraduate and graduate programs; including teaching in the Rome Program, where he lectures and leads courses on Roman Villas and Gardens, Renaissance and Baroque Architecture and Urban Design. He also teaches seminars on selected topics on Early American Architecture and heads the UM Grand Tour of Europe (a university wide summer study abroad program), along with participating in international summer programs on traditional architecture and urban design research.

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Ciudad Cayalá, a New Extension of Guatemala City

Ciudad Cayalá, una nueva ampliación de la Ciudad de Guatemala

Ciudad Cayalá, uma nova extensão da Cidade da Guatemala

María Sánchez,
Pedro Pablo Godoy,
Leon Krier

Ciudad Cayalá is a new town in Guatemala that is being built according to traditional urban and architectural principles. It is situated on a plateau some 4 kilometres to the east of the historic center of Guatemala City. Planning began in 2002, when the firm of Estudio Urbano invited celebrated masterplanner Leon Krier to join the effort. After establishing the partnership, the team persuaded the landowner client to embrace their vision for a vibrant, humanist new development. Masterplanning commenced with a charrette in 2003.

The site comprised over 538 acres surrounded by deep ravines, which were portioned into interconnected urban quarters (Paseo Cayalá, Nogales, Socorro Bajo and Socorro Alto), each consisting of several neighborhoods and connected by a 4 kilometres long main street extending along a natural ridge. A 103-acre green area on the west side of Paseo Cayalá has been retained as the largest ecological reserve in Guatemala City.

The goal of the masterplanning team has been the creation of a humane, hospitable urban environment that fosters a strong sense of community and pride of place in its residents, and a vibrant commercial and civic life.

Ciudad Cayalá es una ciudad nueva en Guatemala que se está construyendo de acuerdo con principios urbanos y arquitectónicos tradicionales. Está situada sobre una meseta, unos 4 kilómetros al este del centro histórico de la Ciudad de Guatemala. Su planificación comenzó en 2002, cuando Estudio Urbano invitó al famoso urbanista Leon Krier a unirse a la iniciativa. Una vez formada la colaboración, el equipo convenció al propietario del terreno para que aceptara su visión de una nueva urbanización dinámica y humanista. La elaboración del plan general se inició con un taller que tuvo lugar en 2003.

El terreno ocupaba 142 hectáreas rodeadas de profundos barrancos, divididas en distritos urbanos interconectados (Paseo Cayalá, Nogales, Socorro Bajo y Socorro Alto), cada uno de ellos compuesto por varios barrios y conectados por una calle principal de 4 kilómetros de longitud que discurría a lo largo de un risco natural. Se ha mantenido una zona verde de 41 hectáreas en el lado oeste del Paseo Cayalá como la mayor reserva ecológica de la Ciudad de Guatemala.

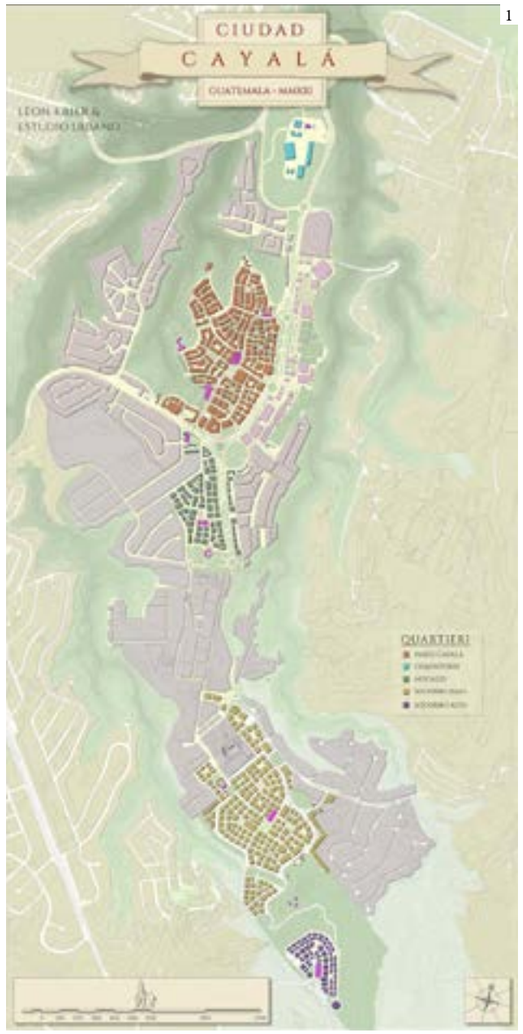
El objetivo del equipo encargado del plan general era la creación de un entorno urbano humano y acogedor que fomentara un fuerte sentido de comunidad y orgullo entre sus residentes, así como una actividad comercial y cívica de gran dinamismo.

A Ciudad Cayalá é uma cidade nova na Guatemala que está a ser construída de acordo com princípios urbanos e arquitectónicos tradicionais. Está situada num planalto a cerca de 4 quilómetros a leste do centro histórico da Cidade da Guatemala. O seu planeamento começou em 2002, quando a empresa Estudio Urbano convidou o célebre urbanista Leon Krier a juntar-se à iniciativa. Uma vez estabelecida a parceria, a equipa persuadiu o cliente e proprietário do terreno a abraçar a sua visão para um novo projecto vibrante e humanista. A criação do plano director começou com uma *charrette* em 2003.

O local compreende mais de 538 acres rodeados por ravinas profundas, que foram repartidas em distritos urbanos interligados (Paseo Cayalá, Nogales, Socorro Bajo e Socorro Alto), cada um deles constituído por vários bairros, e ligados por uma longa rua principal de 4 quilómetros que se estende ao longo de uma crista natural. Manteve-se uma área verde de 103 acres no lado oeste de Paseo Cayalá como a maior reserva ecológica da Cidade da Guatemala.

O objectivo da equipa de planeamento geral foi a criação de um ambiente urbano humano e hospitaleiro que fomentasse um forte sentido de comunidade e orgulho no local por parte dos seus residentes, e uma vida comercial e cívica vibrante.

Main Street at Paseo Cayalá Neighborhood, with Azarias Civic Hall and the church campanile in the back | Calle principal en el Barrio Paseo Cayalá, con el Centro Cívico Azarias y el campanario de la iglesia al fondo | Rua principal no Bairro Paseo Cayalá, com o Centro Cívico Azarias e o campanário da igreja ao fundo (Waseem Syed)



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1: Master Plan of Ciudad Cayalá with defined urban quarters 2: Paseo Cayalá surrounded by ravines and nature 3: Busy Main Street at Paseo Cayalá Neighborhood | 1: Plan director de Ciudad Cayalá 2: Paseo Cayalá rodeado de barrancos y naturaleza 3: La concurrida calle principal de Paseo Cayalá | 1: Plano principal da Cidade Cayalá 2: Paseo Cayalá rodeado de barrancos e natureza 3: A concorrida rua principal de Paseo Cayalá (1: Estudio Urbano 2: Carmen Maldonado 3: Grupo Cayalá)

The first phase of Cayalá's masterplan broke ground in 2009 with the construction of Paseo Cayalá. This new urban quarter is designed around four principal streets converging on a main square. These connect to a public promenade that offers breathtaking views of Guatemala City's skyline and volcanic peaks on the horizon. The quarter consists of several neighborhoods: these are the commercial center, Ramblas, Nova, Belesa, Olmos, and Lirios.

Las obras de la primera fase del plan general de Cayalá se iniciaron con la construcción del Paseo Cayalá. Este nuevo distrito urbano está diseñado alrededor de cuatro calles principales que convergen en una plaza mayor, y que conectan con un paseo público que ofrece unas vistas panorámicas espectaculares de la Ciudad de Guatemala, con las cumbres de los volcanes en el horizonte. El distrito está formado por varios barrios: el Centro, Ramblas, Nova, Belesa, Olmos y Lirios.

A primeira fase de criação do plano director de Cayalá iniciou-se em 2009 com a construção do Paseo Cayalá. Este novo distrito urbano foi concebido em torno de quatro ruas principais que convergem numa praça principal. Estas ligam-se a um passeio público que oferece vistas deslumbrantes do panorama urbano da Cidade da Guatemala e dos picos vulcânicos no horizonte. O distrito é composto por vários bairros: o centro comercial, Ramblas, Nova, Belesa, Olmos, e Lirios.

The masterplan of Paseo Cayalá has received numerous international awards including the 2021 CNU Charter Award, the 2016 Arthur Ross Award, the 2015 Acanthus Award and Acanthus Award of Areté in the same year, and the 2015 IMCL Award for re-establishing a sustainable, safe, mixed-use, pedestrian-oriented urban environment that embraces Guatemala's unique architectural identity and offers a way of life that is greatly improved as compared to the typically disconnected, car-oriented developments around Guatemala City.

El plan general del Paseo Cayalá ha recibido numerosos premios internacionales, entre los que se encuentran el CNU Charter Award de 2021, el Arthur Ross Award 2016, el Acanthus Award 2015 y el Acanthus Award of Areté en el mismo año, así como el IMCL Award 2015 por el restablecimiento de un entorno urbano sostenible, seguro, de uso mixto y orientado al peatón, acorde con la singular identidad arquitectónica de Guatemala y que ofrece una forma de vida muy mejorada en comparación con las típicas urbanizaciones desconectadas y orientadas hacia el automóvil que rodean la Ciudad de Guatemala.

O plano director de Paseo Cayalá recebeu numerosos prémios internacionais, incluindo o CNU Charter Award de 2021, o Prémio Arthur Ross 2016, o Prémio Acanthus 2015 e o Prémio Acanthus de Areté no mesmo ano, e o Prémio IMCL 2015 por restabelecer um ambiente urbano sustentável, seguro, de uso misto e orientado para os peões, que abraça a identidade arquitectónica única da Guatemala e oferece um modo de vida que é grandemente melhorado em comparação com os projectos tipicamente desconectados e centrados nosautomóveis que se situam ao redor da Cidade da Guatemala.

1: Master Plan of the Quartiere of Paseo Cayalá and neighborhoods 2: Aerial view of Paseo Cayalá (looking north) within Guatemala City | 1: Plan director de Paseo Cayalá y sus barrios 2: Vista aérea del Paseo Cayalá (hacia el norte) en la Ciudad de Guatemala | 1: Plano principal de Paseo Cayalá e os seus bairros 2: Vista aérea de Paseo Cayalá (orientado a norte) na cidade de Guatemala (1: Estudio Urbano 2: Rudy Pineda)

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Block design for an enclave in Distrito Moda, part of the quartiere of Paseo Cayalá | Diseño de una manzana para el Distrito Moda, parte del barrio de Paseo Cayalá | Desenho de um quarteirão para o Distrito Moda, parte do bairro de Paseo Cayalá (Estudio Urbano)

New Urban Quarter of Paseo Cayalá

The principle of a mix of uses applied in the design of Paseo Cayalá has enabled the emergence of a strong, healthy public realm. The great range in size, configuration and allocation of the building lots ensures programmatic and typological variety, architectural richness, and picturesque beauty.

Public buildings and spaces are carefully integrated and connected to promote social interaction and reinforce a sense of community among the residents and visitors. The intention has been to create a beautiful, secure place for Guatemalans to visit and enjoy for generations to come.

El nuevo distrito urbano del Paseo Cayalá

El principio de la mezcla de usos que se puso en práctica en el diseño del Paseo Cayalá ha hecho posible la creación de un espacio público robusto y saludable. El amplio rango de tamaños, configuraciones y asignación de los solares garantiza la variedad programática y tipológica, la riqueza arquitectónica y la belleza pintoresca.

Los edificios y espacios públicos están cuidadosamente integrados y conectados para fomentar la interacción social y reforzar el sentido de comunidad entre residentes y visitantes. La intención era crear un lugar hermoso y seguro para que lo visitaran los guatemaltecos y lo disfrutaran las futuras generaciones.

Novo Distrito Urbano de Paseo Cayalá

O princípio da utilização mista aplicado ao design de Paseo Cayalá permitiu o surgimento de um domínio público forte e saudável. A grande diversidade dos lotes em termos de tamanho, configuração e alocação assegura uma variedade programática e tipológica, riqueza arquitectónica, e beleza pitoresca.

Os edifícios e espaços públicos são cuidadosamente integrados e interligados para promover a interacção social e reforçar o sentido de comunidade entre os residentes e visitantes. A intenção foi a de criar um lugar bonito e seguro para os habitantes da Guatemala visitarem e desfrutarem nas gerações futuras.

1: Main Street at Paseo Cayalá Neighborhood looking north, 2016 2: Cinema and Main Square at Paseo Cayalá Neighborhood, 2019 | 1: Calle principal en Paseo Cayalá. Vista hacia el norte, 2016 2: Cine y Plaza Mayor en Paseo Cayalá, 2019 | 1: Rua principal em Paseo Cayalá. Vista orientada a norte, 2016 2: Cinema e Plaza Mayor em Paseo Cayalá, 2019 (1: Waseem Syed 2: Carmen Maldonado)

At Paseo Cayalá, the small urban blocks, a building height limit of three-to-four stories, and a walkable network of streets and boulevards, reinforce a pedestrian realm that includes vehicular thoroughfares. Arcades, loggias and roof terraces line the principal streets and squares, and take advantage of Guatemala's temperate climate.

The urban fabric at Paseo Cayalá consists of multi-story, mixed-use and commercial buildings, along with parking pavilions, entertainment complexes, market sheds, and civic and sacred edifices, all of which take their architectural cues from regional precedents. Parking is largely underground and out of sight, with escalators situated in the arcades or in free-standing pavilions that give access to the main street.

En el Paseo Cayalá, las pequeñas manzanas urbanas, el límite de tres a cuatro alturas para los edificios, y la red existente de calles y bulevares, refuerzan un espacio peatonal que incluye vías públicas para los vehículos. Las galerías, las logias y las terrazas en las cubiertas se alinean a lo largo de las principales calles y plazas, aprovechando el clima templado de Guatemala.

El tejido urbano del Paseo Cayalá consiste en edificios comerciales de varias plantas y uso mixto, junto con aparcamientos, centros de ocio, mercados y edificios cívicos y religiosos, en los que sus claves arquitectónicas provienen de precedentes regionales. El aparcamiento es sobre todo subterráneo y por tanto no está a la vista, con escaleras mecánicas en las galerías o en pabellones independientes que dan acceso a la calle principal.

Em Paseo Cayalá, os pequenos blocos urbanos, um limite de altura dos edifícios de três a quatro andares, e uma rede de ruas e avenidas com boa acessibilidade pedonal, reforçam um espaço pedestre que inclui vias de circulação de veículos. Galerias, lógias e terraços enfileiram as ruas e praças principais, e tiram partido do clima temperado da Guatemala.

O tecido urbano de Paseo Cayalá consiste em edifícios de vários andares, de uso misto e comerciais, juntamente com parques de estacionamento cobertos, complexos de entretenimento, tendas de mercado, e edifícios cívicos e sagrados, que vão buscar as suas referências arquitectónicas aos precedentes regionais. O estacionamento é em grande parte subterrâneo e longe da vista, com escadas rolantes situadas nas galerias ou em pavilhões independentes que dão acesso à rua principal.

Mudéjar-inspired mixed-use building, with integrated porticoes, along the main street of Paseo Cayalá, 2016 | Edificio porticado de usos mixtos de inspiración mudéjar, en la calle principal del Paseo Cayalá, 2016 | Edifício porticado de uso misto de inspiração mudéjar, na rua principal de Paseo Cayalá, 2016 (Waseem Syed)

Balconies are wooden or feature decorative ironwork. Roofs are finished in traditional red Spanish tiles. The colonnades lining commercial streets draw inspiration from the wooden porticoes of Spanish colonial plazas, such as the Parque Central of Antigua Guatemala, and take advantage of dramatic views while sheltering shoppers during the rainy season. Details such as octagonal or rosette windows, tiled cornices, corner bollards, finials, consoles, fountains, window lattices, and chamfers, enhance the elevations, establishing rhythm and alternation along facades and enlivening the streetscape.

Civic buildings adapt the classical forms and principles of Guatemala's enduring Mayan and Spanish architectural languages. A consistently civic scale, use of a formal architectural vocabulary, and greater richness of materials allows Paseo Cayalá's public edifices –e.g. the Azaria Hall by Richard Economakis, the Market Tower by Leon Krier, and the Church of Santa Maria Reina de la Familia by Pedro Godoy and Maria Sanchez of Estudio Urbano– to stand out against the surrounding buildings, and serve as visual points of reference. Although entrusted to different architects, these buildings are designed to be good architectural neighbors; they represent variety within unity and symbolize a hopeful, collaborative society.

The pride of place and sense of community that one finds at Paseo Cayalá was made possible by the design team's deep knowledge of traditional town planning, combined with a passion for the forms of Spanish and indigenous architecture. Their advocacy of the use of natural materials and methods of lighting and ventilation, and a reduced dependency on the automobile, have positively impacted the welfare of residents, lifespan of the buildings, and the economy of Cayalá, which has continued to grow.

Los balcones son de madera o incorporan herrajes decorativos. Las cubiertas están acabadas en teja cerámica española tradicional. Las columnatas que flanquean las calles comerciales se inspiran en los pórticos de madera de las plazas coloniales españolas, como el Parque Central de Antigua Guatemala, y aprovechan las espectaculares vistas al tiempo que ofrecen refugio a los compradores durante la temporada de lluvias. Los detalles como las ventanas octogonales o en roseta, las cornisas cerámicas, los guardacantones, los fastigios, las ménsulas, las fuentes, las celosías de las ventanas y los chaflanes mejoran los alzados, creando ritmo y alternancia a lo largo de las fachadas y animan el paisaje urbano.

Los edificios civiles adaptan las formas y los principios clásicos de los lenguajes imperecederos de las arquitecturas mayas y españolas. Una escala cívica coherente, el uso de un vocabulario arquitectónico formal, y la mayor riqueza de sus materiales permite que los edificios públicos del Paseo Cayalá – como el Gran Salón Azaria, obra de Richard Economakis, la Torre del Mercado, de Leon Krier, y la Iglesia de Santa María Reina de la Familia, de Pedro Godoy y María Sánchez, de Estudio Urbano – destaquen entre los edificios circundantes, y sirvan de puntos de referencia visuales. Aunque son obra de distintos arquitectos, estos edificios fueron diseñados para ser buenos vecinos arquitectónicos; representan variedad dentro de la unidad y simbolizan una sociedad esperanzada y colaborativa.

El orgullo del lugar y el sentido de comunidad que se encuentran en el Paseo Cayalá han sido posibles gracias al profundo conocimiento del urbanismo tradicional del equipo, junto con su pasión por las formas de las arquitecturas españolas y autóctonas. Su defensa del uso de los materiales y los métodos de iluminación y ventilación naturales, así como de una menor dependencia del automóvil han tenido un efecto positivo sobre el bienestar de los residentes, la vida de los edificios, y la economía de Cayalá, que continúa creciendo.

Os balcões são de madeira ou apresentam trabalhos decorativos em ferro. Os telhados têm um acabamento em telha tradicional espanhola vermelha. As colunatas que perfilam as ruas comerciais inspiram-se nos pórticos de madeira das praças coloniais espanholas, como o Parque Central de Antígua Guatemala, e tiram partido de vistas dramáticas enquanto abrigam os clientes durante a estação chuvosa. Detalhes tais como janelas octogonais ou rosáceas, cornijas de cerâmica, postes de protecção nas esquinas, fastígios, consolas, fontes, janelas com treliças, e chanfraduras, realçam as elevações, estabelecendo um ritmo e alternância ao longo das fachadas e dando vida à paisagem da rua.

Os edifícios cívicos adaptam as formas e princípios clássicos das perenes línguas arquitectónicas Maia e Espanhola da Guatemala. Uma escala cívica consistente, o uso de um vocabulário arquitectónico formal, e uma maior riqueza de materiais permitem que os edifícios públicos de Paseo Cayalá - por exemplo, o Salão Azaria de Richard Economakis, a Torre do Mercado de Leon Krier, e a Igreja de Santa Maria Reina de la Familia de Pedro Godoy e Maria Sanchez, do Estudio Urbano - se destaquem face aos edifícios circundantes, e sirvam como pontos de referência visual. Embora atribuídos a diferentes arquitectos, estes edifícios são concebidos para serem bons vizinhos arquitectónicos; representam variedade dentro da unidade e simbolizam uma sociedade esperançosa e colaborativa.

O orgulho no local e o sentido de comunidade que se encontra em Paseo Cayalá foi possível graças ao profundo conhecimento de planeamento tradicional de cidades por parte da equipa de design, combinado com uma paixão pelas formas da arquitectura Espanhola e indígena. A sua defesa da utilização de materiais e métodos de iluminação e ventilação naturais, e uma reduzida dependência do automóvel, tiveram um impacto positivo no bem-estar dos residentes, na longevidade dos edifícios e na economia de Cayalá, que tem continuado a crescer.

Church of Santa Maria Reina de la Familia, 2021 | Iglesia de Santa María Reina de la Familia, 2021 | Igreja de Santa Maria Rainha da Família, 2021 (Estudio Urbano)

Main street at Paseo Cayalá with underground parking pavilion in the foreground, 2016 | Calle principal de Paseo Cayalá con el pabellón de acceso al parking subterráneo, 2016 | Rua principal de Paseo Cayalá com o pavilhão de acesso ao parque de estacionamento subterrâneo, 2016 (Waseem Syed)

The Neighborhoods of Ramblas, Nova, Belesa and Olmos within the quarter of Paseo Cayalá

As part of Paseo Cayalá, Estudio Urbano was commissioned to design the buildings of the residential neighborhoods of Ramblas, Nova, Belesa, and Olmos. These areas, which comprise a range of attractive housing options and landscaped parks, were completed between 2014 and 2019. The buildings are intimately-scaled, single or two-to-three story family houses, townhouses, attached multi-family condos, and apartments that are arranged to form pleasant streetscapes.

Los barrios de Ramblas, Nova, Belesa y Olmos dentro del distrito de Paseo Cayalá

Como parte del Paseo Cayalá, se encargó a Estudio Urbano el diseño de los edificios de los barrios residenciales de Ramblas, Nova, Belesa, y Olmos. Estas zonas, que comprenden varias opciones atractivas de vivienda y parques ajardinados, se construyeron entre 2014 y 2019. Los edificios, de una escala íntima, están compuestos por viviendas unifamiliares de dos o tres plantas y edificios de apartamentos, casas urbanas y edificios de apartamentos adosados, y están distribuidos para formar agradables

Os Bairros de Ramblas, Nova, Belesa e Olmos no distrito de Paseo Cayalá

Fazendo parte de Paseo Cayalá, o Estudio Urbano foi encarregado de projectar os edifícios dos bairros residenciais de Ramblas, Nova, Belesa, e Olmos. Estas áreas, que incluem um conjunto de opções habitacionais e parques paisagísticos atractivos, foram concluídas entre 2014 e 2019. Os edifícios, construídos numa escala mais íntima, são casas familiares de piso único, ou de dois ou três andares, vivendas, condomínios geminados multifamiliares, e apartamentos que estão dispostos de forma a constituir

1: Variety of housing typologies: single-family town houses in the front, with a multi-family complex in the back, surrounded by green, walkable streets, 2021 2: Street view at Ramblas, 2019 3: Town house facade compositions facing the neighborhood park at Ramblas, 2019 | 1: Variedad de tipos de vivienda: casas unifamiliares en el frente, con un edificio plurifamiliar en la parte trasera, rodeado de calles verdes y caminables, 2021 2: Vista de la calle en las Ramblas, 2019 3: Composiciones de fachadas de casas frente al parque del barrio en las Ramblas, 2019 | 1: Vários tipos de vivenda: casas unifamiliares em frente, com um edifício plurifamiliar nas traseiras, rodeado de ruas verdes e caminhável, 2021 2: Vista da rua nas Ramblas, 2019 3: Composição de fachadas de casas em frente ao parque do bairro nas Ramblas, 2019 (1: Camila Godoy 2, 3: Carmen Maldonado)

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In order to meet the existing building regulations on seismic events, they employ concrete frame construction with plaster over thick walls, to ensure robust exteriors with deep reveals in door and window openings. Vertical alignments of walls comply with traditional masonry techniques while porticos, loggias and balconies are employed liberally to take advantage of climate and views.

As in the commercial areas of Paseo Cayalá, the boulevards, streets and squares of these residential neighborhoods are paved with cobbles and flagstones to reinforce the primacy of the pedestrian over the automobile. Green spaces and parking options are shared among neighbors, and wooden elements such as doors, gates, and screens provide privacy and visual interest.

paisajes urbanos. Con el fin de cumplir las normativas vigentes de edificación respecto a los terremotos, se utilizan estructuras de pórticos de hormigón armado, pero con gruesos muros revocados para asegurar unos exteriores robustos, con profundos vanos en los huecos de las puertas y ventanas. Las alineaciones verticales de las paredes se realizan conforme a las técnicas de albañilería tradicional, al tiempo que se utilizan pórticos, galerías y balcones de forma generosa para aprovechar el clima y las vistas.

Al igual que en las zonas comerciales del Paseo Cayalá, los bulevares, las calles y las plazas de estos barrios residenciales están pavimentados con adoquines y baldosas para recalcar la primacía del peatón sobre el automóvil. Los vecinos comparten las zonas verdes y los aparcamientos disponibles, y los elementos de madera, como las puertas, verjas y mamparas, proporcionan intimidad y son visualmente muy atractivos.

agradáveis paisagens de rua. A fim de cumprir os regulamentos de construção existentes referentes a eventos sísmicos, foram utilizadas estruturas de betão com argamassa sobre as paredes grossas, de forma a garantir exteriores robustos com vãos profundos nas aberturas das portas e janelas. Os alinhamentos verticais das paredes estão de acordo com as técnicas tradicionais de alvenaria, enquanto que os pórticos, lógias e varandas são utilizados livremente para tirar partido do clima e das vistas.

Tal como nas zonas comerciais de Paseo Cayalá, as avenidas, ruas e praças destes bairros residenciais são pavimentadas em calçada e laje para reforçar a primazia do pedestre sobre o automóvel. Os espaços verdes e opções de estacionamento são partilhados entre os vizinhos, e elementos de madeira como portas, portões e biombos dão privacidade e interesse visual.

The Neighborhood of Lirios within the quarter of Paseo Cayalá

The new neighborhood of Lirios was designed in response to the demand for mixed-use housing near the center of town. The design process generated a new building type, the *palacito*, which addressed the client's density requirements while allowing the design of humanly-scaled streets. The masterplanning and building designs were coordinated to allow for a continuous parking area beneath the streets and blocks. The result is a compact neighborhood made up of *insulae*, or small enclaves, which in turn are comprised of five-to-seven story *palacitos*, connected by a pedestrian network of streets and plazas. Lirios saw its first enclave open in 2019, with five more expected to be completed soon.

El barrio de Lirios dentro de distrito de Paseo Cayalá

El nuevo barrio de Lirios se diseñó como respuesta a la demanda de vivienda en edificios de uso mixto cerca del centro de la ciudad. El proceso de diseño generó un nuevo tipo de edificio, el *palacito*, que cumplía con los requisitos de densidad del cliente al tiempo que permitía el diseño de calles con una escala humana. Se coordinó el plan general con los diseños de los edificios para permitir la construcción de una zona de aparcamiento continuo debajo de las calles y las manzanas. El resultado es un barrio compacto formado por *insulae*, o pequeños enclaves, que están compuestos a su vez por *palacitos* de cinco a siete plantas, conectados por una red peatonal de calles y plazas. El primero de estos enclaves se inauguró en Lirios en 2019, y en breve se espera concluir la construcción de otros cinco más.

O Bairro de Lirios, no distrito de Paseo Cayalá

O novo bairro de Lirios foi concebido como resposta à procura de habitações de uso misto perto do centro da cidade. O processo de concepção gerou um novo tipo de edifício, o *palacito*, que deu resposta às exigências do cliente em termos de densidade, permitindo ao mesmo tempo a concepção de ruas à escala humana. A concepção do plano director e o design dos edifícios foram coordenados para permitir uma área de estacionamento contínuo sob as ruas e blocos. O resultado é um bairro compacto composto por *insulae*, ou pequenos enclaves, que por sua vez são compostos por *palacitos* de cinco a sete andares, ligados por uma rede pedonal de ruas e praças. Lirios viu o seu primeiro enclave abrir em 2019, prevendo-se em breve a conclusão de mais cinco.

1

2

1: Urban squares at Lirios, 2020 2: High rise mixed use buildings at Lirios | 1: Manzanas urbanas en Lirios 2: Edificios de uso mixto de gran altura en Lirios | 1: Quarteirões urbanos em Lirios 2. Edifícios de uso misto de grande altura em Lirios (1: Rudy Pineda 2: Estudio Urbano)

New urban quarters (on the drawing boards)

Following the success of Paseo Cayalá, the new quarters of Nogales, El Socorro Bajo, and El Socorro Alto are currently under design, with construction of the first neighborhoods expected to begin in 2021. A new bridge will connect Paseo Cayalá with Nogales, to ensure continuity of the main street along the length of Ciudad Cayalá.

Nuevos distritos urbanos (en la mesa de dibujo)

Tras el éxito del Paseo Cayalá, actualmente se están diseñando los nuevos distritos de Nogales, El Socorro Bajo, y El Socorro Alto, para los que el inicio de la construcción está previsto para 2021. Un puente nuevo conectará el Paseo Cayalá con Nogales, para asegurar la continuidad de la calle principal a lo largo de toda la Ciudad Cayalá.

Novos distritos urbanos (nos estiradores)

No seguimento do sucesso de Paseo Cayalá, os novos distritos de Nogales, El Socorro Bajo, e El Socorro Alto estão actualmente a ser concebidos, esperando-se que a construção dos primeiros bairros tenha início em 2021. Uma nova ponte ligará Paseo Cayalá a Nogales, para assegurar a continuidade da rua principal ao longo da Ciudad Cayalá.

Biographies | Biografías | Biografias

María Sánchez

She is an architect and urban planner, passionate about reinvigorating tradition in our modern world. With her husband and business partner, Pedro Godoy, established Estudio Urbano in Guatemala in 2001. A shared vision to improve urban life led the firm to collaborate with architect Leon Krier on master plans for new cities, including Ciudad Cayalá, Guatemala, and Herencia de Allende in Mexico. María's architectural commissions range from private residences and mixed-use buildings to sacred buildings. With Pedro, María serves as Town Architect for Cayalá and founded Arte Cívico, a nonprofit foundation that promotes integrated placemaking in Guatemala. Estudio Urbano has received numerous awards including the Institute of Classical Architecture and Art's Arthur Ross Award in Civic Design, among others.

Arquitecta y urbanista, apasionada de la revitalización de la tradición en nuestro mundo actual. Fundó Estudio Urbano en Guatemala en 2001 junto con su marido y socio, Pedro Godoy. Su visión compartida de mejorar la vida urbana llevó al estudio a colaborar con el arquitecto Leon Krier en los planes generales de nuevas ciudades, incluida Ciudad Cayalá, Guatemala, y Herencia de Allende, en México. Sus obras arquitectónicas van desde residencias privadas y edificios de uso mixto hasta edificios de culto. Junto con Pedro, María es Arquitecto Municipal de Cayalá y fundaron Arte Cívico, una organización sin ánimo de lucro que fomenta la planificación integrada de lugares en Guatemala. Estudio Urbano ha recibido numerosos premios, como el Arthur Ross Award in Civic Design del Institute of Classical Architecture and Art, entre otros.

É arquitecta e urbanista, apaixonada pelo revigoramento da tradição no nosso mundo moderno. Com o seu marido e parceiro de negócios, Pedro Godoy, criou o Estudio Urbano na Guatemala em 2001. Uma visão partilhada para melhorar a vida urbana levou o escritório a colaborar com o arquitecto Leon Krier em planos directores de novas cidades, incluindo Ciudad Cayalá, Guatemala, e Herencia de Allende no México. Os projectos de arquitectura comissionados a María vão desde residências privadas e edifícios de uso misto até edifícios sagrados. Juntamente com Pedro, María trabalha como Arquitecto Municipal em Cayalá e fundou a Arte Cívico, uma fundação sem fins lucrativos que promove a planificação integrada de lugares na Guatemala. O Estudio Urbano recebeu inúmeros prémios, incluindo o Arthur Ross Award in Civic Design do Institute of Classical Architecture and Art, entre outros.

Pedro Pablo Godoy

He is an architect and urban planner specializing in traditional forms and principles. In 2001, Pedro established Estudio Urbano in his native Guatemala City with his wife and business partner, María Sánchez. The firm's portfolio includes low-income housing, custom residences, restorations of historic town centers, and new communities from the ground up. Estudio Urbano collaborates regularly with renowned architect Leon Krier, notably on masterplans for Herencia de Allende, Mexico, and the new city of Cayalá, Guatemala. The firm's work has received numerous awards including the Institute of Classical Architecture and Art's Arthur Ross Award in Civic Design, among others. In addition, Pedro and María founded Arte Cívico, a nonprofit foundation that promotes integrated placemaking in Guatemala.

Arquitecto y urbanista especializado en formas y principios tradicionales. En 2011, fundó Estudio Urbano en su ciudad natal, Guatemala, junto con su mujer y socia María Sánchez. La cartera del estudio incluye viviendas de renta baja, residencias por encargo, restauración de cascos urbanos históricos, y nuevas comunidades creadas *ex novo*. Estudio Urbano colabora regularmente con el prestigioso arquitecto Leon Krier, en especial en los planes generales para Herencia de Allende, México y la nueva ciudad de Cayalá, Guatemala. El trabajo de su estudio ha recibido numerosos premios, entre los que se incluyen el Arthur Ross Award in Civic Design del del Institute of Classical Architecture and Art. Adicionalmente, Pedro y María fundaron Arte Cívico, una fundación sin ánimo de lucro que fomenta la planificación integrada de lugares en Guatemala.

É um arquitecto e urbanista especializado em formas e princípios tradicionais. Em 2001, Pedro criou o Estudio Urbano na sua cidade natal, a Cidade da Guatemala, com a sua esposa e parceira de negócios, María Sánchez. O portfólio da empresa inclui habitações de baixo rendimento, residências personalizadas, restaurações de centros históricos de cidades, e novas comunidades construídas a partir do zero. O Estudio Urbano colabora regularmente com o arquitecto de renome Leon Krier, nomeadamente nos planos directores de Herencia de Allende, México, e da nova cidade de Cayalá, Guatemala. O trabalho da empresa recebeu inúmeros prémios, incluindo o Arthur Ross Award in Civic Design do Institute of Classical Architecture and Art, entre outros. Além disso, Pedro e María fundaram a Arte Cívico, uma fundação sem fins lucrativos que promove a planificação integrada de lugares na Guatemala.

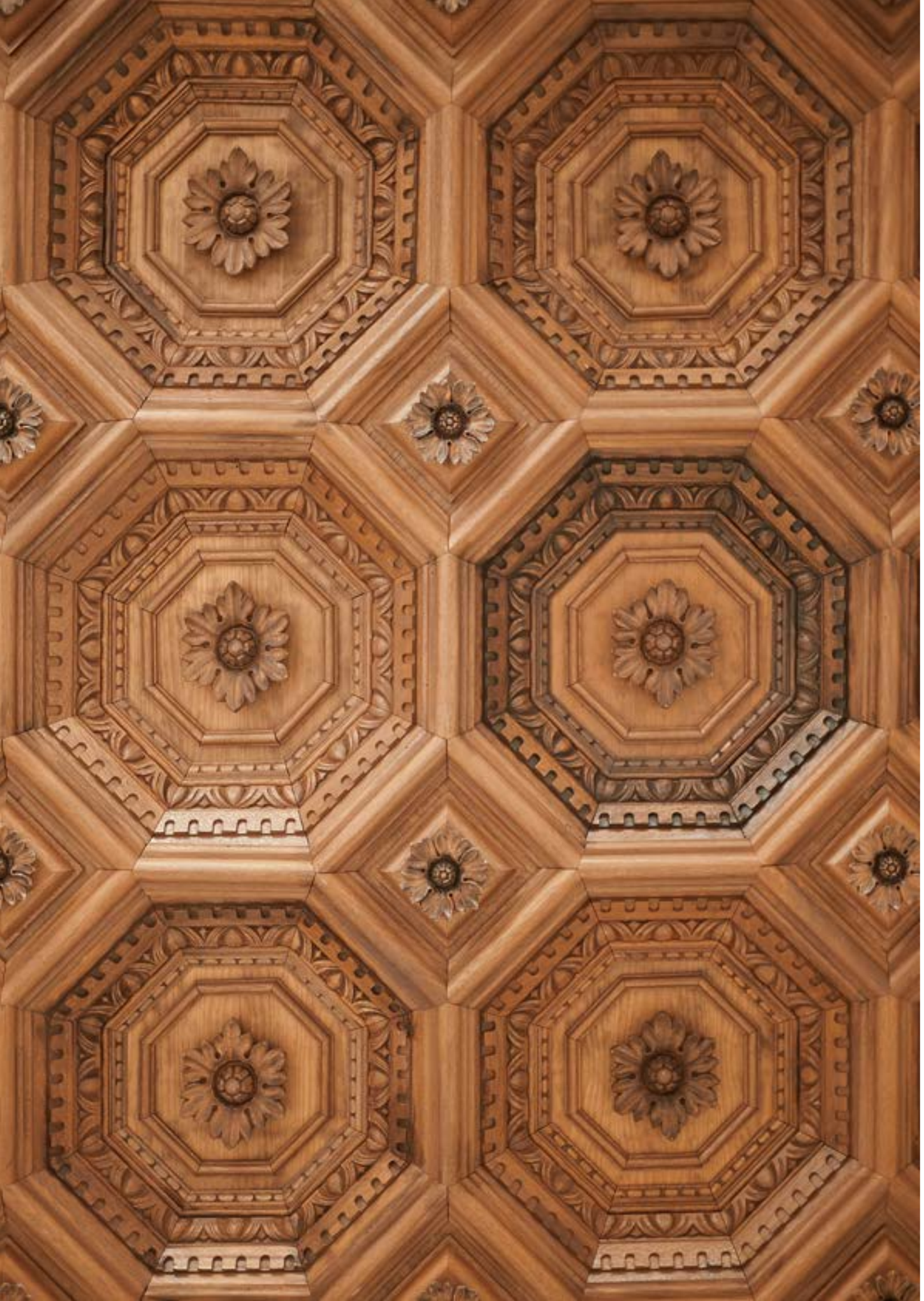
Léon Krier

He is an Architecture and Urbanism consultant and a designer; author and teacher. He was born in 1946 in Luxembourg City. He studied at Stuttgart University from 1967 to 68 and left to work with James Stirling from 1968 to 1974. Leon Krier is a theorist who promotes the technological, ecological and social rationality and the modernity of traditional urbanism and architecture, summarized in his book *The Architecture of Community* (Island Press, 2009) and its expanded Spanish edition *La arquitectura de la comunidad: La modernidad tradicional y la ecología del urbanismo* (Editorial Reverté, 2013). Since 1988, he masterplans the New Town of Poundbury for The Prince of Wales; since 2003, Cayalá, in Guatemala; since 2015 and 2020 the El Socorro and the Nogales developments, also in Guatemala; and since 2018 the New Town of Herencia de Allende, in Guanajuato, México. He has taught a several schools of architecture and is a Visiting Professor at Yale School of Architecture and was awarded the British honour of Commander of the Royal Victorian Order, the Silver Medal of the Académie Française in 1997, the Athena Award of the Congress of New Urbanism in 2006 and was the inaugural recipient of the Richard H. Driehaus Prize in 2003. Since 1990 he also designs for Giorgetti and Valli-Valli.

Arquitecto y consultor de urbanismo y proyectista; escritor y profesor. Nació en 1946 en la ciudad de Luxemburgo. Estudió en la Universidad de Stuttgart desde 1967 al 68 y la dejó para trabajar con James Stirling entre 1968 y 1974. Leon Krier es un teórico que defiende la racionalidad tecnológica, ecológica y social así como la modernidad del urbanismo y la arquitectura tradicionales, que resumió en su libro *The Architecture of Community* (Island Press, 2009) y su edición ampliada en español *La arquitectura de la comunidad: La modernidad tradicional y la ecología del urbanismo* (Editorial reverté, 2013). Desde 1988, está a cargo del plan general del nuevo pueblo de Poundbury para el Príncipe de Gales; desde 2003, de Cayalá, en Guatemala; desde 2015 y 2020, de las urbanizaciones de El Socorro y Nogales, también en Guatemala; y desde 2018, de el nuevo pueblo de Herencia de Allende en Guanajuato, México. Ha dado clases en varias escuelas de arquitectura y es Profesor Visitante de la Escuela de Arquitectura de Yale, y recibió la distinción de Comandante de Honor de la Real Orden Victoriana, la Medalla de Plata de la Académie Française en 1997, el Premio Athena del Congress for the New Urbanism en 2006 y fue el primer ganador del Premio Richard H. Driehaus en 2003. Desde 1990, también diseña para Giorgetti y Valli-Valli.

É consultor de Arquitectura e Urbanismo e designer; autor e professor. Nasceu em 1946 na cidade do Luxemburgo. Estudou na Universidade de Estugarda de 1967 a 68 e trabalhou com James Stirling de 1968 a 1974. Leon Krier é um teórico que promove a racionalidade tecnológica, ecológica e social e a modernidade do urbanismo e da arquitectura tradicional, resumida no seu livro *The Architecture of Community* (Island Press, 2009) e na sua edição Espanhola alargada *La arquitectura de la comunidad: La modernidad tradicional y la ecología del urbanismo* (Editorial Reverté, 2013). Desde 1988, é responsável pelo plano director da Nova Cidade de Poundbury para O Príncipe de Gales; desde 2003, Cayalá, na Guatemala; desde 2015 e 2020 os projectos El Socorro e Nogales, também na Guatemala; e desde 2018 a Nova Cidade de Herencia de Allende, em Guanajuato, México. Leccionou em várias escolas de arquitectura e é Professor Convidado na Escola de Arquitectura de Yale, tendo-lhe sido atribuída a honra Britânica de Comandante da Ordem Real Vitoriana, a Medalha de Prata da Académie Française em 1997, o Prémio Athena do Congress for the New Urbanism em 2006, e foi o primeiro galardoado com o Prémio Richard H. Driehaus em 2003. Desde 1990, desenha também para a Giorgetti e Valli-Valli.

El Socorro Alto and Bajo elevation view | Alzado de El Socorro Alto y Bajo | Alçado de El Socorro Alto y Bajo (Estudio Urbano)



Three Projects Recovering the Mudéjar Carpentry Tradition in Andalusia

Tres trabajos de recuperación de la tradición de la carpintería mudéjar en Andalucía

Três trabalhos de recuperação da tradição da carpintaria mudéjar em Andaluzia

Paco Luis Martos

Mudéjar carpentry

When in the nineties I started out in what is called *carpintería de armar* or *de lo blanco* (Mudéjar ceiling carpentry), the trade was almost extinct. Although I had the good fortune to learn the rudiments of the craft from master carpenters in my family, a key encounter for me was with the architect Enrique Nuere, a world specialist in Mudéjar carpentry and decorative wooden strapwork. Since then I have been able to explore the trade myself, researching it and learning with each new job I have done.

Although my main business is designing and building new roof structures, chiefly for private houses and historic buildings, the work I most enjoy, because of the continual learning involved, is restoring, rebuilding or recreating Mudéjar wooden ceilings. Setting out to build or restore such ceilings requires not just a command of the techniques of carving, inlay work, traditional jointing (such as of interlaced laths) or the design and execution of *muqarnas* vaulting and the geometric layouts forming these artefacts but also a thorough knowledge of their characteristic finishes, such as gilding, gold varnish or polychrome.

La carpintería mudéjar

Cuando en los años noventa me inicié en la conocida como carpintería de armar, el oficio estaba casi extinto. Aunque tuve la gran suerte de aprender las bases de este arte de otros maestros carpinteros de mi familia, fue fundamental para mí entrar en contacto con el arquitecto Enrique Nuere, uno de los mayores especialistas a nivel mundial de la carpintería de lo blanco o de armar y de la carpintería de lazo. A partir de este momento, tuve la oportunidad de adentrarme en el oficio por mi cuenta, investigando y aprendiendo con cada nuevo trabajo que he llevado a cabo.

Si bien mi actividad principal consiste en el diseño y la construcción de nuevas armaduras de cubierta, principalmente para casas particulares y edificios históricos, la labor que más disfruto, por el aprendizaje continuo que implica, es la restauración, la reconstrucción o la recreación de artesonados. Enfrentarse a la construcción o restauración de un artesonado implica dominar no sólo las técnicas de la talla, la taracea, las técnicas tradicionales de ensamblado –como los apeinazados– o el diseño y la ejecución de mocárabes y de los trazados geométricos que componen estas estructuras, sino conocer además en profundidad los acabados propios de las mismas, como son los dorados, los estofados y la policromía.

A carpintaria mudéjar

Quando nos anos noventa me iniciei na que era conhecida como carpintaria de armação, o ofício estava quase extinto. Ainda que tivesse tido a sorte de aprender as bases desta arte com outros mestres carpinteiros da minha família, para mim o importante foi ter entrado em contacto com o arquiteto Enrique Nuere, um dos maiores especialistas mundiais da carpintaria branca, carpintaria de laço e da carpintaria de armação. A partir desse momento, tive a oportunidade de entrar no ofício por conta própria, pesquisando e aprendendo com cada trabalho novo que realizava.

Embora a minha atividade principal consista na conceção e construção de novas armaduras de cobertura, principalmente para casas particulares e edifícios históricos, o labor que mais gosto, devido à aprendizagem contínua que implica, é a restauração, reconstrução ou recriação de artesoados. Ter na frente a construção ou restauração de um artesoado implica dominar não só as técnicas de talha, de marchetaria, técnicas tradicionais de samblagem – como os *apeinazados*– ou a conceção e execução de *mocárabes* e os traçados geométricos que compõem estas estruturas, como também conhecer em profundidade os acabamentos destas estruturas, tais como o douramento, os estofados e a policromia.

< Coffered ceiling over the stairway of the Palace of the Counts of Guadiana, Úbeda, Jaén | Artesonado de la escalera del Palacio de los Condes de Guadiana, Úbeda, Jaén | Artesoado da escada do Palácio dos Condes de Guadiana, Úbeda, Jaén (Lucho Dávila)

1: Detail of a coffered ceiling in the turret of the Palace of the Counts of Guadiana, Úbeda, Jaén 2: Coffered ceiling in the courtyard of the Palace of the Counts of Guadiana, Úbeda, Jaén, made out of recovered pieces and recycled beams | 1: Detalle del artesonado del torreón del Palacio de los Condes de Guadiana, Úbeda, Jaén 2: Artesonado del patio del Palacio de los Condes de Guadiana, Úbeda, Jaén, construido con maderas recicladas y piezas recuperadas | 1: Pormenores do artesoado do torreão do Palácio dos Condes de Guadiana, Úbeda, Jaén 2: Artesoado do pátio do Palácio dos Condes de Guadiana, Úbeda, Jaén, construído com madeira reciclada e peças recuperadas (Lucho Dávila)

Over my career I have had the opportunity to make a whole range of Mudéjar ceilings, some of which are especially significant, such as the coffered panelling around the courtyard of the Alcázar fortress in Toledo (2005-06), Mudéjar ceilings in the hotel conversion of the Condes de Guadiana Palace in Úbeda (2012) or a ceiling of Mudéjar coffers for the Andalusian Memory Museum in Granada (2008-09), among many other examples, some of which I will describe below.

Peculiar to the Iberian Peninsula from medieval times to the present day, what is known as Mudéjar art, and in particular the carpentry developed in that tradition, has a set of features that give it a unique character.

The product of a mix of cultures, arts and traditions, the Mudéjar style involves a blend of Muslim, Christian and Jewish input. This mix represented a new approach to architecture, borrowing elements from East and West and from the many other styles with which it coexisted, from Romanesque to Renaissance, and using the geometric, decorative and building techniques of the various peoples that have lived in the Iberian Peninsula over the ages.

Durante mi carrera profesional he tenido la oportunidad de realizar artesonados muy diversos, algunos de ellos especialmente representativos, tales como los alfarjes del patio del Alcázar de Toledo (2005-06), los artesonados del Palacio de los Condes de Guadiana de Úbeda, reconvertido en hotel (2012), o un artesonado de casetones mudéjares para el Museo de la Memoria de Andalucía, Granada (2008-2009), entre muchos otros ejemplos, algunos de los cuáles describiré a continuación.

Propio de la península Ibérica desde el medievo hasta la actualidad, el arte denominado mudéjar, y, en particular, la carpintería desarrollada en esta tradición, presenta una serie de características que le confieren su carácter único.

Fruto de la mezcla de culturas, artes y tradiciones, a él contribuyeron musulmanes, cristianos y judíos. Esto dio lugar a una nueva forma de entender la arquitectura, que fue tomando prestados elementos de Oriente y Occidente y de los distintos estilos con los que fue conviviendo, desde el románico hasta el renacentista, y que empleó formas geométricas, decorativas y constructivas de los distintos pueblos que convivieron en la Península durante varios siglos.

Durante esta larga etapa de convivencia, que se prolongó durante más de ocho siglos –con periodos de paz y de conflicto, de divisiones y de alianzas– constructores, carpinteros y artesanos –al margen de sus respectivas confesiones– realizaron obras tanto civiles como religiosas para una nueva sociedad que demandaba esta nueva forma de entender el arte, en la que diversos oficios alcanzaron un prodigioso nivel de excelencia y de belleza, entre ellos el de la carpintería.

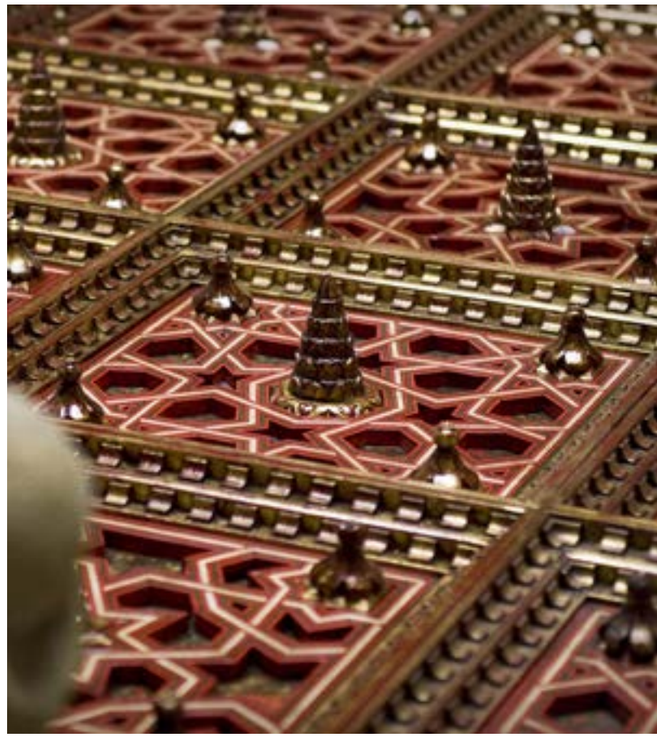
Durante a minha carreira profissional tive a oportunidade de criar artesoados bastante diversos, alguns deles particularmente representativos, tais como os alfarges do pátio do Alcáçar de Toledo (2005-06), os artesoados do Palácio dos Condes do Guadiana de Úbeda, reconvertido em hotel (2012), ou um artesoado de caixotões mudéjares para o Museu da Memória de Andaluzia, Granada (2008-2009), entre muitos outros exemplos, alguns dos quais descreverei a seguir.

Característico da península Ibéria desde o medievo até à atualidade, a denominada arte mudéjar e, em particular, a carpintaria desenvolvida nesta tradição, apresenta uma série de características que lhe conferem um carácter único.

Fruto de uma mistura de culturas, artes e tradições contributo de muçulmanos, cristãos e judios. Isto deu origem a uma nova forma de compreender a arquitetura, que tomou emprestado elementos do Oriente e do Ocidente e dos diferentes estilos com os que coexistiu, desde o românico ao renascimento, e que empregou formas geométricas, decorativas e construtivas dos diferentes povos que conviveram na Península durante vários séculos.

Durante este longo período de coexistência, que durou mais de oito séculos –com períodos de paz e conflito, de divisões e alianças– construtores, carpinteiros e artesãos –independentemente das suas respetivas crenças– realizaram obras civis e religiosas para uma nova sociedade que exigia esta nova forma de entender a arte, na que vários ofícios atingiram um nível prodigioso de excelência e beleza, entre os quais a carpintaria.

Gilded and polychrome Mudejar coffers, in the Memoria de Andalucía Museum | Casetones mudéjares dorados y policromados, en el Museo de la Memoria de Andalucía, Granada | Caixotões mudéjares dourados e policromados, no Museu da Memória de Andaluzia, Granada (Lucho Dávila)

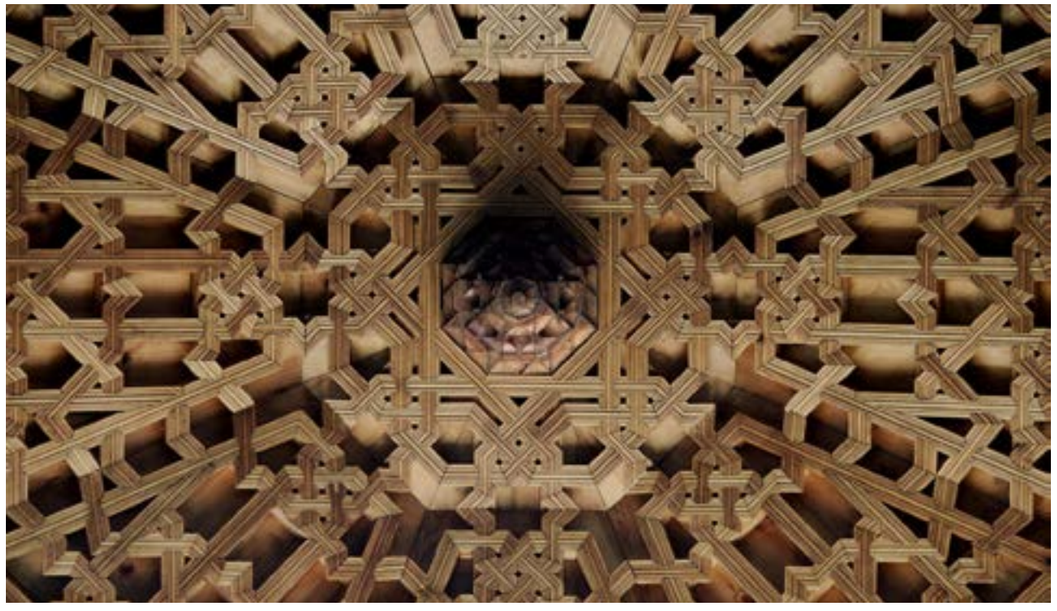


The tradition of building wooden roof and ceiling assemblies could hardly have evolved since the time of the Roman Empire. We know that truss and purlin frames were built to form sturdy self-supporting structures that conveyed no horizontal thrust to the load-bearing walls. The Mudéjar roof and ceiling assemblies developed later were to work in much the same way, as they were built with rafters, collar ties and ridges to form hip or gable slopes, and tie beams were laid at intervals to secure the *estribo* top plates, giving the ensemble stability and autonomy. This new way of building involved a set of parallel rafters with little in-between spacing and which was thus suitable for the inclusion of the geometric patterns of Islamic culture in which the master builders of the time were proficient.

La tradición constructiva de las armaduras de madera apenas debía haber evolucionado desde la época del Imperio Romano. Sabemos que se construían estructuras de cerchas y correas para formar conjuntos sólidos y autoportantes que no transmitieran empujes horizontales a los muros de carga. Los artesonados mudéjares desarrollados más adelante iban a funcionar de modo parecido, ya que se construían mediante pares, nudillos e hileras, para formar las pendientes y los tirantes se colocaban cada cierta distancia, sujetando el estribo, lo que aportaba estabilidad e independencia a todo el conjunto. Mediante esta nueva manera de construir, se creaba un entramado de pares paralelos, con escasa separación entre ellos, que era ideal para incorporar en ellos los motivos geométricos que, tomados de la cultura musulmana, los alarifes dominaron a la perfección.

A tradição construtiva de armações de madeira pouco deve ter evoluído desde a época do Império Romano. Sabemos que as estruturas de asnas e madres foram construídas para formar conjuntos sólidos e autoportantes que não transmitiam forças horizontais às paredes de carga. Os caixotões mudéjares desenvolvidos mais tarde iam funcionar de forma semelhante, uma vez que foram construídos utilizando pernas, níveis e fileiras para formar as pendentes, e as linhas eram colocadas a uma certa distância, segurando o frechal, o que proporcionava estabilidade e independência ao conjunto. Mediante esta nova forma de construir, criou-se uma armação de varas paralelas, com pouca separação entre as mesmas, que ideal para incorporar nelas os motivos geométricos que, emprestados da cultura muçulmana, os alarifes dominaram na perfeição.

Detail of an octagonal Mudéjar ceiling | Detalle de un artesonado ochavado | Pormenor de um artesoado octogonal



Rebuilding of the Mudéjar ceiling at Carmen de las Palmas

Carmen de las Palmas is a 19th-century Granadan townhouse built in neo-Mudéjar style, which before being restored had gone to ruin. In 2005 a group of students from the Albayzin School of Craft and Historic Heritage Restoration and Refurbishment who were inspecting the building with the guidance of Luis Ramírez Barea, a teacher at the school and a good friend of mine, showed me some very old pieces of wood bearing remains of polychrome.

On looking at the pieces closely, we saw at once the antiquity and significance of the find. We decided right then to gather up all the wood remaining on the site so as to restore it and also to make a detailed study of our findings as an extra practical activity within the Mudéjar carpentry courses given at the school.

Reconstrucción del artesonado del Carmen de las Palmas

El Carmen de las Palmas es un edificio granadino del siglo XIX, construido en estilo neomudéjar, que se encontraba hasta el momento de su intervención en estado de ruina. En el año 2005 un grupo de alumnos de la Escuela de Formación en Artesanía, Restauración y Rehabilitación de Patrimonio Histórico y Cultural Albayzin, que realizaba labores de inspección en el edificio guiado por Luis Ramírez Barea, profesor de la Escuela y gran amigo mío, me entregó unas piezas de madera muy antiguas con restos de policromía.

Tras estudiar las piezas detenidamente, fuimos inmediatamente conscientes de la antigüedad e importancia del descubrimiento. Se decidió en ese momento llevar a cabo una recogida minuciosa de todos los restos de madera que allí se encontraban, con el propósito de restaurarlos y, además, se planteó hacer un estudio en profundidad de los hallazgos, como actividad complementaria y práctica en el marco de uno de los cursos de carpintería de armar que estaba impartiendo en la Escuela.

Reconstrução do artesoado de Carmen de las Palmas

Carmen de las Palmas é um edifício granadino do século XIX, construído em estilo neomudéjar que, aquando da sua intervenção, se encontrava num estado de ruína. Em 2005, um grupo de alunos da Escola de Formação em Artesanato, Restauração e Reabilitação de Património Histórico e Cultural de Albayzin, realizavam labores de inspeção no edifício sob a orientação de Luis Ramírez Barea, professor da Escola e grande amigo meu, e este entregou-me algumas peças de madeira muito antigas com vestígios de policromia.

Depois de estudar as peças detalhadamente, fomos imediatamente conscientes da antiguidade e da importância da descoberta. Decidiu-se nesse momento realizar uma recolha minuciosa de todos os restos de madeira que ali se encontravam, com o objetivo de restaurá-los, e também decidimos realizar um estudo aprofundado dos achados, como atividade complementar e prática no âmbito de um dos cursos de carpintaria de armação que eu estava a lecionar na Escola.

Thorough collection of the wood remains found in Carmen de las Palmas | Recogida minuciosa de los restos de madera encontrados en el Carmen de las Palmas | Recolha minuciosa dos restos de madeira encontrados no Carmen de las Palmas

1

2

1. Slender rafter 2. Collar ties | 1: Par de pequeña sección 2: Nudillos | 1: Par de secção escassa 2: Níveis

Supervised by the restorer and pedagogue Susana Rodríguez, we sent some samples of the wood and polychrome to the laboratory Arte-Lab, SL. Within days they found that the polychromy was a preparation of plaster, lime sulphate, animal glue and various mineral pigments: azurite for blues, lead carbonate for whites and various earths for orangey tones. At the surface there was also lacquer and varnish, perhaps from later repainting or varnishing.

The lab report confirmed that the technique and materials used in the polychrome were the same as used historically on polychrome wood. In this case I estimated the work to date from the 14th or 15th centuries.

After examining the wooden members in structural terms and measuring the timbers, we concluded that this was indeed a Mudéjar ceiling, though with considerable differences vis-à-vis the traditional models for such assemblies that spread over Iberia and some of the Americas in the 16th to 18th centuries.

Bajo la supervisión de Susana Rodríguez, restauradora y docente, enviamos algunas muestras de la madera y la policromía al laboratorio Arte-Lab, S.L. Días después, los resultados confirmaron que la policromía era una preparación de yeso, sulfato de cal, cola animal y diferentes pigmentos minerales: azurita en el caso de los azules, carbonato de plomo en el de los blancos y tierras varias en los anaranjados. En la capa exterior también aparecieron restos de goma laca y barnices, posiblemente provenientes de repintes o barnizados posteriores.

Este informe corroboró que la técnica y los materiales empleados en la policromía eran idénticos a los que históricamente se han utilizado para policromar la madera. En este caso particular, pude estimar que la obra pertenecía a los siglos XIV o XV.

Una vez estudiadas las piezas de madera desde el punto de vista estructural y tras analizar y medir los maderos, llegamos a la conclusión de que se trataba de un artesonado de tipo mudéjar, pero con ciertas diferencias sensibles respecto a los modelos tradicionales de estas armaduras que proliferaron por toda la península y parte de América entre los siglos XVI y XVIII.

Sob a supervisão de Susana Rodríguez, restauradora e docente, enviámos algumas amostras da madeira e da policromia ao laboratório Arte-Lab, S.L. Dias depois, os resultados confirmaram que a policromia era uma preparação de gesso, sulfato de cal, cola animal e diferentes pigmentos minerais: azurite no caso dos azuis, carbonato de chumbo no caso dos brancos e várias terras nas alaranjados. A camada exterior também apresentava restos de goma laca e verniz, possivelmente da repintura ou envernizamentos posteriores.

Este relatório corroborou que a técnica e os materiais utilizados na policromia eram idênticas aos utilizados historicamente na policromia da madeira. Neste caso particular, pude estimar que a obra pertencia ao século XIV ou XV.

Uma vez estudadas as peças de madeira do ponto de vista estrutural e após analisar e medir o madeiramento, chegámos à conclusão de que se tratava de um artesoado tipo mudéjar, mas com algumas diferenças sensíveis em relação aos modelos tradicionais destas armaduras que proliferaram por toda a península e parte da América entre os séculos XVI e XVIII.

The rafters had a notably small cross-section of just 4.5 x 6 cm. And though the cross-section of the structural timbers respected the normal ratio between width and height, i.e. the square root of 2, we found another notable difference in the spacing between rafters. These spaces would as a rule be twice the thickness of a rafter, but here they were nearly three times this thickness. This anomaly is most often found in Mudéjar ceilings of later centuries, as the development of wooden strapwork for decorating panels and the need to economize wood caused the spacing to be increased above what had been standard. Rafter thickness is always crucial, as this measurement is the basic unit for the whole ceiling assembly.

We also found that the collar ties (the wooden members linking each pair of rafters, whose length is normally a third of the width of the room below) were much shorter than usual – a rare feature in later ceilings.

The *almizate* (the horizontal panel level with the collar ties at the top of the ceiling assembly) was formed by a series of ties among which we found some known as *alfardones*, i.e. planks decorated with *cinta y saetino* lstrapwork and trim, both chamfered and with traces of polychrome.

Era llamativa la escasa sección de los pares, de tan sólo 4,5 x 6 centímetros. A pesar de que en la sección de la estructura se cumplía la regla habitual de proporción entre el ancho y el alto, que suele ser raíz de dos, encontramos otra diferencia reseñable en la separación entre un par y el siguiente. Según los cánones, esta separación debía ser el doble del grueso del par, mientras que, en nuestro artesonado, esta era de casi tres veces su grosor. Es más frecuente encontrar esta anomalía en artesonados más tardíos, de siglos posteriores, en los que debido tanto al desarrollo de la lacería que decora los paños como a otras razones relacionadas con la economización de la madera utilizada, se aumentó esta distancia respecto a lo que marcaban los cánones. El grueso del par es siempre determinante, ya que toda la construcción de una armadura parte del empleo de esta medida como unidad.

También encontramos que los nudillos (las piezas de madera que unen un par con su contrario y que tienen una longitud de un tercio del ancho de la sala en la que se encuentran) eran mucho más cortos de lo habitual, algo difícil de ver en armaduras posteriores.

El almizate (el paño horizontal ubicado en la parte superior de la armadura, a la altura de los nudillos) estaba conformado por la sucesión de nudillos, entre los que encontramos los llamados alfardones, que son tablas decoradas con cinta y saetino, ambos biselados y con restos de policromía.

Era chamativa a escassa secção das pernas, de apenas 4,5 x 6 centímetros. Embora a secção da estrutura cumprisse a regra habitual de proporção entre largura e altura, que é normalmente a raiz quadrada, encontramos outra diferença notável na separação entre uma perna e a seguinte. De acordo com os cânones, esta separação devia ser o dobro da espessura da perna, no entanto, no nosso artesoado, esta era quase três vezes a sua espessura. Esta anomalia é mais frequente encontra-la em artesoados mais tardios, de séculos posteriores, nos quais, devido ao desenvolvimento da laçaria que decora os panos como por outras razões relacionadas com a economia da madeira utilizada, esta distância foi aumentada em relação ao que estipulavam os cânones. A espessura da perna é sempre determinante, uma vez que toda a construção de uma armação se baseia no emprego desta medida como unidade.

Também encontramos que os níveis (as peças de madeira que unem uma perna com a sua oposta e que têm um comprimento de um terço da largura da sala na que se encontram) eram muito mais curtos do que o habitual, algo difícil de encontrar em armaduras posteriores.

O *almizate* (o pano horizontal situado na parte superior da armadura, à altura do nível) estava constituído por uma sucessão de níveis, entre os quais encontramos os chamados *alfardones*, que são tábuas decoradas com *cinta e saetino*, ambos biselados e com vestígios de policromia.

Alfardón plank decorated with *cinta y saetino* motifs | Alfardón decorado con cinta y saetino | *Alfardón* decorado com *cinta* e *saetino*

The hip ends each consisted of a panel delimited by single hip rafters (of the type known as *lima bordón*), by contrast with other later Mudéjar ceilings which normally have two (known as *limas mohamares*). Building ceiling assemblies with twin hip rafters allows the panels to be made wholly in a workshop, making them easier to install than with single hip rafters.

The rafters had been jointed at the top plate with birdsmouth cuts known as *patilla* and *barbilla*, neatly fitting into the plates. The assembly had been strengthened with nails.

Los testeros estaban formados por un paño delimitado por limas únicas (del tipo denominado lima bordón), a diferencia de otros artesonados posteriores que normalmente llevan dos (las llamadas limas mohamares). Fabricar los artesonados con limas mohamares permite que los paños se puedan construir enteros en el taller, lo que facilita mucho el montaje respecto a cuando se utiliza una única lima.

La unión de los pares al estribo se había realizado mediante unos cortes llamados *patilla y barbilla*, que encajaban perfectamente en dicho estribo. Para reforzar el ensamble se habían empleado clavos.

Os testeiros estavam constituídos por um pano delimitado por arestas únicas (do tipo denominado *lima bordón*), ao contrário de outros artesoados posteriores que normalmente têm duas arestas (denominadas de *limas mohamares*). Fabricar artesoados com *limas mohamares* permite que os panos possam ser construídos inteiros numa oficina, o que facilita muito a montagem em relação àqueles que utilizam uma aresta única.

A união das pernas ao frechal tinha sido feita mediante uns cortes chamados de *patilla* e *barbilla*, que encaixavam perfeitamente no dito frechal. Para reforçar a samblagem, empregaram-se pregos.

1: *Patilla* and *barbilla* birdsmouth for a wall plate 2: Salvaged structural member with polychrome remains in *gramil* grooves 3: *Alfardón* plank in *almizate* section 4: Board trimmed with plant motifs 5: Polychrome *tabica* board | 1: *Patilla y barbilla* en estribo 2: Pieza estructural recuperada con restos de policromía en los gramiles 3: Alfardón del almizate 4: Tablazón con una cenefa con motivos vegetales 5: Tabica policromada | 1: *Patilla y barbilla* no frechal 2: Peça estrutural recuperada com restos de policromia nos graminhos 3: *Alfardón* do *almizate* 4: Tabuleiro com uma sanefa com motivos vegetais 5: Tabica policromada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We were unable to find any trace of the *cuadrales* (members laid diagonally to the wall tops so as to brace the top plates at the corners) or of the tie beams (horizontal timbers attached to the top plates on either side, normally in pairs in such assemblies and which serve to prevent the structure from being deformed by horizontal thrust from the ceiling panels). These timbers must surely have existed, but no trace of them remained.

On studying the remains that we did have, we could infer that the ceiling had originally been wholly polychrome: all of its structural members were orange and, in the lower part, the grooves in the interlaced laths were black and red with a central line of white. The panelling consisted of planks of some 1 cm thick by 20 cm wide, trimmed with a strip of polychrome plant motifs in red, white and green. On the *alfardón* hexagonal segments of the *almizate* section, the surviving designs, damaged and patchy, showed a twin eight-pointed star with a cross in the middle. At the edges were plant motifs on a red background, akin to classical Nasrid plasterwork.

There was striking polychrome on the *tabicas*, i.e. the boards covering the gaps between one rafter and the next in the ceiling's lower region. Against an orange background there was an eight-point star consisting of eight equilateral triangles painted in white with fine dark lines accentuating the outline. The eight-point star is perhaps the most recurrent geometric motif in Nasrid designs and often a starting point for further geometric elaboration. But in this Mudéjar ceiling the stars were such as I had not seen before, so I have been unable to determine the design's origin.

A few months after finding the ceiling, we made a reproduction of it in polychrome wood, with the same measurements as the original.

No pudimos obtener ninguna información sobre los cuadrales (maderos colocados en diagonal a las cabezas de los muros para trabar los estribos en las esquinas), ni de los tirantes (maderos horizontales que atan entre sí los estribos de ambos extremos, que son normalmente dobles en este tipo de armaduras y cuya función es evitar que la estructura se deforme por los empujes horizontales de los paños de la armadura). Sin duda los tuvo que tener, pero no encontramos ningún resto.

Por lo que pudimos deducir tras analizar los vestigios disponibles, originalmente el artesonado estaba totalmente policromado: todos los elementos estructurales en naranja y, en la parte inferior, los gramiles en negro y rojo con una franja central blanca. La tablazón estaba formada por tablas de un centímetro de grosor por veinte centímetros de ancho, aproximadamente, y en los bordes tenía una cenefa con motivos vegetales policromados con rojos, blancos y verdes. En los alfardones del almizate, los dibujos conservados –muy deteriorados y escasos– mostraban una estrella doble de ocho puntas con una cruz en el medio. A los lados se encontraban motivos vegetales sobre un fondo rojo, semejantes a los de las clásicas yeserías nazaríes.

Era llamativa la policromía de las tabicas, que son las tablas que cubren los huecos entre par y par en la zona inferior del artesonado. Sobre un fondo naranja se encontraba dibujada una estrella de ocho puntas, compuesta por ocho triángulos equiláteros pintados de blanco con una fina línea oscura para acentuar el trazado. En su centro se apreciaban tres círculos negros con puntos blancos. La estrella de ocho puntas es quizá el motivo geométrico más representado en las geometrías nazaríes, y es el frecuente punto de partida para el desarrollo de las restantes geometrías decorativas. En este artesonado, sin embargo, apareció un tipo de estrellas como nunca lo he visto

Não pudemos obter qualquer informação sobre os *cuadrales* (madeiro colocado em diagonal nas cabeças das paredes para travar os frechais nos cantos), nem sobre as linhas (madeiro horizontal que ata os frechais entre si de ambos extremos, normalmente dois neste tipo de armaduras e cuja função é evitar que a estrutura seja deformada pelas forças horizontais dos panos da armadura). Sem dúvida alguma, esta deve-os ter tido, mas não encontrámos nenhum vestígio.

O pudemos deduzir depois analisar os vestígios disponíveis, originalmente o artesoado estava policromado: todos os elementos estruturais em cor de laranja e, na parte inferior, os gramis em preto e vermelho com uma faixa central branca. O tabuleiro estava formado por tábuas de um centímetro de espessura e vinte centímetros de largura, aproximadamente, e nas bordas tinha uma sanefa com motivos vegetais policromados a vermelho, branco e verde. Nos *alfardones* do *almizate*, os desenhos conservados –muito deteriorados e escassos– mostravam uma estrela dupla de oito pontas com uma cruz no meio. Nos lados encontravam-se motivos vegetais sobre um fundo vermelho, semelhantes aos das gessarias nazari clássicas.

Era chamativo a policromia das tabicas, que são as tábuas que cobrem os vãos entre perna e perna na zona inferior do artesoado. Sobre um fundo cor de laranja encontrava-se desenhada uma estrela de oito pontas, composta por oito triângulos equiláteros pintados a branco com uma fina linha escura para acentuar o seu contorno. No seu centro encontravam-se três círculos negros com pontos brancos. A estrela de oito pontas é talvez o motivo geométrico mais representado na geometria Nasrid, e é o frequente ponto de partida para o desenvolvimento das restantes geometrias decorativas. Neste artesoado, porém, apareceu um tipo de estrela como nunca tinha visto na minha

en mi carrera profesional, por lo que no me ha sido posible determinar el origen de este dibujo.

Unos meses después del hallazgo del artesonado, realizamos una reproducción del mismo en madera policromada, con las mismas medidas que el original.

carreira profissional, pelo que não me foi possível determinar a origem deste desenho.

Alguns meses após a descoberta do artesoado, reproduzimos o mesmo em madeira policromada, com as mesmas medidas que o original.

A new Mudéjar ceiling for Alcalá de Guadaíra

Another experience worth noting here is that of a project I did at Alcalá de Guadaíra, when in 2008 a client asked me to build a new Mudéjar ceiling similar to an existing one in Casa de Pilatos in Seville.

Casa de Pilatos is a palace belonging to the House of Medinaceli, an iconic ensemble of 16th-century secular Andalusian architecture with a blend of Italian Renaissance and Spanish Mudéjar styles, built in stages from the 15th to 17th centuries. The house where the new Mudéjar ceiling was fitted is newly built, in the characteristic Sevillian baroque style.

This Mudéjar ceiling has a square structure with twin hip rafters and an upper *almizate* section with twelve and eight-pointed compositions and two *muqarnas* bosses. Its panels have three longitudinal bands with eight-pointed stars. The lower band forms the edge of the ensemble, the second one runs along the middle and the upper band is interlinked with the *almizate* section. Notable in its decoration are the gilding of the light fixtures, the *almendrilla* rhomboids, the middle *agramilado* grooving on the rafters, the *sino* rosette hubs carved with gold and the motifs with natural pigments and egg on a green background with gold leaf.

Nuevo artesonado para Alcalá de Guadaíra

Otra experiencia reseñable es la de las obras que he realizado en Alcalá de Guadaíra, donde en el año 2008 un cliente me pidió construir un nuevo artesonado similar a otro existente en la Casa de Pilatos, en Sevilla.

La Casa de Pilatos es un palacio perteneciente a la Casa de Medinaceli que constituye uno de los conjuntos más representativos de la arquitectura civil andaluza del siglo XVI y que presenta un mestizaje de estilos renacentista-italiano y mudéjar-español a lo largo de las diversas intervenciones llevadas a cabo entre los siglos XV y XVII. La vivienda donde se construyó este nuevo artesonado es también de obra nueva, de característico estilo barroco-sevillano.

El artesonado contaba con una armadura cuadrada con limas mohamares o dobles y almizate con lazo de doce y ocho, con dos piñas de mocárabes. En los paños aparecían tres bandas longitudinales con estrellas de ocho. La banda inferior servía de remate al conjunto, una segunda se situaba en la central y, finalmente, la banda superior continuaba el lazo con el almizate. Entre sus elementos decorativos conviene destacar también el dorado de los plafones, las *almendrillas* y el agramilado central en los pares, *sinos* tallados con oro y motivos con pigmentos naturales y con huevo sobre fondo verde y pan de oro.

Novo artesoado para Alcalá de Guadaíra

Outra experiência notável é o das obras que realizei em Alcalá de Guadaíra, onde em 2008 um cliente me pediu que construísse um novo artesoado semelhante a outro existente na Casa de Pilatos, em Sevilha.

A Casa de Pilatos é um palácio pertencente à Casa de Medinaceli que constitui um dos conjuntos mais representativos da arquitetura civil andaluza do século XVI e que apresenta uma mistura de estilos renascentista-italiano e mudéjar-espanhol ao longo das várias intervenções realizadas entre os séculos XV e XVII. A casa onde se construiu este novo artesoado é também uma construção nova, de característico estilo barroco-sevilhano.

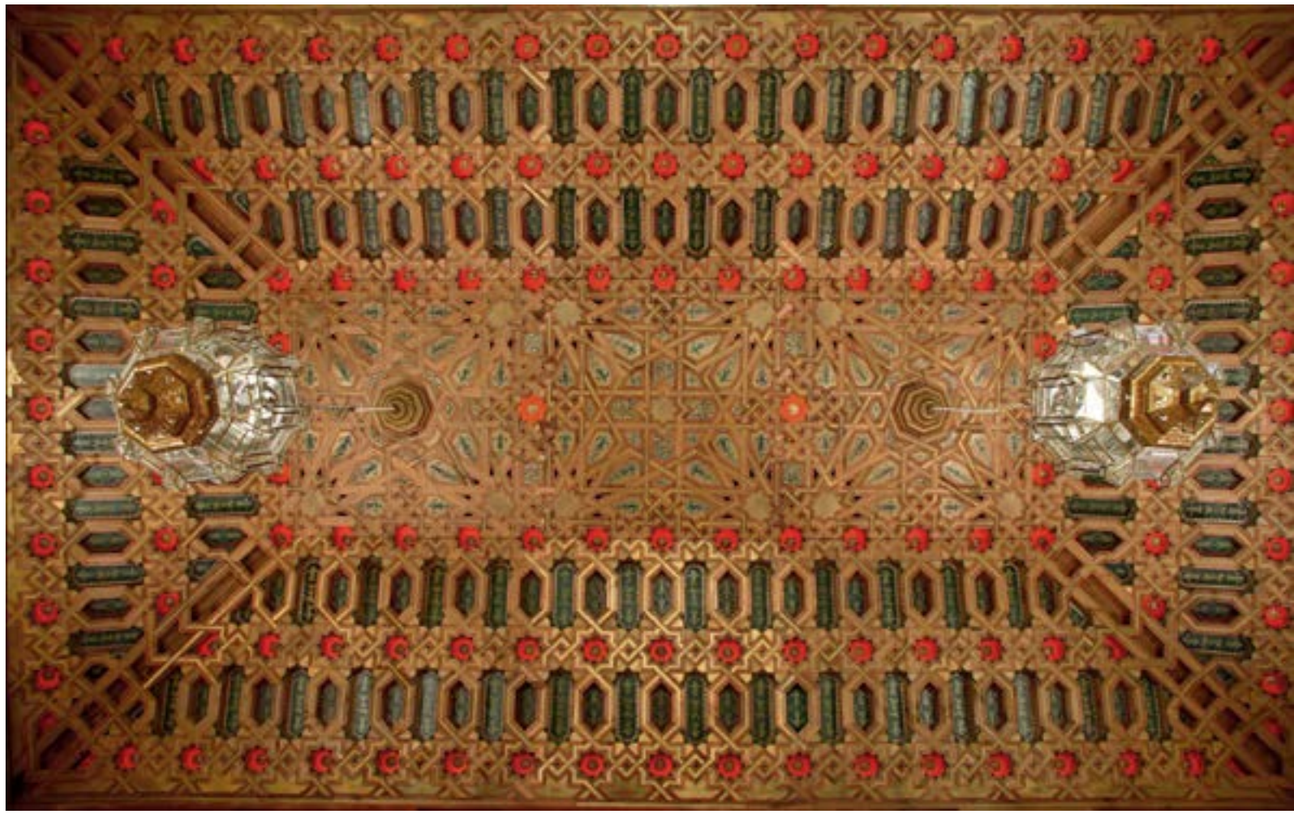
O artesoado contava com uma armadura quadrada com *limas mohamares* ou arestas duplas e *almizate* com laço de doze e oito com duas pinhas de muqarnas. Nos panos apareciam três bandas longitudinais com estrelas de oito pontas. A banda inferior servia de remate ao conjunto, uma segunda banda encontrava-se no centro e, finalmente, a banda superior continuava o laço com o *almizate*. Entre os seus elementos decorativos convém destacar também o dourado das pinhas de muqarnas, *almendrillas* e o agramilado central nas pernas, sinos talhados com ouro e motivos com pigmentação natural e com um ovo sobre um fundo verde e folha de ouro.

We should note that the ceiling's function is structural as well as ornamental, so the rafters need to have a sufficient cross-section to bear the weight of the roof. Despite the size of the panels, they could easily be made in a workshop and transported to the site, where they were assembled on the floor and then, using hoists on the top plates, fitted whole into their final position. This is a great advantage of Mudéjar carpentry, as being able to assemble parts in a workshop greatly facilitates the construction process.

Cabe destacar que el artesonado cumplía con una función estructural, además de la ornamental, por lo que los pares contaban con una sección suficiente como para soportar el peso de la cubierta. Los paños, a pesar de su tamaño, pudieron ser construidos fácilmente en el taller y luego trasladados a la obra, donde fueron montados primeramente en el suelo y, después, mediante unos amarres en los estribos, colocados de una sola pieza en su posición final. Esta es una de las grandes ventajas de los trabajos de carpintería de armar: al poder realizar el montaje previo en el taller se facilita mucho el proceso de construcción.

Cabe destacar que o artesoado cumpria com uma função estrutural, para além de ornamental, pelo que as pernas contavam com uma secção suficiente para suportar o peso da cobertura. Os panos, apesar do seu tamanho, puderam ser facilmente construídos na oficina e depois foram transferidos para a obra, onde foram primeiro montados no chão e, depois, por meio de fixações nos frechais, colocados numa só peça na sua posição final. Esta é uma das grandes vantagens dos trabalhos da carpintaria de armação: ao poder realizar a montagem previamente na oficina, simplifica-se bastante o processo de construção.

Mudéjar ceiling for a house in Alcalá de Guadaira, Seville | Artesonado para una vivienda en Alcalá de Guadaira, Sevilla | Artesoado para uma vivenda em Alcalá de Guadaira, Sevilha



Replica of the Partal Palace Oratory Mudéjar ceiling | Réplica del artesonado del Oratorio del Partal | Réplica do artesoado do Oratório del Partal

Replica of the Mudéjar ceiling of the Partal Palace Oratory

A third job I would like to mention is a Mudéjar ceiling that I made in 1997 for a project to reproduce several rooms of the Granadan Alhambra, for a private house. The client commissioned me to reproduce the Mudéjar ceiling of the Partal Palace Oratory, originally built in 1333-54. Located by the Partal Palace, this rectangular-plan oratory is part of the Alhambra palace complex, perched on its outer walls for purposes of meditation and prayer. My client wished to replicate not just the Alhambra woodwork but also the plasterwork and other decoration, so several craft trades were involved in the project.

This is a rectangular Mudéjar ceiling. Although the original lacks some characteristic features, such as *cuadral* corner members and tie beams, it is a prototypical example of Mudéjar carpentry as regards its structure, jointing and decoration. The reproduction I made was not polychrome but of bare wood. This allows the structural members and the rafter dimensions and collar ties to be seen in detail as well as giving the ensemble the characteristic sobriety of wood. As in the previous example, this ceiling assembly has a structural as well as a decorative function, as it supports the roof of the room where it is fitted. Studying the ceiling of the Partal Palace Oratory led me to reflect on the origins of Mudéjar woodwork, as this assembly, despite exhibiting most of the classical characteristics of Mudéjar ceilings, was built at least 300 years before such compositions became widespread.

Réplica del artesonado del Oratorio del Partal

Un tercer trabajo al que me gustaría hacer mención es un artesonado que realicé en el año 1997 para un proyecto en el que se buscaba reproducir varias estancias de la Alhambra de Granada y que debía servir como residencia privada. El cliente me encargó reproducir el artesonado del Oratorio del Partal, construido originalmente entre los años 1333 y 1354. Situado junto al pórtico del Palacio del Partal, este edificio de planta rectangular es un oratorio integrado en el conjunto palaciego de la Alhambra. Aparece montado sobre la muralla general del recinto, con el fin de favorecer la meditación y el rezo. La persona que está detrás de este encargo no buscaba replicar únicamente los trabajos de carpintería de la Alhambra, sino también las yeserías y demás decoraciones, por lo que son varios los oficios artesanales que se vieron involucrados en la ejecución de las obras.

Se trata de un artesonado rectangular. Pese a que está desprovisto de algunos elementos característicos, como los cuadrales y los tirantes, se trata de un ejemplo prototípico de carpintería mudéjar en cuanto a estructura, tipos de ensambles y decoración. La reproducción que llevé a cabo no estaba policromada, sino que se dejó la madera vista. Esto permitía observar con más detalle los elementos que forman la armadura y las dimensiones de los pares y los nudillos y le aportó la sobriedad de la propia madera. Al igual que el ejemplo antes referido, este artesonado debía desempeñar también una función estructural, además de la decorativa, ya que sostenía la cubierta de la habitación donde se encontraba. Estudiar el artesonado del Oratorio del Partal me permitió reflexionar sobre el origen de la carpintería mudéjar, ya que este, a pesar de contar con gran parte de las características de los elementos mudéjares clásicos, fue construido al menos trescientos años de que esas composiciones clásicas se popularizaran.

Replica do artesoado do Oratório de Partal

O terceiro trabalho que gostaria de mencionar é um artesoado que realizei em 1997 para um projeto no que procurava reproduzir vários compartimentos da Alhambra de Granada e que devia servir como residência privada. O cliente encarregou-me de reproduzir o artesoado do Oratório del Partal, construído originalmente entre 1333 e 1354. Localizado junto ao pórtico do Palácio del Partal, este edifício de planta retangular é um oratório integrado no conjunto palaciano da Alhambra. Aparece montado sobre a muralha geral do recinto, a fim de favorecer a meditação e a oração. A pessoa por detrás desta encomenda não só procurava apenas replicar os trabalhos de carpintaria da Alhambra, como também os trabalhos de estuque e demais decorações, pelo que são vários os ofícios artesanais envolvidos na execução das obras.

Trata-se de um artesoado retangular. Apesar de estar desprovido de alguns elementos característicos, tais como os *cuadrales* e as linhas, trata-se de um exemplo prototípico de carpintaria mudéjar em termos de estrutura, tipos de samblagem e decoração. A reprodução que realizei não estava policromada, pelo que a madeira foi deixada à vista. Isto permitia observar com mais atenção os elementos que formam a armadura e as dimensões das pernas e dos níveis, e proporcionou-lhe a sobriedade da própria madeira. Tal como o exemplo antes mencionado, este artesoado devia desempenhar também uma função estrutural, para além de decorativa, já que suportava a cobertura do compartimento onde que se encontrava. Estudar o artesoado do Oratório del Partal permitiu-me refletir sobre a origem da carpintaria mudéjar, uma vez que esta, apesar de ter grande parte das características dos elementos mudéjar clássicos, foi construída pelo menos trezentos anos antes destas composições clássicas se tornarem populares.

An age-old, living tradition

Working on these Mudéjar ceilings caused me to ask many questions about how these assemblies may have originated and evolved, and also about my own role in the transmission of a know-how deeply rooted in our region and very much part of our identity.

It seems the style may have evolved by two paths, both springing from the same source and combining the same influences. Either it would have emerged in Iberia from the Roman tradition of carpentry, with Christian carpenters

Una tradición centenaria y viva

Trabajar en estos artesonados provocó que me hiciera muchas preguntas, relacionadas tanto con los posibles orígenes y la evolución de las armaduras mudéjares como con mi propio papel en la cadena de transmisión de un saber muy arraigado en nuestro territorio y con un importante valor de identidad.

Parece que existieron dos posibles vías para su desarrollo, aunque partiendo de un mismo origen y combinando las mismas influencias: una es que se desarrollara en la Península a partir de la tradición

Uma tradição centenária e viva

Trabalhar nestes artesoados fez-me colocar muitas perguntas relacionadas tanto com as possíveis origens e evolução das armaduras mudéjares, como com o meu próprio papel na cadeia de transmissão de um conhecimento profundamente enraizado no nosso território e com um importante valor identitário.

Parece que existiram duas possíveis vias para o seu desenvolvimento, ainda que partissem da mesma origem e combinassem as mesmas influências: uma desenvolveu-se na Península a

blending in the new geometric patterns arriving from the East in their wooden assemblies; or, also emerging from the Roman carpentry tradition and the geometric decoration that proliferated through the Muslim world, carpenters in the newly Islamized regions of North Africa would have progressively blended such designs into the structures of the mosques they were building. In any event we know that in the vast territory ruled by the Almohads in the 12th century, spanning both Iberia and the Maghreb, there were already carpenters building assemblies similar to the remains that we found in a *carmen* house in Granada 900 years later, and to others made by me for various clients and described here. The structural and decorative basis may have been laid then, before developing over centuries throughout Spain and inspiring the most notable work of my own.

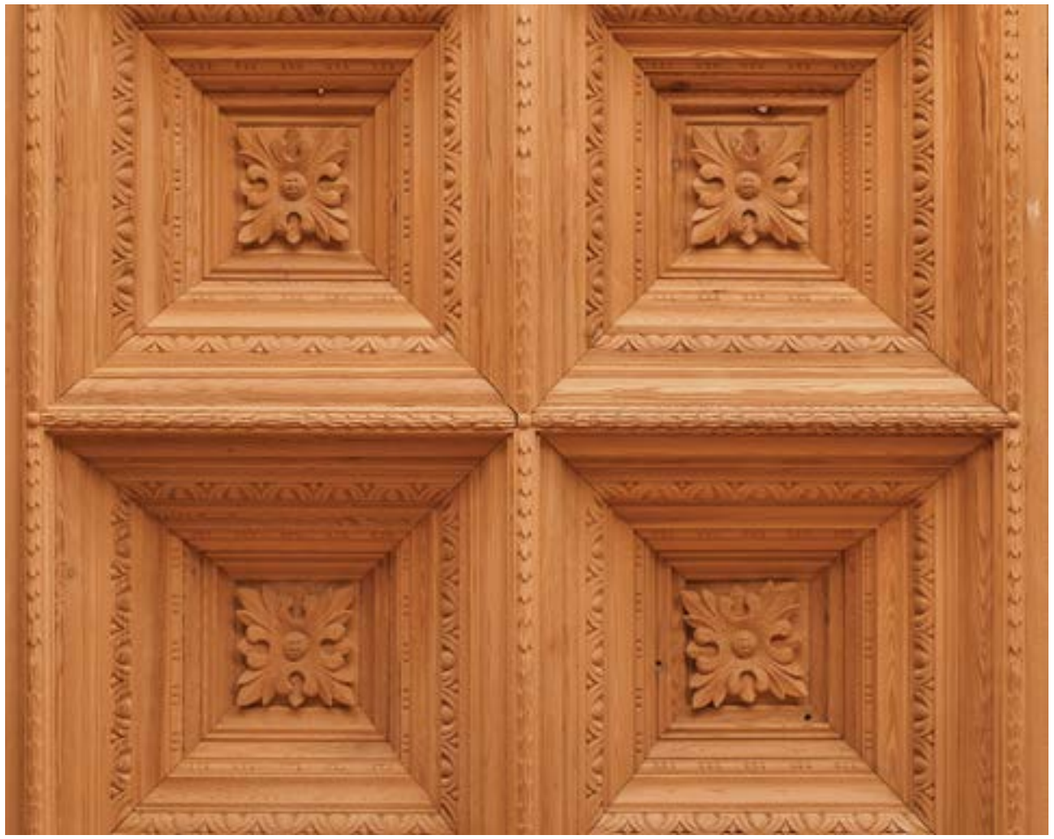
In such work I have always set out from the tradition and the legacy handed down to me and which I have sought to continue, update and keep alive as regards the carpentry and the geometric elaboration that have historically enriched it, while also making use of polychromy to add ornamentation and beauty.

carpintera de origen romano y que los carpinteros cristianos incorporaran al diseño de sus sus armaduras los nuevos esquemas geométricos llegados de Oriente; la otra vía tomaría también como base la carpintería de tradición romana y las composiciones geométricas que proliferaron en el mundo musulmán, y sería que los carpinteros de los nuevos territorios norteafricanos islamizados fueran incorporando este tipo de trazados a las estructuras de las mezquitas que se fueran levantando en ellos. En todo caso, sabemos que en el vasto territorio dominado por los Almohades en el siglo XII y que comprendía tanto la Península como el Magreb, había ya carpinteros construyendo armaduras similares a la de los restos que encontramos en un carmen de Granada 900 años después, así como a los ejemplos realizados por mí para distintos clientes que aquí he presentado. Pudo ser entonces cuando se sentaran las bases estructurales y decorativas que durante siglos se han desarrollado en toda España y que han sido la inspiración de los trabajos más importantes que he realizado.

En estos trabajos he partido siempre del aprendizaje de la tradición y la herencia recibida, que he buscado continuar, actualizar y mantener viva, no sólo en lo relativo a la propia carpintería y los desarrollos geométricos con los que históricamente se ha enriquecido, sino también explotando la capacidad de la policromía para ornamentar y embellecer estos elementos.

partir da tradição carpinteira de origem romana e que os carpinteiros cristãos incorporaram os novos esquemas geométricos chegados do Oriente ao desenho das suas armaduras; e a outra via teria também como base a carpintaria de tradição romana e as composições geométricas que proliferaram no mundo muçulmano, e seria que os carpinteiros dos novos territórios norte africanos islamizados foram incorporando este tipo de traçado às estruturas das mesquitas que estavam a ser levantadas neles. Em qualquer caso, sabemos que no vasto território dominado pelos almóadas no século XII, que incluía tanto a Península como o Magrebe, já existiam carpinteiros a construir armaduras semelhantes à de dos restos encontrados num *carmen* em Granada 900 anos depois, bem como os exemplos feitos por mim para diferentes clientes que aqui apresentei. Pode ter sido então quando se estabeleceram as bases estruturais e decorativas que durante séculos foram desenvolvidas em toda a Espanha e que foram a inspiração para os trabalhos mais importantes que realizei.

Nestes trabalhos parti sempre da aprendizagem da tradição e da herança recebida, que procurei continuar, atualizar e manter viva, não só em termos da própria carpintaria e dos desenvolvimentos geométricos com que historicamente foi enriquecida, mas também explorando a capacidade da policromia para ornamentar e embelezar estes elementos.



Coffers ready for decoration | Casetones preparados para su decoración | Caixotões preparados para a sua decoração

Biography | Biografía | Biografia

Paco Luis Martos

Paco Luis is one of the foremost masters of Mudéjar carpentry working in the trade in Spain. He learned its rudiments from other master carpenters in his family, though also important to him were undertaking a restoration of a Mudéjar ceiling and coming into contact with Enrique Nuere, and since then he has gone on researching the trade and learning more about it with each job, thereby keeping alive a craft which when he took it up was nearly extinct. In 2006 his firm, Artesonados Mudéjares, opened a branch in Los Angeles. He has given many courses and lectures and his work has been shown in various exhibitions. His wide-ranging output notably includes the coffered panelling around the courtyard of the Alcázar fortress in Toledo (2005-06), Mudéjar ceilings in the hotel conversion of the Condes de Guadiana Palace in Úbeda (2012) and a ceiling of Mudéjar coffers for the Andalusian Memory Museum in Granada (2008-09). Over his career he has also received many accolades, among which we may highlight the Richard H. Driehaus Building Arts Award in 2020.

Paco Luis es uno de los más destacados maestros de la carpintería de armar que ejercen el oficio en España. Aprendió sus bases de otros maestros carpinteros de su familia, aunque fue fundamental para él tener que enfrentarse a la recuperación de un artesonado, entrar en contacto con Enrique Nuere y seguir desde entonces investigando y aprendiendo con cada nuevo trabajo, contribuyendo así a mantener vivo un oficio que encontró casi extinto. En el año 2006 su empresa, Artesonados Mudéjares, con sede en Úbeda (Jaén), abrió una delegación en la ciudad de Los Ángeles. Ha impartido gran cantidad de cursos y conferencias, y su trabajo ha sido expuesto en varias muestras. Entre las muchas obras que ha realizado pueden destacarse los alfarjes del patio del Alcázar de Toledo (2005-06), los artesonados del Palacio de los Condes de Guadiana de Úbeda, reconvertido en hotel (2012), o un artesonado de casetones mudéjares para el Museo de la Memoria de Andalucía, en Granada (2008-2009). Asimismo, ha recibido gran cantidad de premios durante su trayectoria, entre los que se puede destacar el Premio Richard H. Driehaus de las Artes de la Construcción en el año 2020.

Paco Luis é um dos mais notáveis mestres da carpintaria de armação que exercem o ofício em Espanha. Aprendeu as suas bases com outros mestres carpinteiros da sua família, ainda que fosse fundamental para ele ter de enfrentar a recuperação de um artesoado, entrar em contacto com Enrique Nuere e continuar desde então a investigar e a aprender com cada trabalho novo, contribuindo desta a manter vivo um ofício que encontrou quase extinto. Em 2006, a sua empresa, Artesoados Mudéjares, abriu uma filial na cidade de Los Angeles. Tem dado uma grande quantidade de cursos e conferências, e o seu trabalho foi exposto em várias amostras. Entre as muitas obras que realizou, podemos destacar os alfarjes do pátio do Alcazar de Toledo (2005-06), os artesoados do Palácio dos Condes de Guadiana em Úbeda, convertidos em hotel (2012), ou um artesoado de caixotões mudéjares para o Museu da Memória de Andaluzia, Granada (2008-2009). Desta forma, também recebeu uma grande quantidade de prémios durante a sua trajetória, entre os quais podemos destacar o Prémio Richard H. Driehaus das Artes da Construção em 2020.

Restoration of the Marabout of Sidi Abdullah Khalifa at Ouled Youssef, M'hamid Oasis, Morocco

Restauración del morabito de Sidi Abdullah Khalifa en Ouled Youssef, Oasis de Mhamid, Marruecos

Restauração do marabu de Sidi Abdullah Khalifa em Ouled Youssef, Oásis de Mhamid, Marrocos

Marta Colmenares Fernández, Alejandro García Hermida, Carmen Moreno Adán

Background

The restoration of the marabout shrine of Sidi Abdullah Khalifa is one of various actions undertaken by the Terrachidia association since 2012 at the M'hamid Oasis, the last and southernmost oasis in the Draa valley in Zagora province, Morocco.

This work has sought to preserve, study, disseminate and continue the tangible and intangible heritage of the oasis dwellers. Although its ultimate aim is to help preserve the traditional local knowledge that over centuries allowed the cultural landscape of such oases to be created and transformed, this has been pursued by means of restoring, recovering or rebuilding various of their public spaces and architectural features with heritage value. These notably include the gateways to eleven of the twelve traditional walled ensembles (*ksur*) conserved at the oasis, along with mosques, streets and other communal buildings and spaces.

The neglect of traditional urban ensembles in certain rural settings along with policies and regulations encouraging people to leave them means that the regular maintenance needed by these architectures has

Antecedentes

La restauración del morabito de Sidi Abdullah Khalifa forma parte de las acciones emprendidas por la Asociación Terrachidia desde el año 2012 en el oasis de Mhamid, el último y más meridional oasis del valle del Draa, en la provincia de Zagora, Marruecos.

Estos trabajos han tenido como objetivos la conservación, el estudio, la difusión y la continuación del patrimonio material e inmaterial de las poblaciones de este oasis. Si bien su fin último ha sido contribuir a la conservación de los conocimientos locales tradicionales que permitieron crear y transformar durante siglos el paisaje cultural de estos oasis, esto se ha emprendido a través de la restauración, la recuperación o la reconstrucción de diferentes espacios públicos y elementos arquitectónicos de valor patrimonial del oasis. Entre ellos, pueden destacarse las puertas de acceso del recinto amurallado de once de los doce conjuntos tradicionales (*ksur*) que se conservan en este oasis, así como mezquitas, calles y otros edificios y espacios comunitarios.

La falta de atención hacia los conjuntos urbanos tradicionales en determinados entornos rurales y las

Antecedentes

A restauração do marabu de Sidi Abdullah Khalifa forma parte das ações empreendidas pela Associação Terrachidia desde 2012 no oásis de Mhamid, o último e mais meridional oásis do vale do Draa, na província de Zagora, Marrocos.

Estes trabalhos tiveram como objetivos a conservação, o estudo, a difusão e a continuação do património material e imaterial das populações deste oásis. Embora a sua última finalidade tenha sido contribuir para a conservação dos conhecimentos locais tradicionais que permitissem criar e transformar durante séculos a paisagem cultural deste oásis, isto foi empreendida através da restauração, recuperação ou da reconstrução de diferentes espaços públicos e de elementos arquitetónicos de valor patrimonial do oásis. Entre eles, podemos destacar as portas de acesso ao recinto amuralhado de onze dos doze conjuntos tradicionais (*ksur*) que se conservam neste oásis, bem como as mesquitas, ruas e outros edifícios e espaços comunitários.

A falta de atenção para com os conjuntos urbanos tradicionais em determinados meios rurais e as políticas e normas que

< View of the exterior of the Marabout of Sidi Abdellah Khalifa from the southwest after the restoration | Vista del exterior del Morabito de Sidi Abdellah Khalifa desde el suroeste después de la restauración | Vista exterior do Marabu de Sidi Abdellah Khalifa desde o sudoeste depois da restauração

View of the Ouled Youssef *ksar* | Vista del *ksar* de Ouled Youssef | Vista do *ksar* Ouled Youssef (Amanda Roelle)

ceased, and over the years they have progressively deteriorated, often to the point of ruin.

This is the context in which Terrachidia works, and it does so always with local master builders, versed in traditional materials and techniques. In each project it also includes young local apprentices so as to help pass on this expertise to new generations, give continuity to trades with a view to future work and offer job opportunities to a sector of society that often opts to migrate to cities.

políticas y normativas que favorecen su abandono hacen que desaparezca el mantenimiento periódico que necesitan estas arquitecturas y que su deterioro se vaya agudizando con el paso de los años, a menudo hasta su completa ruina.

Este es el contexto en el que Terrachidia desarrolla su labor, y lo hace siempre con maestros de obra locales, quienes dominan los materiales y las técnicas tradicionales de construcción. Además, incorpora a cada obra aprendices jóvenes locales para contribuir a la transmisión de estos conocimientos a las futuras generaciones, a la continuidad del oficio para futuras intervenciones y a aportar oportunidades laborales a una franja social cuya opción frecuente es la emigración hacia las ciudades.

favorecem o seu abandono provocam o desaparecimento da manutenção periódica que precisam estas arquiteturas e que o seu deterioramento se agudize com o transcurso dos anos, frequentemente até à sua total ruina.

Este é o contexto no que Terrachidia desenvolve o seu labor, e o faz sempre com mestres de obras locais que dominam os materiais e as técnicas tradicionais de construção. Para além disso, incorpora aprendizes locais em cada obra para contribuir com a transmissão destes conhecimentos às futuras gerações, com a continuidade do oficio para futuras intervenções e para proporcionar oportunidades laborais a uma franja social cuja opção frequente é a emigração para as cidades.

View of the Mhamid *ksar* from the palm grove | Vista del *ksar* de Mhamid desde el palmeral | Vista do *ksar* Mhamid desde o palmeiral

Terrachidia thus combines training for both local youth and domestic or foreign volunteers taking part in each intervention with the recovery of tangible and intangible heritage, development cooperation and awareness and outreach work on these projects, which also help preserve the place's identity.

To complement this documentation and dissemination of heritage, in 2018 we invited the team of ArCHIAM (Centre for the Study of Architecture and Cultural Heritage of India, Arabia and the Maghreb) at Liverpool University to participate in the restoration of the gateway to the *ksar* of Ouled Driss, in which fifteen architecture students from the university also took part. That positive experience led to a partnership and co-funding for another venture at the oasis: the restoration of the marabout shrine of Sidi Abdullah Khalifa.

Terrachidia aúna así formación tanto de los jóvenes locales como de los voluntarios nacionales e internacionales que participan en cada una de sus intervenciones, con la recuperación del patrimonio tangible e intangible, con la cooperación y con las acciones de sensibilización y difusión de los trabajos realizados, que contribuyen también a la mejor conservación de la identidad propia del lugar.

Como complemento a estas labores de documentación y difusión del patrimonio, en 2018 se invitó al equipo de ArCHIAM (Centre for the Study of Architecture and Cultural Heritage of India, Arabia and the Maghreb) de la Universidad de Liverpool a colaborar en ellas con motivo de la restauración de la puerta de acceso al *ksar* de Ouled Driss, en la que además participaron 15 estudiantes de arquitectura de esta universidad. La experiencia positiva abrió la puerta a la colaboración y la cofinanciación para otro proyecto en el oasis: la restauración del morabito de Sidi Abdullah Khalifa.

Terrachidia une assim a formação tanto de jovens locais como de voluntários nacionais e internacionais que participam em cada uma das suas intervenções, com a recuperação do património tangível e intangível, com a cooperação e com as ações de sensibilização e difusão dos trabalhos realizados, que contribuem também para a melhor conservação da identidade própria do local.

Como complemento a estes labores de documentação e difusão do património, em 2018 convidou-se a equipa de ArCHIAM (Centre for the Study of Architecture and Cultural Heritage of India, Arabia and the Maghreb) da Universidade de Liverpool para colaborar neles com motivo da restauração da porta de acesso ao *ksar* de Ouled Driss, no que também participaram 15 estudantes de arquitetura desta universidade. A experiência positiva abriu a porta para a colaboração e o cofinanciamento para outro projeto no oásis: a restauração do marabu de Sidi Abdullah Khalifa.

Desert dunes advancing towards the palm trees | Dunas del desierto avanzando sobre el palmeral | Dunas do deserto no palmeiral

The marabout of Sidi Abdullah Khalifa

This shrine stands within a palm grove, by a water well, between the *ksur* of Ouled Youssef and M'hamid El Ghezlane. The marabout is one of the oasis's finest and most remarkable buildings, as well as a site appreciated and venerated by local people. It is the resting place of the holy man after whom it is named: Sidi Abdullah Khalifa, who is still renowned as he must have been in life as a spiritual guide and healer, especially of mental ailments.

It is a small building with a square plan, with sides of 7.8 m (15 cubits) and an area of just 40 m2, though there is also a long porch annexed to it as an anteroom. The floor of the square building is divided into nine modules. The central space contains the tomb, surrounded by an ambulatory. The anteroom gave shelter to those arriving on pilgrimage. The marabout is just one story high but the middle section rises above the rest of the main volume, which is in turn higher than the long porch. The main building, 5 m (9 cubits) high, is crowned by five parabolic domes rising from roof level, one over each corner module of the ambulatory and a larger one in the middle, raised over a cubic block with typically stepped corners. The ambulatory's four intermediate modules are simply covered with flat roofing, as is the anteroom.

El morabito de Sidi Abdullah Khalifa

El edificio se yergue en mitad de un palmeral, junto a un pozo de agua, entre los *ksur* de Ouled Yussef y Mhamid El Ghezlane. Este morabito es uno de los edificios más singulares y bellos de este oasis, además de un lugar apreciado y respetado por sus habitantes. En él descansan los restos del morabito que le da nombre, Sidi Abdullah Khalifa, quien ha conservado hasta hoy la reputación que debió tener en vida, de excelente guía espiritual y sanador, en especial de patologías psíquicas.

Se trata de un pequeño edificio de planta cuadrada, de 7,8 metros (15 codos) de lado y apenas 40 metros cuadrados, si bien se adosa a él un segundo espacio longitudinal que le sirve de antesala. La planta del edificio cuadrado está dividida en nueve módulos. El espacio central alberga la tumba y un deambulatorio alrededor de éste. La mencionada antesala daba cobijo a quienes peregrinaban hasta el lugar. El morabito tiene una sola planta de altura, pero el espacio central se alza por encima del resto de la construcción principal, a su vez de mayor altura que el espacio longitudinal anejo. La construcción principal, de 5 metros (9 codos) de altura, está coronada por cinco cúpulas parabólicas que se alzan sobre esa cota: una sobre cada uno de los módulos de esquina del deambulatorio y otra de mayor altura en el centro, elevada sobre un tambor cúbico con remates de esquina típicamente escalonados. Los cuatro módulos intermedios del deambulatorio están sencillamente cubiertos por un forjado horizontal, como lo está también la antesala.

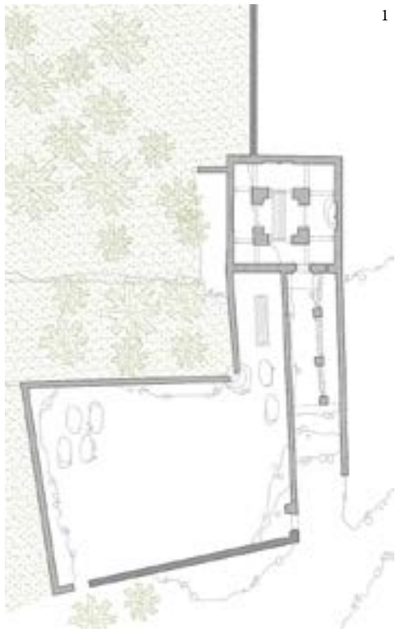
O marabu de Sidi Abdullah Khalifa

O edifício ergue-se no meio de um palmeiral, junto a um poço de água, entre os *ksur* de Ouled Yussef e Mhamid El Ghezlane. Este marabu é um dos edifícios mais belos e singulares deste oásis, para além de ser um lugar apreciado e respeitado pelos seus habitantes. Nele descansam os restos do marabu que lhe deu o nome, Sidi Abdullah Khalifa, quem conservou até hoje a reputação que teve em vida, a de excelente guia espiritual e sanador, em concreto de patologias psíquicas.

Trata-se de um pequeno edifício de planta quadrada, de 7,8 metros (15 côvados) de largura e de apenas 40 metros quadrados, ainda que haja um segundo espaço longitudinal unido a este que lhe serve de antecâmara. A planta do edifício quadrado está dividida em nove módulos. O espaço central, que alberga a tumba, e um deambulatório à volta deste. A mencionada antecâmara dava abrigo àqueles que peregrinavam até ao local. Este marabu tem apenas um piso de altura, mas o espaço central alça-se por cima do resto da construção principal, por sua vez mais alto do que o espaço longitudinal anexo. A construção principal, de 5 metros (9 côvados) de altura, está coroada por cinco cúpulas parabólicas que se alçam sobre essa cota: uma sobre cada um dos módulos de esquina do deambulatório e outra de maior altura no centro, elevada sobre um tambor cúbico com remates de esquina tipicamente escalonados. Os quatro módulos intermédios do deambulatório estão simplesmente cobertos com umaestrutura de madeira, como também o está a antecâmera.

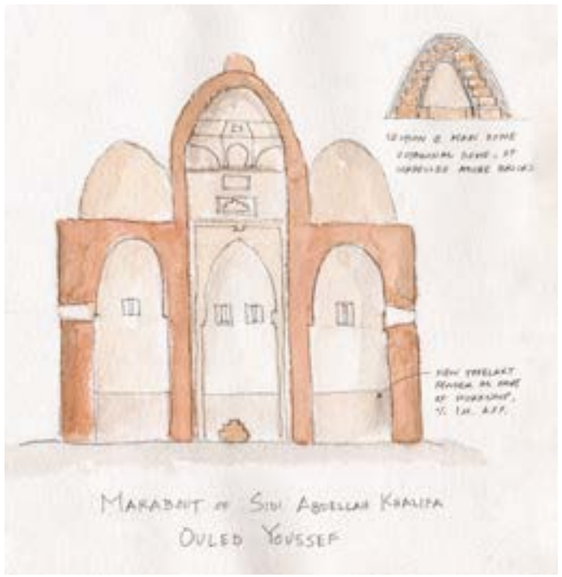
1: Plan of the Marabout 2: Ortophoto of the location | 1: Planta del Morabito 2: Ortofoto del emplazamiento | 1: Planta do Marabu 2: Ortofotografia da localização (2: Google Earth)

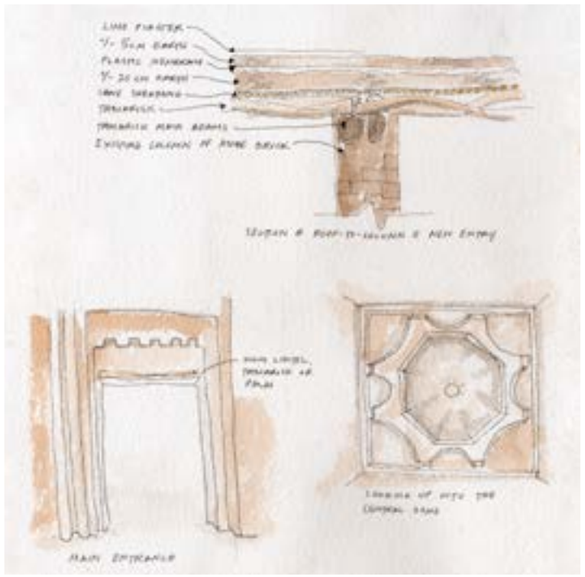
1

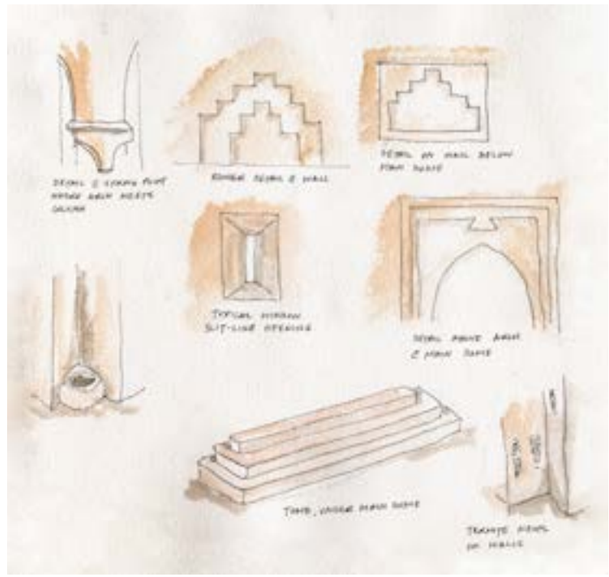


2

View of the domes of the Marabout | Vista del exterior de las cúpulas del Morabito | Vista exterior das cúpulas do Marabu







Diverse constructive details of the Marabout | Diversos detalles constructivos del Morabito | Diversos pormenores construtivos do Marabu (Amanda Roelle)

The simplicity and delicacy of the shrine's forms reflect the know-how of the masters who built it over a century ago. The mud, wood and lime covering the domes were skillfully molded so as to create one of the oasis's finest architectures. Its five stepped paraboloids gleam amid the green of the palm groves and constitute a landmark overlooking the countryside by the turreted walls of the two neighboring *ksur*.

The interior is a space in twilight, with some light slanting in through deep, narrow, splayed slits in the facades, just 10-12 cm wide on the outside and 38-40 cm high, and more light coming in through the wider and shallower openings in the drum of the central dome so that the inner lighting is focused with sharp contrast over the tomb that is the shrine's reason for being. The plentiful suspended dust gives materiality to the beams and heightens their symbolic force as they slant down from the central dome.

La sencillez y la delicadeza de sus formas reflejan el saber hacer de los maestros que lo construyeron hace ya más de un siglo. El barro, la madera y la cal que protege sus cúpulas fueron magistralmente moldeados para crear una de las más bellas arquitecturas del oasis. Sus cinco paraboloides escalonados refulgen en mitad del verde de las palmeras y se convierten en un hito que domina el paisaje situado frente a las murallas torreadas de los dos *ksur* vecinos.

Respecto al interior, es un espacio en penumbra, donde solo entra la luz a través de los profundos, estrechos y abocinados huecos de sus fachadas, de solo unos 10 o 12 centímetros de ancho en su alzado exterior y entre 38 y 40 centímetros de altura; y, principalmente, de los más amplios y menos profundos huecos abiertos en el tambor de su cúpula central, que hacen que la iluminación interior se concentre con un fuerte contraste sobre la tumba que da sentido a la construcción. El abundante polvo en suspensión aporta materialidad e incrementa el poder simbólico de los rayos de luz que atraviesan el espacio desde la cúpula central.

A simplicidade e a delicadeza das suas formas refletem o saber-fazer dos mestres que o construíram há já mais de um século. O barro, a madeira e a cal que protege as suas cúpulas foram magistralmente moldados para criar uma das mais belas arquiteturas do oásis. Os seus cinco paraboloides escalonados refulgem na metade do verde das palmeiras, convertendo-se numa referência que domina a paisagem situada em frente às muralhas torreadas dos dois *ksur* vizinhos.

Relativamente ao interior, é um espaço penumbroso, onde mal entra a luz através dos profundos, estreitos e afunilados vãos das suas fachadas, de apenas uns 10 ou 12 centímetros de largura no seu alçado exterior e entre 38 e 40 centímetros de altura; e, principalmente, dos mais amplos e menos profundos vãos abertos no tambor da sua cúpula central, que fazem que a iluminação interior se concentre com um forte contraste sobre a tumba que dá sentido à construção. A abundante poeira em suspensão proporciona materialidade e incrementa o poder simbólico dos raios de luz que atravessam o espaço desde a cúpula central.

The tomb itself stands directly on the rammed-earth floor and stretches 3.33 m long and 30 cm high with double adobe stepping, coated on the outside at some point with cement mortar.

The anteroom is a low shady chamber opening to the south and annexed to the main entrance subsequent to the building of the original shrine, as its roof cuts across the portal composition. It contains a lengthwise row of pillars forming two bays. To the west, adjoining both this chamber and the main building, there is a cemetery, while the well, today a water tank, was located to the east.

The entrance to the marabout is also low, just 1.40 m high and 87 cm wide. But it is framed and highlighted by an elaborate composition with side pilasters and serrated decoration over the lintel, above which is a blind parabolic arch, subtly multifoil in form and contained in an alfiz frame. When the restoration work began, the flat roof of the annexed chamber intersected the portal at the level of the lintel, preventing those entering from appreciating the elaborate upper part.

La tumba propiamente dicha se levanta directamente sobre el pavimento de tierra apisonada y es un elemento longitudinal de 3,33 metros de longitud y 30 centímetros de altura con un doble escalonamiento realizado con adobes y fue revestido exteriormente en algún momento con mortero de cemento.

La mencionada antesala es un espacio bajo y sombreado que se abre hacia el sur y fue adosada a la puerta principal en algún momento posterior a la construcción del edificio original, ya que su forjado secciona la composición de esta portada. Cuenta con una hilera longitudinal central de pilares que la dividen en dos crujías. Hacia el oeste, adosado tanto a este espacio como al principal, se sitúa un cementerio, mientras que el pozo, hoy un depósito de agua, estaba situado hacia el este.

La puerta de acceso al morabito es también baja. Tiene apenas 1,40 metros de altura y 87 centímetros de ancho. Pero está enmarcada y realzada por una cuidada composición con pilastras laterales y decoración dentada sobre el dintel, sobre los que se alza un arco parabólico ciego, sutilmente polilobulado y enmarcado

A tumba propriamente dita levanta-se diretamente sobre o pavimento de terra batida e é um elemento longitudinal de 3,33 metros de comprimento e 30 centímetros de altura com um duplo escalonamento realizado com adobes, tendo sido revestido exteriormente nalgum momento com argamassa de cimento.

A mencionada antecâmara é um espaço baixo e sombrio que se abre para o sul e foi adossada à porta principal nalgum momento posterior ao da construção do edifício original, já que a sua estrutura secciona a composição desta portada. Conta com uma fila longitudinal central de pilares que a divide em duas galerias. Orientado a oeste, adossado tanto a este espaço como ao principal, encontra-se um cemitério, enquanto que o poço, hoje depósito de água, estava orientado a este.

A porta de acesso ao marabu é também baixa. Tem apenas 1,40 metros de altura e 87 centímetros de largura. Mas está enquadrada e realçada por uma composição com pilastras laterais e por uma decoração dentada sobre o dintel, sobre os que se alça um arco parabólico cego, subtilmente polilobulado e

Entrance porch of the Marabout of Sidi Abdellah Khalifa | Porche de entrada del Morabito de Sidi Abdellah Khalifa | Alpendre de entrada do Marabu de Sidi Abdellah Khalifa

All the walls are earthen. The perimeter walls are built of rammed earth 53-54 cm (1 cubit) thick, and the central module containing the tomb is supported by four L-shaped adobe abutments with sides of roughly 1 m (2 cubits). This bearing structure was in broadly good condition, except for damage due to runoff water at the top of the walls and slight losses of material at the base due to damp evaporating from the ground.

por un alfiz. Al comenzar las obras de restauración, la cubierta horizontal del edificio anejo seccionaba esta portada a la altura del dintel de la puerta, lo que impedía disfrutar de su elaborado remate superior al acceder al edificio.

Todos los muros son de tierra. Los muros perimetrales están construidos con tapial de 53-54 centímetros (un codo) de sección, mientras que el módulo central, el que cobija la tumba, está soportado por cuatro machones de adobe con planta en forma de "L" con aproximadamente un metro (dos codos) de lado. En general, la estructura portante se encontraba en buen estado, salvo por el deterioro causado por la escorrentía de agua en las cabezas de los muros y mínimas pérdidas de material en su base debidas a la evaporación de la humedad procedente del terreno.

enquadrado por um alfiz. Ao começar as obras de restauração, a cobertura horizontal do edifício anexo seccionava esta portada à altura do dintel da porta, o que impedia apreciar o seu elaborado remate superior ao aceder ao edifício.

Todas as paredes são de terra. As paredes perimetrais estão construídas com taipa de 53-54 centímetros (um côvado) de secção, enquanto que o módulo central, o que abriga a tumba, está apoiado por quatro pilares de adobe com planta em forma de "L" com aproximadamente um metro (dois côvados) de largura. No geral, a estrutura portante encontrava-se em bom estado, salvo a deterioração causada pela escorrência de água nas cabeças das paredes e as perdas mínimas de material na sua base devido à evaporação da humidade procedente do terreno.

In the ambulatory, light false parabolic adobe arches no more than 15 cm thick link the abutments to the perimeter walls. The four abutments are also interlinked by another four false parabolic adobe arches with a greater thickness, some 25-30 cm. These four arches are braced at impost level with tamarisk beams, though some of these braces have been lost. They have an alfiz frame decorated with various local motifs at the top, both centrally and at the corners, and these four arches bear the square-based drum, 1.60 m high, on which stands the central dome.

The domes, simple and irregular in shape and with inner diameters of 1.25-1.35 m, stand on an octagonal timber substructure and were built of corbeled courses of adobe. So in building terms they are false domes, and their pointed shape results from the need to facilitate the laying of adobe bricks without

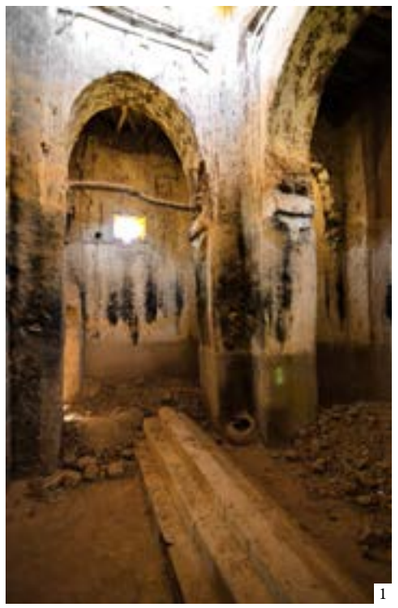
En el deambulatorio, ligeros falsos arcos parabólicos de adobe de no más de 15 centímetros de sección conectan los machones con los muros perimetrales. Los cuatro machones están además unidos entre sí por otros cuatro falsos arcos parabólicos de adobe con mayor sección, unos 25 o 30 centímetros. Estos cuatro arcos están atirantados a la altura de las impostas con vigas de tamarisco, aunque estos tirantes se han perdido en algunos de ellos. Cuentan con un alfiz decorado con diversos motivos locales en su extremo superior, tanto en su centro como en sus esquinas, y son estos cuatro arcos los que soportan el tambor de base cuadrada y 1,60 metros de altura sobre el que se alza la cúpula central.

Las cúpulas, de trazado sencillo e irregular y con un diámetro interior de 1,25 a 1,35 metros, se alzan sobre una subestructura ochavada de madera y están ejecutadas por aproximación de hiladas de adobe.

No deambulatório, ligeiros arcos falsos parabólicos de adobe de não mais de 15 centímetros de secção conectam os pilares com as paredes perimetrais. Os quatro pilares estão também unidos entre si por outros quatro arcos falsos parabólicos de adobe de maior secção, uns 25 ou 30 centímetros. Estes quatro arcos estão atirantados à altura das impostas com vigas de tamarisco, ainda que estas tirantes se tivessem perdido nalgum deles. Contam com um alfiz decorado com diversos motivos locais no seu extremo superior, tanto no seu centro como nas suas esquinas, e são estes quatro arcos os que suportam o tambor de base quadrada e o 1,60 metro de altura sobre o que se alça a cúpula central.

As cúpulas, de traçado simples e irregular e com um diâmetro interno entre 1,25 e 1,35 metros, alçam-se sobre uma subestrutura octogonal de madeira e estão executadas por aproximação de fiadas

1: Interior of the Marabout of Sidi Abdellah Khalifa with his tomb 2: Bottom-up interior view of the Marabout's central dome | 1: Interior of the Marabout of Sidi Abdellah Khalifa with his tomb 2: Bottom-up interior view of the Marabout's central dome | 1: Interior do Marabu de Sidi Abdellah Khalifa com a sua tumba 2: Vista da cúpula central do marabu desde o seu interior



1

2

falsework. The domes at the marabout's four corners have a continuous intrados whereas the larger central dome is octagonal inside, and so it maintains its course throughout. Underneath the dome's spring points are false decorative squinches with roughly the shape of half cloister vaults.

The main shrine's four sections of flat roof and the anteroom roof are made of palm-wood beams or tamarisk branches, sinuous and irregular and highly resistant to the ubiquitous termites, which barely get beyond their outer rings. This is not so with palm wood, much more susceptible to insect attack. Of whatever material, all the flat roofs have a compression layer of rammed earth over palm-frond bedding. The lack of maintenance and consequent poor rainwater drainage had caused deterioration in all the horizontal structures, and most were damaged or partially collapsed to a degree beyond recovery.

All the walls are rendered with mud and straw mortars, washed over with lime on interior elevations. The existerior mud mortars had been eroded and were all but missing in some places owing to the shrine's disrepair. The interior renders, sculpted in successive layers of decorative stepped motifs, are blackened in many places by soot from candles placed inside the shrine. The roof damage had also resulted in many stains and losses of material owing to water leakage. Outside, only the portal and domes were rendered with lime mortar, though in previous repairs of

Constructivamente son, por tanto, falsas cúpulas, y su forma apuntada responde a la necesidad de facilitar la colocación de los ladrillos de adobe en ausencia de cimbras. Las cúpulas de las cuatro esquinas del morabito tienen el intradós continuo, mientras que la cúpula central, de mayor tamaño, hacia el interior es ochavada, con lo que mantiene el trazado del arranque en todo su desarrollo. Bajo el arranque de las cúpulas penden unas falsas trompas decorativas trazadas aproximadamente en forma de media bóveda de rincón de claustro.

Los cuatro tramos de cubierta plana del edificio principal y la cubierta de la antesala están ejecutados con vigas de palmera o con ramas de tamarisco, sinuosas e irregulares, pero muy resistentes a las omnipresentes termitas, que rara-

de adobe. Construtivamente são, portanto, falsas cúpulas, e a sua forma apontada responde à necessidade de facilitar a colocação dos tijolos de adobe ante a ausência de cimbres. As cúpulas das quatro esquinas do marabu têm o intradorso contínuo, enquanto que a cúpula central, de maior tamanho, orientada para o interior é octogonal, com o que mantém o traçado do arranque em todo o seu desenvolvimento. Por debaixo do arranque das cúpulas pendem umas falsas trompas decorativas traçadas aproximadamente em forma de meia abóbada de claustro.

Os quatros lanços da cobertura plana do edifício principal e da cobertura da antecâmara estão executados com vigas de palmeira ou com ramos de tamarisco, sinuosos e irregulares, mas muito resistentes às omnipresentes térmitas, que rara-

que apenas logran ir más allá de sus anillos exteriores. No ocurre lo mismo con la palmera, mucho más susceptible a estos ataques. Sean del material que sean, todas las cubiertas planas contaban con una torta de compresión realizada con tierra apisonada sobre una cama de hoja de palmera. La falta de mantenimiento y las consiguientes dificultades para evacuar el agua de lluvia habían deteriorado todas las estructuras horizontales y en su mayor parte presentaban tantos daños y derrumbes parciales que eran ya irrecuperables.

Todos los muros están revestidos con morteros de barro y paja, sobre los que existe una jabelga de cal en los alzados interiores. Los morteros de barro exteriores estaban muy lavados e incluso prácticamente desaparecidos en algunos

mente conseguem ir mais além dos seus anéis exteriores. O mesmo não acontece com a palmeira, muito mais suscetível a estes ataques. Qualquer que seja o material, todas as coberturas planas contavam com uma torta de compressão realizada com terra batida sobre um leito de folha de palmeira. A falta de manutenção e as conseguintes dificuldades para evacuar a água da chuva tinham deteriorado todas as estruturas horizontais e na sua maior parte apresentavam tantos danos e desabamentos parciais que eram já irrecuperáveis.

Todas as paredes estão revestidas com argamassa de barro e palha, sobre as que existe uma camada de cal nos alçados interiores. A argamassa de barro exterior estava bastante desgastada e inclusive quase desaparecida nalguns

Condition of the exterior of the domes and the roof before restoration | Estado del exterior de las cúpulas y la cubierta antes de la restauración | Estado do exterior das cúpulas e a cobertura antes da restauração

1

2

Bottom-up interior view of the central dome and the floors | Vista interior de la cúpula central y un forjado | Vista interior da cúpula central e uma estrutura de madeira

the domes this render had been coated with a mixed mortar of mud, cement and lime with barely any adherence to the previous layers. The voids generated by this ill-advised measure had helped the scarce rainfall to significantly damage not just the domes' render but also their adobe structure, in which there were already many cavities.

tramos por la falta de mantenimiento del edificio. Los revestimientos interiores, retallados en capas sucesivas con motivos decorativos escalonados, están oscurecidos en numerosos puntos por el hollín procedente de las velas que se colocan en el interior del edificio. El deterioro de las cubiertas había provocado además múltiples manchas y pérdidas de material causadas por las filtraciones de agua. Al exterior, sólo la portada y las cúpulas estaban revestidas con mortero de cal, si bien en alguna reparación anterior de las cúpulas este revestimiento había sido recubierto por un mortero bastardo de barro, cemento y cal sin apenas adherencia con las capas preexistentes. Las oquedades generadas por esta inapropiada solución habían contribuido a que las escasas precipitaciones existentes dañaran significativamente no sólo los revestimientos de las cúpulas, sino también su estructura de adobe, en la que existían ya diversas lagunas.

lanços devido à falta de manutenção do edifício. Os revestimentos interiores, retalhados em camadas sucessivas com motivos decorativos escalonados, estão escurecidos em numerosos pontos devido à fuligem proveniente das velas que se colocam no interior do edifício. A deterioração das coberturas também provocou múltiplas manchas e perdas de material causadas pelas infiltrações de água. No exterior, apenas a portada e as cúpulas estavam revestidas com argamassa de cal, embora nalguma reparação anterior das cúpulas este revestimento tivesse sido revestido com uma argamassa bastarda de barro, cimento e cal sem qualquer aderência com as camadas pré-existentes. As cavidades provocadas por esta solução inapropriada contribuíram para que as escassas precipitações existentes danificassem consideravelmente não só os revestimentos das cúpulas, mas também a sua estrutura de adobe, na que existiam já algumas lacunas.

Northeast corner of the Marabout. Condition of the exterior finishings prior to the restoration | Esquina noreste del Morabito. Daños en acabados exteriores previos a la intervención | Esquina noroeste do marabu. Danos nas fachadas exteriores antes da intervenção

Restoration of the marabout

Terrachidia has since 2012 been engaged in studying, transmitting and promoting traditional building techniques. On undertaking the restoration of traditional architectures, the use where possible of the same materials and techniques with which they were built as well as forms similar or comparable to the existing ones ensures that new additions are compatible with what is already there and avoids significant alterations of composition, structure and function. For this principle to be applied, the professional practice and teachings of local master builders are indispensable. For work such as that done by Terrachidia at the M'hamid Oasis there remain good master builders versed in techniques with rammed earth and adobe, mud and straw renders and the horizontal structures used in floors and roofs, with beams of palm wood (quarter-logs or on rare occasions half-logs, depending on the span to be covered) or tamarisk (available in the form of thick beams and also of branches with short spans and very small cross-sections).

But the fragility of palm wood and the growing scarcity of tamarisk, except where only thin sticks are wanted, mean that reused wood is preferred where possible. Otherwise eucalyptus beams, always available at the local market, need to be bought. And both the production of lime and its use in higher-quality renders, though both were visibly common in the recent past, have now ceased. So the lime and the master builders specialized in working with it now come from other areas farther up the Draa valley.

La restauración del morabito

Terrachidia trabaja desde 2012 en el estudio, la transmisión y la puesta en valor de las técnicas tradicionales de construcción. Al acometer la restauración de arquitecturas tradicionales, recurrir en la medida de lo posible a los mismos materiales y técnicas de construcción con las que fueron levantadas y a formas análogas o similares a las precedentes asegura la compatibilidad de los nuevos añadidos con las preexistencias y se evitan alteraciones significativas de su composición, su estructura y su funcionamiento. Para poder poner en práctica este principio, la labor profesional y las enseñanzas de los maestros de construcción locales son imprescindibles. En el caso de las obras acometidas por Terrachidia en el oasis de Mhamid, quedan aún buenos maestros de construcción que dominan las técnicas de la construcción con tapial y adobe, los revestimientos de barro y paja y las estructuras horizontales que se utilizan en forjados y cubiertas, con viguería de palmera (cuartos o en raras ocasiones medios troncos, según la luz a salvar) o de tamarisco (disponible tanto en forma de vigas de gran sección como de ramas de escasa luz y muy reducida sección).

Sin embargo, la fragilidad de la madera de palmera y la creciente escasez de la de tamarisco, salvo en los casos que sólo requieren ramas de pequeña sección, hacen que se opte siempre que sea posible por madera reutilizada, o que sea necesario adquirir vigas de eucalipto, también disponibles hoy en el mercado local. Tanto la producción de cal como su uso para la realización de acabados de especial calidad, si bien es patente que fueron comunes en un pasado reciente, han desaparecido en la actualidad. Por ello, tanto la cal como los maestros especializados en trabajarla proceden hoy de otras zonas del valle del Draa situadas aguas arriba.

A restauração do marabu

Terrachidia trabalha desde 2012 no estudo, transmissão e valorização das técnicas tradicionais de construção. Ao empreender a restauração de arquiteturas tradicionais, recorrer dentro do possível dos mesmos materiais e técnicas de construção com as que foram levantadas e a formas análogas ou semelhantes aos precedentes garante a compatibilidade das novas adições com as pré-existentes e evitam-se alterações significativas na sua composição, estrutura e funcionamento. Para poder pôr em prática este princípio, o labor profissional e a transmissão de conhecimento dos mestres de construção locais são imprescindíveis. No caso das obras efetuadas por Terrachidia no oásis de Mhamid, ainda há mestres de construção bons que dominam as técnicas da construção com taipal e adobe, os revestimentos de barro e palha e as estruturas horizontais que se utilizam em tetos e coberturas, com vigas de palmeira (quartos ou em raras ocasiões meios troncos, segundo a luz a salvar) ou de tamarisco (disponível tanto em forma de vigas de grande secção como de ramos de escassa luz e muito reduzida secção).

No entanto, a fragilidade da madeira de palmeira e a crescente escassez da madeira de tamarisco, exceto nos casos que apenas requerem ramos de pequena secção, fazem que se opte sempre que seja possível por madeira reutilizada, ou que seja necessário adquirir vigas de eucalipto, também disponíveis hoje em dia no mercado local. Tanto a produção de cal como o seu uso para a realização de acabamentos de qualidade especial, ainda que patente que foram comuns num passado recente, estas práticas desapareceram no presente. Por isso, tanto a cal como os mestres especializados na sua elaboração provêm hoje de zonas do vale do Draa situadas águas acima.

Sketch on the restoration works of the Marabout | Dibujo de los trabajos de restauración del Morabito | Desenho dos trabalhos de restauração do Marabu (Amanda Roelle)

In the case of the restoration of the marabout of Sidi Abdullah Khalifa, the process began with the shrine being documented so as to elucidate how it was built and the defects it had acquired and thus to be able to assess the extent of work required. This documentation was performed on various trips made by Terrachidia in 2014-15, and in September 2018 the dataset was assessed with a view to defining the steps to be taken: after agreeing the details of the work with the municipality of M'hamid and the Ouled Youssef community leaders (suitable local masters and apprentices for each task involved along with matters of materials and their transportation, tools, stockpiles and general site organization), the restoration work was carried out over two stages in February and October 2019.

In all the work, apart from the Terrachidia and ArCHIAM teams, there were 38 participants from several countries; the *maalem* (master builder) Abdelkader Mahassine, a specialist in lime renders such as *tadelakt* and a regular Terrachidia partner for such finishes; the local master builders Bouchaib Bourhim, Abdelkader Ahssane, Brahim Banhman, Lahsan Kuidr, Hosine Karoumi and Saaid Gahmini; and ten young apprentices from Ouled Youssef itself.

The adobe bricks needed were supplied by Ouled Youssef families, to whom the bricks made during the project, not cured enough for use in building, were given in return. Tamarisk wood was needed only in the form of thin branches and so was easy to source. For the layers of compression bedding in the roofs we opted to buy rolls of cane rather than using palm fronds, as today this is the commonest traditional solution for its ease of application. Water could simply be drawn from the nearby tank and earth was taken from near the shrine. The municipality of M'hamid helped with transporting some of the sand and straw needed.

En el caso de la restauración del morabito de Sidi Abdullah Khalifa, el proceso comenzó por la documentación inicial del edificio para conocer mejor su constitución y el cuadro patológico que presentaba y poder así evaluar el alcance de la intervención que requería. Estos trabajos de documentación se llevaron a cabo durante los diferentes viajes realizados por Terrachidia entre 2014 y 2015 y se evaluaron más adelante estos datos para definir las actuaciones a realizar en septiembre de 2018: Tras acordar los detalles de la obra con la Commune de Mhamid y la cabila de Ouled Youssef (maestros y aprendices locales apropiados para cada trabajo a realizar, así como cuestiones relativas a los materiales y su transporte, las herramientas, las zonas de acopio y la organización de la obra en general), los trabajos de restauración se ejecutaron en dos etapas durante los meses de febrero y octubre de 2019.

En el conjunto de los trabajos, además de los equipos de Terrachidia y ArCHIAM, intervinieron 38 participantes llegados desde numerosos países; el *maalem* (maestro) Abdelkader Mahassine, especialista en revestimientos de cal como el *tadelakt* y colaborador habitual de Terrachidia para este tipo de acabados; los maestros de obra locales Bouchaib Bourhim, Abdelkader Ahssane, Brahim Banhman, Lahsan Kuidr, Hosine Karoumi y Saaid Gahmini; y diez aprendices jóvenes del propio Ouled Youssef.

Los ladrillos de adobe necesarios fueron cedidos por familias de Ouled Youssef, a quienes se les devolvieron a cambio los producidos durante la obra, aún no suficientemente curados para haber sido usados en ella. Sólo se necesitaba madera de tamarisco en forma de ramas de pequeña sección y fue por tanto fácil de conseguir. Para el asiento de las capas de compresión del forjado se optó por adquirir rollos de cañizo en lugar de utilizar hojas de palmera, al ser la solución tradicional más común en la actualidad por su rápida colocación. El agua pudo sencillamente obtenerse del

No caso da restauração do marabu de Sidi Abdullah Khalifa, o processo começou pela documentação inicial do edifício para conhecer melhor a sua constituição e o quadro patológico que apresentava para assim poder a avaliar o alcance da intervenção que requereria. Estes trabalhos de documentação realizaram-se durante as diferentes viagens realizadas por Terrachidia, entre 2014 e 2015, e os dados foram avaliados posteriormente para definir as ações a realizar em setembro de 2018: após o acordo dos pormenores da obra com a Commune de Mhamid e a cabila de Ouled Youssef (mestres e aprendizes locais idóneos para cada trabalho a realizar, bem como questões relativas aos materiais e ao seu transporte, as ferramentas, as zonas de recolha e a organização da obra em geral), os trabalhos de restauração foram executados em duas fases durante os meses de fevereiro e outubro de 2019.

No conjunto dos trabalhos, para além das equipas de Terrachidia e ArCHIAM, intervieram 38 participantes provenientes de vários países; o *maalem* (mestre) Abdelkader Mahassine, especialista em revestimentos de cal como o *tadelakt* e colaborador habitual de Terrachidia para este tipo de acabamentos; os mestres de obra locais Bouchaib Bourhim, Abdelkader Ahssane, Brahim Banhman, Lahsan Kuidr, Hosine Karoumi e Saaid Gahmini; e dez aprendizes jovens do próprio Ouled Youssef.

Os tijolos de adobe necessários foram cedidos por famílias de Ouled Youssef, a quem em troca se lhes devolveu os produzidos durante a obra, ainda não curados o suficientemente para que pudessem ter sido usados na mesma. Apenas se precisava de madeira de tamarisco em forma de ramos de pequena secção, pelo que foi fácil de conseguir. Para o assentamento das camadas de compressão da estrutura de horizontal de madeira optou-se por adquirir rolos de caniço em vez de usar folhas de palmeira, como era a solução tradicional mais comum atualmente devido à sua rápida colocação. A água pôde ser simplesmente obtida do

Manufacturing of adobe bricks | Fabricación de ladrillos de adobe | Fabrico de tijolos de adobe

The first tasks undertaken were intended to allow us to work safely at the various levels of the building in later phases of work. For the same reason we worked in stages: the levels were secured from bottom up, so that once consolidated, each one gave safe and easy access to the next one.

Thus we first demolished and rebuilt the roof of the south-facing anteroom – the lower-level roof from which there would be easy access to the roof of the main volume. This was the shrine's least well preserved roof, despite being a later addition, as it was relatively poorly built. Its deterioration was such that a partial replacement would have been an insufficient remedy, so it had to be replaced in full: two complete lengthwise bays with thin tamarisk ceiling joists on which cane bedding was laid along with a top layer of rammed earth. We opted not to prolong the roofing over the west bay right up to the main shrine so as to prevent the portal composition from being intersected again by this roof, allowing the portal to be viewed as originally on approaching the shrine. The inclusion of a skylight at this point rather than in the middle of the anteroom, where one had been previously, also helped highlight the main entrance.

depósito cercano y la tierra, del propio entorno del edificio. La Commune de Mhamid colaboró en el transporte de parte de la arena y la paja requeridos.

Los primeros trabajos que se acometieron estuvieron dirigidos a que se pudiera trabajar con seguridad en los distintos niveles del edificio durante las fases posteriores de la obra. Se procedió por el mismo motivo de forma escalonada: se aseguraron las distintas alturas de abajo hacia arriba, de forma que, una vez consolidadas, cada una de ellas permitiera acceder con comodidad y seguridad a la situada inmediatamente por encima.

Se procedió por ello a demoler y reconstruir primero la cubierta de la antesala meridional, la superficie situada a una cota más baja, y desde la que podía accederse con mayor facilidad a la cubierta del cuerpo principal. Se trataba de la cubierta peor conservada del edificio, pese a tratarse de un añadido posterior, por ser más pobre su ejecución. Su deterioro era tal que cualquier sustitución parcial hubiera sido un remedio insuficiente, por lo que hubo que reemplazarla en su totalidad: dos crujías longitudinales completas con viguería de tamarisco de pequeña sección sobre las que se colocó la cama de cañizo y la capa final de tierra compactada. Se optó por no llevar el forjado de una de las dos crujías, la occidental, hasta el cuerpo principal del edificio. Con ello, se evitó que la composición de la portada volviera a quedar seccionada por este forjado y se logró que pudiera apreciarse nuevamente al acceder al edificio. Además, la introducción de un lucernario en este punto en lugar de en el centro de la antesala, sobre el que estaba anteriormente, contribuía a realzar la portada principal.

depósito próximo e a terra, do próprio entorno do edifício. A Commune de Mhamid colaborou no transporte de parte da areia e da palha requeridos.

Os primeiros trabalhos que se elaboraram estiveram orientados para que se pudesse trabalhar com segurança nos distintos níveis do edifício durante as fases posteriores da obra. Procedeu-se pelo mesmo motivo de forma escalonada: assegurar as diferentes alturas de baixo para cima, de forma a, uma vez consolidadas, cada uma delas permitisse aceder com comodidade e segurança à situada imediatamente por cima.

Procedeu-se por isso primeiro à demolição e à reconstrução da cobertura da antecâmara meridional, a superfície situada a uma cota mais baixa, e desde a qual se podia aceder mais facilmente à cobertura do corpo principal. Tratava-se da cobertura do edifício pior conservada, apesar de se tratar de uma adição posterior, por ser mais pobre a sua execução. A sua deterioração era de tal modo que qualquer substituição parcial teria sido um remédio insuficiente, pelo que este teve de ser substituída na sua totalidade: duas galerias longitudinais completas com vigas de tamarisco de pequena secção sobre as que se colocou o leito de caniço e a camada final de terra compactada. Optou-se por não levar a estrutura de madeira de uma das galerias, a ocidental, até ao corpo principal do edifício. Com isto evitou-se que a composição da portada voltasse a ficar seccionada por esta estrutura de madeira e conseguiu-se que pudesse ser apreciada novamente ao aceder ao edifício. Para além disso, a introdução de uma lucerna neste ponto em vez do centro da antecâmara, sobre o qual estava antes, contribuía a realçar a portada principal.

Demolition and reconstruction of the roof of the south-facing anteroom | Demolición y reconstrucción de la cubierta de la antesala meridional | Demolição e reconstrução da cobertura da antecâmara meridional

1

2

The roof of the south-facing anteroom before and after its reconstruction | Cubierta de la antesala meridional antes y después de su reconstrucción | Cobertura da antecâmara meridional antes e depois da sua reconstrução

1

2

1

2

3

1: Roof construction with tamarisk branches and reed mats 2: Last layer of mud on the roof 3: Tamarisk branches of the roof of the Marabout before restoration | 1: Construcción del techo con vigas de tamarisco y esteras de caña 2: Última capa de barro en el techo 3: Vigas de tamarisco de la cubierta del Morabito antes de la restauración | 1: Construção do teto com vigas de tamarisco e esteiras de cana 2: Última camada de barro no teto 3: Vigas de tamarisco da cobertura do Marabu antes da restauração

With this task complete, the roof of the main shrine could be safely reached with just a ladder. The two most damaged sections of flat roof over this volume (south and west), beyond simple repair, were demolished and rebuilt. The building method was as described above, though here the result was more robust, as the span to be covered was shorter.

Once this second platform was also consolidated, with the international participants and most of the local masters and apprentices now in situ, and with the help and oversight of Abdelkader Mahassine, the flaking or hollowed render and the damaged adobe in the domes and the crumbling coverings on all the facades were removed and part of the roof parapet was demolished, as it was also damaged and liable to collapse.

Terminada esta operación, era ya posible acceder con seguridad a la cubierta del edificio principal con una sencilla escalera de mano. Se demolieron y reconstruyeron entonces los dos tramos con cubierta plana de este volumen que se encontraban más deteriorados y que no podían ser simplemente reparados: el meridional y el occidental. El sistema constructivo utilizado fue el mismo ya descrito, si bien aquí dotado de una mayor solidez, al tener que salvar una luz menor.

Una vez consolidada también esta segunda plataforma, ya incorporados a la obra los participantes internacionales y el grueso de los maestros y los aprendices locales, y con la ayuda y la supervisión de Abdelkader Mahassine, se retiraron los revocos desprendidos o ahuecados y los adobes deteriorados de las cúpulas y los revestimientos deteriorados de todas las fachadas y se demolió parte del peto de cubierta, que se encontraba deteriorado y había riesgo de que se cayera.

Terminada esta operação, já era possível aceder com segurança à cobertura do edifício principal com um simples escadote. Foram demolidos e reconstruídos então os dois lanços com cobertura plana deste volume que se encontravam mais deteriorados e que não podiam ser simplesmente reparados: o meridional e o ocidental. O sistema construtivo utilizado foi o mesmo já descrito, embora aqui dotado com mais solidez, ao ter que salvar uma luz menor.

Uma vez consolidada também esta segunda plataforma, já incorporados na obra os participantes internacionais e a maior parte dos mestres e aprendizes locais, e com a ajuda e supervisão de Abdelkader Mahassine, retiraram-se os rebocos desprendidos ou esburacados e os adobes deteriorados das cúpulas e os revestimentos deteriorados de todas as fachadas e demoliu-se parte da platibanda da cobertura, que se encontrava deteriorado e havia o risco de ruína.

Restoration works of the domes | Trabajos de restauración de las cúpulas | Trabalhos de restauração das cúpulas

The typically problematic points in such buildings were repaired: the jointing between the roof and the parapet, the spout attachments and the slopes for rainwater runoff. The drainage on the roof of the anteroom was improved with conduits made in the wall itself that were coated with lime mortar.

As to the domes, the original volumes were restored with adobe, a layer of mud mortar was applied, and finally they were rendered with lime and sand.

All the facades were covered with two layers of earth and straw mortar: a first rough coat and then a finer surface finish. The lower part of the walls had lost material due to erosion, so the mass was made up using blocks or pieces of adobe.

Se repararon los puntos más problemáticos en este tipo de construcciones: el encuentro de la cubierta con los petos, el arranque de las gárgolas, y las pendientes que evacúen el agua en caso de lluvias. En la cubierta de la antesala meridional la evacuación de aguas se reforzó mediante acanaladuras en el propio muro que se revistieron con mortero de cal.

En cuanto a las cúpulas, se restituyó con adobe su volumen original, se aplicó una capa de mortero de barro y, finalmente, un revoco de cal y arena.

Todas las fachadas fueron revestidas con morteros de tierra y paja compuestos por dos capas: un enfoscado inicial más rugoso y un revoco de terminación

Repararam-se os pontos mais problemáticos neste tipo de construções: o encontro da cobertura com as platibandas, o arranque das gárgulas, e as vertentes que evacuam a água no caso de chuva. Na cobertura da antecâmara meridional a evacuação das águas reforçou-se mediante caneluras na própria parede que se revestiram com argamassa de cal.

Em relação às cúpulas, o seu volume original foi restituído com adobe, aplicou-se uma camada de argamassa de barro e, por último, um reboco de cal e areia.

Todas as fachadas foram revestidas com argamassa de terra e palha compostas por duas camadas: um reboco fosco inicial mais rugoso e um reboco de acaba-

The portal was also restored. Its decorative relief was renovated with mud mortar and a lime finish.

Inside the marabout a 90 cm plinth covering was made with lime mortar and finished with colorless *tadelakt* so as to protect the lower part of the walls. *Tadelakt* is a lime-based interior render whose surface is painstakingly smoothed, polished and finally waterproofed and rubbed over with black soap.

de superficie más cuidada. Las partes inferiores de los muros exteriores presentaban pérdidas de material debido a la erosión, por lo que se reintegró su masa utilizando adobes o fragmentos de adobes.

La portada de acceso fue también restaurada. Se recuperó el relieve de su decoración con mortero de barro y una terminación de cal.

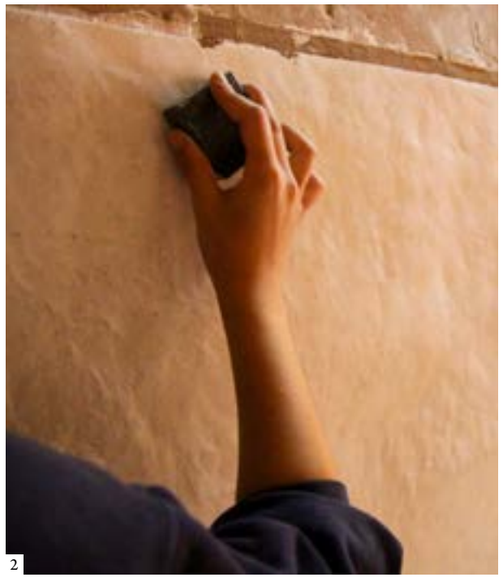
En el interior del morabito, se realizó un zócalo de 90 centímetros de altura con mortero de cal y acabado de *tadelakt* sin coloración, con el fin de proteger la parte inferior de los muros. El *tadelakt* es un tipo de acabado interior a base de cal cuya superficie es cuidadosamente alisada, pulida y finalmente impermeabilizada y terminada con jabón negro.

mento de superfície mais cuidado. As partes inferiores das paredes exteriores apresentavam perdas de material devido à erosão, pelo que se reintegrou a sua massa utilizando adobes ou fragmento de adobes.

A portada de acesso também foi restaurada. O relevo da sua decoração foi recuperado com argamassa de barro e um acabamento de cal.

No interior do marabu, realizou-se um embassamento de 90 centímetros de altura com argamassa de cal e um acabamento de *tadelakt* sem coloração, a fim de proteger a parte inferior dos muros. O *tadelakt* é um tipo de acabamento interior à base de cal cuja superfície é cuidadosamente alisada, polida e por fim impermeabilizada e terminada com sabão negro.

1



2

1: Sketch on the *tadelakt* technique 2: *Tadelakt* application | 1: Dibujo sobre la técnica del *tadelakt* 2: Aplicación del *tadelakt* | 1: Desenho sobre a técnica do *tadelakt* 2: Aplicação do *tadelakt* (1: Amanda Roelle)

Façades restoration | Restauración de las fachadas | Restauração das fachadas

The upper part of the inner walls was treated with lime water, a translucent glaze that cleanses, consolidates and sanitizes them, without hiding the soot stains attesting to the use made of the shrine.

We also worked on the public space in the marabout's vicinity. The aim was to enhance the character of the ensemble as a 'precinct'. The space was delimited by means of rebuilding the perimeter walls that had been lost or ruined. They were rebuilt with rammed earth one cubit thick and just one course high and rendered with earthen mortar. We also created comfortable and shady areas, as this is a busy spot on account of the water tank, and we levelled the terrain, which was highly uneven due to the half-ruined walls. Finally we planted palm trees so as to create a pleasanter environment and to encourage future maintenance.

En la parte superior de los muros interiores se dio un agua de cal, una veladura translúcida que limpia, consolida e higieniza el espacio, pero no oculta las ya mencionadas manchas de hollín que atestiguan y explican el uso que ha tenido el edificio.

Además, se trabajó sobre el espacio público del entorno del morabito. Se buscó con ello potenciar la lectura del carácter de "recinto" del conjunto. Se delimitó el espacio libre levantando muros perimetrales que se habían perdido o se encontraban arruinados. Estos muros se realizaron con tapiales de un codo de sección y una sola hilada de altura y se revocaron con mortero de tierra. Se crearon también espacios de estancia y de sombra, pues se trata de un espacio concurrido por la presencia del depósito de agua, y se niveló el terreno de la parcela, en el que existían importantes desniveles por la ruina parcial de algunos muros. Finalmente, se plantaron palmeras con el fin de crear un entorno más agradable y favorecer su mejor mantenimiento futuro.

Na parte superior das paredes interiores deu-se uma água de cal, uma veladura translúcida que limpa, consolida e higieniza o espaço, mas não oculta as já mencionadas manchas de fuligem que testemunham e explicam o uso que o edifício teve.

Para além disso, trabalhou-se sobre o espaço público do entorno do marabu. Procurou-se com isso potenciar a leitura do carácter de "recinto" do conjunto. Delimitou-se o espaço livre levantando paredes perimetrais que se tinham perdido ou se encontravam arruinadas. Estas paredes realizaram-se com taipais de um côvado de secção e apenas una fiada de altura e foram rebocadas com argamassa de terra. Também se criaram espaços de estadia e de sombra, pois trata-se de um espaço concorrido pela presença do depósito de água, e nivelou-se o terreno da parcela, no que existiam desníveis consideráveis pela ruina parcial de algumas paredes. Por último, plantaram-se palmeiras com o objetivo de criar um entorno mais agradável e favorecer a sua melhor manutenção futura.

Participants and local masters working together on the restoration of the Marabout | Participantes y maestros locales trabajando en la restauración del Morabito | Participantes e mestres locais a trabalharem na restauração do Marabu

Impact on the oasis and conclusions

Beyond the restoration of the architectural feature, the project has had repercussions at various levels:

- Social impact: the project model, setting out from dialog with a local population that is involved both in the decisions taken and in the performance of the work (with masters and apprentices), reinforces collective cultural identity. The enhanced habitability of the restored space and the very attention paid both to the place and to its traditions also help raise local people's awareness of the importance of preserving their heritage (architecture, landscape, inherited knowledge, etc.).

- Economic impact: thanks to our commitment to traditional local techniques, 50% of the overall project budget was spent directly on the wages of masters and apprentices, and just 15% on materials, 20% on overheads at the oasis and 15% on the Terrachidia structure. With the use of non-imported local materials (unlike reinforced concrete, prefabricated blocks or other such materials manufactured at a distance) and the choice of building solutions devised on site rather than brought in ready-made, most of the project budget goes on generating quality local employment and supporting a circular economy at the oasis. This provides broad benefits for local living conditions, as opposed to other forms of building in which much of the money invested ends up leaving the oasis and even the country.

- Environmental impact: given that the materials used in the work are all from the region, mostly from the oasis itself and some, such as earth, from the actual site, the impact of their transportation on the environment is virtually zero. These are also recyclable and infinitely reusable materials, and as regards earth and wood, also reused here. Even the most processed material – lime, used only in places and in small proportions – has a quite low environmental impact as compared to the high emissions produced by cement. So the work did not and will not generate any waste, or jeopardize the oasis's fragile environmental balance.

Terrachidia's methods, giving priority to traditional building materials and techniques in its projects and recovering the figures of master and apprentice, included in each project as a key part of the process, have proven to be effective not just in restoring the tangible and intangible heritage of a place but also in helping maintain its social, economic and environmental balance.

As well as the work on the marabout itself, it is worth noting the documentation and dissemination of the place's heritage resulting from Terrachidia's partnership with ArCHIAM, notably including the production of the documentary *M'hamid Oasis Morocco: Restoring, Recording and Inventorying the Tangible and Intangible Cultural Heritage*, directed by Monika Koeck, and the

Impacto en el oasis y conclusiones finales

Más allá de la propia restauración del elemento arquitectónico la intervención ha tenido impacto a distintos niveles:

- Impacto social: el modelo de intervención que parte del diálogo con la población local, que es integrada tanto en la toma de decisiones como en el propio desarrollo de la obra (maestros y aprendices) refuerza la identidad cultural colectiva. Además, la mejora en las condiciones de habitabilidad del espacio recuperado y la propia atención prestada tanto al lugar como a sus tradiciones contribuyen a concienciar a la población sobre la importancia de conservar su patrimonio (la arquitectura, el paisaje, el conocimiento heredado, etc.).

- Impacto económico: gracias a la apuesta por técnicas locales artesanales, el 50% del presupuesto global del proyecto se ha destinado directamente a los sueldos de los maestros y los aprendices, sólo un 15 % a los materiales, un 20% a los gastos indirectos generados en el propio oasis y un 15% a la propia estructura de Terrachidia. Al utilizar materiales locales y no importados (como sería el caso del hormigón armado, los bloques prefabricados u otros materiales elaborados fuera de la zona), y optar por soluciones constructivas que se producen en la propia obra y no llegan ya preparadas de fábrica, la mayor parte del presupuesto se destina a generar empleo de calidad en el propio lugar y a reforzar la economía circular del oasis. Esto se traduce en una mejora general de las condiciones de vida de la población, frente a otras formas de construir en las que buena parte de la inversión económica escapa del oasis, e incluso del país.

- Impacto medioambiental: dado que los materiales utilizados en la obra proceden todos de la región, casi todos ellos del propio oasis y algunos, como la tierra, de la propia parcela en la que se trabajó, el impacto que tiene su transporte sobre el medioambiente es prácticamente nulo. Se trata además de materiales reciclables e infinitamente reutilizables y, en el caso de la tierra y la madera, de hecho, también reutilizados. Incluso el más procesado de ellos, la cal, utilizada sólo de forma puntual y en baja proporción, tiene un impacto medioambiental bastante bajo cuando se compara con las altas emisiones producidas por el cemento. La obra no generó ni generará, por tanto, residuo alguno y el frágil equilibrio medioambiental del oasis no se verá amenazado por ella.

La metodología de Terrachidia, con el empleo prioritario de materiales y técnicas tradicionales de construcción en sus obras, y con la recuperación de las figuras del maestro y el aprendiz, que se incorporan a cada obra como un elemento esencial del proceso, demuestra ser una forma eficaz de recuperar no sólo el patrimonio material e inmaterial de un lugar, sino de contribuir a mantener su equilibrio social, económico y medioambiental.

Como complemento a la intervención en el propio morabito es importante señalar los trabajos de documentación

Impacto no oásis e conclusões finais

Mais além da própria restauração do elemento arquitetónico a intervenção teve um impacto a vários níveis:

- Impacto social: o modelo de intervenção que parte do diálogo com a população local, que é incluída tanto na tomada de decisões como no próprio desenvolvimento da obra (mestres e aprendizes) reforça a identidade cultural coletiva. Adicionalmente, a melhoria das condições de habitabilidade do espaço recuperado e da própria atenção prestada, tanto ao lugar como às suas tradições contribuem para sensibilizar a população sobre a importância de conservar o seu património (a arquitetura, a paisagem, o conhecimento herdado, etc.).

- Impacto económico: graças à aposta pelas técnicas locais artesanais, 50 % do orçamento global do projeto foi destinado diretamente ao salário dos mestres e dos aprendizes, apenas um 15 % aos materiais, um 20 % aos gastos indiretos gerados pelo próprio oásis e um 15 % à própria estrutura de Terrachidia. Ao utilizar materiais locais e não importados (como seria o caso do betão armado, os bloques pré-fabricados ou outros materiais elaborados fora da zona), e optar por soluções construtivas que se produzem na própria obra e que não chegam já preparadas de fábrica, a maior parte do orçamento destina-se a criar emprego de qualidade no próprio lugar e a reforçar a economia circular do oásis. Isto traduz-se numa melhoria geral das condições de vida da população se comparado com outras formas de construir nas que boa parte do investimento económico escapa ao oásis, e inclusive ao país.

- Impacto ambiental: dado que os materiais utilizados na obra provêm todos da região, quase todos do próprio oásis e alguns, como a terra, do próprio terreno que foi lavrada, o impacto que tem o seu transporte sobre o meio ambiente é praticamente nulo. Trata-se também de materiais recicláveis e infinitamente reutilizáveis e, no caso da terra e da madeira foram em realidade também reutilizados. Inclusive o mais processado deles, a cal, utilizada apenas de forma esporádica e em baixa proporção, tem um impacto ambiental bastante baixo quando comparada com as altas emissões produzidas pelo cimento. A obra não gerou nem gerará, portanto, qualquer resíduo e o frágil equilíbrio ambiental do oásis não se verá ameaçado pela mesma.

A metodologia de Terrachidia, com o emprego prioritário de materiais e técnicas tradicionais de construção nas suas obras, e com a recuperação da imagem do mestre e do aprendiz, que se integraram a cada obra como um elemento essencial do processo, demonstra ser uma forma eficaz de recuperar não só o património material e imaterial de um lugar, mas também a de contribuir para manter o seu equilíbrio social, económico e ambiental.

Como complemento à intervenção no próprio marabu é importante salientar os trabalhos de investigação e difusão

publication of the book *Ouled Youssef, an old* ksar *in the M'hamid Oasis* (INTBAU Spain, 2021), thanks to funding from the Barakat Trust and Liverpool University. These activities are part of a range of outreach and awareness actions deployed alongside Terrachidia's projects at the M'hamid Oasis, including the holding of seminars, meetings and exhibitions at the oasis and elsewhere and various publications on the local heritage and the work done.

A year and a half after its restoration, the marabout is in perfect condition and the locals from the nearby *ksur* are able to enjoy a pleasanter and better cared for site and environment on their visits there.

y de difusión del patrimonio del lugar desarrollados como fruto de la colaboración de Terrachidia con ArCHIAM, entre los que podemos destacar la producción del documental *M'hamid Oasis Morocco: Restoring, Recording and Inventorying the Tangible and Intangible Cultural Heritage*, dirigido por Monika Koeck, y la publicación del libro *Ouled Youssef, an old ksar in the M'hamid Oasis* (INTBAU España, 2021), gracias a la financiación del Barakat Trust y la Universidad de Liverpool. Estas actividades se integran en el conjunto de actuaciones de difusión y sensibilización implementados junto con los proyectos de Terrachidia en el oasis de Mhamid, que han incluido la organización de seminarios, encuentros y exposiciones tanto en el oasis como fuera de él y diversas publicaciones sobre el patrimonio local y los trabajos realizados.

Un año y medio después de su restauración, el morabito está en perfecto estado y los vecinos de los *ksur* cercanos pueden disfrutar de un entorno y un espacio más cuidados y agradables en sus visitas al lugar.

do património do local desenvolvidos como fruto da colaboração de Terrachidia com ArCHIAM, entre os que podemos destacar a produção documental *M'hamid Oasis Morocco: Restoring, Reccording and Interventorying the Tangible and Intangible Cultural Heritage*, dirigido por Monika Koeck, e a publicação do livro *Ouled Youssef*, an old ksar in the M'hamid Oasis (INTBAU Espanha, 2021), graças ao financiamento do Barakat Trust e da Universidade de Liverpool. Estas atividades integram-se no conjunto de ações de difusão e sensibilização implementados em conjunto com os projetos de Terrachidia no oásis de Mhamid, que incluíram a organização de seminários, encontros e exposições tanto no oásis como fora deste e diversas publicações sobre o património local e dos trabalhos realizados.

Ano e meio depois da sua restauração, o marabu está em perfeito estado e os vizinhos dos *ksur* cercanos podem apreciar um entorno e um espaço mais cuidado e agradável nas suas visitas ao local.

Exterior of the restored domes | Exterior de las cúpulas restauradas | Exterior das cúpulas restauradas

Biographies | Biografías | Biografias

Marta Colmenares Fernández

Architect, MSc in Land Planning and Management (Urban Studies) specializing in Development of Informal Human Settlements at the Madrid Polytechnic University School of Architecture. She has worked for more than 15 years in architecture, cataloguing of architectural and urban heritage and urban planning, and has been involved in various development and basic-housing projects since 2007. She has been a guest speaker at various international courses, congresses and seminars and is often invited to lecture on aspects of basic housing and development cooperation at the Madrid Polytechnic University School of Architecture. She is a member of the board of the NGO Terrachidia, whose work has been honored with the INTBAU Excellence Award 2015 and the Prix européen d'architecture Philippe Rotthier 2021.

Es Arquitecta, Máster en Planeamiento y Ordenación del Territorio (Estudios Urbanos) y Especialista en Desarrollo de Asentamientos Humanos Precarios por la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid. Lleva más de 15 años trabajando en arquitectura, en catalogación del patrimonio arquitectónico y urbano y en planificación urbana y ha estado vinculada a diversos proyectos de desarrollo y habitabilidad básica desde el año 2007. Ha sido conferenciante invitada en distintos cursos, congresos y seminarios internacionales y es regularmente invitada como docente en materias de habitabilidad básica y cooperación en la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid. Es miembro de la Junta Directiva de la ONG Terrachidia, cuyo trabajo ha recibido el INTBAU Excellence Award 2015 y el Prix Européen d'Architecture Philippe Rotthier 2021.

É arquiteta, mestre em Planeamiento y Ordenación del Territorio (Estudios Urbanos) e especialista em Desarrollo de Asentamientos Humanos Precarios pela Escola Técnica Superior de Arquitectura da Universidade Politécnica de Madrid. Há mais de 15 anos que trabalha em arquitetura, na catalogação do património arquitetónico e urbano e na planificação urbana e esteve vinculada a diversos projetos de desenvolvimento e habitabilidade básica desde 2007. Foi convidada como conferencista em diversos cursos, congressos e seminários internacionais e é regularmente convidada como docente em matérias de habitabilidade básica e cooperação na Escola Técnica Superior de Arquitectura da Universidade Politécnica de Madrid. É membro do Conselho Diretivo da ONG Terrachidia, cujo trabalho recebeu o INTBAU Excellence Award 2015 e o Prix Européen d'Architecture Philippe Rotthier 2021.

Alejandro García Hermida

He is an Associate Professor at the Department of Architectural Composition of the Escuela Técnica Superior de Arquitectura of the Universidad Politécnica de Madrid, graduated in Architecture and holds a PhD from the same university, and has been a Visiting Scholar at the School of Architecture of the University of Notre Dame. His professional practice has been focused on traditional architecture and construction and the restoration and study of historic buildings. He is the Executive Director of the INTBAU Initiatives in Spain and Portugal, member of the Board of Terrachidia NGO; and Vice Chair of INTBAU Spain. Some of these works have been awarded the 2015 INTBAU Excellence Award, the 2019 Hispania Nostra Award, a Special Mention from the 2019 Europa Nostra Awards and the 2021 Prix Européen d'Architecture Philippe Rotthier.

Es Profesor Asociado del Departamento de Composición Arquitectónica de la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid, Doctor Arquitecto por la misma universidad, y ha sido Visiting Scholar en la Escuela de Arquitectura de la Universidad de Notre Dame. Ha dedicado su actividad profesional a la arquitectura y la construcción tradicionales y a la restauración y el estudio de edificios históricos. Es Director Ejecutivo de las Iniciativas de INTBAU en España y Portugal; miembro de la Junta Directiva de la ONG Terrachidia; y Vicepresidente de INTBAU España. Algunos de estos trabajos han sido galardonados con el INTBAU Excellence Award 2015, el Premio Hispania Nostra 2019, una Mención Especial de los Premios Europa Nostra 2019 y el Prix Européen d'Architecture Philippe Rotthier 2021.

É Professor Associado no Departamento de Composição Arquitectónica pela Escola de Arquitectura da Universidade Politécnica de Madrid, Doutor Arquitecto pela mesma universidade, e foi Visiting Scholar na University of Notre Dame School of Architecture (Indiana, E.U.A.). Dedicou a sua actividade profissional à arquitectura e construção tradicionais e ao restauro e análise histórico-construtiva de edifícios históricos. É director executivo das iniciativas do INTBAU em Espanha e Portugal, membro do Conselho de Administração da ONG Terrachidia e Vice-presidente do INTBAU Espanha. Algumas dessas iniciativas foram premiadas com o INTBAU Excellence Award 2015, o Prémio Hispania Nostra 2019, a menção especial Europa Nostra 2019 e o Prix Européen d'Architecture Philippe Rotthier 2021.

Carmen Moreno Adán

She is an Architect and holds a Master's in Conservation and Restoration of Architectural Heritage and a Postgraduate Diploma in Development of Precarious Human Settlements from the School of Architecture of the Universidad Politécnica de Madrid. She is an Associate Professor at the Department of Architectural Composition of the Universidad Alfonso X el Sabio, Madrid. She has been a guest lecturer at various conferences and dedicates her professional activity to the recovery and restoration of public spaces and buildings within traditional towns. She is a member of the management committee at the LabOasis Foundation and a member of the board of Terrachidia NGO, whose work has been honoured with the 2015 INTBAU Excellence Award and the 2021 Prix Européen d'Architecture Philippe Rotthier.

Es Arquitecto, Máster en Conservación y Restauración del Patrimonio Arquitectónico y Especialista en Desarrollo de Asentamientos Humanos Precarios por la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid. Es profesora del Departamento de Composición Arquitectónica de la Escuela de Arquitectura de la Universidad Alfonso X El Sabio. Ha sido conferenciante invitada en diversos congresos y dedica su actividad profesional a la recuperación y restauración de espacios públicos y edificaciones de ciudades tradicionales. Es miembro del comité directivo de la Fundación LabOasis y miembro de la Junta Directiva de la ONG Terrachidia, cuyo trabajo ha recibido el INTBAU Excellence Award 2015 y el Prix Européen d'Architecture Philippe Rotthier 2021.

Arquiteta, Mestre em Conservação e Restauração do Património Arquitetónico e Especialista em Desarrollo de Asentamientos Humanos Precarios pela Escola Técnica Superior de Arquitetura da Universidade Politécnica de Madrid. É professora do Departamento de Composição Arquitetónica da Escola de Arquitectura da Universidade Alfonso X, El Sabio. Foi convidada como conferencista em diversos congressos e dedica a sua atividade profissional à recuperação e restauração de espaços público e edificações de cidades tradicionais. É membro do comité diretivo da Fundación LabOasis e membro do Conselho Diretivo da ONG Terrachidia, cujo trabalho recebeu o INTBAU Excellence Award 2015 e o Prix Européen d'Architecture Philippe Rotthier 2021.

A house in Wilmersdorf, Berlin

Una casa en Wilmersdorf, Berlín

Uma casa em Wilmersdorf, Berlim

Sebastian Treese Architekten

Emser Straße follows a straight line from Lietzenburger Straße in the north, a thoroughfare disfigured by post-war reconstruction, to Hohenzollerndamm in the south, Berlin's south-west boulevard – also somewhat disfigured but with more remaining grandeur. In between lies Ludwigkirchplatz, a charming square with a small park and a neo-Gothic church, lined with cafés, restaurants, and shops, which in pandemic-free times forms the quietly throbbing heart of Wilmersdorf.

The district of Wilmersdorf was built between 1895 and 1914 during the second half of the city's explosive expansion subsequent to 1870. Additional buildings and ensembles were built in the 1920s and the Nazi era, and the post-war reconstruction after 1945 added another more petit-bourgeois layer without much altering the urban structure.

Emser Straße 36 is second on the right as you walk south from Lietzenburger Straße toward Ludwigkirchplatz. The surrounding buildings date from all the periods described above and bear witness to the disruptions of those years. Half-grown plane or lime trees punctuate the sidewalks, large enough to act as a kind of filter, blending the

Emser Straße sigue una línea recta desde Lietzenburger Straße, al norte, una vía pública desfigurada por la reconstrucción de posguerra, hasta Hohenzollerndamm, al sur, el bulevar del suroeste de Berlín que también quedó desfigurado pero conservó cierto esplendor. En medio queda Ludwigkirchplatz, una coqueta plaza con un pequeño parque y una iglesia neogótica en la que hay cafés, restaurantes y tiendas que, en tiempos sin pandemia, constituye el tranquilo centro neurálgico de Wilmersdorf.

El distrito de Wilmersdorf se construyó entre 1895 y 1914, durante la segunda mitad del crecimiento explosivo de la ciudad posterior a 1870. En los años 20 y en la época nazi se construyeron más edificios y conjuntos residenciales y, en la reconstrucción posterior a 1945, se añadió otra capa pequeñoburguesa que no alteró sustancialmente la estructura urbana.

Emser Straße 36 es el segundo edificio a la derecha en dirección sur yendo desde Lietzenburger Straße hacia Ludwigkirchplatz. Los edificios adyacentes son de las épocas mencionadas y dan fe de las perturbaciones sufridas en esos años. Plátanos y tilos de media altura salpican las aceras y son lo bastante grandes para

Emser Straße segue em linha reta desde Lietzenburger Straße a norte, uma rua desfigurada pela reconstrução do pós-guerra, até Hohenzollerndamm a sul, o bulevar sudoeste de Berlim – também um pouco desfigurado, mas com mais grandeza remanescente. No meio encontramos Ludwigkirchplatz, uma praça formosa com um pequeno parque e uma igreja neogótica, rodeada de cafés, restaurantes e comércios, que nos tempos sem pandemia forma o sossegado coração latejante de Wilmersdorf.

O distrito de Wilmersdorf foi construído entre 1895 e 1914 durante a segunda metade da explosiva expansão urbana após 1870. Outros edifícios e conjuntos foram construídos na década de 1920 e durante a era Nazi, e a reconstrução pós-guerra depois de 1945 acrescentou outra camada pequeno-burguesa sem alterar muito a estrutura urbana.

Emser Straße 36 é a segunda rua à direita para quem caminha em direção a sul desde Lietzenburger Straße até Ludwigkirchplatz. Os edifícios circundantes datam de todos os períodos anteriormente descritos e evidenciam as ruturas desses anos. Os limoeiros e plátanos em fase de crescimento pontuam os passeios e são suficientemente grandes para atuarem como uma espécie de filtro, combinando

< View of the building's façade | Vista de la fachada del edificio | Vista da fachada do edifício

rather fragmented fabric of individual buildings into an urban whole.

In 2016 Sebastian Treese Architekten designed this seven-story residential building with forty-two flats and roughly 13,000 m² of gross floor area to replace a five-story office block that in its short life of less than half a century had outlived its economic usefulness. Started in 2019, the new building's structure and façade are almost complete, and residents will be able to move in during 2022.

This residential building is one of a series of designs that Treese has produced for its long-time partner developer Ralf Schmitz, a family firm that has been developing, building and selling real estate with high craftsmanship and technical quality since 1864.

actuar como una especie de filtro que ayuda a convertir un tejido bastante fragmentado de edificios individuales en un conjunto urbano.

En 2016 Sebastian Treese Architekten proyectó este edificio residencial de siete alturas con 42 pisos y aproximadamente 13.000 m² de superficie construida para sustituir a un edificio de oficinas de cinco plantas que en su corta vida de menos de medio siglo había vivido más que su utilidad económica. La estructura y la nueva fachada del edificio, comenzadas en 2019, están casi terminadas. Los residentes podrán mudarse en 2022.

Este edificio residencial es uno de los proyectos que Treese ha realizado para su socio, el promotor Ralf Schmitz, una empresa familiar que promociona, construye y vende propiedades de gran calidad técnica y artesanal desde 1864 y con la que colabora desde hace mucho tiempo.

o tecido fragmentado dos edifícios individuais num todo urbano.

Em 2016, Sebastian Treese Architekten projetou este edifício residencial de sete andares composto por quarenta e dois apartamentos, e aproximadamente 13.000 m2 de superfície total, para substituir um edifício de escritórios de cinco andares que, na sua curta vida de menos de meio século, tinha sobrevivido à sua utilidade económica. Iniciado em 2019, a estrutura e a fachada do novo edifício estão quase completas, e os residentes poderão instalar-se ao longo de 2022.

Este edifício residencial é apenas um de uma série de desenhos que Treese concedeu para o seu sócio promotor de longa data Ralf Schmitz, uma empresa familiar que tem desenvolvido, construído e vendido imóveis de elevada qualidade técnica e artesã desde 1864.

Location map | Plano de situación | Planta de situação

As Wilmersdorf was built later than other districts, a lot of the plots are much larger than in older parts of the city. Like its neighbors, Emser Straße 36 spans more than 50 m, much more than a typical plot in Berlin – of around 20 m, usually accommodating a single residential building with wings stretching to the rear.

In front of the house is a strip of garden behind which the plinth rises up, clad in pale, slightly rusticated limestone, taking its cue from the neighboring building, a former post office, which even after a lackluster reconstruction has retained its heavily rusticated plinth of pale sandstone with massive arches.

With its alternating height of one or two stories, the plinth accentuates the façade's slight projections and recesses, subtle and ambiguous variations lending vertical character to the broad building.

Two ordering principles are combined: on one hand, the two-story plinth areas subdivide the building into units which, rather like townhouses, create a recurring pattern of frontage on the pedestrian's scale. On the other hand, the projections and recesses along the façade create a classical structure for the building as a whole by highlighting the central and lateral protrusions.

This arrangement makes the house's side entrances and the central passage to the courtyard intuitively intelligible. The leeway allowed by the strip of garden is thus used to form an "urban palace", avoiding the dullness that we often perceive when walking past a long uniform façade.

At the side of the plot is a pergola covering the entrance to the underground garage. As the neighboring house abuts here with a forecourt, the pergola acts as a scaling device refining the coarse

Dado que Wilmersdorf se construyó después que otros distritos, muchas de las parcelas eran bastante más grandes que las situadas en zonas más antiguas de la ciudad. Al igual que sus vecinos, Emser Straße 36 cubre más de 50 metros, mucho más que el típico solar de Berlín, –de unos 20 metros– en el que suele haber un único edificio residencial con alas que se extienden hacia atrás.

Delante de la casa hay una franja ajardinada tras la cual se eleva el zócalo, revestido de piedra caliza clara y ligeramente almohadillado, siguiendo la pauta del edificio adyacente, una antigua oficina de Correos, que incluso después de una reconstrucción mediocre ha conservado su zócalo fuertemente almohadillado de caliza clara con arcos masivos.

Alternando alturas de una o dos plantas, el zócalo acentúa las leves proyecciones y huecos de la fachada, cuyas variaciones sutiles y ambiguas confieren al ancho edificio un carácter vertical.

En el edificio se combinan dos principios de ordenación: por una parte, las zonas del zócalo de dos alturas lo subdividen en unidades que, al estilo de las casas entre medianeras, crean un motivo recurrente de fachadas a escala del peatón. Por otra parte, las proyecciones y huecos de la fachada crean una estructura clásica en todo el edificio al destacar los salientes centrales y laterales.

Esta disposición consigue que las entradas laterales de la casa y el pasadizo central hacia el patio sean inteligibles de manera intuitiva. El margen de maniobra que proporciona la franja ajardinada se utiliza, por consiguiente, para formar un "palacio urbano" que evita la monotonía que a menudo se percibe cuando se pasa junto a una larga fachada uniforme.

En el lateral de la parcela una pérgola cubre la entrada del aparcamiento subterráneo. Puesto que la casa limítrofe

Uma vez que o distrito de Wilmersdorf foi construído mais tarde do que os demais distritos, muitos dos seus lotes são bastante maiores do que nas partes mais antigas da cidade. Tal como os seus vizinhos, Emser Straße 36 estende-se ao longo de mais de 50 m, muito mais do que um lote típico em Berlim – de aproximadamente 20 m, normalmente alojando apenas um edifício residencial com alas que se estendem até à retaguarda.

Na frente da casa há uma pequena faixa de jardim atrás da qual se alça o embasamento, revestido de pedra calcária pálida, ligeiramente rústica, inspirado no seu edifício vizinho, um antigo posto de correios, que mesmo depois de uma reconstrução medíocre conseguiu conservar o seu pesado embasamento rústico de arenito pálido com enormes arcos.

Com a sua altura alterna de dois ou três andares, o embasamento acentua os ligeiros avanços e recuos da fachada, variações subtis que dão um carácter vertical ao amplo edifício.

Combinam-se dois princípios: por um lado, as áreas do embasamento de dois andares subdividem o edifício em unidades que, um pouco como as câmaras municipais, criam um padrão de fachada recorrente à escala pedestre. Por outro lado, os avanços e os recuos, ao longo da fachada criam uma estrutura clássica para o edifício como um todo, destacando as protuberâncias laterais e centrais.

Esta disposição torna as entradas laterais da casa e a passagem central para o pátio intuitivamente inteligível. A flexibilidade permitida pela faixa de jardim é, portanto, usada para formar um "palácio urbano", evitando assim a monotonia que frequentemente percebemos quando se caminha ao longo de uma fachada uniforme.

Ao lado do terreno encontra-se uma pérgula que cobre a entrada para a garagem subterrânea. Como a casa contígua

Elevation of the ensemble | Alzado del conjunto | Alçado do conjunto

driveway and also as a frame and mediator with the adjoining forecourt, spatially integrating the gap into the streetscape.

The dark violet brick façade of *Wittmunder Torfbrandklinker* – fine, traditionally sintered bricks from northern Germany – rises above the plinth, vertically structured by the façade projections with their monumental three-to-four story arches and capped by a recessed penthouse floor at a height of some 21 m – the standard eave height in Berlin.

Finely rounded cornices accentuate the horizontal structure, crowned by the penthouse, which also adds vertical character with three large arches, rounding off the skyward thrust.

linda aquí con un antepatio, la pérgola sirve como elemento de escala que acota el ordinario acceso, además de como marco y elemento intermedio con el patio contiguo. Así, consigue integrar espacialmente el hueco en el paisaje urbano.

La fachada de ladrillo violeta oscuro de *Wittmunder Torfbrandklinker* – tradicional ladrillo noble sinterizado del norte de Alemania– se eleva sobre el zócalo, estructurado verticalmente por las proyecciones de la fachada con sus arcos monumentales de entre tres y cuatro alturas que culmina en el ático retranqueado a una altura de unos 21 metros –la altura estándar de los aleros en Berlín.

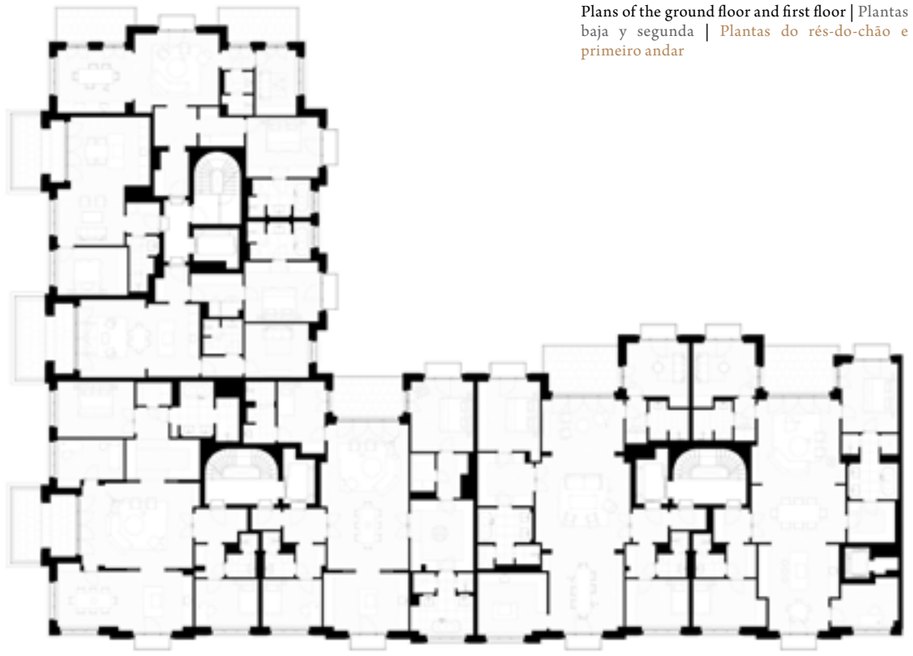
Las cornisas perfectamente rematadas acentúan la estructura horizontal, coronada por el ático, que asimismo añade verticalidad mediante tres grandes arcos que completan el empuje hacia el cielo.

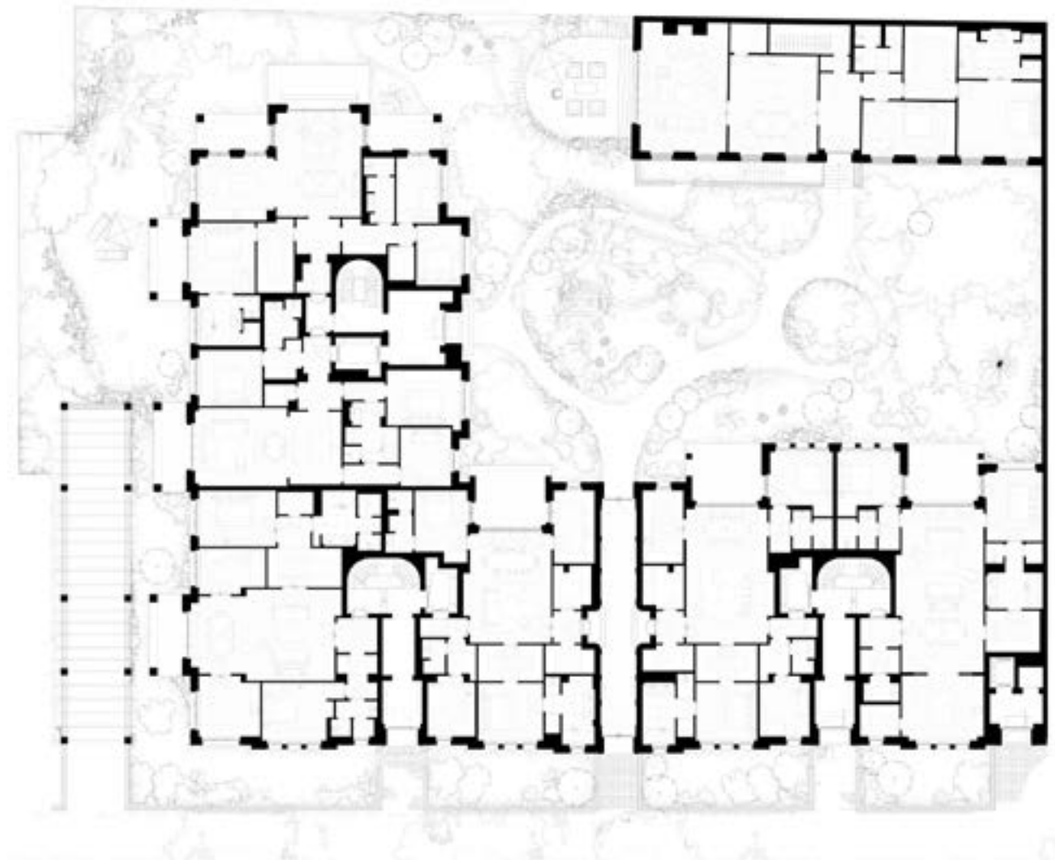
ladeia aqui com um pátio de entrada, a pérgula atua como um dispositivo de transição que afina o caminho de acesso grosseiro e também atua como um marco e mediador com o pátio de entrada adjacente, integrando espacialmente o vazio no cenário urbano.

A fachada de tijolo purpúreo de *Wittmunder Torfbrandklinker* – tijolos finos sinterizados tradicionalmente característicos do norte da Alemanha – alça-se sobre o embasamento, estruturando-se verticalmente pelas projeções da fachada com os seus monumentais arcos de três a quatro pisos e culmina com um terraço de um apartamento recuado (*penthouse*) a uma altura de mais ou menos de 21 m – a altura padrão dos beirados em Berlim.

Cornijas finamente arredondadas acentuam a estrutura horizontal, coroada pelo apartamento recuado (*penthouse*), que também adiciona o carácter vertical com três grandes arcos, rematando o impulso para o céu.

Plans of the ground floor and first floor | Plantas baja y segunda | Plantas do rés-do-chão e primeiro andar



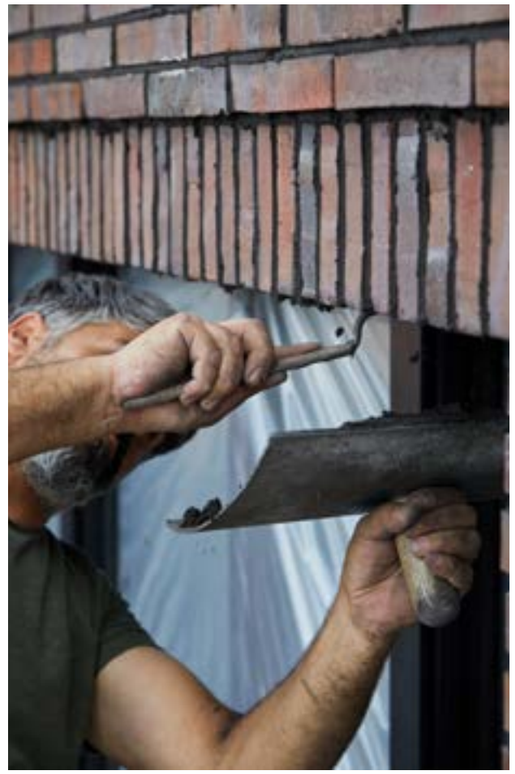


The building's three-dimensional, sculptural plasticity enlivens the streetscape along its frontage for passers-by and frames it against the sky. It is intuitively intelligible for users and is developed using the inherent qualities of brick that make this kind of plasticity possible – and even demands it – if one does not opt for a sheer wall.

La plasticidad escultórica y tridimensional del edificio anima la calle a lo largo de toda su fachada para los viandantes y lo enmarca contra el cielo. Los usuarios la entienden de forma intuitiva y está proyectada utilizando las cualidades inherentes del ladrillo que permiten este tipo de plasticidad –e incluso la exigen– si no se opta por un simple muro.

A plasticidade tridimensional e escultórica do edifício dá vida ao cenário urbano ao longo da sua fachada para os transeuntes e enquadra-o contra o céu. É intuitivamente inteligível para os usuários e desenvolve-se utilizando as qualidades inerentes do tijolo que tornam este tipo de plasticidade possível – e até exigível – a menos que se opte por uma simples parede.

View of the building's courtyard façade | Vista de la fachada del edificio hacia el patio | Vista da fachada do pátio do edifício



Bricklaying on site | Trabajo del ladrillo en obra | Trabalho do tijolo na obra (Andreas Gehrke)

Exposed brick has been used in public buildings in Berlin since the Middle Ages. It was Schinkel who revived this tradition with the Friedrichswerder Church and the Bauakademie, and in Berlin's 19th-century expansion, most public buildings were built this way.

El ladrillo visto se ha utilizado en Berlín desde la Edad Media. Fue Schinkel quien recuperó esta tradición en la iglesia de Friedrichswerder y en la Bauakademie. En el ensanche de Berlín del siglo XIX, la mayoría de los edificios públicos se construyeron de esta forma.

O tijolo face à vista é usado nos edifícios públicos berlinenses desde a Idade Média. Schinkel foi quem reavivou esta tradição com a Igreja de Friedrichswerder e a Bauakademie, e durante a expansão de Berlim no século XIX a maioria dos edifícios públicos foi construída desta forma.

Violet sintered bricks were increasingly used. After the First World War, such bricks were widely employed in industrial settings, such as the Siemens buildings by Hans Hertlein or the prominent industrial buildings by Hans Müller for Bewag, Berlin's electricity company, scattered throughout the city.

El ladrillo sinterizado de color violeta era cada vez más utilizado. Tras la Primera Guerra Mundial, este tipo de ladrillo se empleó mucho en contextos industriales, como los edificios Siemens de Hans Hertlein o las notables construcciones industriales de Hans Müller para Bewag, la compañía eléctrica de Berlín, diseminados por toda la ciudad.

Os tijolos sinterizados purpúreos foram cada vez mais utilizados. Após a Primeira Guerra Mundial, estes tijolos foram amplamente utilizados em ambientes industriais, como nos edifícios Siemens por Hans Hertlein ou nos proeminentes edifícios industriais por Hans Müller para a Bewag, a companhia de eletricidade de Berlim, espalhada por toda a cidade.

They were subsequently incorporated into buildings of the emerging Modernist movement. Not far from Emser Straße, Erich Mendelsohn's Woga complex (1925-31), today the Schaubühne Theater, is one prominent

Posteriormente se incorporaron a edificios del incipiente Movimiento Moderno. No muy lejos de Emser Straße, el complejo Woga (1925-1931) de Erich Mendelsohn, que es actualmente el teatro Schaubühne, es un ejemplo

Estes foram subsequentemente incorporados aos edifícios do emergente movimento modernista. Não muito longe de Emser Straße, o complexo Woga de Erich Mendelsohn (1925-31), atualmente ocupado pelo Teatro Schaubühne, é um

Precedents. 1: The west façade of Chorin Cloister 2: Erich Mendelsohn's Woga complex | Precedentes. 1: Fachada oeste del Claustro Chorin 2: Complejo Woga, de Erich Mendelsohn | Precedentes. 1: A fachada oeste do Chorin Cloister 2: Complexo Woga, de Erich Mendelsohn (1: Königlich Preußische Messbildanstalt 2:Tobias Zepter)

Precedents. 1: Building in Kurfuerstendamm 2: A former electric transformer building by Hans Heinrich Müller for BEWAG, the Berlin electricity company, from 1929, nowadays used as an office building 3: Example of a building which incorporates a larger outdoor space called "loggia". Walter Benjamin remembers their presence in his book *Berliner Kindheit um 1900* | Precedentes. 1: Antiguo edificio de transformadores de Hans Heinrich Müller para BEWAG, la compañía eléctrica de Berlín, de 1929, actualmente utilizado como edificio de oficinas 3: 3: Ejemplo de edificio que incorpora un espacio exterior más grande llamado "logia". Walter Benjamin recuerda su presencia en su libro *Infancia en Berlín hacia 1900* | Precedentes. 1: Antigo edifício de transformadores de Hans Heinrich Müller para BEWAG, a companhia elétrica de Berlim desde 1929, atualmente utilizado como edifício de escritórios 3: Exemplo de edifício que incorpora um espaço exterior maior, chamado "lógia". Walter Benjamin recorda a sua presença no seu livro *Berliner Kindheit um 1900* (Tobias Zepter)

example. In Emser Straße itself, near Ludwigkirchplatz, the façade of an entire residential block designed by Paul Hetzer and completed in 1932 is structured with alternate sections of clinker brick and plaster.

More recently, Hans Kollhoff reintroduced clinker brick into the cityscape, such as in his Haus am Stadtring, in Wilmersdorf near Hohenzollerndamm. Of particular prominence is his high-rise building on Potsdamer Platz.

The physical and visual density of brick contributes to a presence which stands out and also apart, in an exoticism that is certainly intended here. The canopies over the entrances underscore this feeling and seem to belong more on 5th Avenue than on Emser Strasse – a connotation also evoked by the interplay between the rustic stone plinth and the brickwork above.

This exoticism – taking pleasure in foreign places and in the world at large – may be seen as typical of Berlin. The city has always been a late developer and gleaned its cosmopolitanism from abroad, starting with Schinkel, continuing with Stüler and Persius and perhaps culminating in the still underrated work of Ludwig Hoffmann, whose elegant and picturesque details make his many buildings a source of pleasure.

Sebastian Treese Architekten aims to work at the same level of detail but within the rigid constraints of today's standardized building industry. Emser Straße 36 is a product of its time, with all that this implies.

The more complex parts of the clinker brickwork and the reinforced-concrete cornices and arches arrived at the site as prefabricated elements and were crane-fitted into the hand-built masonry wall. The windows are triple-glazed and correspondingly heavy. Visual subtlety and precision in window frames could be achieved with composite wood-aluminum frames.

The character of the flats changes according to their position in the house as well as their relationship with the street. Each has its own qualities and its own way of dealing with the depth of the building, taking advantage of the plot and reducing the energy required

notable. En la propia Emser Straße, cerca de Ludwigkirchplatz, la fachada de toda una manzana residencial diseñada por Paul Hetzer y terminada en 1932 está estructurada con secciones alternas de ladrillo vitrificado y enlucido.

Más recientemente, Hans Kollhoff volvió a utilizar el ladrillo vitrificado en el paisaje urbano, por ejemplo, en su Haus am Stadtring, en Wilmersdorf, cerca de Hohenzollerndamm. Especialmente reseñable es el rascacielos que construyó en Potsdamer Platz.

La densidad física y visual del ladrillo confiere una presencia sobresaliente y destacada, con un exotismo que fue ciertamente buscado en este caso. Las marquesinas de las entradas subrayan esta sensación y parecen más propias de la Quinta Avenida que de Emser Strasse, una connotación también evocada por el juego entre el rústico zócalo de piedra y la fábrica de ladrillo sobre él.

Este exotismo –que se recrea en lugares lejanos y en el mundo en general– puede considerarse algo típico de Berlín. La ciudad siempre ha tenido un desarrollo tardío y tomado su carácter cosmopolita del extranjero, empezando por Schinkel, continuando con Stüler y Persius, y culminando en la obra, todavía hoy infravalorada, de Ludwig Hoffmann, cuyos detalles elegantes y pintorescos hacen de sus numerosos edificios una fuente de placer.

Sebastian Treese Architekten intenta construir con el mismo nivel de detalle, pero dentro de las estrictas limitaciones actuales impuestas por el estandarizado sector de la construcción. Emser Straße 36 es un producto de su época, con todo lo que esto conlleva.

Las partes más complejas de la fábrica de ladrillo vitrificado y las cornisas y los arcos de hormigón armado llegaron a la obra como elementos prefabricados y se montaron con grúa en el muro de mampostería construido a mano. Las ventanas tienen triple acristalamiento y, por consiguiente, pesan mucho. La sutileza y la precisión visual de los marcos de las ventanas se consiguieron gracias a la mezcla de madera y aluminio.

El carácter de los pisos cambia según su ubicación en el edificio, así como su relación con la calle. Cada uno tiene sus propias cualidades y su forma de afrontar la profundidad del inmueble,

exemplo proeminente. Na própria Emser Straße, perto de Ludwigkirchplatz, a fachada do edifício residencial projetada por Paul Hetzer, concluída em 1932, está estruturada com secções alternadas de tijolo clínquer e estuque.

Mais recentemente, Hans Kollhoff reintroduziu o tijolo clínquer na paisagem urbana, como na sua Haus am Stadtring, em Wilmersdorf perto de Hohenzollerndamm. De particular destaque é a sua torre em Potsdamer Platz.

A densidade física e visual do tijolo contribui para uma presença que se destaca e que também se desliga, num exotismo que é certamente intencional aqui. Os toldos sobre as entradas realçam este sentimento e dão a sensação de pertencerem mais à 5ª Avenida do que à Emser Straße – uma conotação também evocada pela interação entre o embasamento de pedra rústica e a estrutura de tijolo por cima deste.

Este exotismo – que tem encanto em lugares estrangeiros e no mundo em geral – pode ser considerado como típico de Berlim. A cidade desenvolveu-se sempre tarde e importou o seu cosmopolitismo do estrangeiro, começando por Schinkel, continuando com Stüler e Persius e talvez culminando na ainda subestimada obra de Ludwig Hoffmann, cujos elegantes e pitorescos detalhes fazem dos seus muitos edifícios uma fonte de prazer.

Sebastian Treese Architekten procura trabalhar com o mesmo nível de detalhe, mas dentro dos atuais rígidos limites normativos da indústria da construção. Emser Straße 36 é um produto do seu tempo, com tudo o que isto implica.

As partes mais complexas da estrutura de tijolo clínquer e as cornijas e os arcos de betão armado chegaram ao local de construção como elementos pré-fabricados e foram instaladas com grua na parede de alvenaria construída à mão. As janelas são de vidro triplo e, portanto, pesadas. A subtileza e precisão visual nos caixilhos das janelas podiam ser alcançada com caixilhos compostos de madeira-alumínio.

O carácter dos apartamentos muda de acordo com a sua posição na casa, bem como com a sua relação com a rua. Cada um tem as suas próprias características e a sua própria forma de lidar com a profundidade do edifício, tirando vantagem do lote do terreno e reduzindo a ener-

for heating, as well as having the shady quietude that is the hallmark of a Berlin flat.

The high arcades are particularly esthetic, and if this house is granted a longer life than its predecessor, one will hopefully see time standing still in one of them – as Walter Benjamin did, in the loggia of his childhood.

aprovechando la parcela y reduciendo la energía necesaria para calefacción. Se consigue así la sombreada quietud característica de los pisos de Berlín.

Las altas arcadas son especialmente estéticas y, si este edificio consigue vivir más que su predecesor, con suerte alguien verá el tiempo detenerse en una de ellas, como le sucedió a Walter Benjamin en la logia de su infancia.

gia necessária para o aquecimento, bem como o usufruto da quietude sombria que é a marca distintiva de um apartamento berlinense.

As arcadas altas são particularmente estéticas, e se esta casa conseguir perdurar mais do que a sua predecessora, esperamos que o tempo tenha parado numa delas – tal como fez Walter Benjamin na lógia da sua infância.

Bricklaying on site | Trabajo del ladrillo en obra | Trabalho do tijolo na obra (Andreas Gehrke)

Biographies | Biografías | Biografias

Tobias Zepter

Tobias (author of this article) studied architecture in Berlin and Delft (NL) and worked after his graduation for Modersohn & Freiesleben Architekten in Berlin. Since 2003 he has been freelance. In 2009 he published the book *Das Leben der Dinge* (The Life of Things), a monograph on the work of Modersohn & Freiesleben and a general reflection on architecture. Between 2008 and 2015 he worked in partnership with Modersohn & Freiesleben on a hotel project in Cochin, Kerala state, India. He and his family lived alternately in Cochin and Berlin from 2010 to 2015. The buildings in Kerala were constructed in close cooperation with local craftsmen and engineers, and reflect this cooperation as well as an engagement with local traditions, techniques and materials. In 2017 Antje Freiesleben and Tobias imported furniture produced in Kerala and designed by Hendrike Farenholtz and Tobias for a "pop-up" sale in Berlin. Since 2018 Tobias has been working in partnership with Sebastian Treese Architects on a house in Mumbai. At the same time he works on his own projects in Berlin and its region. Reflections on architecture and contemporary living culture are a necessary part of Tobias's professional practice.

Tobias (autor de este artículo) estudió arquitectura en Berlín y Delft (Países Bajos) y tras graduarse trabajó para Modersohn & Freiesleben Architekten en Berlín. Desde 2003 es autónomo. En 2009 publicó *Das Leben der Dinge* (La vida de las cosas), una monografía sobre la obra de Modersohn & Freiesleben y una reflexión general sobre arquitectura. Entre 2008 y 2015 se asoció con Modersohn & Freiesleben para el proyecto de un hotel en Cochín, en el estado indio de Kerala. Junto con su familia residió entre Cochín y Berlín desde 2010 hasta 2015. Los edificios de Kerala se construyeron en estrecha colaboración con artesanos e ingenieros locales y reflejan esta cooperación, así como el compromiso con las tradiciones, técnicas y materiales locales. En 2017 Antje Freiesleben y Tobias importaron muebles fabricados en Kerala y diseñados por Hendrike Farenholtz y Tobias para una venta "pop-up" en Berlín. Desde 2018 Tobias colabora con Sebastian Treese Architekten en una casa en Bombay. Al mismo tiempo, trabaja en sus propios proyectos en Berlín y alrededores. La reflexión sobre la arquitectura y la cultura viva contemporánea es una parte indispensable del ejercicio profesional de Tobias.

Tobias (autor deste artigo) estudou arquitetura em Berlim e em Delft (NL) e trabalhou após a sua graduação em Modersohn & Freiesleben Architekten em Berlim. Desde 2003 é trabalhador independente. Em 2009, publicou o libro *Das Leben der Dinge* (a vida das coisas), uma monografia sobre o trabalho de Modersohn & Freiesleben e uma reflexão geral sobre a arquitetura. Entre 2008 e 2015 trabalhou em parceria com Modersohn & Freiesleben num projeto hoteleiro em Cochim, no estado de Querala, na Índia. Ele e a sua família viveram alternadamente em Cochin e Berlin entre 2010 e 2015. Em 2017, Antje Freiesleben e Tobias importaram mobiliário produzido em Querala e concebido por Hendrike Farenholtz e Tobias para uma venda "pop-up" em Berlim. Desde 2018, Tobias tem colaborado em parceria com Sebastian Treese Architekten numa casa em Mumbai. Ao mesmo tempo, trabalha nos seus próprios projetos em Berlin e na sua região. Reflexões sobre a arquitetura e cultura viva contemporânea são uma parte necessária da prática profissional de Tobias.

Sebastian Treese Architekten

In 2008, Sebastian Treese established his own firm in Berlin after completing his studies at the Berlin University of the Arts and working with Hans Kollhoff also in Berlin. Sebastian grew up in Mainz in a Catholic region of Germany with a palpable Roman heritage, surrounded by Romanesque cathedrals and imperial palaces. The contrasts between a Catholic region of Europe and the rich and fragmented present state of architecture in Berlin have shaped Sebastian's architectural sensibility. Sebastian Treese Architects was founded in 2011. Julia Treese joined the practice in 2012, and Jan Burggraf joined as a partner in 2013. Since 2016, the practice has been architect of record in collaboration with Robert AM Stern Architects for a villa in Berlin Grunewald and for a large residential project in central Berlin. In 2021 the firm opened a branch office in Munich. At the core of its work lies the conviction that tradition in architecture is a cultural and technical accumulation of human knowledge and spirit. Building involves applying this heritage to the present. The firm has grown significantly in the past ten years. Ralf Schmitz has been its chief client and a valuable support. Outside Berlin, the focus of its work has been projects in Hamburg, Munich and Düsseldorf. Its first building outside Germany is situated in Mumbai, India, and is currently under construction. In 2021 Sebastian Treese Architects received the Richard H. Driehaus Prize.

En 2008, Sebastian Treese abrió un estudio en Berlín tras terminar la carrera en la Facultad de Artes de la ciudad y trabajar con Hans Kollhoff, también en Berlín. Sebastian creció en Maguncia, una región católica de Alemania con un patrimonio romano tangible, rodeado de catedrales románicas y palacios imperiales. El contraste entre una zona católica de Europa y el rico y fragmentado estado actual de la arquitectura en Berlín han forjado la sensibilidad arquitectónica de Sebastian. Sebastian Treese Architekten se fundó en 2011. Julia Treese se incorporó al estudio en 2012, y Jan Burggraf se asoció en 2013. Desde 2016, el estudio ha llevado la dirección de obra, en colaboración con Robert AM Stern Architects, de una vivienda en el área de Grunewald y de un gran proyecto residencial en el centro de Berlín. En 2021 el estudio abrió una oficina en Múnich. En el fondo su trabajo subyace el convencimiento de que la tradición en arquitectura es la suma cultural y técnica de conocimientos y espíritu. Construir significa aplicar este legado al presente. El estudio ha crecido considerablemente en los diez últimos años. Ralf Schmitz ha sido su principal cliente y un valioso apoyo. Fuera de Berlín, el estudio se ha centrado en proyectos en Hamburgo, Múnich y Düsseldorf. Su primer edificio fuera de Alemania está en Bombay (India) y se encuentra actualmente en construcción. En 2021 Sebastian Treese Architekten recibió el Premio Richard H. Driehaus.

Em 2008, Sebastian Treese estabeleceu a sua própria firma em Berlim após completar os seus estudos na Universidade das Artes de Berlim e após colaborar com Hans Kollhoff, também em Berlim. Sebastian cresceu em Mogúncia numa região católica da Alemanha com um património romano palpável, rodeado de catedrais românicas e palácios imperiais. O contraste entre a região católica da Europa e o seu rico e fragmentado estado atual da arquitetura em Berlim moldaram a sensibilidade arquitetónica de Sebastian. Sebastian Treese Architekten foi fundada em 2011. Julia Treese uniu-se ao gabinete em 2012, e Jan Burggraf como sócio em 2013. Desde 2016, o gabinete colabora com Robert AM Stern Architekten para uma vila em Berlim Grunewald e para um grande projeto residencial no centro de Berlim. Em 2021, a firma abriu uma filial em Munique. O seu trabalho centra-se na convicção de que a tradição na arquitetura é uma acumulação cultural e técnica de conhecimento e espírito humano. A construção envolve a aplicação deste património ao presente. A firma tem crescido significativamente nos últimos dez anos. Ralf Schmitz tem sido o seu principal cliente e um valioso apoio. Fora de Berlim, o seu trabalho inclui projetos em Hamburgo, Munique e Dusseldorf. O seu primeiro edifício fora da Alemanha, atualmente em construção, localiza-se em Mumbai, Índia. Em 2021, Sebastian Treese Architekten recebeu o Prémio Richard H. Driehaus.

Reflections
Reflexiones
Reflexões

Mohamad Hamouie

The Architect-Craftsperson

El Arquitecto-Artesano

O Arquitecto-Artesão

Abstract | Resumen | Resumo

The scarcity of craftsmanship in our society is the result of modernist philosophies that celebrate mass production, mechanized industry, exponential economic gain and a corporate/developer-led economy. This relatively recent rupture in thousands of years of human history has led to the loss of generations of valuable knowledge and of an understanding of life stretching beyond material face value. A reconciliation between the traditional values of craftsmanship and contemporary technological advances has been at the core of my practice for over three decades. Here, the need for the "Architect Craftsman" is presented as an alternative approach to the egocentric modernist figure of the "Architect Artist" that has in recent times so widely informed our ways of building.

La escasez de artesanos en la sociedad actual es resultado de las filosofías modernas que celebran la producción en serie, las industrias mecanizadas, el beneficio económico exponencial y las economías mundiales dirigidas por empresas y promotores. Esta ruptura relativamente reciente con los miles de años de historia tradicional de la humanidad ha llevado a la pérdida de valiosos conocimientos de generaciones y de una forma de entender la vida que va más allá de su valor material nominal. La reconciliación entre los valores de la artesanía tradicional y los avances tecnológicos ha sido la base de mi práctica profesional durante más de tres décadas. Aquí, la necesidad del "Arquitecto artesano" se presenta como planteamiento alternativo a la aparición de la figura egocéntrica y vanguardista del "Arquitecto artista", que últimamente ha dado forma ampliamente a nuestros modos de construir.

A escassez de artesanato na nossa sociedade contemporânea é o resultado de filosofias modernistas que celebram a produção em massa, indústrias mecanizadas, ganhos económicos exponenciais e economias mundiais lideradas por corporações e promotores. Esta ruptura relativamente recente nos milhares de anos da história humana tradicional levou à perda de gerações de conhecimentos valiosos, e de uma compreensão da vida que vai para além do valor facial e material. Uma reconciliação entre os valores tradicionais do artesanato e os avanços tecnológicos contemporâneos tem estado no centro da minha prática há mais de três décadas. Aqui, a necessidade do "Arquitecto Artesão" é apresentada como uma abordagem alternativa à emergência modernista e egocêntrica do "Arquitecto Artista" que, recentemente, foi tão amplamente atribuída às formas de construção.

< Drawings, details and patterns of the Masjid Al Attar, Tripoli Lebanon, 2019 - In progress

> *There are, however, cases in which men feel too keenly to be silent, and perhaps too strongly to be wrong; I have been forced into this impertinence; and have suffered too much from the destruction or neglect of the architecture I best loved, and from the erection of that which I cannot love* (John Ruskin 1849).

Wherever in the world we look today we see cities in crisis. Most of the traditional city fabric has been destroyed, damaged or left to decay. With a few exceptions, it has been replaced by morphological schemes and building types that bear no resemblance to their urban context. They are true images of our fractured and fragmented societies, torn between tradition and modernity.

The traditional view of things

In traditional societies, human behavior was continually guided by spiritual values that had their source in a sacred order. This sacred order existed in the vertical dimension of heaven, thereby giving access to the divine source at any moment, and the horizontal dimension in the depths of time, thereby linking successive generations to the originary event of revelation. The immutable nature of the Divine gave the guiding principles of traditional societies "constant and universal qualities", providing a point of reference.

The extraordinarily beautiful buildings and towns of the past were the product of cooperation between builders and craftspeople, who labored with love and were organized in guilds. These guilds preserved the sacred order. This was a moral and spiritual order first and foremost. The guild's moral and spiritual horizon guaranteed workers' dignity and freedom and the quality of their work. It gave work its character and guaranteed its craftsmanship.

The beauty of traditional craft comes from three ingredients: the beauty of natural materials, the beauty of natural processes, and the beauty of natural forms. It was in the crucible of the builder-craftsperson's creative imagination that forms and materials were alchemically transformed into the beauty we see in traditional work.

Condition of the interior before restoration (1) and Interior view looking towards the new mezzanine (2) of the Masjid Al Attar, Tripoli, Lebanon, 2019 - In progress

1

2

Builders and craftspeople toiled silently and anonymously, serving their community. Submission to tradition granted the modestly talented builder-craftsman the accumulated wisdom of countless generations and the gift of creating unparalleled beauty – a beauty he could not have produced alone.

Not all of us can leave our mark through our own invention, but through the grace of tradition we can transcend our limitations.

Innovation or change always happened, but innovation in the traditional view of things was "change within continuity". This is change driven by innovations in design, technology, and materials within a continuity with a cherished past, giving it a seemingly "static" quality..

The modern view of things

Modernism, and by extension modernist architecture, represents a break, a rupture in the traditional view of things. It made a break with a way of understanding both the world and humankind.

The new understanding of the world involved an abandonment of metaphysics as the framework for the study of the natural world (as was the case in traditional societies) and the rise of positivist science. The new understanding of humankind involved a personal autonomy for the individual unfettered by tradition or external authority. This began with the Renaissance and continued well into the twentieth century. The individual became little more than a product of his or her time.

This historicization of consciousness and repudiation of the traditional view led to the development of the modern individual, whose rise was a tacit recognition of the self as detached from the interrelationship that had defined each person and given him or her purpose and meaning. Individuals were no longer linked to a higher order but seemingly free to do as they pleased. This gave the modern view of things a dynamic and horizontal character in that it is not the symbolism of things that is of interest but their ever-changing material and theoretical connections.

Thus, modernism's rallying call became "innovation for innovation's sake". As a result, architectural theory and practice ceased to be a normative body of knowledge grounded in a sacred order of tradition to become a self-conscious solipsistic discourse adrift in the ever-changing currents of history. Guilds were dismantled in the name of efficient industrial production and craftspeople reduced to laborers. Then the architect-artist was born.

Architect-artists are driven by new theories, a sense of authority allowing them to look upon the past as an accumulation of what was done over thousands of years and to decide what is to be kept and what is not. Architect-artists never ask whether a historic building is true or false, good or bad, right or wrong; rather they will report on who designed it, what inspired him, who the patron was, which style it belongs to, and how original it is.

So according to this modern view, everything is tied to its historical context and time, its horizontal dimension, with no enduring and universally valid norms connecting the past with present and future.

Reconciling tradition and modernity

One can appreciate that the modern world has offered great technological improvements and opportunities. But a fair assessment of its legacy, particularly its architectural legacy, will be critical. Its "innovation for innovation's sake" and iconoclastic approach to all things past make for a dubious doctrine, whose erosion of the fabric of our beloved traditional cities must be regretted. The paradigm of the architect-artist that dominated the 20th century may be said to be *passé*. And nor can we rely on the traditional builder-craftsperson. Alas, guilds have long since disappeared and with them many crafts; the master-apprentice relationship that allowed architectural

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Detail of the zelig base and gypsum carvings (1) and the brass lantern in the entrance portico (2) of the Jameh Al Khereiji, Eastern Province, Kingdom of Saudi Arabia, 2010-2020

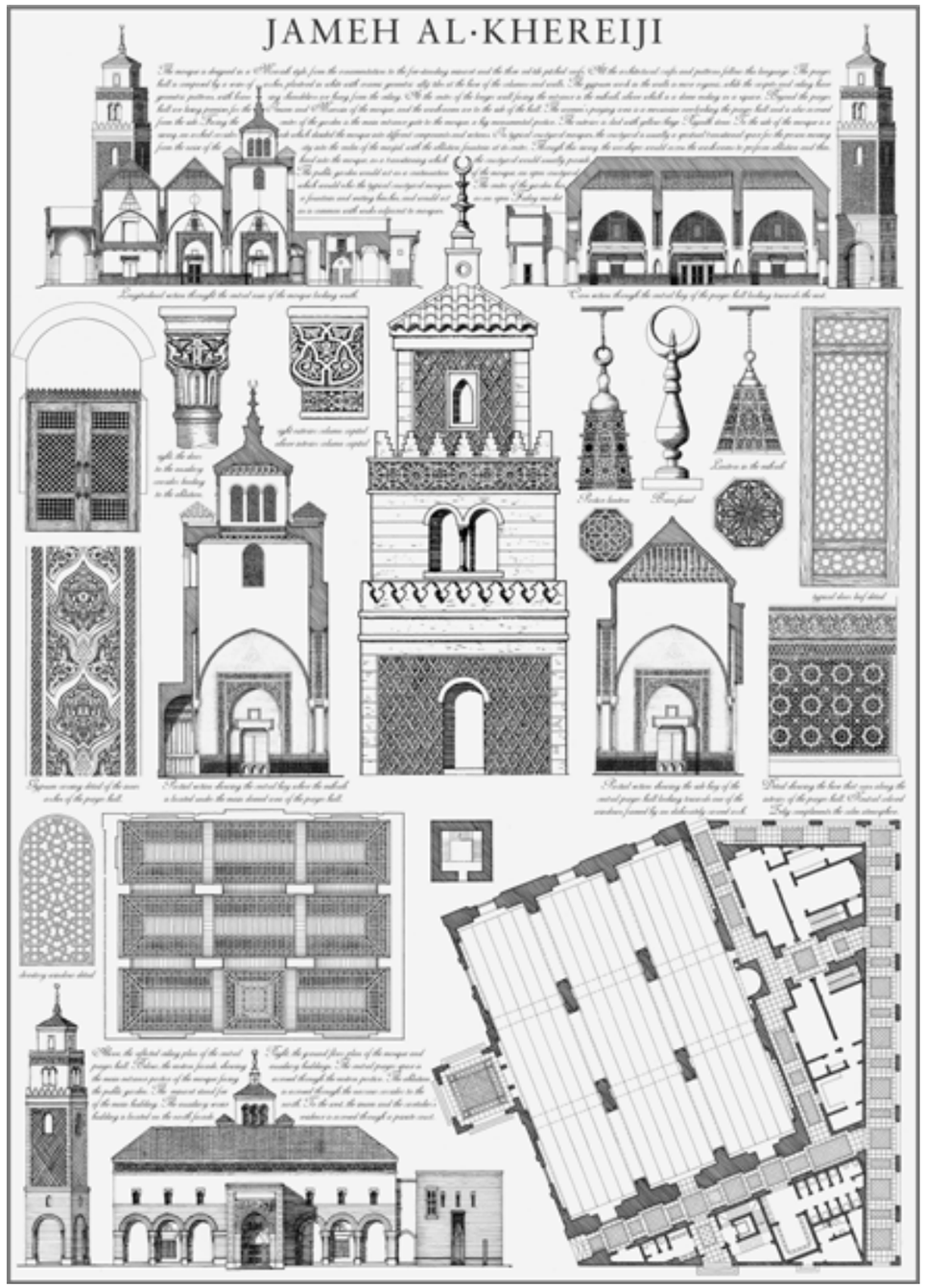
knowledge to be passed on has been replaced by modern university architectural education, and architectural theory – the stability of meaningful forms – has at best been preserved as a historical relic that may or may not inspire architects.

3: Exterior view of the Jameh Al Khereiji as seen from the garden

3

In this context, what type of designer can preserve tradition and embrace what the contemporary world can offer? The "architect-craftsperson" – one who combines craftsmanship and the building arts with the role of architect. It is to this paradigm that I like to see myself as belonging.

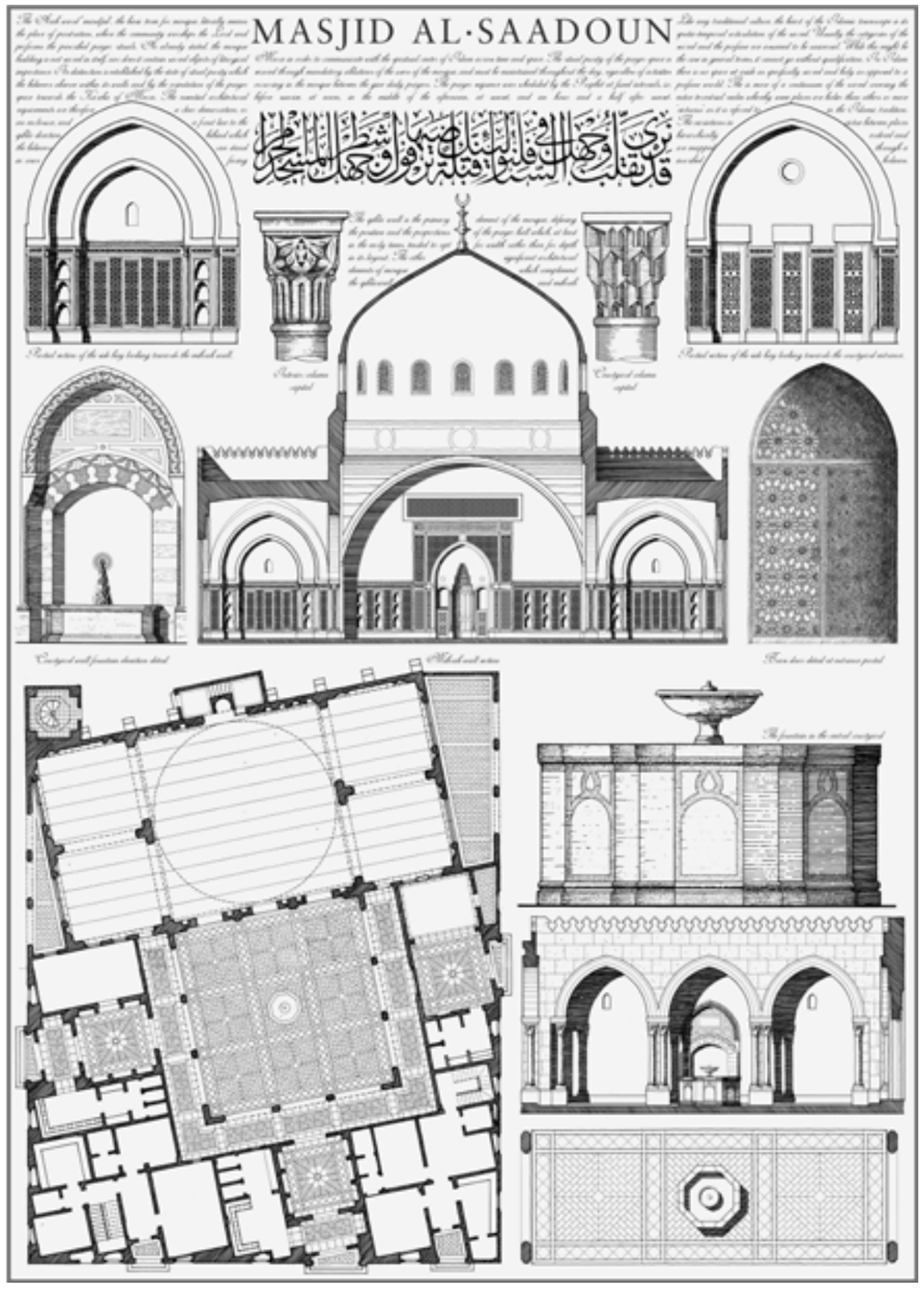
Drawings, details and patterns of the Jameh Al Khereiji, Eastern Province, Kingdom of Saudi Arabia, 2010-2020



This is not to call for a return to the past. That is simply impossible. Without slavish imitation, the past and its architectural vocabulary and forms, its structural solutions, its sustainable practices, its existential meanings, and its historical significance should be taken as a model to be learned from and improved upon. I have always advocated a relationship to tradition and the past not of imitation but of emulation with innovation. The architect-craftsperson loves tradition and gives it a future in a contemporary context.

The traditional crafts have not entirely disappeared. They have survived in discrete pockets the world over. So the architect-craftsperson has an opportunity here but also a responsibility of

Drawings, details and patterns of the Masjid Al Saadoun, Eastern Province, Kingdom of Saudi Arabia, 2011-2021



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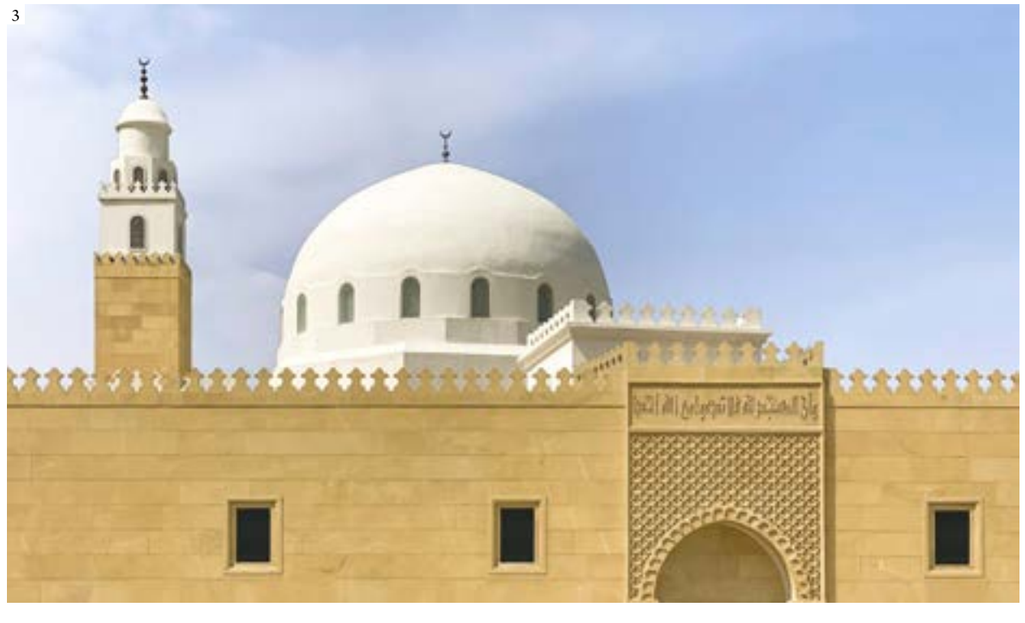
Gypsum carving of the four squinches supporting the dome (1) and intricately carved gypsum work on the dome above the prayer hall (2) of the Masjid Al Saadoun, Eastern Province, Kingdom of Saudi Arabia, 2011-2021

3: Exterior view of the Masjid Al Saadoun from the east

3



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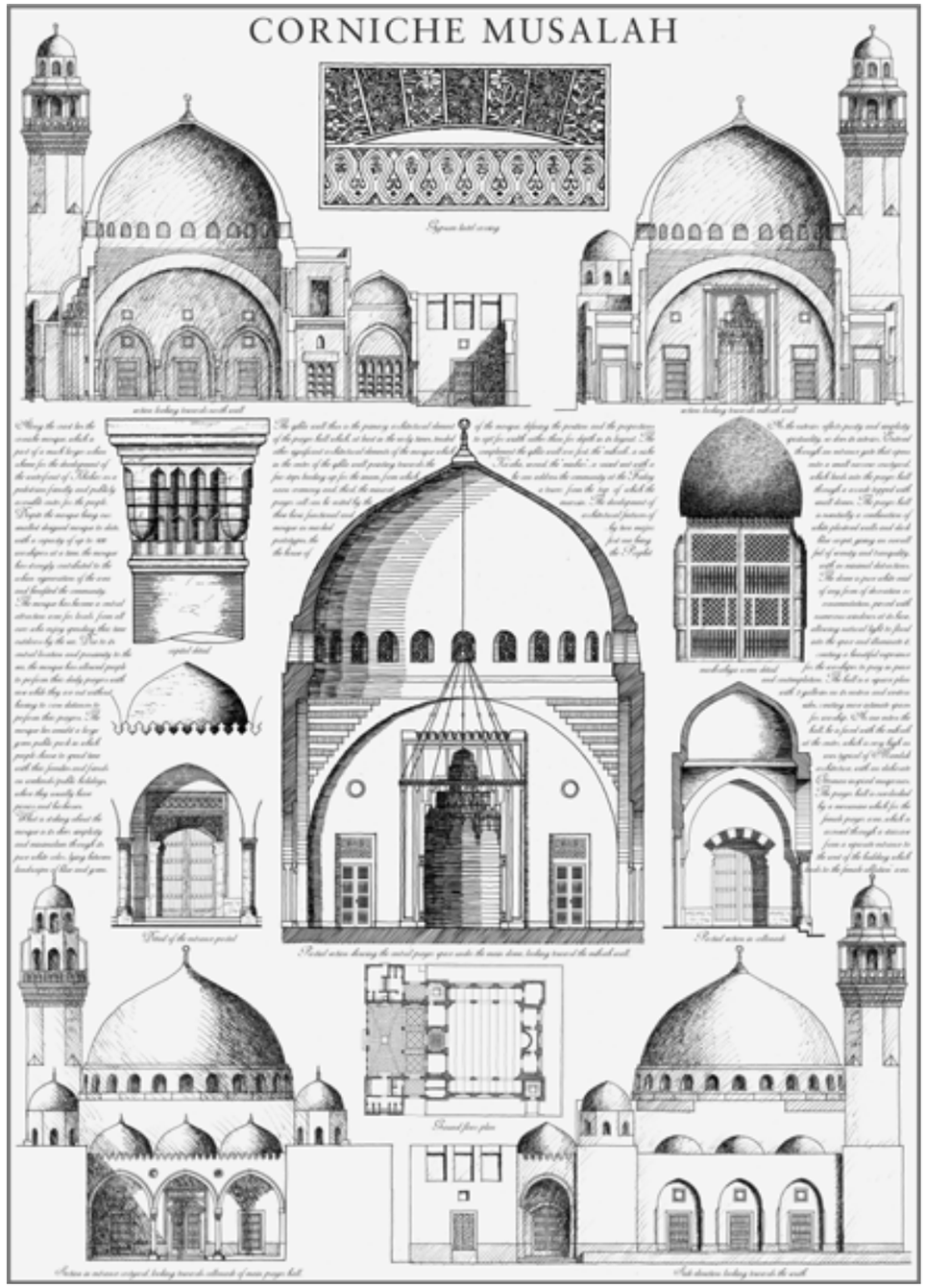
View from the prayer hall towards the entrance (1) and the mihrab (2) of the Corniche Musalah, Eastern Province, Kingdom of Saudi Arabia, 2013-2019

leadership and stewardship: to guide and preserve craftspeople and their craftsmanship. This is why I work closely with craftspeople around the world, visiting their workshops, designing and detailing the work we do, staying with them until the final touch is given. The building site becomes a community of workers collaborating to produce space for the soul.

View of the mosque from the bay. Corniche Musalah

The architect-craftsperson's responsibility is great. It requires several qualities: a sensibility toward beauty, a love and understanding of precedent and architectural typology, sufficient technical training, a collaborative spirit, and creative talent.

Drawings, details and patterns of the Corniche Musalah, Eastern Province, Kingdom of Saudi Arabia, 2013-2019

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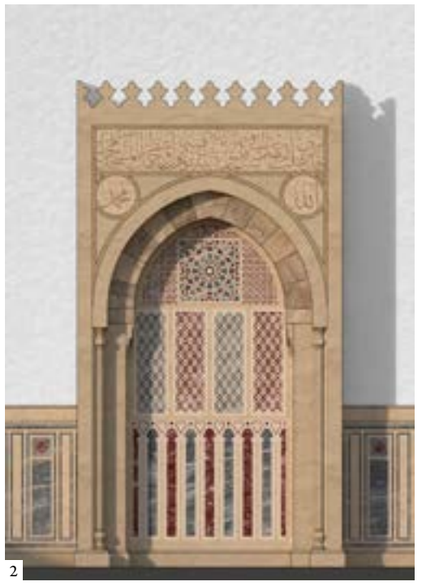
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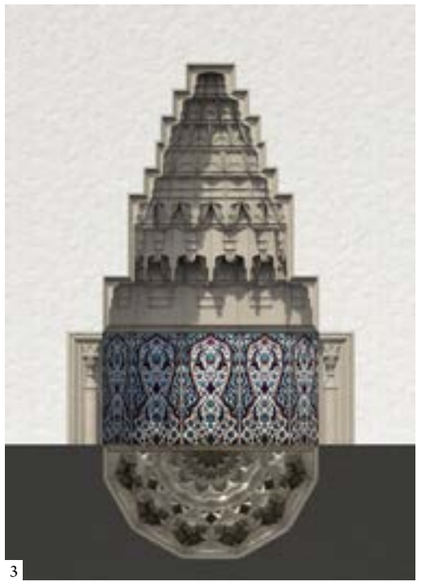
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Details of the mezzanine *mashrabiyah* screen (1) and the new mihrab (2) of the Masjid Al Attar, Tripoli, Lebanon, 2019 - In progress
3: Detail of the mihrab muqarnas and Iznik tiles of the Masjid Al Saadoun, Eastern Province, Kingdom of Saudi Arabia, 2011-2021

This may seem quite a burden. It is, but it is a burden of love. There is nothing more satisfying than successfully channeling the spirit of the past through the design process into a unique contemporary product that embodies best contemporary practice, materials, and technology while providing continuity with tradition and spiritual meaning.

References | Referencias | Referências

Ruskin, John. 1849. *The Seven Lamps of Architecture*. London: Smith, Elder & Co.

Biography | Biografía | Biografia

Mohamad Hamouie

His private research and practice have made him one of the leaders of New Traditional Architecture in the Middle East. He is a member of the INTBAU College of Traditional Practitioners, a Professor of Practice and the Director of the Institute of Islamic Art & Architecture at the Lebanese American University in Beirut. In 1993, Hamouié established his private practice. His first project, the Central Mosque in Shkodër, Albania was nominated for the Aga Khan Award for Architecture in 2001. Through his comprehensive knowledge of history and awareness of local context, Hamouié has designed and built more than 300 projects. Collaborating with master craftsmen worldwide, his buildings are as much guided by contemporary theories as by traditional values.

Salima Naji

Networks of the Sacred in the Atlas: Igudar *and* zawya, *Intercessory Repositories of pre-Saharan Morocco*

Redes sagradas en el Atlas: Igudar *y* zawaya, *depósitos de intercesión del Marruecos presahariano*

Redes do sagrado no Atlas: Igudar *e* zawaya, *repositórios de intercessão do Marrocos pré-Saaariano*

Abstract | Resumen | Resumo

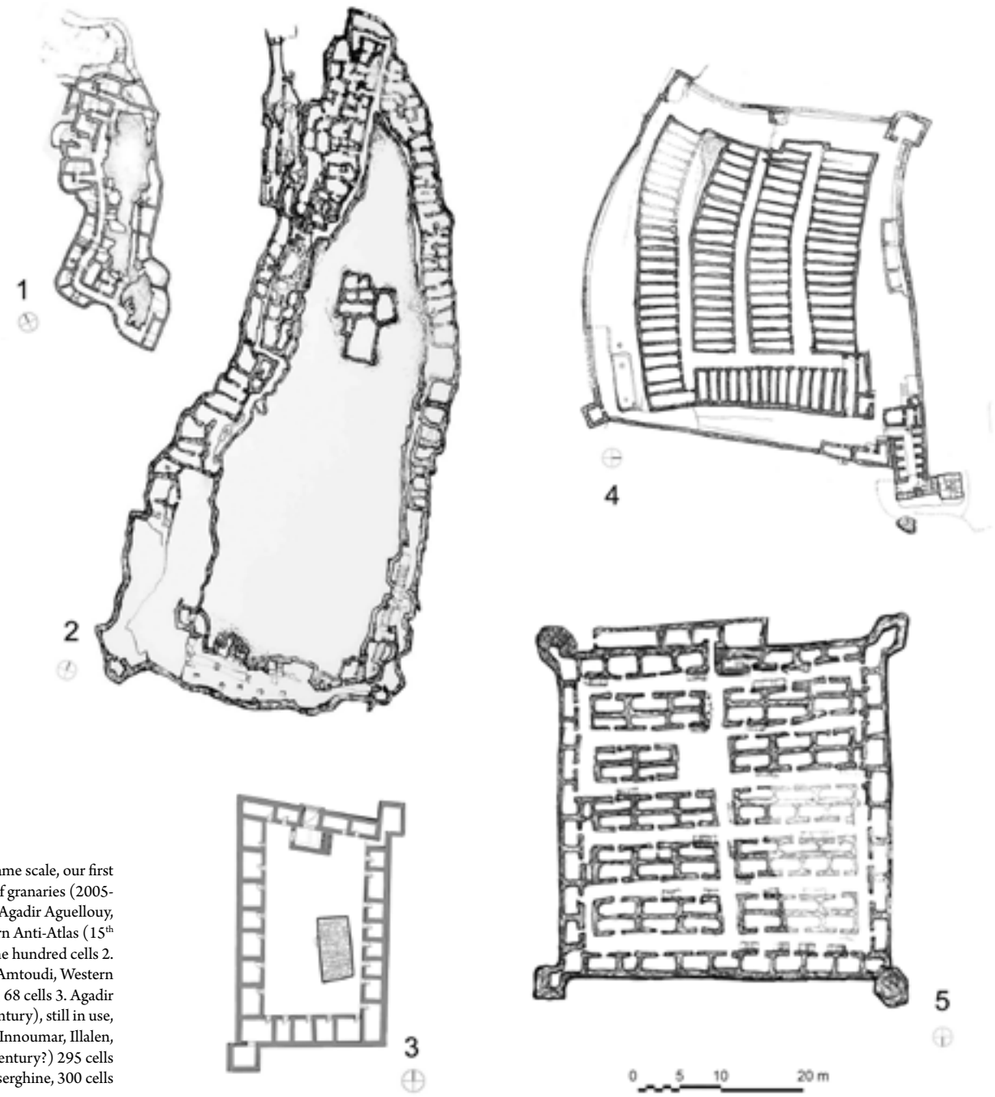
How does the collective granary (*agadir*) of the Atlas survive "modernity" when everywhere else in the Maghreb it has died out? Years of research in the Atlas (in 2000–2019, identifying 300 active, disused or ruined granaries) support the notion of there being a wider community, beyond blood ties, whose identity is affirmed by the collective institution of the sacred *agadir*. For on fixed dates each year all the tribes with an active granary bring their offerings or gifts to the southern *zawaya*, on the fringes of the Sahara, and thus renew their oaths of allegiance to the great regional saints. Over the past two decades we have been able to identify more than a hundred active granaries in the Central Atlas, the High Atlas and the Anti-Atlas, and have ourselves endeavored to restore them in an attempt to ensure the survival of this emblematic resource.

¿Cómo sobrevive a la "modernidad" un granero colectivo (*agadir*) en el Atlas cuando han desaparecido por el resto del Magreb? Años de investigación en el Atlas (entre 2000 y 2019, con la identificación de 300 graneros en funcionamiento, en desuso o en ruinas) respaldan la idea de que existe una comunidad amplia, más allá de los lazos de sangre, cuya identidad se afirma mediante la institución colectiva de los *igudar* sagrados. Cada año, en fechas fijas, todas las tribus con un granero en funcionamiento llevan ofrendas y regalos a las *zawaya* del sur, en los límites del Sahara, y renuevan así su juramento de fidelidad a los grandes santos regionales. En las dos últimas décadas hemos identificado más de cien graneros activos en el Atlas Medio, el Alto Atlas y el Anti-Atlas y hemos intentado restaurarlos para garantizar la supervivencia de estos recursos emblemáticos.

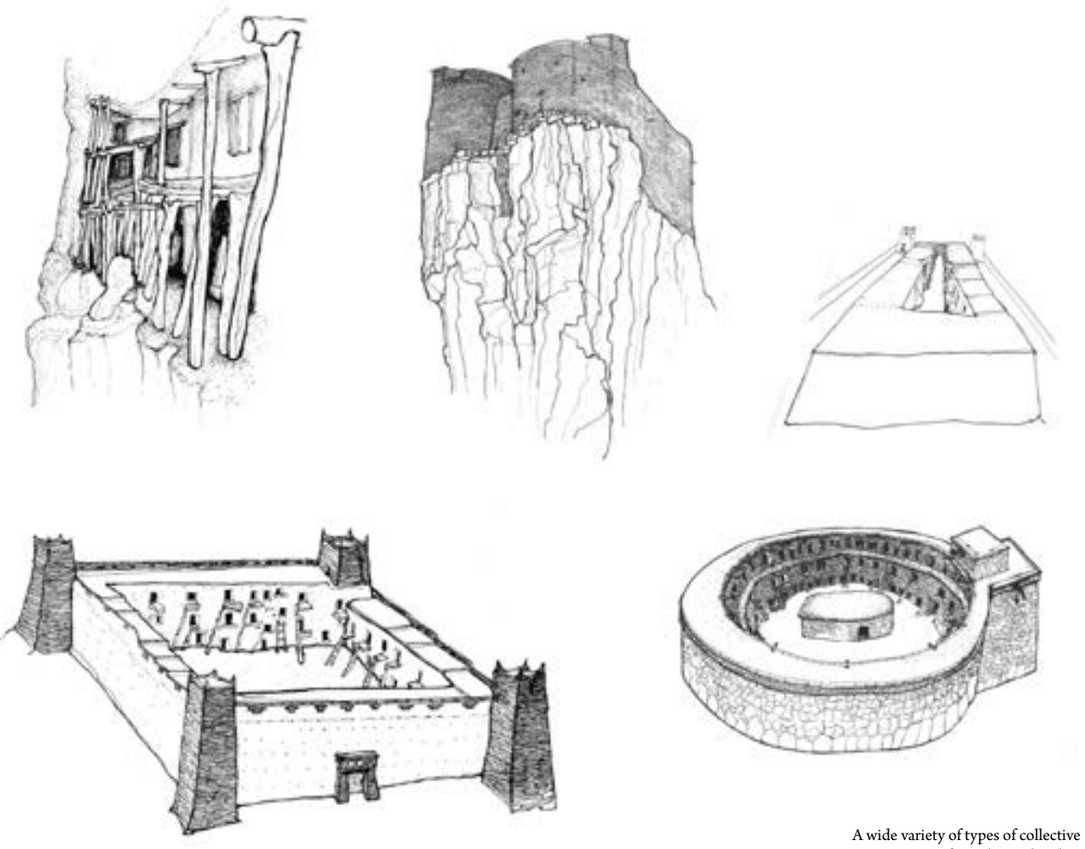
Como é que o celeiro (*agadir*) colectivo do Atlas sobrevive à "modernidade" quando ele já não existe em qualquer outro lugar de Magrebe? Anos de investigação no Atlas (entre 2000 e 2019, tendo identificado 300 celeiros activos, em desuso ou em ruínas) apoiam a noção de que existe uma comunidade mais ampla, para além dos laços de sangue, cuja identidade é afirmada pela instituição colectiva do *agadir* sagrado. Pois em datas fixas todos os anos, todas as tribos com um celeiro activo trazem as suas ofertas ou presentes para o *zawaya* do sul, à margem do Saara, e assim renovam os seus votos de fidelidade aos grandes santos regionais. Ao longo das últimas duas décadas, conseguimos identificar mais de cem celeiros activos no Atlas Central, no Alto Atlas e no Anti-Atlas, e nós mesmos tentámos restaurá-los, numa tentativa de assegurar a sobrevivência deste recurso emblemático.

This paper[1] seeks to show that restoring monuments that have endured for centuries involves not just fine and complex know-how in the science of restoration but also restoring the conditions enabling the emergence of vernacular buildings and their actual uses in a specific context. In such work the restoration architect must also wear the hat of an anthropologist, looking both at walls and at people. The aim is both to study the stonework, which has proved its durability, and to understand the uses and spatial practices accounting for these structures.

While these architectural monuments are indeed threatened with absorption by "modernity", we must neither write them off as dead nor take a nostalgic, archaeological view – that of the reconstruction of a glorious past – but rather apprehend an object that is very much alive. Though the death knell of granaries was sounded in the 1930s,[2] they are nevertheless still in use, or at least the more accessible ones, often inside villages, and the more remote ones. A granary remains a necessity for impoverished communities where collective strength is vital to guarantee a minimum standard of living[3] for these old agrarian societies of the Amazigh Mountains.



On the same scale, our first restorations of granaries (2005-2013): 1. Agadir Aguellouy, Amtoudi, Western Anti-Atlas (15th century?), one hundred cells 2. Agadir Id Issa d'Amtoudi, Western Atlas (18th century) 68 cells 3. Agadir Ait Kin (17th century), still in use, 77 cells 4. Agadir Innoumar, Illalen, Anti-Atlas. (16th century?) 295 cells 5. Agadir n'Isserghine, 300 cells



A wide variety of types of collective granaries exist from the High Atlas to the Anti-Atlas: granaries with a barred spur, granaries with a central aisle, quadrangular kasbah type granaries and circular or crown granaries. A handful of them are still in use

Although in decline, the institution of the granary endures

In the Atlas Mountains and the high pre-Saharan valleys of southern Morocco, the fear of scarcity or surprise attack formerly united communities in the face of adversity. In this land of hunger and thirst, grain was vital, and protecting it assured the group's survival. It was locked up in impregnable citadels, collective granaries called *igherm* or *agadir* (plural *igudar*), depending on the region. This is why it might be thought in these easier and more plentiful times that the institution had become obsolete, that as in the rest of North Africa granaries were dead and no more than heaps of faded stones. But on the contrary, over the past two decades we have seen more than a hundred active granaries in the Central Atlas, the High Atlas and the Anti-Atlas, and have sought where possible to restore[4] them in an attempt to ensure the survival of this common resource, emblematic of the kingdom and of these regions.

So we must first ask how this North African institution has survived in a continent that has many forms of granary for grain (including millet). While a comparison with the granaries of the Dogon Country, of Burkina Faso or even of modern Benin is interesting, those are clan or family granaries, whereas the Atlas granary is the product of a complex collective. Thus we must be wary of deceptive similarities and trace the specific character of the collective granary, which is to be seen first and foremost as an institution for the common good. So how has the collective granary survived in Morocco when it has died out everywhere else in the Maghreb?

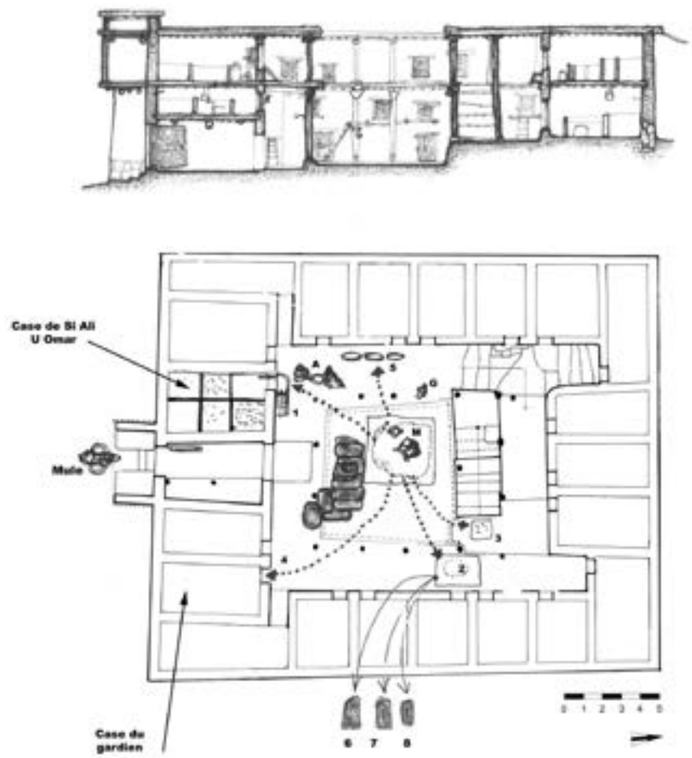
A sacred entity

Traditionally considered sacred places, these repositories are always surrounded by diverse practices relating to *baraka*, the proliferation of Divine Providence, which now has less to do with old agrarian cults linked to grain than with the better-known Quranic *ni'imah* (blessing) on cereals (or bread). This diffuse *baraka* is very much present in granaries. It takes the form of various spatial arrangements, ranging from a simple cell at the granary entrance to jars for

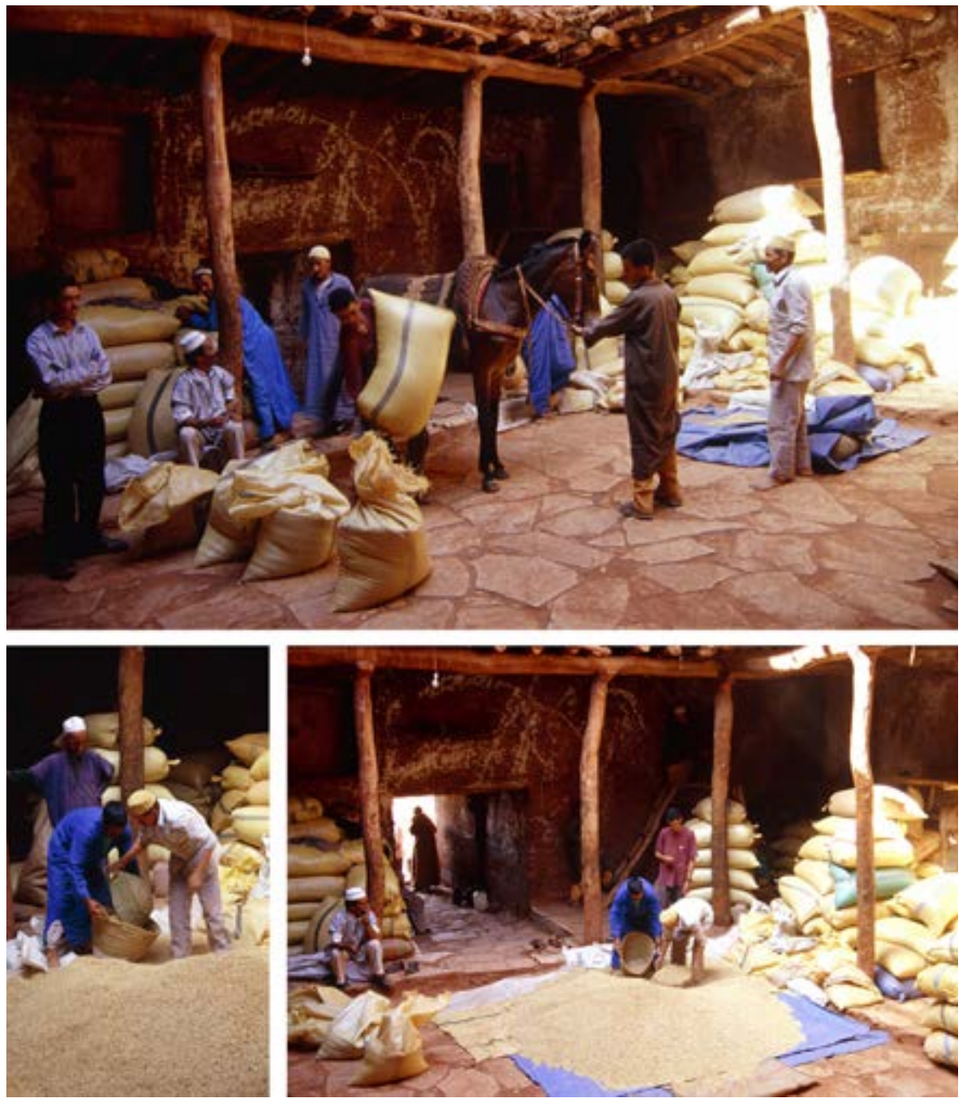
Granary embedded in the eponymous Ksar of Tiskmoudine (Tata Province), aerial photographs and photogrammetry from drone recording (M. Benssid)

Amassine Granary of the Ayt Khuzama in the High Atlas in winter, when the Atlas is snowy, and in summer, when the harvests are fenced (silage barley bags)

gifts or boxes for offerings arranged inside and even, more recently, piggy banks hung in common spaces. Valuable cereal products must be treated with consistent and discreet care. The many opportunities to encourage offerings within the granary are thus linked by name to local or regional saints to whom offerings are made, often daily. When a user leaves the granary, having filled his bag for a week or a few days, he does not fail to leave a small portion for the saints. The accumulation of these regular offerings allows a substantial quantity to be amassed by the end of an agrarian cycle, for distribution to the destitute. The tutelary figures chosen and associated with these devices are supposed to activate or reactivate a beneficent *baraka* and guarantee protection for one's home against the vagaries of existence.



Plan of the granary of Tashdirt at the Ayt Tidili. The drawing shows the path of the grain, in the center of the building to the cell. The longitudinal section presents details of cell and earthen chests for grain



Measuring ritual in the granary of Tashdirt at the Ayt Tidili. The drawing shows the path of the grain to the cell, the tenth measure (of the grain or any other stored goods) is the *zakat*, the part which every Muslim is obliged to give to the needy

Baraka and ascetic saints: an active spiritual legacy

It was in these regions that the ascetic saints movement arose in the 15th and 16th centuries, giving rise to the institution of the *zawya*, the greatest of which played a major political role in Morocco as of this period (Jacques-Meunié 1982: 465–489). In the Maghreb, a *zawya* (plural *zawaya*) is the venerated and sanctified tomb of a holy man to which a mosque and Quranic teaching halls have been added. The mountain granaries are networked with the great southern *zawaya*, to which granary users pay homage every year, renewing their allegiance through gifts and sacrifices at large festive gatherings (*tayfa*, *muwassim*, *ammuggar*) where covenants considered sacred are made. Thus in the Anti-Atlas the granary is often called *zawyata*, i.e. "small *zawya*" or "little shrine".

But above all, granaries and *zawaya* form a system that has ensured the permanence of these institutions over a large area, linked to mastery of the Tachelhit language and to the customs of these societies of limited means, concerned with pooling scarce and complementary resources of grain. Thanks to this institution, those who produce oil or grain can exchange these fruits of the earth for the fruits of animal husbandry: meat, wool, etc. And live together in mutual understanding.

A web of gifts: networking from granaries to *zawaya*

Through an in-depth study in 1999-2006 of some twenty sites with several tribes alongside an analysis of a hundred others in remoter locations, we found that this eminently sacred institution remains alive. The *agadir* was found not to be a relic of another age, the "vital archaism" perceived by colonial theorists (Montagne 1930; Jacques-Meunié 1939), but rather a central marker of the social, territorial and symbolic organization of wide communal networks that often extend beyond the immediate local community. These granaries, once seemingly doomed, are still alive eighty years after those colonial studies. The granary was and remains a fixed place where covenants are renewed, manifested through a series of gifts involving collective rights and duties within a strict Islamic framework.

From the High Atlas to the fringes of the Moroccan Sahara, in each *agadir* of each village, just beyond the porch, before the individual chambers are reached, there is a cell, a jar or even a box reserved for a saint. This is often Sîdî Mhammd Û Ya'qûb, who in the 16th century brought his pilgrim's staff (*akuray*) to certain villages, where he would have erected or blessed a granary, and perhaps at the same time a first mosque, which in many places was associated with him.[5]

These granaries, sanctified by the great saint, still have a compartment for him, shared with the other saints[6] of each locality. This compartment is usually placed at the entrance and has a box for offerings in the passage and an opening on the other side for emptying it. Each time food was stored or withdrawn, granary members would deposit a handful of barley (*uraw*), a measure (*tagra*) of dates or a variable portion of whatever was in store. We observed this ritual among the Iberkaken and the Illalen, though mostly in elderly users, including women. These gifted portions, called *tirba'în*, are regarded as a duty of believers within the framework of the *zakat*, the purifying legal alms which every Muslim must give to the needy.

Restoring the offering jars of the granaries of Ait Kin and Isserghine

The offering jars built directly into the passageways and entrances (*arghumi*) of collective granaries allow the collection of small daily gifts on behalf of the high tutelary figures that they are supposed to represent.

In 2012–2013, a double restoration project was made possible by the Ambassadors Fund for Cultural Preservation, via the United States embassy in Morocco, for the granaries of Ait Kin (Idaw Nadif) and Isserghine (Feijja) in the province of Tata. The argument that convinced the committees was that each granary was still active and that saving it, as well as extending the building's life, would allow the preservation of precious intangible practices. They had very different configurations and social contexts – an earthen mountain granary, some three centuries old, and a large oasis granary built of rubble masonry and probably much older.

We had known about these granaries for some time, and knew also how offerings functioned in them. At Ait Kin these had been given up by contemporary practice rejecting such almsgiving. But in restoring the entrance we cleared and restored the boxes as they had been, guided by clues left in the stonework and by constant advice from local elders who became our "assistants".

In the case of Isserghine, the granary was completely ruined when I found it. But I had photographs from 1974[7] and 2002. At the time of the restoration, the part for offerings had all but gone, and would probably have been overlooked by restorers unfamiliar with the specific practice of daily almsgiving.

Once the idea had been discussed with the local community (the villagers, representatives of local associations and the more motivated workers, in the presence of the authorities), evidence from photographic archives and recognizable elements in the masonry were compared. Then we invited the village potters, Brahim Ouaabach and Ahmed Saber (aged 63 and 65 respectively) to take measurements with a view to making similar jars (as the bases of the old jars were still in place).

Our detailed knowledge of the collective granaries of the Moroccan Atlas made us cautious with the information we were given: it was probably a late form of the granary, different from the early order previously described. We needed to call on the testimony of the elders. The elders told us of the harsh rule of the Glaoui[8], so we cross-checked in terms of dates. The last guardians of the granary, it seems, appropriated certain chambers to live in with their families. Mrs Ijja ben Lhoucine Azekri (of the Afous Id Hamou lineage) was the daughter of the two last generations of guardians, as well as the oldest of the women and the maternal aunt of Ahmed Id Malek (Afous Id Malk), one of the keenest workers. Their social status was indicated by their having no choice of dwelling but the granary. We then called on local religious figures to help us understand how the offerings were organized. The information was fragmentary but it helped us to apprehend a localized geography of the sacred that had been partly lost but which was partly revived for this project. There seemed now to be confusion as to the chambers of the saints, no longer nominative but plural, as in all granaries where the use of gifts has declined.

Finally, before restoring the jars, we surveyed them with the village elders and then examined the saints' chambers so as to restore their exact names and to better understand how they worked in Isserghine. This allowed us to grasp another non-visible process: how the compartments were emptied even as they were steadily being filled.[9]

This exciting session of returning to the sources took much time, care and discussion, and by the end all the workers wishing to participate (as their daily working hours were over) were fascinated by this historical reconstruction. Some years later, at their own initiative, they assembled various objects to create a kind of museum, which they also maintained without outside financial support. They said it was the restoration that prompted this quest for origins.

Isserghine's granary, before and after the reconstitution of the jars

Isserghine's granary, the new donation jars reconstituted with the help of the residents of the village

Forms of measurement in these granaries

We can compare the wooden or metal objects used to measure alms, still in use in some granaries today, with other recognized measures, linked to practices that are relatively ancient in Morocco but preserved in these granaries.

Some objects are carved from a single block of wood, such as among the Ait Tidili, where they are called *tagra* and are passed down from guardian to guardian.

There are also recent urban measures made of steel, still used for the precise counting of grains stored in the granary.

Measuring instruments preserved in museums are most often from the Saadian period, inspired by the practice of the Prophet himself. Fashioned in hammered brass, they are engraved with epigraphs[10]. Designed to bless the measurements made during the counting of the *zakat* of legal alms with Quranic inscriptions, these measurements evoke the distribution by the Sultan, head of the believers, of the manna of Divine Providence at the feast closing the fast of Ramadan. This practice was reproduced until recent times (1950s–60s) in all the great families of the imperial cities of the kingdom. These measures, or *mudd*, are made of copper in the Anti-Atlas of the Idaw Ukensouss tribe – ornamented objects on which a Quranic inscription was once said to have appeared of its own accord. The same inscription can be found on the porches of some of these granaries (Naji 2006: 91-95).

Bit-lmakhazin: from the *agadir* to the Makhzen as provider of the common good

The sociologist Paul Pascon said in a famous article that every tribal group united in "a political association between lineages, founded on socio-economic needs: the relationship between man and soil, between human exertion and an area's ecological resources with a given level of technology. This association can be a mere temporary alliance, a covenant for the use of pasture, a good neighborliness agreement for the use of a resource, a loose multifunctional confederation, a closer federation based on consensus (unanimity), or a union of lineages institutionalizing authorities. We should note the existence of tribal states in south-west Morocco where the *igudar* were more

Ancient models for measuring *mudd* almsgiving, in hammered brass, preserved in the Batha Museum (Fez), on which are engraved the blessings of use. Above, the left one dated AH 1209 / AD 1795 and the right one dated AH 980 / July 1572 (both from the *Catalogue du Maroc des Empires*, Louvre). Below, the measures of the mountains, made of wood with metal circles and elegantly forged handles, and other recent urban measures in steel

Last guardians (*aduwab, atuwab, amîn, lamîn*) of collective granaries. Top left to right: Fakhour, Magdaz, Tashdirt, Ait Tidili, Agadir n'Tizza, Iberkaken, Agadir Tachakoucht, Amassine, High Atlas and Anti-Atlas. Below, guardian of Atogha (Ayt Tinider) (S. Naji and D. Goeury)

than fortress-refuges, where they supported a public treasury and collective projects (e.g. *medersa*, irrigation networks)" (Pascon 1979: 105-119). We know that this form of territorial administration of a community exchequer was the inspiration for the Makhzen[11] or "central government": it is from this institution for the common good that religious and executive authorities developed. The Sultanate in Morocco was thus heir to the institution of the *agadir*, as described by Prof. Ahmed Toufiq, who emphasizes the etymological link and historically connects the *agadir* and the Makhzen, particularly as of the Almohad dynasty (Toufiq 1976: 35). The twin connotations of granaries, the historical value of any site rooted far back in time in the eyes of communities and the sacredness of these places, testify to the significance of a codified institution that remains active.

So each grain stored in the sacred community granary helped to provide for the event of a crisis of subsistence in the community. In cities, following this model, the large granaries of the Makhzen made it possible to respond to a shortage of grain and to prevent a crisis or famine. By allowing the preservation of social well-being based on mutual aid, these ancient Berber institutions have persisted to the present day in two forms: collective granaries, and authorities aware of social responsibility.

Agadir n'Uguellouy, Western Anti-Atlas, before and after the restoration of 2016

The *Zawya* of Imi n'Tatelt

The *Zawya* of Imi n'Tatelt, a *zawya* monastery of the 15th-century Jazulite movement, shut away and little known as compared to other *zawaya* (Tamgroute, Illigh, Tamesloht, etc.), gives us a glimpse of a symbolic and economic arrangement with a large network of granaries linked to one or more prominent shrines. In the *mûssems* (the great festivals held in spring), this *zawya* still attracts a large number of pilgrims from neighboring communities and also from hundreds of miles away. The eastern Anti-Atlas, an insecure and rural land, without regular open-air markets, once needed annual or seasonal fairs at which complementary regions could trade. We know that these fairs were associated with large religious gatherings, which were themselves intimately linked to the figures of regional saints who once drew large crowds.

Agadir n'Uguellouy, Western Anti-Atlas, just after the restoration of 2016, photograph by drone (M. Benssid)

These votive fairs, generally held by a large *zawya*, soon became part of trans-Saharan trade, from its heyday in the medieval period to its decline at the end of the 19th century. Spiritual benefits, pious visits to the marabout tomb and material profit from trade were the driving forces behind these gatherings which, at Imi n'Tatelt, succeeded one another, highlighting the complementary needs of pilgrims..

The granary-*zawya* system

Every year in the spring, offerings are gathered and taken to the village of Imi n'Tatelt, where the saint settled nearly five centuries ago. In mid-April (by the Julian calendar) the place becomes the scene of a series of ceremonies called *Tayfa n'ibrîl*, during which the saint's great *zawya* (tomb-mosque) collects all these gifts, which are then immediately redistributed to pilgrims, who come in droves. The village, usually of two thousand souls, triples in size.

This circulation of gifts seems very much like a system based around *baraka* (Mauss's "total social fact"), as shown first by the network of village granaries and then by the network of tribes, gathered en masse around the *zawya* of Imi n'Tatelt (Eastern Anti-Atlas).

Today, as in the past, promises are kept, as the saint's mystical testament predicted with astonishing precision. Little is asked for, but the number of affiliated communities is such that the offerings are plentiful. This *zawya* thus functions as a huge store, a repository for gifts in kind from all the tribes bound by oath. This singular network may be called a "granary system", through which part of the food produced in these regions circulates as symbolic offerings, making granaries indispensable.

All these processes of evoking or reviving the sacred through which both material and intangible offerings circulate were extremely interesting to observe in their relationship with the *zawaya*, i.e. with the saints embodied therein, though certain practices are increasingly criticized in the name of a purifying orthodoxy that is also tending to do away with many sacred places in the mountains of present-day Morocco.

Current evolution of the secular institution of the collective granary

If we accept the definition of "institution" as a social organization generating duties and rights, then an institution is a normative tool forming a legal system at the service of a community and able to impose itself as a source of authority. Institutions control human behavior and channel it in a particular direction. They disseminate a moral order consisting of rules and values that are known and given, assimilated and self-evident.

Recently the rules have been evolving, polarized by the institutions of religion on the one hand and of heritage on the other according to a logic of rupture, resulting in an erasure of memory and a rewriting of individual and collective practice. These two entities (*agadir* and *zawya*), overlapping

Agadir n'Uguellouy, Western Anti-Atlas, restoration works in progress

One of the largest tribal granaries in the region it dominates, Adkhss n'Arfalen, originally ruined, was restored with the population in 2019-20 (D. Goeury)

and complementary, are personified institutions, since they are based on the known entity of a localized mystical figure to whom precise rituals linked to the agrarian rhythm are attached.

Indeed, classical institution theory normally distinguishes between "personified" institutions and "thing" institutions. The working of the former rests on a degree of communion among members. The latter involves the formal norms and rules of a more abstract entity (language, money, law, etc.). Thus the *agadir* and the *zawya* should be seen as personified institutions in that they are oriented towards social goals and above all are tangible and can be appropriated: they have a face. In the personified *agadir* and *zawya* institutions there is a real articulation between the ordinary daily economy and an economy of salvation, linked to the sacred, whereas a thing-institution lacks this link and deals with the everyday. A thing-institution, on the other hand, like heritage or religion, can detach itself from location. Thus religion and heritage participate directly in globalization, whereas institutions like the *agadir* and *zawya* remain rooted in a place and in their associated practices.

As a result, those involved in the practices observed around the *agadir*, and especially the *zawya*, are now torn between divergent logics. These personified institutions that once had an overall coherence are suddenly a locus of tension. They are tending to decline, losing the economic and symbolic weight that once made it possible to create social ties or foster the common good. Their buildings are gradually being de-institutionalized. Traditional Islamic religious practices are deprecated by a "new" Islam (Roy 2004: 121-122) that cuts any link between faith and local traditions by devaluing inherited practices in favor of a direct and immediate relationship between the believer and Mecca via the satellite dish and the charter flight, while buildings and ceremonies are absorbed by the designation "universal cultural heritage".

Igudar and *zawaya* thus illustrate the spatial and societal transformations of pre-Saharan Morocco. Places of collective memory, they are now integrated in the great worldwide Islamic movement affirming or reaffirming the unique character of an *umma* (a community of Muslim believers) which can, thanks to the media, widely disseminate a unity of practice and belief that is often averse to local custom. On top of this are social pressures challenging traditional forms of religion. But in these isolated places, particularities of popular culture subsist or are reshaped in the name of an Islamic or even global order. The challenge now is to gauge the degree of

Granary of Ifri Imadiden, Sirwa, in 1948 (D. Jacques-Meunié), and before and during its restoration in 2018-19 (D. Goeury)

participation and acceptance on the part of local people. Indeed, local Muslims sometimes feel downgraded – or on the contrary, increased in value – by these new dynamics. It remains to be seen whether the phenomenon will result in the coming decade in an institutionalization of the heritage of these places or in further dispossession and relegation, where the disappearance of a set of intangible yet powerfully symbolic practices could at the same time lead to a fading away of these deeply rooted places carrying on such particular practices.

Conclusion

While *igadur* and *zawaya* have thus remained sacred entities, repositories and providers of the common good, both are also living institutions of the rural Morocco of yesterday and today that continue to assure daily survival and salvation in a life to come. Above all, granaries and *zawaya* form a system that has allowed the continuity of these institutions over time. Our study of these very much living practices opposes the theory of the granary as a "vital archaism". Without each community's granary, without the renewal of the oath (*'ahd*), the rejoicings at the *tayfa* of Imi n'Tatelt would cease. While the tribes are no longer threatened by famine or war, they nevertheless continue to fill the community granary and to honor the regional saints by setting aside part of their harvest. This suggests that economic theories appraising the utility of granaries fall short and that it is other, less explicit reasons that link groups together over the long term. The *agadir-zawya* system supports the notion of a wider community, beyond the ties of blood, whose identity is affirmed through a sacred covenant.

So now in the early 21st century, the institution of the *zawya* is under pressure from new forms of religion and heritage. Deeply territorialized between the Atlas and the Sahara, the *zawya* is no longer seen by believers as a necessary link between Mecca and local piety. And its cultural specificity makes it suspect in the eyes of certain believers who judge it potentially deviant.

The *zawya* can also be asserted to be a place of memory evoking political issues. The Imi n'Tatelt site, built up around a personified institution bringing together religion, politics and economics, is now torn between religion and heritage by divergent logics allowing in particular the descendants of slaves to be enfranchised from the Chorfas lineage (the saint's descendants). But does a context of the weakening of the religious dimension in favor of a new heritage dimension not change what is involved for granary users? The social bond, formerly established by the traditional institutions of the *agadir* or the *zawya*, seems neutralized by a vision of Islam that devalues certain forms of mutual assistance. Thus many clerics are now trying to remove outward signs of the sacred expressed too strongly in the *agadir* and around the tombs of venerated saints, and may even participate in their destruction. A heritage approach also overrides traditional practices and empties the institution of its *raison d'être*: while leaving the walls intact, it nevertheless lastingly undermines the original purpose of the *agadir* and *zawya*.

Thus, though any renewal of these places must draw upon distant history, it will also involve more contemporary questions. What is at issue today is essentially both a dwindling of traditional practices and, paradoxically, a true renewal. The sacredness of granaries has been gradually replaced by a new sacrality, that of the "intentional monument", opening the door to a heritage approach as classically conceived of in Europe. Practices are tending to evolve into what is recognizable as the cult of monuments, i.e. heritage emptied of its practices of use and now largely identified with modernity. The places remain the same but their use changes.

May this vitality not disappear into the nothingness of folklorization with the introduction of mass tourism to these high places of Atlas culture, or with a restoration of their materiality without apprehending the complex social fabric that underlies them. A practical ethic should be established to prevent the loss of these ways of apprehending the common good that are the granaries of the Atlas. Defending an architecture of the common good means engaging with the architectural object by focusing on its social foundation and on its peculiar uses and spatial practices in order to understand it and to restore it accordingly, and not just its walls.

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[1] This article is taken from our doctoral thesis in social anthropology and ethnology entitled *Les entrepôts de la baraka : du grenier collectif à la Zawya* (École des hautes études en sciences sociales, Paris, 2008) defended before the historian A. Toufiq (Minister of Islamic Affairs), H. Claudot-Awad, F. Sigaut, and T. Yacine, a jury chaired by A. Berque. It has been published in forms such as articles and illustrated books. A summary of it was entitled "Fils de saints contre fils d'esclaves" (Sons of saints versus sons of slaves) (2011). It forms the last part of our thesis.

[2] When discovered by the colonial school, these granaries seemed an "outdated" institution, a throwback to centuries ago, fragile and doomed to disappear (cf. R. Montagne, *L'agadir des Ikounka*, Paris, Alcan, 1930). And yet in the Atlas Mountains, almost a century later, many granaries are still active, albeit in decline.

[3] Growing grain and storing it in such a way as to always have some, whatever the uncertainties of life or the vagaries of weather, owning animals that provide milk or meat, and providing them with fodder from the granary in midwinter.

[4] In order to understand the dynamics of these regions of transhumance and crop-farming between the Atlas and the Sahara, we have done more than 25 months' research in various locations. Our inventory lists nearly 300 active, disused or ruined granaries. We have been able to restore a good dozen of them, from Aguellouy d'Amtoudi in 2004 to the very beautiful granaries of the Feijja or Sirwa more recently; see "Sauvetage des *igudar*, greniers collectifs de l'Atlas. Naissance d'une démarche participative autour de communs, 2001–2018" in our book *Architectures du bien commun: pour une éthique de la préservation*, Geneva, MétisPresses, 2019, pp. 77–93.

[5] *Shajara (Arbre généalogique) wa Waçiyya siriya (et testament mystique de) Sîdî Abû Ɛ Abdellah Mhammed Û Yaɛ qûb*, Imi n'Tatelt, d'après la copie conforme datée de 1191 Hégire (1777), prétendant reproduire mot pour mot l'acte rédigé en 962 (1555) à la mort du Saint, d'après la copie conforme établie en 1313 Hégire (1896), copie conforme datée de 1345 Hégire (1927), 104x36 (recto), rouleau manuscrit original conservé dans un étui en aluminium, fonds privé.
Waçiyya (testament mystique de) Sîdî Abû Ɛ Abdellah Mhammed Û Yaɛ qûb, Imi n'Tatelt, d'après la copie conforme datée de Chawwâl 1311 Hégire (1894), prétendant reproduire mot pour mot l'acte rédigé en 962 (1555) à la mort du Saint, copie conforme datée de 1342 Hégire (1924), 42x23 (recto-verso), photocopie d'après un manuscrit perdu, fonds privé.

[6] For southern communities, allegiance to a saint is never exclusive. A saint is worshipped not alone but with others. Thus one enjoys a range of benefits. This onomastic constellation participates in the place's sacred aura and confers an identity rooted in a set of mental representations through lineages of names that have become talismanic.

[7] Marie-Rose Rabaté, a retired researcher, when told of the restoration, very kindly sent me these from Paris.

[8] A notorious local potentate who taxed communities during colonization.

[9] She also told us that, once installed, the jars were pierced with "mouths", which were closed up with a broken piece of pottery that could be removed when the jar was full in order for it to be emptied from the bottom.

[10] One of the oldest extant models dates from AH 980 / July 1572 [Saadian period] Fez, Batha Museum, inv. 4714.87/2097, mentioned and transcribed in its entirety in the *Catalogue du Maroc des Empires for the exhibition at the Louvre* (Paris, 2014) and the Mohammed VI Museum (Rabat, 2016). It mentions the main links of the *isnad* as recorded by scrupulous Sufi monarchs.

[11] The French *magasin* and the Spanish *almacén* come from the Arabic *makhâzîn*, whose common meanings refer back to the idea of a "store". The word *makhzen* has a particular meaning in Morocco, where it is a synonym for government, and in particular the exchequer. *Bit el-khazîn* (or *makhzen*) originally designated the place where grain was deposited under the responsibility of a body of officials. The term would indeed have referred back to the "treasuries of the Moroccan Muslim community when it established itself for the first time, with the great Berber dynasties of the Almohads and Almoravids", as E. Michaux-Bellaire says in the article "Makhzen", in *Encyclopédie de l'Islam*, 1st edition, volume III, pp. 131–135, Leiden, Brill, 1936.

References | Referencias | Referências

Banerjee, Abhijit Vinayak; and Duflo, Esther. 2012. *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*. Paris: Éditions du Seuil.

Bourdieu, Pierre. 2000. *Annexe d'une Esquisse d'une théorie de la pratique*. Paris: Éditions du Seuil.

Carlat, Louise; Declémenti, Rosène; Delery, Claire; Leonetti, Bulle Tuil; and Lintz, Yannick. 2014. *Maroc Médiéval. Un empire de l'Afrique à l'Espagne*. Catalogue of *Le Maroc médiéval, un empire de l'Afrique à l'Espagne exhibition*. Paris: Hazan.

El-Buqadurî, Mohammed. 2000. *Tarikh qaba-il hilalat bi es-sus*. Casablanca: Najat El Jadida.

Goeury, David. 2011. Les espaces du mérite, ou la valorisation touristique de l'enclavement dans les vallées du Haut-Atlas central (Maroc) et du Zanskar (Inde). In Backouche, Isabelle; Ripoll, Fabrice; Tissot, Sylvie; and Veschambre, Vincent (eds.), *Espaces hérités, espaces enjeux: Regards croisés sur la dimension spatiale des inégalités*, 251–269. Rennes: Presses Universitaires de Rennes.

Halbwachs, Maurice. 1968. *La Mémoire collective*. Paris: Presses universitaires de France.

Jacques-Meunié, Djinn. 1961. L'Agadir berbère, archaïsme vital. Le grenier de tribu au Maroc. Paris. In archaïsme et modernisme dans l'Islam contemporain. *Cahiers de l'Institut de Science Économique Appliqué*, Série V: Humanité, 3. París.

Jacques-Meunié, Djinn. 1939. L'Agadir berbère, archaïsme vital. *Hespéris*. Rabat: Institut des hautes études marocaines.

Jacques-Meunié, Djinn. 1951. *Greniers-citadelles au Maroc*. Paris: Arts & Métiers Graphiques.

Jacques-Meunié, Djinn. 1982. *Le Maroc saharien, des origines à 1670*. Paris: Klincksieck.

Mauss, Marcel. 1923-1924. Essai sur le don. Forme et raison de l'échange dans les sociétés archaïques. In Durkheim, Émile (ed.), *L'Année Sociologique*. Paris: Sorbonne Université.

Meddeb, Abdelwahab. 2012. *La maladie de l'islam*. Paris: Éditions du Seuil.

Montagne, Robert. 1930. *L'agadir des Ikounka*. Paris: Alcan.

Michaux-Bellaire, Édouard. 1936. Makhzen. In Brill, Evert Jan (ed.), *Encyclopédie de l'Islam*, vol. III, 131–135. Leiden: Brill.

Naji, Salima. 2006. *Greniers collectifs de l'Atlas, patrimoines du Sud marocain*. Aix-en-Provence: Edisud.

Naji, Salima. 2008. *Les entrepôts de la baraka: du grenier collectif à la zawya: réseaux du sacré et processus de patrimonialisation dans l'Atlas et Maroc présaharien*. Doctoral thesis in Ethnology and Social Anthropology. Paris: École des hautes études en sciences sociales.

Naji, Salima. 2009. Les greniers collectifs marocains: de l'économie traditionnelle au patrimoine à vocation touristique: Institution collective et bien commun. In Berthold, Étienne (ed.), P*atrimoine et sacralisation*, 187–206. Québec: Éditions Multimondes.

Naji, Salima. 2011. *Fils de saints contre fils d'esclaves: Pèlerinages à la Zawya d'Imi n Tatelt*. Rabat: Éditions des Cinq parties du Monde-DTG.

Naji, Salima. 2019. *Architectures du bien commun: Ethique de la préservation*. Genève: Métis Presses.

Norberg-Schulz, Christian. 1981. *Genius Loci (Paysage, ambiance, architecture)*. Liège: Pierre Mardaga.

Pascon, Paul. 1979. Segmentation et stratification dans la société rurale marocaine. *Bulletin économique et social du Maroc*, 138–139: 105–119.

Roy, Olivier. 2004. *L'islam mondialisé*. Paris: Éditions du Seuil.

Toufiq, Ahmed. 1976. *Aspects d'histoire économique et sociale du Maroc au XIX^e siècle, Inultan de 1850 à 1912 (in Arabic)*. Rabat: Faculté des Lettres.

Biography | Biografía | Biografia

Salima Naji

Salima graduated in architecture at the École Nationale Supérieure d'Architecture (ENSA Paris-La Villette) and took a PhD in social anthropology at the École des hautes études en sciences sociales (EHESS) in Paris. She is involved in many projects for protecting oasis heritage. She set up a practice in Morocco in 2004 in order to offer a building alternative favoring technologies involving basic and sustainably sourced materials, with an innovative approach respectful of the environment. Her practice involves scientific activity in many international research and action programs engaging with sustainability and the deep relationship between societies and their environment. She has been a member of the scientific committee of the Jardin Majorelle Berber Museum (Marrakech) since its creation in 2011 and is currently working in the field of cultural mediation and heritage transmission. A Chevalier of the Ordre des Arts et des Lettres (2017), she has published many works on architecture.

Jelena Pejković

Why Are You Not Using Computers? A Case for Drawing Vernacular Architecture by Hand

¿Por qué no utilizas ordenadores? Un argumento para dibujar a mano la arquitectura vernácula

Porque é que não utiliza computadores? Um motivo para desenhar Arquitectura Vernacular à mão

Abstract | Resumen | Resumo

In the increasingly digitized profession of architecture, opportunities to draw by hand decline constantly. The thorough shift from traditional to digital tools is rarely questioned and commonly justified by the demands of the trade. Cognitive, pedagogic and economic values of traditional documentation methods are easily overlooked, while the craft of hand drawing is under increasing threat of extinction. Taking part in vernacular heritage documentation adventures from China and eastern Serbia to Thailand and northern Pakistan, I witnessed how humble pencils and inking pens enrich human lives. These experiences have transformed me and expanded my own view of the world.

En la cada vez más digitalizada profesión de arquitecto, las oportunidades de dibujar a mano son cada vez más escasas. El cambio profundo de las herramientas tradicionales a las digitales rara vez se cuestiona y normalmente se justifica por las exigencias del oficio. Los valores cognitivos, pedagógicos y económicos de los métodos de documentación tradicionales se pasan por alto fácilmente, mientras que el oficio del dibujo manual está cada vez más amenazado de extinción. Por mi participación en aventuras para documentar el patrimonio vernáculo, desde China y el este de Serbia hasta Tailandia y el norte de Pakistán, he podido comprobar que unos humildes lápices y plumas pueden enriquecer las vidas humanas. Estas experiencias me han cambiado y han ampliado mi visión del mundo.

Na profissão cada vez mais digitalizada da arquitectura, as oportunidades de desenhar à mão diminuem constantemente. A passagem completa das ferramentas tradicionais para as digitais é raramente questionada, e é geralmente justificada pelas exigências do ofício. Os valores cognitivos, pedagógicos e económicos dos métodos tradicionais de documentação são facilmente ignorados, enquanto que a arte do desenho à mão está sob a ameaça crescente de extinção. Tendo participado em aventuras de documentação do património vernacular da China e Sérvia oriental à Tailândia e norte do Paquistão, testemunhei como lápis e canetas humildes enriquecem as vidas humanas. Estas experiências transformaram-me e expandiram a minha própria visão do mundo.

It will be difficult to measure and draw the terracotta dragons that adorn a Pingyao rooftop above me. What year is it? What century? The only giveaway is a muffled beep of the cell phone in my pocket: I sent out some photos of my hand-drawn section from this ancient Chinese town and a friend responds: “One question, why are you not using computers?”

I belong to the generation that was required to draw by hand in the first years of architecture studio, before being torpedoed towards the new and exciting digital tools. Computer generated models and drawings quickly became so pervasive and matter-of-fact that it took me over a decade after graduation to really reconsider the implications of this profound switch. Today I use both digital and analogue methods in my design and conservation work. However, only the latter bring up questions from my colleagues and laypeople alike.

Rooftop dragons, Lei Lv Tai Mansion, Pingyao, China

Documentation of a wine cellar near Štubik, Serbia (Kristina Krkobabić)

I started questioning my own routine reliance on digital technology soon after I first engaged in conservation of architectural heritage. In 2013 I took part in a Regional Restoration Camp (RRC), organized by Cultural Heritage without Borders and the Institute for the Protection of Cultural Monuments of Serbia. Shortly after this training in traditional construction techniques I joined the Institute’s team that sought to complete the documentation of three Serbian vernacular sites.

For weeks at a time, we used simple measuring instruments and drew scale plans, sections and elevations in pencil, on our plastic A3 boards. Hand drawings from these documentation campaigns mostly ended up being redrawn in digital form, to create a basis for conservation projects of individual buildings. To my dismay, these meticulous and lively field sketches were never destined to become anything more than a modest intermediate step in the larger conservation process. Though disappointed, I could understand the reasoning: the Institute had limited documentation equipment available, so drawing by hand in the field was not always a choice. However, once we returned from the field to the office, we needed to switch back to digital tools in order to produce the commonly required graphic documentation.

And back to the computer screens we went. Having spent the time in the field, however, climbing the roofs with not much more than a measuring tape and a plumb bob meant that I could still easily visualize every bit of the buildings I had documented.

This was by no means some magic trick or a sign of extraordinary memorizing capacity. Simply put, to measure a building with basic tools one has to come close to it. This physical proximity to the documented structure allows for a profound understanding of scale, because spatial elements are understood in relation to one’s own body. Also, to measure a beam section with a measuring tape, one typically needs to touch the said beam. This, too, provides tactile information which is memorized better and impossible to collect digitally at a distance. The resulting complex understanding of space, both tactile and intellectual, proved absolutely invaluable in planning the conservation works. Taking the time to physically approach the measured elements and then draw them by hand allowed for a palpable understanding of the recorded buildings – a quality impossible to attain from a digital scan.

I was certainly aware that within a few minutes, a laser scanner could have given me the exact position of every single speck of dust on any chosen wall surface. But this information, while exhaustive, would hardly be of any use in helping me understand the forest of a vernacular roof structure or any actual assembly.

In the light of these insights, it was clear to me that the process of hand measuring and drawing had unexpected value in conservation of vernacular buildings – but I resignedly accepted that the actual field drawings, while beautiful, could only be a stepping stone to the final digital drawing set.

Unsurprisingly, I was thrilled when after a few years I discovered VERNADOC, a field-based method that indisputably elevated hand drawings into an art. The acronym stands for "Vernacular Documentation"; it is a recording and presentation process which emphasizes data collection on site by using basic, low-tech tools to produce high quality, inked, hand-drawings (Sananwai 2013: 3).

VERNADOC origins are more than a hundred years old, reaching back to a tradition of documenting historic buildings established in the 1880s at the Helsinki University of Technology (today Aalto University). In the 1990s, Markku Mattila, a Finnish architect and brilliant pedagogue, distilled this drawing tradition down to a series of discrete steps that could be quickly taught. For several years he has taken his architecture students to sites in Russia and Finland where they meticulously recorded traditional buildings. For one week they would take measurements and draw directly on just one piece of cardstock, "without any notes in-between" (Mattila 2011: 92). The second week of the camp would be dedicated to inking.

Mattila's idea, and that of his predecessors, was not just to teach the students how to draw more effectively, but rather to show them how to take care of the rich vernacular heritage "by using their very basic professional skills and showing their respect" (Mattila 2013: 8). VERNADOC camps became increasingly international after 2005, and have since been organized all across the world, in large part thanks to the endless enthusiasm of dr Sudjit S. Sananwai from Thailand.

Evidently, I was immediately mesmerized by VERNADOC drawings, but it took another two years before I could take the time to actually learn the method.

East view of the Luang Amnach Nararaksha Mansion, Phuket, Thailand

The elevation drawing from my first VERNADOC camp truly tested my limits, both professional and personal. I already had a lot of skill in collecting data using only basic tools, and I was quite confident the measurement week would go without major issues. And it did. But the inking week humbled me.

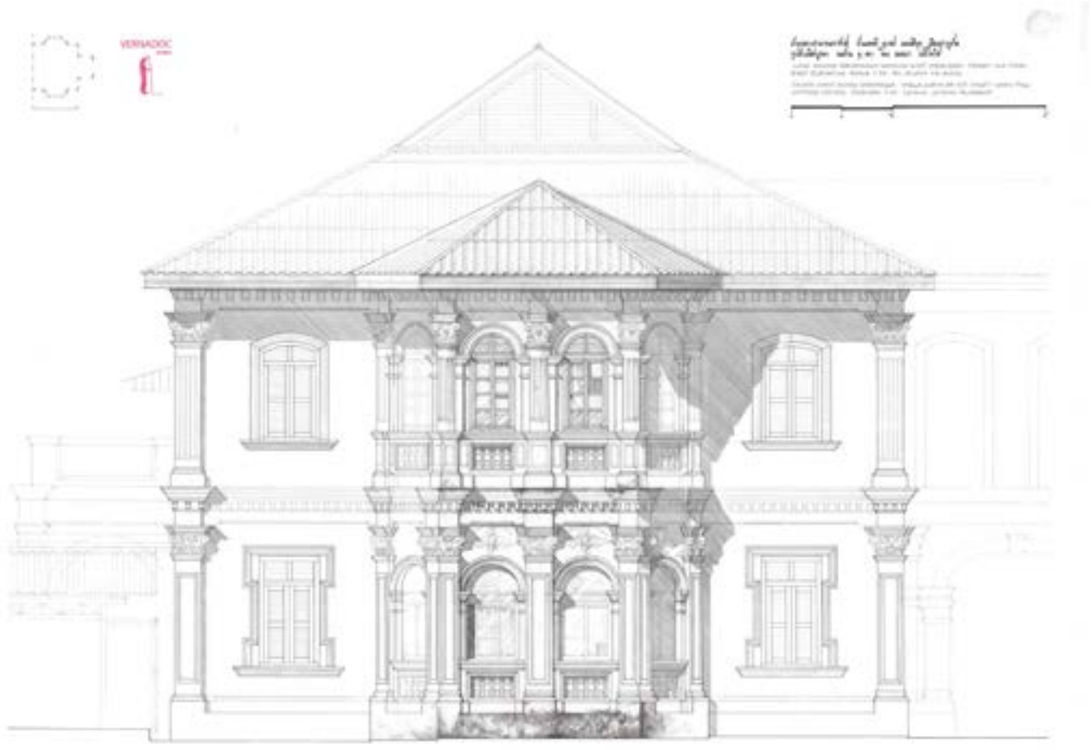
This second part of the camp was the real trial, not just of my rapidograph handling skills but also of my patience, my motivation, my perfectionist tendencies, my ability to handle a task without the "undo" command. "I did not sign up for a school of life!" I often thought, as my fingers trembled at the perceived importance of every ink mark on the one precious sheet of paper I was given.

The method was simple enough, but the work was not easy! I realized very quickly that there really was no abracadabra in those exquisite inked drawings that took my breath away back in 2015. The only "secret" to the process was to follow the steps, to carry on, to put one line down and then another, to forget "ctrl+z" and to resist taking oneself too seriously.

Participation in this VERNADOC camp in Phuket encouraged and invigorated my enthusiasm for hand drawing, especially in the field of vernacular architecture. At the time I was still working on restoring traditional buildings in eastern Serbia and struggling to communicate the meaning of this work to the local community. VERNADOC struck me as a gentle but powerful way to share my passion for vernacular buildings with the local owners, who were often disillusioned with and resentful of their own heritage. With VERNADOC drawings, I thought, it is as if for a brief moment an architect could lend her eyes to a local: after seeing these meticulously detailed and painstakingly rendered presentations of their houses, the owners finally believe that they have something beautiful and valuable.

With every camp that followed, the kaleidoscope of possibilities I saw in drawing by hand only became more intricate and fascinating. In Pakistan, to give just one example, I saw how training in basic documentation techniques could turn into a powerful possibility for education and employment of women.

East elevation of the Luang Amnach Nararaksha Mansion, Phuket, Thailand. Original scale 1:30

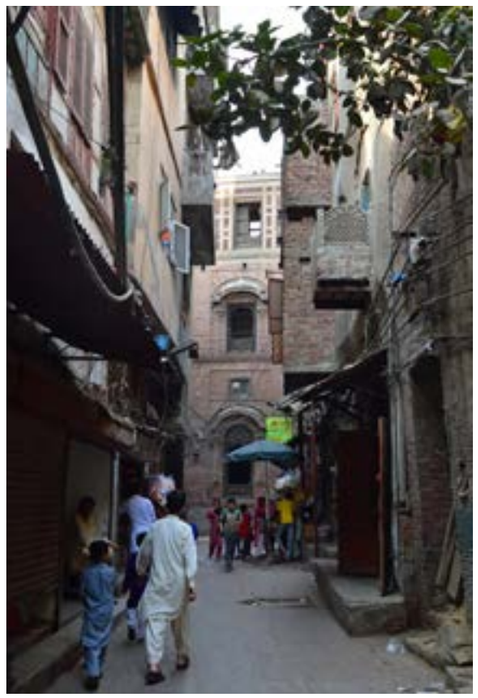


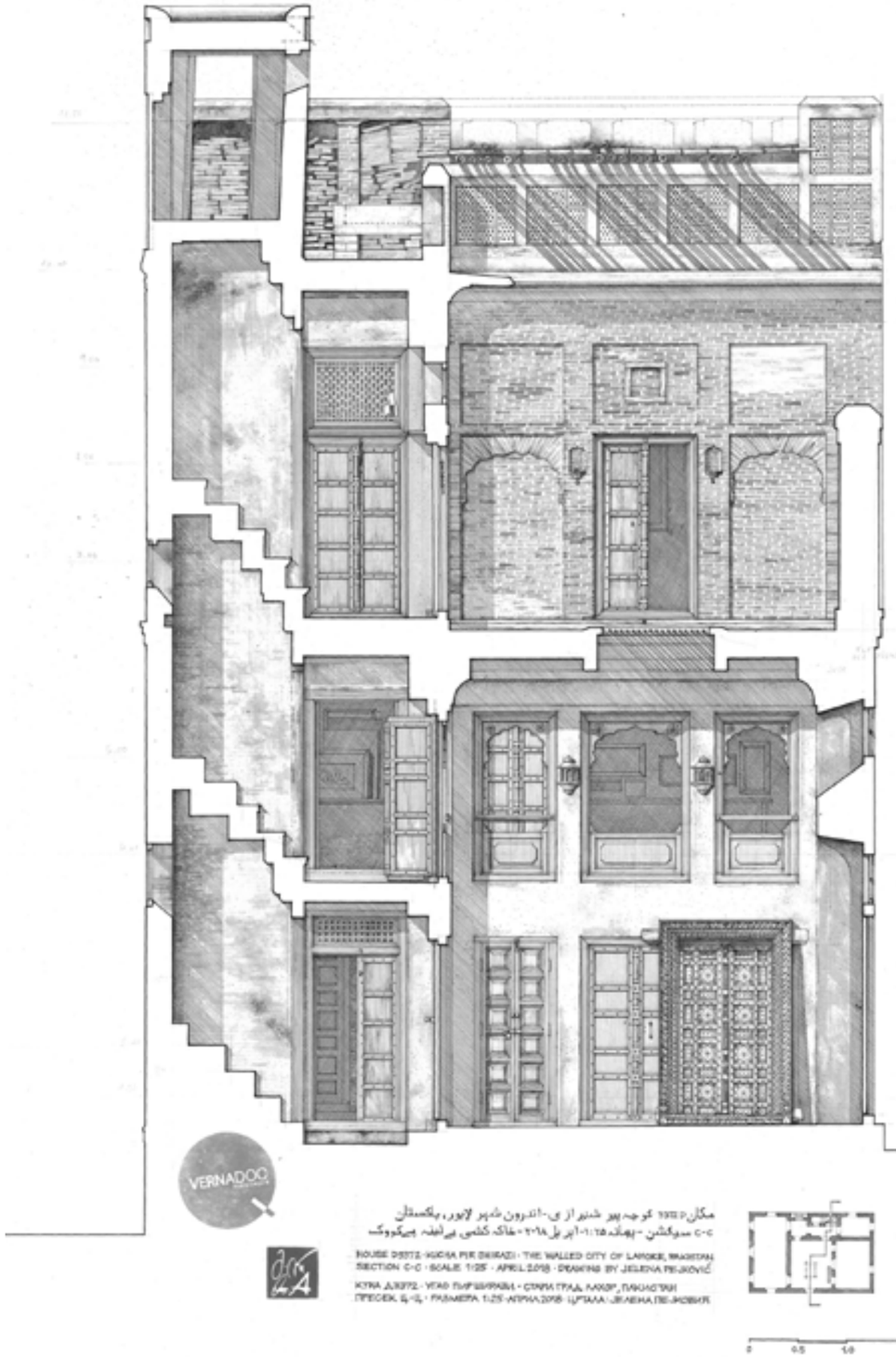
1: Inking in progress
2: Inking studio, Phuket, Thailand
(1,2: Nicholas Ng)

My own plans for drawing in Pakistan went somewhat amiss, though this is not necessarily obvious judging by the resulting drawing set. With a small team of enthusiasts, and the incredible support of architect Wajahat Ali from the Aga Khan Cultural Service in Pakistan, I set out to document the 300 year old traditional timber mosques in Ganish, Hunza. However, the project time frame unexpectedly turned out to be too short to secure all the necessary permits for that location, and eventually a new site was found in the Walled City of Lahore.

The unexpected highlight of the journey, however, was to finally make it to the striking north of this country, and to witness what incredible impact conservation projects can have on remote communities. A particularly impressive case in point is CIQAM, a Women Social Enterprise operating near the Altit Fort in the Hunza Valley. Today CIQAM employs over 90 women in a variety of trades, including carpentry and masonry works in addition to topographic and architectural surveys, design and drafting. But it all started when a small number of local women were trained

House D3372 – Kucha Pir Shirazi,
the Walled City of Lahore, Pakistan





Section of House D3372 – Kucha Pir
Shirazi, the Walled City of Lahore,
Pakistan. Original scale 1:25

in humble hand drawing during the survey of the Altit Fort back in the early 2000s. To this day, the hardworking women of CIQAM demonstrate how simple, low-tech documentation skills can empower communities who are the custodians of much of the world's cultural heritage.

And even when the stakes are not as high as improving livelihoods, teaching low-tech documentation and hand drawing remains a valuable tool. I trained participants in a number of Regional Restoration Camps, both architects and non-architects, and eventually I also organized the first VERNADOC camp in Serbia.

Each of these occasions reinforced my passion for drawing by hand as a powerful pedagogical method for explaining the basic building blocks of architecture. When asked to measure with simple tools and draw by hand, students are invited to patiently observe, analyze and represent the most fundamental, time-tested building materials and systems. In my experience, this process often gives them their first "A-ha!" moments: so *this* is how architecture actually works! The result is a deeper, more thorough appreciation of their future profession, and also of the inherited cultural context in which they will inevitably operate – as designers or conservationists.

For many architecture students, restoration training activities are the only place where they receive *any* instruction on how to draw by hand, since technical drawing, and especially technical inking, is taught less and less in architecture schools. As a result, an actual craft is fading away: the profession of architecture moved on from ruling pens to technical pens to CTB files, and has not looked back.

This thorough shift to digital tools is commonly justified by the demands of the profession – after all, in most places in the world, time and liability constraints on graphic documentation practically dictate the use of digital technology in design and construction. But we need to keep in mind that representing architecture is also a *thinking* discipline that originates in a *craft*, and that both the thinking process and the craft are increasingly under threat of extinction. In this context, restoration training camps, such as RRCs and VERNADOC, provide an invaluable environment, a precious preservation laboratory for the vanishing craft of hand drawing.

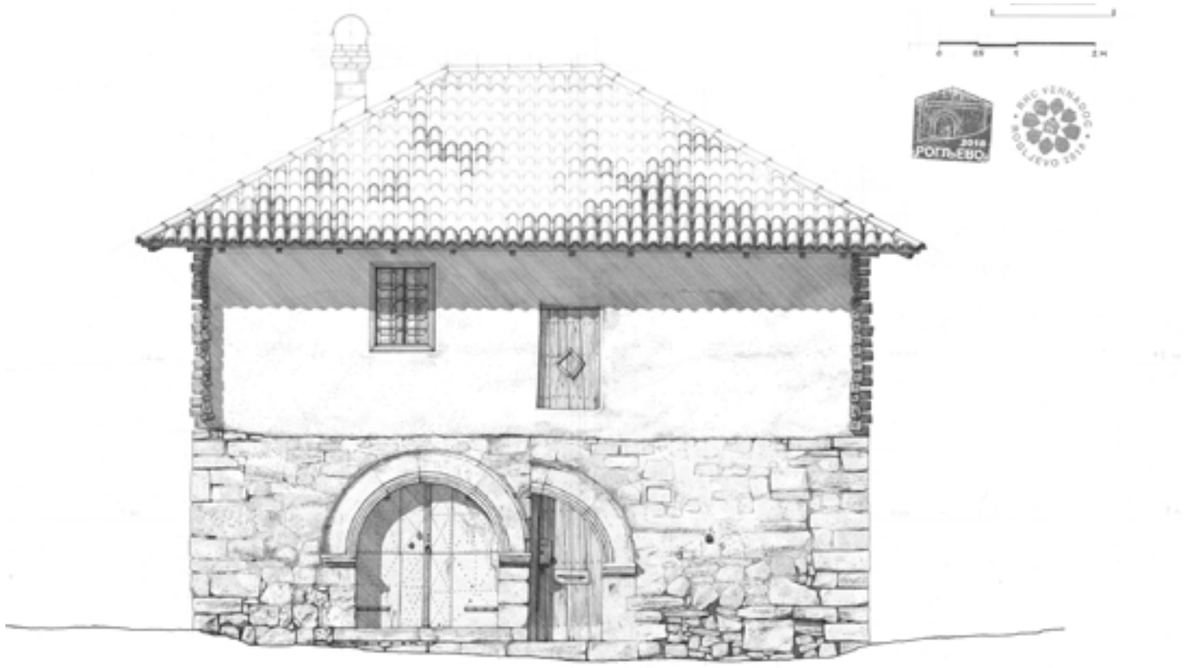
Finally, there is something to be said about drawing by hand as a contemplative, reflective, transformative process for the individual who produces the image. You make the drawing to preserve data and to present the evidence of a historic building. In turn, you learn intricate detail about the object of your interest, both tangibly and intellectually. By the end of this journey, you are a different person than you were when you started – a person with more knowledge, more appreciation, and more respect for the world that surrounds you, via the microcosm of the building you were measuring and drawing. The building you draw with this much focused attention becomes etched in your memory, in your real, physical neural pathways. In other words, you make the drawing – but the drawing also makes you.

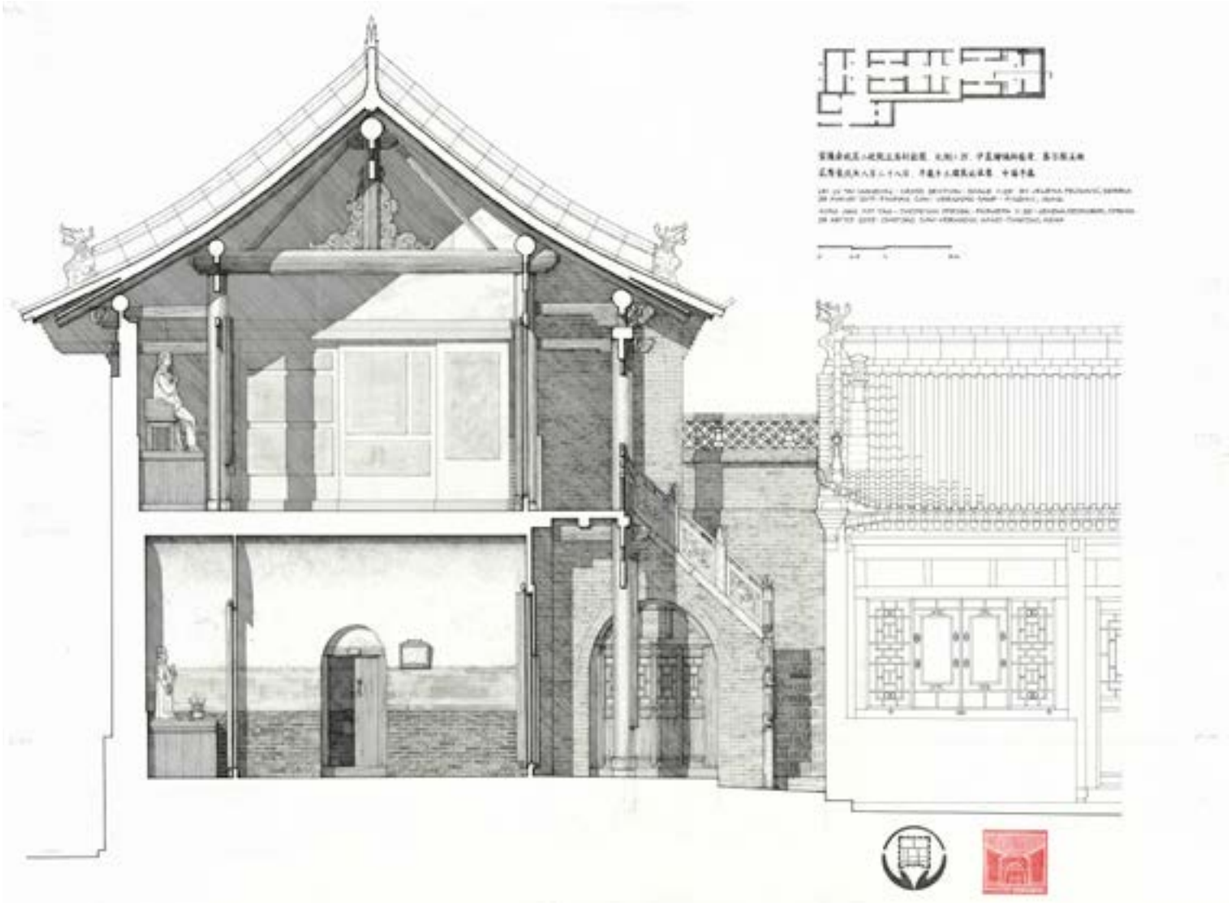
In the increasingly digitized profession of architecture, opportunities to draw by hand decline constantly. This is why I treasure the precious few that remain. I draw by hand to truly see and better understand the fragile traces of modest, nameless buildings from the past. They brought us our today. I draw by hand to build my patience and to put my mistakes in perspective – they are an inevitable part of any bigger picture. I draw by hand because I enjoy the opportunity to lend my eyes to another: "Look! This is the beauty I see in your house!" I marvel at the possibility to empower the guardians of vernacular heritage by teaching them a basic architecture skill. I treasure the chance to give future architects an insight into the basics of their profession by teaching them how to measure and draw by hand. I wish to preserve drawing and inking as the incredible crafts that they are – not to contest digital technology, but, if anything, to give it more meaning through acknowledging its rich lineage. Finally, I measure and draw by hand because the process transforms me; it expands my view of the world.

Try it. You will be surprised.

Rogljevo wine cellars, Serbia

South elevation of the wine cellar of Desanka Tančić 38/KP 2524, Rogljevo, Serbia. Original scale 1:25





Cross section of the Lei Lv Tai Mansion, Pingyao, China. Original scale 1:25

References | Referencias | Bibliografia

Aga Khan Development Network. Building skills, improving lives: CIQAM, Gilgit-Baltistan, Pakistan. https://www.akdn.org/gallery/building-skills-improving-lives-ciqam-gilgit-baltistan-pakistan (consulted on 12/02/2021)

Mattila, Markku, 2011. VERNADOC – Documenting Vernacular Architecture. In Mattila, Markku (ed.), *CIAV VERNADOC 2010 - Keski-Skandinavian suomalaiset*, 92-93. Helsinki: Suomen ICOMOS.

Mattila, Markku, 2013. VERNADOC's Links of Chain in International Co-operation. In Sananwai, Svetachintâ Sudjit (ed.), *VERNADOC Vol. 1: Thailand*, 8-9. Bangkok: Association of Siamese Architects.

Sananwai, S. Sudjit, 2013. VERNADOC around the World. In Sananwai, Svetachintâ Sudjit (ed.), *VERNADOC, Vol. 1: Thailand*, 3. Bangkok: Association of Siamese Architects.

Biography | Biografía | Biografia

Jelena Pejković

She is an architect based in Belgrade. She graduated from Harvard University, Faculty of Arts and Sciences, as a special concentrator in Architecture and Urban Design (A.B. 2003) and received her Master of Architecture degree from the Massachusetts Institute of Technology (M.Arch. 2006). Prior to her return to Belgrade, she worked for the Renzo Piano Building Workshop in Paris (2005, MIT awarded internship) and Genoa (2007-2010) on projects that include the Whitney Museum at Gansevoort (New York, NY) and Harvard Art Museums (Cambridge, MA). She participated in the 2013 Cultural Heritage without Borders (CHwB) Regional Restoration Camp in Rogljevo, Serbia, and has collaborated with CHwB since then. She is a registered architect in Serbia and a qualified conservation architect.

Dhiru A. Thadani

Form not Content Dictates the "Smart" City

La forma y no el contenido dicta la ciudad "inteligente"

A forma, e não o conteúdo, determina a cidade "inteligente"

Abstract | Resumen | Resumo

Over the past 50 years, decision-makers, laypersons, scientific communities, and design professions have repeatedly warned of the impending climate crisis caused by overdependence on fossil fuels. The environmental prophets have admonished that mother earth is on the brink of catastrophe. In response, scientific wizards have boasted that technocratic solutions will save the day. The evidence clearly indicates that a drastic change in policies, lifestyle, and consumption habits is necessary if there is to be a livable world for future generations. Urbanism is the most efficient form of habitation. Embracing and legislating for the traditional pattern of urbanism which is supported by Wi-Fi technology is the livable and sustainable prescription to address climate change and the global dependence on fossil fuels.

En los últimos 50 años, los responsables de tomar decisiones, los legos, las comunidades científicas y los profesionales del urbanismo han avisado reiteradamente sobre la inminente crisis climática provocada por la excesiva dependencia de los combustibles fósiles. Los profetas del medio ambiente han advertido de que la madre tierra está al borde de la catástrofe. Como respuesta, los genios de la ciencia proclamaron que las soluciones tecnocráticas nos sacarían del apuro. Las pruebas indican claramente que se necesita un cambio drástico en las políticas, el estilo de vida y los hábitos de consumo si queremos dejar un mundo habitable a las generaciones futuras. El urbanismo es la forma de habitar más eficiente. Adoptar y legislar para el modelo de urbanismo tradicional que se apoya en la tecnología wifi es la receta de habitabilidad y sostenibilidad para solucionar el cambio climático y la dependencia global de los combustibles fósiles.

Nos últimos 50 anos, responsáveis pela tomada de decisões, leigos, comunidades científicas e profissões de design têm alertado repetidamente para a iminente crise climática causada pela dependência excessiva dos combustíveis fósseis. Os profetas ambientais têm advertido que a mãe terra está à beira da catástrofe. Em resposta, os feiticeiros científicos gabaram-se que as soluções tecnocráticas iriam salvar o dia. As evidências indicam claramente que é necessária uma mudança drástica nas políticas, estilo de vida e hábitos de consumo para que haja um mundo habitável para as gerações futuras. O urbanismo é a forma mais eficiente de habitação. Adoptar e legislar para um modelo tradicional de urbanismo que é apoiado pela tecnologia Wi-Fi é a receita habitável e sustentável para enfrentar as alterações climáticas e a dependência global dos combustíveis fósseis.

Lament

Those who learn from history are forced to live with those who do not.

We suffer the consequences of the ignorant repeating known mistakes.

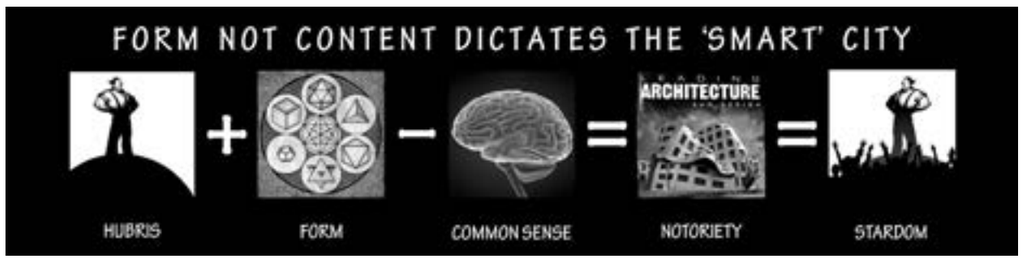
Unspoken Truths

1. Form has always been the primary interest of the architectural designer.

2. Within the design professions, peer recognition is valued higher than the opinions, needs, and desires of the end-users.

3. In the moment of euphoric passion while making what the designer believes is an original form, common sense is dismissed and hubris takes over.

These unspoken truths can be expressed by the formula: Hubris + Form – Common Sense = Notoriety = Stardom



Over the past fifty years, three revelations have warned decision-makers, laypersons, the scientific community, and the design professions of the impending climate crisis caused by overdependence on fossil fuels. The environmental prophets have admonished that mother earth is on the brink of catastrophe. In response, scientific wizards have boasted that technocratic solutions will save the day. The evidence clearly indicates that a drastic change in policies, lifestyle, and consumption habits is necessary if there is to be a livable world for future generations. Despite the overwhelming evidence, the last fifty years have disclosed that the majority of Homo sapiens are unwilling to forgo the comforts that fossil-fueled technology has afforded them. And the design professions have continued to be obsessed with form in lieu of content.

Revelation 1.0

> *Ours is a nation of affluence. But the technology that has permitted our affluence spews out vast quantities of wastes and spent products that pollute the air, poison our waters, and even impair our ability to feed ourselves. At the same time, we have crowded together into dense metropolitan areas where concentration of wastes intensifies the problem.*
>
> *Pollution now is one of the most pervasive problems of our society. With our numbers increasing, and with our increasing urbanization and industrialization, the flow of pollutants to our air, soils and waters is increasing. This increase is so rapid that our present efforts in managing pollution are barely enough to stay even, surely not enough to make the improvements that are needed.*
>
> President Lyndon Johnson
> *Restoring the Quality of Our Environment*, November 1965

US President Johnson announces the findings of The President's Science Advisory Committee

It is surprising to learn that these words were written fifty-five years ago by President Johnson in the introduction to The Report of The Environmental Pollution Panel prepared by the President's Science Advisory Committee. By all accounts, this was the first official report to any government anywhere in the world on the possible challenges arising from increased Carbon Dioxide (CO_2) levels in the atmosphere.

In the report the committee tackled a range of environmental and pollution problems in the 300-page document, which outlines issues such as:

1. Soil contamination from industrial wastes, mining, and airborne contaminants.
2. Health effects of environmental pollution on humans and other living organisms.
3. Increased atmospheric carbon dioxide and effects on climate.
4. Pollutants and air quality.
5. Solid waste, salvaging, landfill, and reclamation.
6. Separation of sewage systems and storm runoff.
7. Effects of chlorinated wastes.
8. Agricultural wastes.
9. Water quality and aquatic blooms.
10. Food security and unsafe pesticides practices.

In hindsight, the 1965 report would have made Nostradamus proud, with statements such as "The climate changes that may be produced by the increased CO_2 content could be deleterious from the point of view of human beings". However, these were not the words of a 16th century oracle making a prophetic prediction, but a reputable group of scientists. The appendix of the report makes reference to three dozen scientific papers from the 1950s and early 60s, and even back to the 19th century. They cover the earliest research developing the scientific understanding of how CO_2 influences climate.

Sadly, the report's findings were generally ignored and no action was taken.

Revelation 2.0

The second critical warning to consider a sustainable fossil-free future occurred in October 1973. The image of lengthy lines at gas stations remains a memorable feature of that crisis. The twelve members of the Organization of the Petroleum Exporting Countries (OPEC) colluded to stop exporting oil to the United States. The embargo was retaliation toward the United States and other nation's that provided military aid to Israel in the Yom Kippur War, and their continued support during post-war negotiations. Canada, Western Europe, Japan, Australia, and New Zealand, all faced substantial petroleum shortages, real and perceived, and rising oil prices. In the US, prices escalated, exceeding a dollar a gallon in that decade.

During the oil embargo gas lines and acute shortages were a common occurrence in America

The energy turmoil experienced during the embargo helped set the US on a slow course of rising energy efficiency. Transportation, household appliances, building construction, and electric generation were industries that modified their inefficient practices. It was understood that the less energy-intensive the economy, the more resilient the country would be in dealing with future shortages. New policies were enacted, including reduction of highway travel speed to 55 mph in an effort to improve vehicular fuel efficiency, and gas-guzzling luxury cars were taxed. The public awareness brought about the ostracizing of owners of monstrous inefficient vehicles. An unintended consequence of the oil price escalation was the resurrection of the coal industry that resulted in a decrease in oil's role as a power generation fuel.

Scientists at major oil companies warn executives that burning of fossil fuel is warming the planet

In 1977, senior scientists at major oil companies informed their executives that CO_2 emissions from burning fossil fuels were potentially warming the planet at a catastrophic rate. Following a decade of further research there was general consensus in the scientific community that CO_2 buildup in the atmosphere was a worldwide problem. A report by Exxon's engineering department stated that "fossil fuel consumption will cause dramatic environmental effects before the year 2050". The report even stated that there would be "major shifts in weather patterns" and "ocean levels would rise four feet" and "great irreversible harm to our planet". In 1988 NASA scientists testified about the issue before Congress, bringing it into the national consciousness, and lawmakers began calling for a reduction in CO_2 emissions.

To derail these actions, oil companies spent fortunes casting doubt on the scientific evidence of the cause of climate change and confusing the public about greenhouse gases and CO_2 emissions. The propaganda successfully promoted the notion that it was inconclusive as to whether human

Dr. Hansen, NASA Director, testifies that the world is getting warmer in 1988 than any time in history

activities affect the global climate, and thus there was no reason to take drastic action. This shortsighted and devious strategy has been used successfully by other profitable corporations such as tobacco company campaigns to throw doubt on the cause-and-effect relationship between smoking and lung cancer. This nefarious gambit placed short-term profitability over human wellbeing.

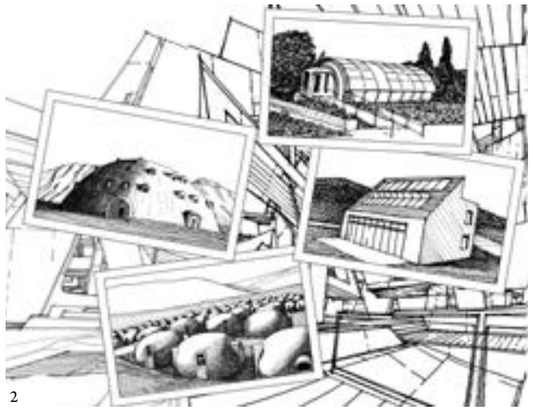
Four decades later, oil can no longer be used as a weapon against the US, coal's negative impact on the environment is widely recognized, and as a fuel source coal is struggling to be competitive with lower-cost, less-polluting natural gas. What has not changed is that oil continues to be the dominant fuel that gets humans and goods from place to place. Until the transportation industry disentangles itself from oil-fired combustion engines, and embraces sustainable and renewable fuels, we will continue to be trapped in the 70s.

Architectural student exploring cubic form

I was an architectural student from 1972 to 1978, and one-half of the academic buzz was enthralled by form-making and aesthetics. The other half was immersed in investigating architecture's role in solving the energy crisis. As I remember, we were taught that proficiency could be achieved by the building's orientation and plan proportion in relation to the site's latitude. In northern latitudes, elongation of the building form in the east-west axis yielded greater southern exposure for solar gain. Latitude also controlled the dimension of roof overhangs to protect from solar radiation and heat gain in summer months, while permitting the sun's radiation to passively heat the interior during winter months. Based on climatic zones, masonry buildings with high thermal mass and concrete floors were desirable as they could store the sun's energy during the day and dissipate the heat after sunset. And shading devices between floors could serve as reflective surfaces to bounce natural light to the innermost portion of the room if windows were strategically located above the overhangs. Insulated walls, windows, and roofs were a necessity; vapor barriers essential; and reduction of the building's surface areas exposed to the elements was a crucial factor in reducing heat loss and gain.

The formula drilled into budding architects was: Heat gain/loss (BTUs) = surface area (square feet) x U-factor (1/R) x temperature differential (inside/outside).

1



2

1: Mechanical Engineering class

2: Solar energy inspired forms

This basic formula considered the surface area, times the U-factor relating to insulation coefficient, times the temperature differential between inside and outside. The formula led to codes that substantially reduced glass areas within a wall surface, as glass has a lower R-value than an insulated wall surface. Focusing on the reduction of surface area led some architects to explore circular buildings and dome shaped structures as those forms enclosed maximum area and volume with the least amount of exterior surface area –think igloos. Architects interested in solar houses responded with shed roofs that were optimized for maximum solar gain and towers that lit the interiors with natural light. Form-driven architects relished the opportunity to explore new forms to increase energy efficiencies.

Surprisingly, there was little or no discussion regarding the efficiency of party-wall construction, exemplified by the row housing type that existed in most American cities. Urban buildings touch one another, hence there is no temperature differential on either side of the party walls, which makes them substantially more efficient than free-standing object buildings. Row housing permitted ownership of land –be it a small portion of land– by consuming less land per unit, creating viable neighborhoods with well-defined streets, and utility delivery was substantially more efficient than the suburban alternative. In hindsight, it was a missed opportunity for the revitalization of cities. However, the economic climate and perception of cities was not conducive to revitalization. In 1975, New York City was on the brink of bankruptcy, other cities were also on the decline, and the bias was clearly toward the suburbs with buildings that did not touch each other.

Ubiquitous rowhousing in many US cities such as Philadelphia

Historic building and wilderness preservation movements were established in the early 20th century. In the US, public support flourished after the loss of New York City's Penn Station, leading to the National Historic Preservation Act of 1966. The Act reaffirmed the federal government's role in preserving the nation's historic sites. After the embargo of 1973, discourse on building preservation –regarding embodied energy in existing buildings, and energy consumed in making new building materials– encouraged many architectural schools to focus on preservation, restoration, and adaptive reuse. This spawned a cadre of architects skilled in materials and methodology of historic structures and an appreciation for preservation. The form-makers probably saw this as a setback, as preservation generally confined design to the parameters of the existing structure.

Libeskind attacks history

By the late 70s, professional organizations and corporations involved in the built environment were all promoting courses, seminars, products, and competitions that addressed adaptive reuse, energy efficiency, and passive-energy designed buildings. After a decade, the enthusiasm faded and the majority of academic institutions and professional architects and planners reverted to business as usual, and continued to explore new forms of expression.

Four decades later –with conclusive evidence and acceptance of climate change being caused by carbon dioxide emissions from the ever-increasing use of fossil fuels– academic institutions, professional architects and planners, and the marketing divisions of every industry have mobilized into bombarding the consuming public with a fresh set of buzzwords: Biodegradable, Carbon Neutral, Compostable, Eco-Friendly, Global-Warming Ready, Green, Low Carbon Footprint, Low VOC, Net Zero, Organic, Recycled, Renewable, Resilient, Smart Building, Smart City, Smart Growth, Sustainability. This technocratic focus has diverted attention from common sense architecture and urbanism that can actually deal with our global climate crisis.

In 2000, global population was evenly divided between urban and rural

Revelation 3.0

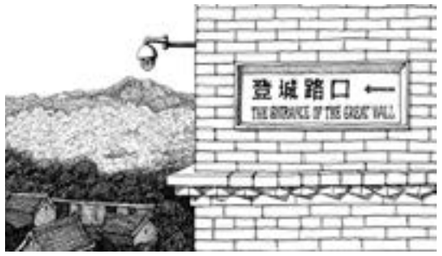
In the early years of the new century, a tsunami of crises coalesced –climate change, over-leveraged mortgage loans, public health, burgeoning population, peak oil, and acute shortage of affordable homes.

The news flash in the year 2000, informed us that 50% of the world's population now lived in urban areas –a broadcast that has been grossly inflated and misunderstood, devaluing the meaning of urban life to a metric of density.

Urbanism is more than a statistic of the number of inhabitants in a finite area of land. Urbanism is a way of life complete with positive attributes that are based on a value system that strives for the collective good while respecting individuality. Foremost it is a way of life that embraces community and celebrates the exchange of ideas, goods, and services.

The hardware –the physical form of the city– is the physical manifestation and repository of its history, identity, and heritage, that responds to genius loci of place, climate, weather, humidity, precipitation, local soils and materials, and the natural environment. The software –the human social capital, traditions, and culture– embraces residents of varying incomes, diversity, race, and ethnicity. The democracy of the city respects and acknowledges the symbiotic relationships of the college-educated, vocationally-trained, self-taught, and apprentice-based workforce.

Without consideration for what true urbanism is, the conversation has drifted toward technological solutions to combat climate change, with little or no regard for the quality of life and wellness of the inhabitants. Software and computer hardware companies see an opportunity to sell their goods under the umbrella of "Smart City". Playing on the perception of cities being dangerous, fear propaganda has made surveillance cameras and monitoring facilities an easy sell. Sensors that monitor all aspects of infrastructure have also sold well, especially after an unforeseen disaster. Obviously, there is a place for technocratic solutions to monitor electrical power grids, test water quality, and measure emissions to assure healthy air quality, but these technocratic solutions should never dictate the urban design of our cities.

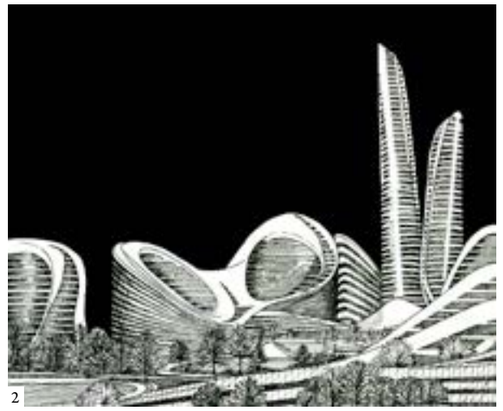


CCTV camera at the Great Wall of China

Images of proposed smart cities, all over the world, present brilliantly rendered views of new developments whose formal geometry and sculptural forms can only be appreciated in an aerial view when flying overhead in a helicopter. The architects of these large scale projects masterfully sell a futuristic lifestyle that proclaims to be efficient, smart, safe, and sustainable –by dazzling the public's imagination with forms that are only possible to imagine and build by using advanced modeling software programs driven by computer-jocks. This leaves the name-on-the-door architect to continually fund software programs which are necessary to make contorted building forms that have little regard for function, efficiency, or beauty.

In the 1950s politicians and decision makers were deceived into believing that expensive highway projects through cities would improve the quality of life and desirability of the cities. Sixty years later they are again being manipulated, this time by the catchy tag line of making their cities smart. Too often they welcome the carpetbaggers that travel the world to sell the city's emperors new sets of clothes. The emperors' advisors only have to remember the most basic formula –Heat


1


2

1: Similar to the promotion of the highway system by Big Oil, Big Asphalt, and Car Manufacturing Industries, "Smart" Cities are being promoted by corporations that have the most financial incentives

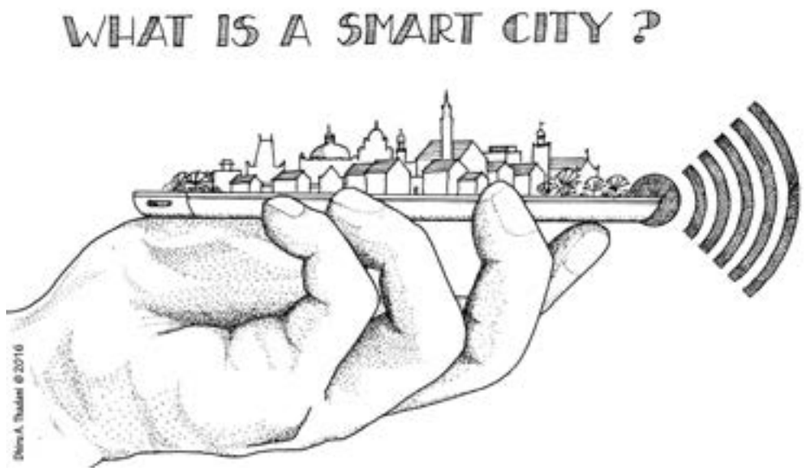
2: A proposed "Smart" City on the outskirts of Moscow

Gain/Loss = Area x U-factor x Temperature Difference– to realize that there is no "smart" in a city that is made of glass towers that maximize exposure of the building surface areas to the natural elements.

The unsustainable form of object buildings, and the intensive energy and resource consumption in making glass, only serve the architect's obsession with form and the hubris of insecure decision makers. Implicit in promoting these ludicrous unattainable propositions, the construction and realization of these faux smart cities will only lead to further distrust and apathy for all. The design profession must restrain its fixation with form and its dependence on technocratic solutions to solve problems that historically were resolved without intense energy consumption.

The unintended consequences of the abundance of cheap energy have steered designers to deemphasize solving problems of inclement climate, harsh weather conditions, and seasonal precipitation. Additionally, there is little thought given to limiting material selection to what is locally obtainable, selecting vegetation that is native, and employing construction methodology based on indigenous practices.

Traditional urbanism supported by Wi-Fi technology is the livable and sustainable alternative to what is being promised in breathtaking futuristic renderings of glass and steel structures within dumb "smart cities".



Smart City in the palm of your hand

Léon Krier explains that tradition is technology that works. This empirical knowledge is continually refined, adapted to changing human needs, and handed down through generations. The unambiguous goal is to improve the quality of life for the inhabitants through efficiency and consumption of the least amount of energy and resources. Materials are local, construction methodologies familiar, and forms respond to the cultural and physical contexts as well as to regional climate.

The global fascination for the shiny and new, and the unwarranted belief and reliance on captivating technology, drives high-profile architects to label anything traditional as nostalgic, unimaginative, and retrograde. Over the last century, the practice of separating uses for noxious reasons and eradicating the pedestrian realm in favor of vehicular movement have proved unsustainable. These practices that are preoccupied by machine-aesthetics and hostility toward the continuum of historical precedents may in fact be nostalgically holding on to a failed paradigm.

The last seventy years are but a small blip in the 5,000-year history of city-making. During this abnormal period, walking has been disregarded as the most sustainable form of travel. The promotion of private automobile conveyance has had catastrophic results, especially pollution, consumption of arable land by sprawl development, loss of life on a global scale of 3,700 auto-related fatalities a day, and financial impact on households having to purchase and maintain personal transportation as transit options were besmirched and demolished.

Instead of recognizing the failures of the recent past, the architecture profession doubles-down to resuscitate these unsustainable paradigms with green technology and wizardry under the "smart city" brand. The most efficient "green" building in the wrong location does not solve the overwhelming crises. Compact urban dwellings that are well connected internally and externally, and complete with walkable access to daily needs and a balance of jobs and beds, must be considered and implemented to follow traditional urban patterns.

Time-tested traditional urbanism consists of clearly demarcated public and private realms. These cities are an assemblage of autonomous neighborhoods with low-scale buildings that define blocks which are integrated into a memorable network of thoroughfares that connect a variety of public spaces.

Future neighborhoods and cities must be designed as if there is no or little external energy available, similar to the places that tourists continue to admire and visit. Places that are livable without excessive energy demands and where beauty prevails. Environments where the urban pattern encourages walking as the primary form of transportation to access human needs. Where civic life thrives and daily human interaction is serendipitous.

Such is successful urbanism.

Biography | Biografía | Biografia

Dhiru Thadani

He is an architect, author, educator and urbanist who has been in practice since 1980. Dhiru was born in Bombay, in India, and moved to Washington, D.C. in 1972 to study architecture at the Catholic University of America. During his forty-eight years in Washington, D.C. he has taught, practiced, and strived to place architecture and traditional urbanism in the public eye. Since its formation in 1993, he has been a charter member of the Congress for the New Urbanism (CNU). He has been the principal designer of new towns and cities, urban regeneration, neighborhood revitalization, academic campuses, and infill densification projects, and authored a number of books and articles on urban design.

Lucien Steil

The Reconstruction of Aleppo

La reconstrucción de Alepo

A reconstrução de Alepo

Abstract | Resumen | Resumo

Human history is marked by a dramatic dialectic of "destruction" and "reconstruction", the record of which has itself often been lost. Yet memories of tragic destructions and often heroic reconstructions remain ingrained in the history, archaeology, and myths of all civilizations. Whereas the predominant contemporary ideology of architecture seems to prefer "deconstruction" and the consecration of an imagery of fragmentation and desolation, the Reconstruction of Aleppo project proposes a traditional strategy of material and moral reconstruction. Such reconstruction seeks not only to repair and recompose the form and meaning of homes and places but also to allow for reconciliation and healing, as well as confidence and identity.

La historia de la humanidad está marcada dramáticamente por la dialéctica de la "destrucción" y la "reconstrucción", cuyo registro a menudo se ha perdido. Pero los recuerdos de estas destrucciones trágicas y estas reconstrucciones a menudo heroicas quedan grabados en la historia, la arqueología y los mitos de todas las civilizaciones. Mientras que la ideología actual predominante en la arquitectura parece preferir la "deconstrucción" y la consagración de un imaginario de fragmentación y desolación, el proyecto de Reconstrucción de Alepo propone una estrategia tradicional de reconstrucción material y moral. La reconstrucción no solo intenta rehabilitar y recomponer la forma y el significado de los hogares y los lugares, sino que posibilita la reconciliación y promueve que se cierren las heridas, así como que se mantengan la confianza y la identidad.

A história da humanidade é marcada de forma dramática pela dialéctica da "destruição" e "reconstrução", cujo registo se perdeu muitas vezes; memórias destas trágicas destruições e reconstruções muitas vezes heróicas permanecem enraizadas na história, arqueologia, e mitos de todas as civilizações. Enquanto a ideologia predominante da arquitectura contemporânea parece preferir a "desconstrução" e a consagração de um imaginário de fragmentação e desolação, o projecto Reconstrução de Alepo propõe uma estratégia tradicional de reconstrução material e moral. Este empreendimento de reconstrução procura não só reparar e recompor a forma e o significado das casas e lugares das pessoas, mas também permitir a reconciliação e a cura, assim como a confiança e a identidade.

Aerial perspective of the proposal for the reconstruction of Aleppo: view from the Citadel of the reconstructed minaret in the center and the proposed new Market Hall on the right (Luke Palmer)

Reconstruction of Aleppo was the topic of my fourth-year studio at the University of Notre Dame in spring 2018. Civil war was still raging in Syria and all the Middle and Near East seemed torn by indefinite strife. Terror, proxy-war politics, bombing and gassing of civilians and the deliberate destruction of cities and historic landmarks seemed an unpropitious context for even thinking of reconstruction; yet my students and I wished to offer a vision of hope and relief, as well as a sustainable project of peace, reconciliation, and healing.

The world has never been at peace for long and is alas often struck by natural or manmade tragedies; if golden ages ever existed, they were rare and short-lived. So here we commemorate the heroic and compassionate resilience of human responses to destruction and draw inspiration from epic efforts to rebuild a finer world over the ruins of old cities and memories.

My thanks to my students Cynthia Sigler, Eva Baghdan, Madeleine Donohue, Patrick Keough, Spicer Emge, Cole Rembecki, Sean Gaouette, Matthew Digoy, and Luke Palmer. They put their talent, intelligence, passion, and dedication into researching and designing a project for rebuilding Aleppo. The outcome is a moving tribute to the people of Syria and also quite an achievement in urban design and architecture.

Destruction and reconstruction

> *The genuine alternative for most of us is that between an aimless utopia of escape and a purposive utopia of reconstruction* (Mumford 1922)

> *Life is a permanent process of reconstruction. The incapacity to rebuild results in an incapacity of life. Death is nothing but a definitive interruption of reconstruction, which though following a fixed plan and order, nevertheless allows infinite and always new and individual variations.* (Krier)

Luxembourg, panoramic view (Yoo Chung, via Wikimedia Commons)

In 1684, prior to the *Nine Years' War* (1688-1697), the armies of Louis XIV bombarded the city of Luxembourg. A beautiful, fortified city of about 10,000 inhabitants was laid to waste by superior French artillery and powerful cannons. After assessing the damage, the French brought in 5,000 masons and craftsmen from Italy and Austria who, supervised by French engineers, rebuilt the city in five years. It was a masterful reconstruction, improving upon the original.

In April 2009, an earthquake in Abruzzo, Italy, killed 300 people, wreaking havoc and leaving 65,000 homeless. The historic center of the city of L'Aquila was near the epicenter and many of its buildings were destroyed. Five years later little or nothing had been done in the way of reconstruction, except for some limited, suburban, almost tragicomic architectural experiments showcased by the Berlusconi government.

I have been dismayed by the ongoing destruction of many cities in the Near and Middle East, from Gaza to Syria, Iraq, Libya, Yemen, etc., and when I returned to my notes of some years ago, it came back to me how important the issue of reconstruction had been in my early understanding of what architecture is about. I vividly remember reading Léon Krier and Maurice Culot's joint publications, particularly the *Déclaration de Bruxelles*, where they wrote eloquently of the urgency of a "moral and material" reconstruction. In an early interview, Léon Krier recounted in a poetic manner the reconstruction of Echternach in the 1950s as a paradigm of this "material and moral" endeavor. Both Léon and his brother Rob refer to this excellent reconstruction, executed by skilled local craftsmen and architects, as an almost legendary undertaking. Witnessing how a small country was able to rebuild its villages, towns, and cities consistently and elegantly after the war, and then seeing their destruction by modernist architecture, functional zoning and traffic planning in the following decades, shaped their thinking and their own designs.

The pairing of "moral and material" in reconstruction was particularly suggestive in my own studies and development. But I was never attracted by the "moralism" of fundamentalist modernism or doctrinaire classicism; my main reasons for studying architecture had to do with social justice, sense of place and the "common good", not with "morality", tainted by strict interpretations of religion and ideology.

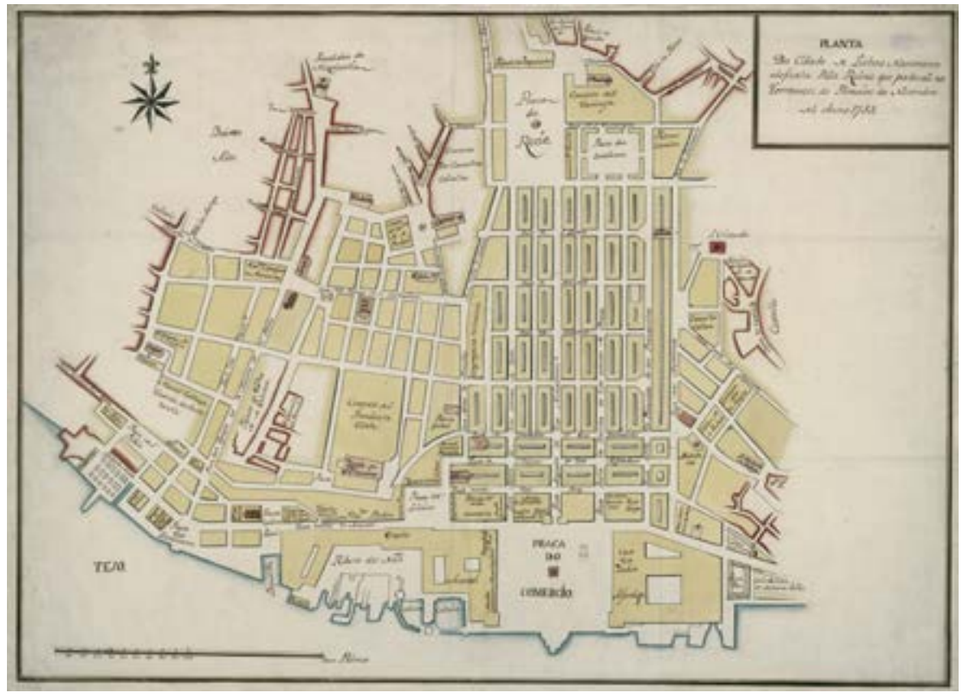
> *Cities are extraordinarily resilient places, as we witnessed immediately after September 11 in New York City, and adversity, far from undermining civic confidence, can bring about a renewed and determined spirit of community and common endeavor* (HRH The Prince of Wales. "Tall Buildings". *Invensys Conference*, London, December 11, 2001)

Noto, Sicily, with the cathedral rebuilt in Sicilian Baroque architecture (1776) after the 1763 earthquake which destroyed the city and its monuments (Leandro Neumann Ciuffo, viaWikimedia Commons)

Let us recall some fine examples of reconstruction from the history of city-building and architecture: Warsaw after the Second World War, Lisbon admirably rebuilt by the Marquis of Pombal after the devastating earthquake of 1755, Catania in Sicily reinvented as a baroque masterwork after the earthquake of 1693, Luxembourg rebuilt after the heavy-handed assault by the troops of Louis XIV in five years by French architects and Italian and Austrian masons, Brussels rebuilt after its destruction by the same state-of-the-art French army in 1695, the cities razed during the Spanish Civil War and wonderfully rebuilt afterwards, and many other examples. My hometown, an industrial city of 25,000 inhabitants, has been wrecked and rebuilt more than twelve times since the Middle Ages, and indeed hardly any European city has escaped the cycle of destruction and reconstruction. There are innumerable examples of cities wrecked by natural causes and often by human havoc, and yet most have been followed by accomplished reconstructions.

World Trade Center reconstruction proposal in New York, by Steve Peterson and Barbara Littenberg (Peterson and Littenberg Architects)

Though historical reconstructions were generally conceived as imitations of destroyed cities, the memories they sprang from were never straightjackets for imagination and recollection. The rebuilders were not bound by nostalgia but rather saw their task as a creative and poetic opportunity. Free of the dogma of archaeological authenticity, literal restitution, or folkloric mimicry, they were unashamed to borrow, copy, and imitate where appropriate, and to innovate where necessary or useful. They were not particularly concerned with expressing a "spirit of the time", or at least not as posited by modernism. It probably seemed evident that their buildings should fit into their settings and that the "spirit of the time" was an inherent condition of human existence in the world. The best reconstructions were not meant to manipulate, censor, or distort memory with emotion or sentimentality. There was no retribution, manifesto, or utopia, but rather an expression of human solidarity, patriotism, and culture.



Final Plan of the Reconstruction of the Baixa Pombalina, Lisbon, Eugénio dos Santos de Carvalho, and Carlos Mardel, 1786 (via Wikimedia Commons)

Our Reconstruction of Aleppo project addresses urban architecture in the specific context of Syria's post-Civil War reconstruction. We chose one of the most damaged yet remarkable neighborhoods located at the foot of the Citadel among various central areas to be rebuilt within a perspective of "philological reconstruction" in both their urban and their architectural forms. The site was chosen for its symbolic and historic significance and complexity in the context of its contemporary and historical civic, architectural, and urbanistic identity and collective memory. Students worked in small planning groups to research, analyze and sketch various iterations of a masterplan to be synthesized afterwards in a single draft. Drawing upon local precedents through typo-morphological analysis and research, the final plan was based on principles of "philological reconstruction" (with reference to Paolo Marconi and Léon Krier) and developed through a methodology of "imitation" (Léon Krier and Demetri Porphyrios, 1980) and "pattern language" (Christopher Alexander, 1977), allowing students to quickly draft a coherent, contextual, and empathic reconstruction model. They then focused individually on the design of a building or built ensemble using similar techniques of "imitation"; they sought to recover the "originality" of the place by returning to the origins and essences of placemaking and architecture in Aleppo .

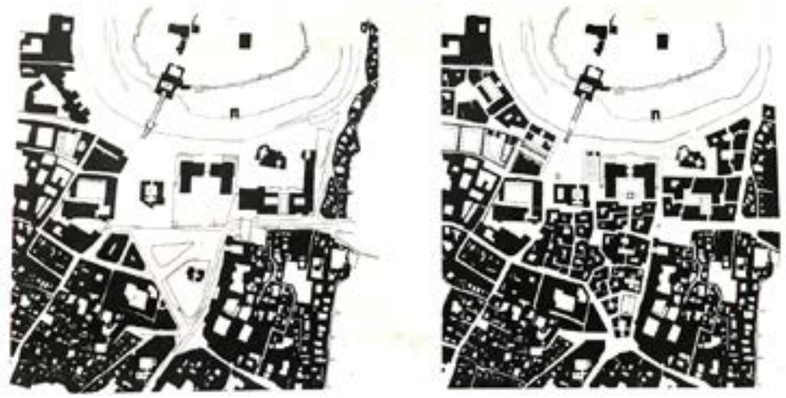
Aleppo reconstruction site before (2012) and after (2017) civil war destruction (Google Earth)

Aerial Perspective of reconstructed Aleppo near the historic Citadel (Spicer Emge and Cole Rembecki)

Proposal for the reconstruction of Aleppo

The purpose of the Aleppo reconstruction exercise was manifold: it was intended above all as a homage to the resilience of Syria and its people in a tragic moment of its history. Our premise was that an empathic and traditional reconstruction is necessary as both a civic and an ecological endeavor. With our project we intended to restore, heal, and enhance a city which has nurtured great achievements in urban culture and civilization and inspired artistic, political, scientific, and poetic imaginations. So the undertaking also highlighted the rich geometric, symbolic, and ornamental complexity of Islamic architecture and its wealth of architectural heritage worldwide.

Elevation studies for typical urban fabric (Cynthia Sigler)



Aleppo reconstruction design area before the war destruction (left) and with the proposed philological reconstruction (right). Collaborative design studio work

We were studying the principles of Islamic city-building as well as considering issues such as climatic, geographic, and cultural sustainability. Dialectics between vernacular and classical architecture, architecture and urbanism, etc. also featured large. The Aleppo project was moreover an opportunity to address the wider issues of destruction and reconstruction and also commemoration with reference to historical examples of urban reconstruction, as mentioned above.

Proposed Masterplan for the reconstruction of Aleppo. Collaborative design studio work

On studying precedents such as Lisbon, London, Warsaw, Luxembourg, Catania, etc., where the aim was largely to rebuild the new as a perfected image of what had been lost through natural or manmade destruction, we were able to apprehend the universality of humanity's aspiration to inhabit this world peacefully with permanence, comfort, and pleasure.

The block structure for the reconstructed Aleppo is derived from morphological and typological studies of traditional block patterns in historic Aleppo. Rather than replicating the previous fragmented condition or experimenting with interpretations, our strategy aspires to a "philological reconstruction": it refers to "imitation" as a technique encompassing both a respect for traditional principles of placemaking and a rigorous implementation of familiar types, tectonics, and building precedents, albeit refined, updated and refreshed.

Plan and aerial view of the typical mixed-use block structure for reconstructed Aleppo (Cynthia Sigler and Sean Gaouette)

Main elevation of Market Hall
(Luke Palmer)

References | Referencias | Referências

Alexander, Christopher et al. 1977. *A Pattern Language*. New York: Oxford University Press.

Barey, André (ed.). 1980. *Declaration de Bruxelles. Propos sur la Reconstruction de la Ville Européenne*. Brussels: Archives d'Architecture Moderne.

Krier, Leon. 2013. *La arquitectura de la comunidad: La modernidad tradicional y la ecología del urbanismo.* Barcelona: Editorial Reverté.

Krier, Leon. 2018. The end of hypocrisy: On the reconstruction of the Frankfurt Old Town houses. In García Hermida, Alejandro (ed.): *The Reconstruction of Cultural Heritage*, 103-130. Madrid: Arcadia Mediática.

Marconi, Paolo. 2003. *Il recupero della bellezza*. Milan: Skira Editore.

Mumford, Lewis. 1962 [1922]. *The Story of Utopias*. New York: Viking Press.

Porphyrios, Demetri, ed. 1992. *Classical Architecture: The Living Tradition*. New York: McGraw Hill.

Biographies | Biografías | Biografias

Lucien Steil

He was born in Joao Monlevade (Brazil), and lived and studied in Luxembourg. He studied architecture and urbanism in Paris and Vincennes and graduated as an Architecte DPLG (*Diplômé par le gouvernement*). He has collaborated with Maurice Culot and Léon Krier at the Archives d'Architecture Moderne, in Brussels, and later with Colum Mulhern in Luxembourg. "Mulhern & Steil" produced a wide range of projects in traditional urbanism and traditional architecture. Lucien Steil has lectured and taught at the Prince of Wales's Urban Design Task Force in Potsdam and Berlin, the Oregon School of Design (Portland, Oregon), the University of Miami, the Universidad Politécnica de Puerto Rico, the University of Notre Dame in Rome and in Indiana, the Università di Bologna, the Universidade Católica Portuguesa in Viseu, the Prince's Foundation and the University of Buckingham. He has been actively involved in traditional and ecological urbanism and architecture, which have become central to his teaching and design practice. Lucien Steil was the editor of *Katarxis* and principal of "Katarxis Urban Workshops ASBL".

With Students:

Cynthia Sigler (HKS Architects, Chicago, Illinois), Eva Baghdan (Solomon Cordwell Buenz, Chicago, Illinois), Madeleine Donohue (Appleton Partners, LLO, Santa Monica, California), Luke Palmer (Wade Weissmann Architecture, Milwaukee; Wisconsin), Patrick Keough (J. Ryan Duffey Architect, Atlanta, Georgia), Spicer Emge (Dibello Architects, Austin, Texas), Cole Rembecki (Torti Gallas + Partners, Washington DC), Matthew Digoy (Torti Gallas + Partners, Washington DC), and Sean Gaouette (Torti Gallas + Partners, Washington DC). All students graduated in May 2019 with a professional degree in architecture at the University of Notre Dame.

Hans van der Heijden

Persoonshaven Urban Housing, Rotterdam

Viviendas urbanas en Persoonshaven, Róterdam

Habitação urbana Persoonshaven, Roterdão

Abstract | Resumen | Resumo

The social housing project at Persoonshaven in the Feijenoord district of Rotterdam in the Netherlands provides an adaptation of a common late 19th-century speculative house type. The changes in its appearance, spatial organization, details and structure result from standardized contemporary Dutch construction techniques and current regulations and spatial standards. The house types and building methods will be described in the context of Martin Steinmann's characterization of traditionalist design as practiced by the Danish architect Kay Fisker.

El proyecto de viviendas sociales de Persoonshaven, en el distrito de Feijenoord de Róterdam (Países Bajos), sugiere una adaptación de un tipo de vivienda especulativa que fue habitual a finales del siglo XIX. Las modificaciones en su imagen, su organización espacial, sus detalles y su estructura tienen su origen en las técnicas estandarizadas de construcción que se utilizan actualmente en Holanda, así como en los actuales reglamentos y normas relativas al espacio. Tanto la tipología como el método de construcción se van a describir en el marco de la caracterización del diseño tradicionalista de Martin Steinmann tal como lo practicaba el arquitecto danés Kay Fisker.

O projecto de habitação social em Persoonshaven, no distrito de Feijenoord em Roterdão, nos Países Baixos, sugere uma adaptação de um tipo especulativo de casa que é comum no final do século XIX. As alterações das suas imagens, organização espacial, detalhe e estrutura têm origem em técnicas Holandesas de construção contemporâneas e padronizadas, e regulamentos e normas espaciais contemporâneas. Tanto a tipologia como a metodologia de construção serão descritas no contexto da caracterização de Martin Steinmann do design tradicionalista como praticado pelo arquitecto Dinamarquês Kay Fisker.

In the 1997 essay *The Tradition of Objectivity and the Objectivity of Tradition*, the Swiss architect and theorist Martin Steinmann aptly sums up traditionalist design praxis as liable to "be simplistically divided into two categories: the first is related to the work it takes to create forms, while the second is related to the values with which the forms are invested. (...) In one, the idealistic view, tradition congeals into a set of forms with traditional connotations and that cannot be changed without removing the ground it stands on. In the other, tradition is something that is 'in flux'" (Steinmann 2003: 51).

To the Danish architect Kay Fisker, Steinmann argues, "tradition is not related to an 'image' to be preserved, and certainly not to the essence of a people reflected in that image; it is related to the material and intellectual conditions in which architects work. This includes the decision to use new means if they are superior to the old ones, but also not to use those means that are new or connote 'modernity' but are not better" (Steinmann 2003: 51). In other words, according to Steinmann, Fisker focused on the working methods of broad groups within construction culture rather than on static ideals.

The types of housing at Persoonshaven are part of a long tradition. They are widely seen to have originated in the 17th century. When Dutch urban dwellings ceased to be built of timber, they were typically designed as row housing with load-bearing brick cross walls. The width of houses was usually determined by the size of plots, which in turn was determined by the maximum span of timber beams, of around 6 meters. The timber sections were often reduced by adding a secondary load-bearing wall, the sleeper wall, separating the main dwelling rooms from the circulation bay containing the entrance, the hall, the stairways and (where present) kitchens and bathrooms. This type, initially for the wealthy elite, developed into a speculative multifamily model in which the circulation bay served small separated apartments, with or without sleeping alcoves. The width of that bay allows for two front doors side by side. This makes it possible to separate ground-floor dwellings from those on upper floors. These two doors allow variety within the type (Grinberg 1982: 27; Komossa 2010).

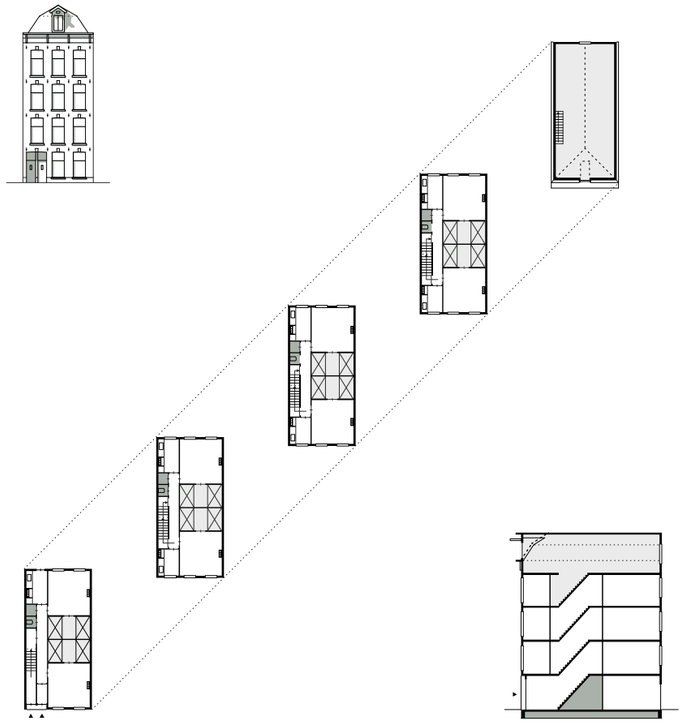
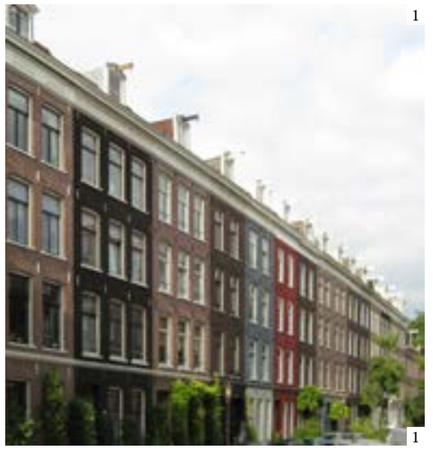


Diagram of nineteenth century house with two doors



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1: Late nineteenth century speculative house with two doors
2: Minimisation of wall thickness and space size
3: Exception proving the rule, house with two separated front doors

Thus the two-door house type manifests itself in considerably different ways. In the late 19th century, it was the common house type in the western Netherlands (chiefly the provinces of Utrecht and North and South Holland), suited to speculative mass housing with as many as 8 or 10 apartments per house. In such cases, one door would give access to the upper 6 or 8 units while the other door would open onto 1 or 2 apartments or even a workplace or shop. Differences in appearance (i.e. 'image') were minimal, though it was not uncommon for spec builders to 'sign' their buildings with their own carved keystones above windows. As well as in workers' housing, the principle was applied in more varied manifestations of the type for middle-class homes. In such variants the units were reduced to just two stacked maisonettes or apartments and their

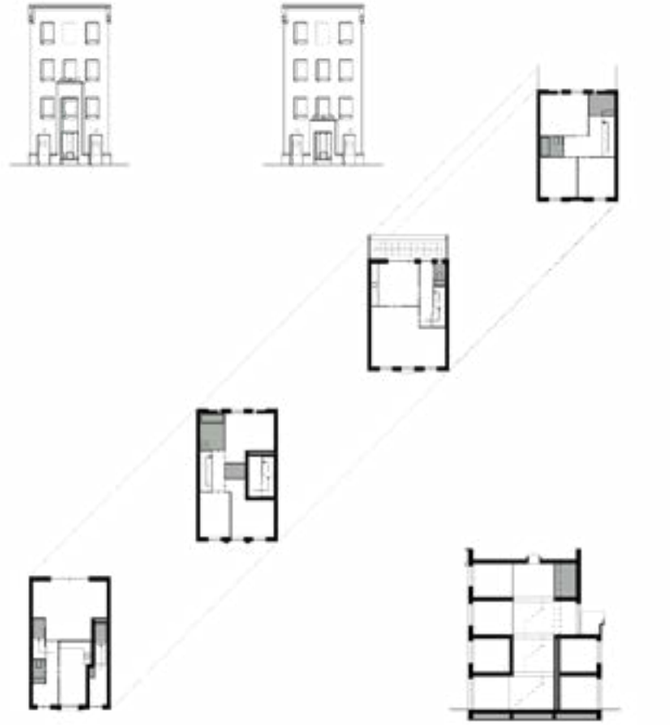
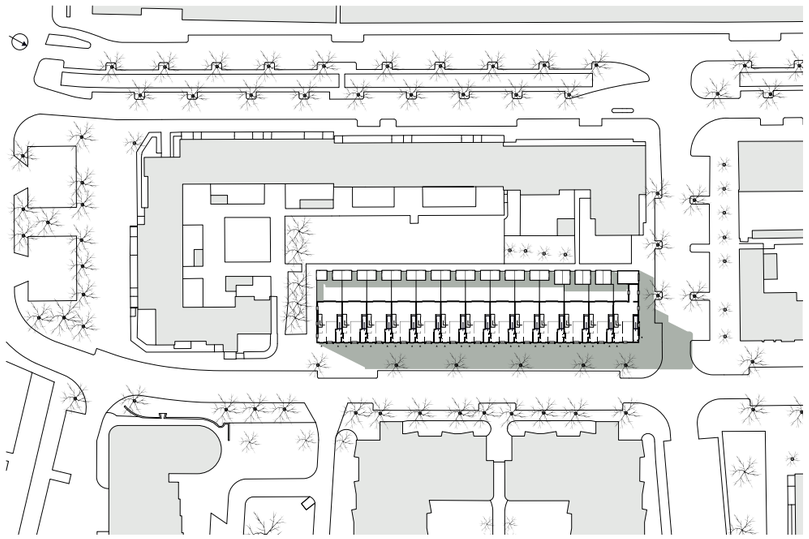


Diagram of Persoonshaven variant of house with two doors

Aerial view of the project site



Site plan

appearance was typically diversified. In both cases, the two front doors always marked the width of the circulation bay, introducing an asymmetry in an otherwise repetitive façade.

The two-door house was reintroduced in Feijenoord for good reasons. In the 19th century, the type had dominated speculative development in the area. Apart from urban and esthetic considerations, two-door houses with two stacked maisonettes had the clear benefit of avoiding difficult-to-manage circulation spaces, such as communal access decks and stairs. The street was assumed to regain its traditional status as a space for coming and going and meeting. After all, the street remains the arena where citizens learn, use and enjoy social codes.

But the design could not be directly copied from its precursors. After more than a century, building regulations had changed, requiring wide doors, meter cupboards, turning space for wheelchairs, etc. Modern concrete floors do not limit the spans of houses, so the secondary load-bearing cross wall has disappeared. It once sufficed to separate the staircases by a mere 70 mm wall, but today's sound insulation regulations require 300 mm walls. So the two front doors needed to be separated in the ground-floor plan, resulting in a symmetrical façade with the lower maisonette kitchen in the middle. It was as if the type were finally living up to its latent aspiration to symmetry. Because of the lack of direct historical references, this updated two-door house acquired a "generality" in its appearance, avoiding any a priori suggestion of wealth or lack of prosperity and suiting today's emancipatory ambitions in social housing.

The façades were developed with a comparable modus operandi. They are quite evidently made of brick, and again, what at first glance seems rooted in architectural tradition is actually different from centuries-old Dutch housing. The outer wall has evolved from a monolithic structure into an assembly of brick layers with insulation and a cavity in between.

Façade along Persoonshaven (Sebastian van Damme)

In 1991, Hans Kollhoff considered the resulting problem of tectonic plausibility in his essay *The Myth of Construction and the Architectonic*. This was 20 years after the oil crisis. Buildings were wrapped up in insulation and clad with all sorts of finishing materials. What we could name the "cold bridge modernism" which had been in vogue functioned no longer. According to Kollhoff, the separation of the outer façade layer from the main structure induced solutions which may be structurally sound but are less acceptable to the eye. In his words, the feel for the architectonic was at stake, whether a house "ultimately leaves an impression of solidity that gives me the feeling of being elevated. Or whether it constantly confronts me with details that call the house as a whole into question, in that components become independent, and I have to fear that everything will collapse like a house of cards" (Kollhoff 2010: 77).

Meanwhile, we may add, the meaning of the word "joint" is now at odds with its etymology. Today a joint separates building components rather than joining them. By contrast with the esthetic of three-dimensional joint patterns in the stonework of Palladio's renaissance villas, contemporary joints are strict technical requirements. They are there to allow thermal movement in the outer façade layer, detached from the main structure. Additionally, joints may be needed to separate different materials supplied and built by different subcontractors. Kollhoff again: "Maybe the silicon gun was the invention with the most impact on the second half of the 20th century" (Kollhoff 2010: 80).

Obviously uninterested in Kollhoff's objections, the Dutch architect Willem Jan Neutelings stirred matters up by stating that his buildings are born naked and then dressed up according to the prevailing trends: "The pattern of the materials may vary: one season it may be check, the next polka dot" (Van den Heuvel et al. 1997: 90). Façades, as Neutelings sees them, are consumer goods, regardless of sustainability, longevity, and appropriation by their owners.

At Persoonshaven, the response to this was a robust house design in which the plans, section and main façade are strongly interdependent (Van der Heijden 2016: 169). The façade is reciprocal

< Front facade with the spout ending the expansion joint (Sebastian van Damme)

> 1: Expansion joint as tectonic detail of the house 2: Manipulation of standard front door 3: Ressault and kitchen window 4: Detail of the rhythm of the Persoonshaven front façade (1-4: Sebastian van Damme)

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in its relationship with the structure, the building geometry and the type. Its look reflects the tectonic possibilities and restrictions of its main materials, in this case brick.

The Persoonshaven front façade has a regular rhythm of vertical windows, slightly modified by protruding brick features in the central axes. These ressauts, projecting by half a brick, introduce a degree of relief which was formerly common in the façades of row housing. The vertical expansion joint is articulated architecturally by bricks on edge, marking the load-bearing cross walls. In methodological terms, the design is a stable point of departure for further development, on the one hand defining the application of design solutions to different (and possibly unrelated) requirements, and on the other hand leaving room for negotiation in deciding on buildability.

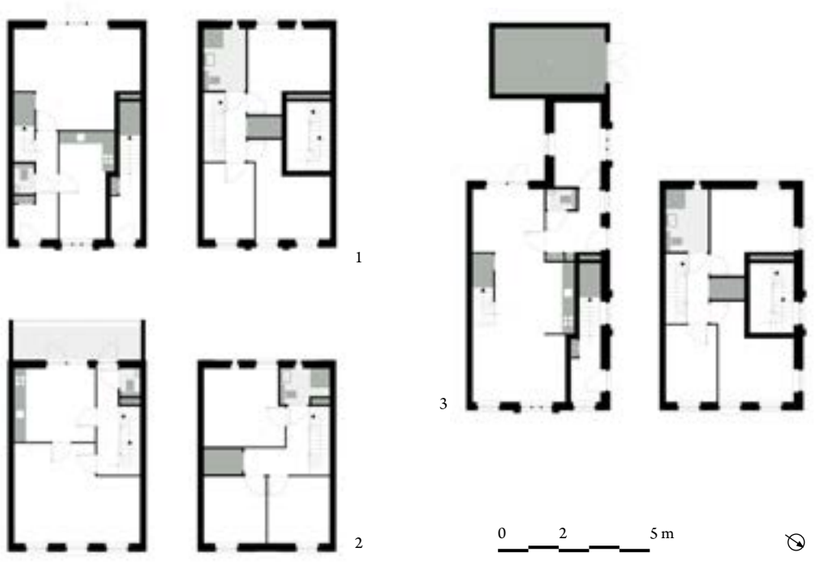
Sections and elevation of the façade

In this process of negotiation and design development, Dutch standard details were applied wherever possible. Only where appropriate, slight changes were introduced. The standard timber sections of the windows appear thinner than they are because they are partly concealed by the bricks of the façade. The back of the projecting bricks follows the general brickwork pattern and is easy to build. Timber battens were added to standard industrial front doors. The thinness of the steel railings was deliberately exaggerated in order to add fine details to a façade which is otherwise on the coarser scale of the human hand (bricks, timber window frames, sills, roof edges, and so on). Steel sections were bent to form curves. Welding was not used, again with cost-limiting effect.

For better or worse, in Dutch social housing practice, the micromanagement of construction sites is a phenomenon of the past. That is not to say that handcraft has disappeared from the construction industry altogether. The design question is rather one of where handcraft is to be found in construction nowadays.

So in the design process, the skills of carpenters in producing the formwork needed for prefabricated concrete were used to guide the site works from a distance. Eaves, copings, sills, and spouts (obligatory under Dutch building regulations and normally specified by structural engineers in technical terms) were drawn into the architectural realm and their relatively complex shapes were eventually produced with great precision. They are the ornaments of façades – tectonic details, as Kollhoff might say. Both concrete and steelwork presuppose a high degree of manufacturing expertise and quality management is restricted to specifications and form drawings and the assessment of production drawings and samples.

By contrast, brickwork benefits from the skills of the bricklayers that are still widely available on Dutch building sites. Brickwork is very much a bulk product and brick façades are cheap to produce. The design question is how to influence such standardized practice. At Persoonshaven several changes to this practice were proposed. Within the lower price range of bricks, a nuanced factory-made but quasi-handcrafted brick was selected. Laid with a random bond, its horizontal joints were pointed and deeply recessed whilst the vertical joints were minimized in size. This results in façade planes with deep orange tones and a strong texture. The tile bond of the protruding features also helps avoid any impression of bulk production.



1. Lower standard maisonette, ground and first floor plans
2. Upper standard maisonette, second and third floor plans
3. Lower corner maisonette, ground and first floor plans

It might be argued that architecture is always an act of imitation. But analogous design is different from literal copying in its use of historic precedent. The Persoonshaven project shows a design practice seeking to operate within the practice of Dutch construction culture. The design optimizes and engages critically with this rather than seeking to disregard or rework the culture in which it was conceived. The use of available types and building know-how contribute to affordability, buildability, acceptability, and sustainability. All such choices make these buildings analogous to those of the past rather than close copies of them.

By way of conclusion it is worth quoting Steinmann at length: "The essence of Danish architecture was once explained by the two types of people who inhabit the country: they are farmers, and farmers distrust new things. But they are also sailors, and sailors love to bring foreign things home. The history of Danish architecture is the history of foreign ideas that have influenced traditions in the country. (...) This image of the farmer and the sailor, which is more than just a metaphor here, addresses a fundamental condition of tradition: it is dependent on novelty that it cannot produce itself, just as novelty is dependent on tradition. It makes no sense, therefore, to wish to abolish the tension between them; in this tension they condition each other. In other words, tradition is only possible as a critical tradition – within this opposition" (Steinmann 2003: 57).

Steinmann's quote on Kay Fisker's praxis comes from his book *Forme Forte*. Does the title suggest an agenda, an a priori striving for strong form perhaps? Although the Persoonshaven design process is clearly akin to Fisker's approach and design methods, the form and appearance were never preconceived. And any such strong form is precluded by the two-door house design. Form is as much a consequence of a cultural reality as a representation of an ideal (Van der Heijden 2000: 110).

References | Referencias | Referências

Grinberg, Donald I. 1982. *Housing in The Netherlands*. Delft: Delft University Press.

Kollhoff, Hans. 2010. Der Mythos der Konstruktion und das Architektonische. In: Fritz Neumeyer (ed.), *Hans Kollhoff, das architektonische Argument, Texte und Interviews*. Zürich: gta Verlag.

Komossa, Susanne. 2010. *Hollands bouwblok en publiek domein, Model, regel en ideaal*. Nijmegen: Uitgeverij Van Tilt.

Steinmann, Martin. 2003. Die Tradition der Sachlichkeit und die Sachlichkeit der Tradition, Zur Architektur von Kay Fisker. In: Martin Steinmann, *Forme forte, Ecrits/Schriften 1972-2002*, 51. Basel, Boston, Berlin: Birkhäuser.

Van den Heuvel, Dirk; Kompier, Vincent; and Schuilding, Sanne. 1997. Interview with Willem Jan Neutelings. *Born naked*, Oase #47.

Van der Heijden, Hans. 2016. On the Eye and the Mind. In: Jan Peter Wingender (ed.), *Brick an Exacting Material*. Amsterdam: Architectura & Natura Press.

Van der Heijden, Hans. 2000. The diagram of the house. *Architectural Research Quarterly*, 5, 2.

Biography | Biografía | Biografia

Hans van der Heijden

Hans van der Heijden (The Hague, The Netherlands, 1963) is an architect with a portfolio of housing, urban design, re-use, cultural buildings, and research. He studied architecture and urban design at the Delft University of Technology. He co-authored four editions of the *Dutch Architecture Yearbook*. For the Rotterdam architecture platform AIR, he curated the debate series entitled *Architecture Cases*. He has been a professor in Cambridge and is lecturing at the Rotterdam Academy of Architecture. He is Honorary Visiting Professor of Contemporary Practice at Liverpool University and a member of the Design Board of Potsdam, Germany.

Fernando Vela Cossío

25 years of the Traditional Architecture Research Center

25 años del Centro de Investigación de Arquitectura Tradicional

25 anos do Centro de Investigação de Arquitetura Tradicional

Abstract | Resumen | Resumo

The Traditional Architecture Research Center (CIAT) is a science and technology center established by virtue of an agreement signed in 1996 by the Polytechnic University of Madrid and the town council of Boceguillas (Segovia province, Spain) for the performance of research, training and dissemination in the field of traditional architecture and construction, historic cities, cultural landscapes and built heritage. The helpfulness of Boceguillas town council, support from the Madrid Polytechnic University and its College of Architecture and funding from the development department of the government of Castilla y León and the EU Leader II Program (managed in this area by CODINSE) allowed the building that houses the center's headquarters to be refurbished and its activities to start up. It is celebrating its 25th anniversary in 2021.

El Centro de Investigación de Arquitectura Tradicional (CIAT) es un centro científico-tecnológico fruto del convenio suscrito en 1996 entre la Universidad Politécnica de Madrid y el Ayuntamiento de Boceguillas (Segovia, España) para el desarrollo de actividades de investigación, formación y difusión de los valores de la arquitectura y la construcción tradicionales, la ciudad histórica, el paisaje cultural y el patrimonio edificado. La excelente disposición del Ayuntamiento de Boceguillas, la ayuda recibida de la Universidad Politécnica de Madrid y de su Escuela Técnica Superior de Arquitectura, y la financiación recibida de la Consejería de Fomento de la Junta de Castilla y León y del Programa Leader II de la Unión Europea (gestionado en la comarca nordeste de Segovia por CODINSE) hicieron posible la rehabilitación del edificio que alberga su sede y el inicio de su programa de actividades, que celebra en 2021 su veinticinco aniversario.

O Centro de Investigação de Arquitetura Tradicional (CIAT) é um centro científico-tecnológico fruto do convénio subscrito em 1996 entre a Universidade Politécnica de Madrid e a Câmara Municipal de Boceguillas (Segóvia, Espanha) para o desenvolvimento de atividades de investigação, formação e divulgação dos valores da arquitetura e da construção tradicionais, da cidade histórica, da paisagem cultural e do património edificado. A excelente disposição da Câmara de Boceguillas, a ajuda recebida da Universidade Politécnica de Madrid e da sua Escola Técnica Superior de Arquitetura, e o financiamento recebido da *Consejería de Fomento* da Junta de Castela e Leão e do Programa Leader II União Europeia (gerido na comarca nordeste de Segóvia por CODINSE) tornaram possível a reabilitação do edifício que alberga a sua sede e o início do seu programa de atividades, que celebra em 2021 o seu vigésimo-quinto aniversário.

Veinticinco años después de su creación, materializada a través del convenio firmado entre la Universidad Politécnica de Madrid y el Ayuntamiento de Boceguillas (Segovia) en julio de 1996, el Centro de Investigación de Arquitectura Tradicional (CIAT) sigue firmemente comprometido en el estudio, la enseñanza y la difusión de los valores de la arquitectura y la construcción tradicional, la ciudad histórica, el paisaje cultural y el patrimonio edificado.

No resulta fácil resumir en unas pocas páginas el conjunto de actividades que hemos tenido oportunidad de desarrollar para el cumplimiento de nuestro compromiso desde entonces hasta el término del pasado 2020, un año marcado inevitablemente por las graves consecuencias de la epidemia mundial de COVID-19. Sin embargo, a pesar de las circunstancias tan adversas de los últimos meses, hemos seguido avanzando y dando continuidad a la misión que tenemos encomendada, de la cual este artículo desea ofrecer el sintético resumen y las referencias más importantes con relación a las actividades formativas (cursos y talleres), científico-tecnológicas (proyectos de investigación y seminarios) y de transferencia del conocimiento (conferencias, jornadas, publicaciones, etc.) que hemos llevado a cabo entre 1996 y 2020.

Sede del CIAT en la Plaza de España de Boceguillas, Segovia

Formación

Las actividades de carácter formativo se han desarrollado desde la creación misma del Centro, que ha promovido la celebración de ya más de un centenar de cursos y talleres. Habría que llamar la atención sobre los de "construcción con tierra", uno de los campos en los que más hemos trabajado, y los de "carpintería de armar", integrados en los propios Cursos de Verano de la Universidad Politécnica de Madrid con la participación de especialistas de gran prestigio internacional. Sin embargo, también nos hemos acercado a muchas otras temáticas, siempre transversalmente, entre las que se encuentran la Restauración de Monumentos, la Arqueología de la Arquitectura, la Historia de la Construcción, el Paisaje Cultural, el Patrimonio Vernáculo o incluso las Artes Plásticas. Muchos de estos cursos tuvieron lugar en nuestra sede de Boceguillas, pero se desarrollaron otros en localizaciones alternativas, como ha sucedido con los Talleres Hispano-Rumanos de Restauración, puestos en marcha con la Universidad Ion Mincu de Bucarest, y que se han celebrado alternativamente desde 2006 en Rumanía y en España, contando con la decisiva ayuda de los Ayuntamientos y otras instituciones de las localidades donde tuvieron lugar.

También hemos desarrollado actividades formativas dirigidas a estudiantes de Grado y Postgrado de la Universidad Politécnica de Madrid. Entre los primeros cabe destacar a los del Grado en Fundamentos de la Arquitectura, que participan de forma frecuente en los programas del Centro, y a los del Grado en Diseño de Interiores, que programa en el Centro actividades específicas, sobre todo relacionadas con la enseñanza del dibujo y la expresión gráfica y con la construcción y la tecnología.

Entre los cursos de Postgrado que han desarrollado actividades en el CIAT no podemos dejar de referirnos a algunos tan consolidados como el de Formación de Recursos Humanos en Cooperación para el Desarrollo de Asentamientos Humanos Precarios, promovido por el Instituto de Cooperación y Habitabilidad Básica (ICHAB) y la Cátedra UNESCO homónima;

Participantes en diferentes cursos de Técnicas Tradicionales de Construcción

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1: Taller de carpintería de armar
2: Taller de forja tradicional con el maestro Santiago Martínez Otero
(2: David Fuentes Diego)

el Máster en Medio Ambiente y Arquitectura Bioclimática (MAYAB); el Máster Universitario en Construcción y Tecnología de los Edificios Históricos (MUCTEH), promovido por el Departamento de Construcción y Tecnología Arquitectónicas; el Máster Universitario en Conservación y Restauración del Patrimonio Arquitectónico (MUCRPA); o el Máster en Diseño y Arquitectura de Interiores (MDAi), cursos todos ellos que imparte la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid.

Taller de Cantería con el profesor Miguel Sobrino en el CIAT

Investigación

El desarrollo de proyectos de investigación vertebra la actividad del CIAT desde su creación y ha constituido un ámbito preferente de nuestro día a día. El estudio de los materiales, técnicas y sistemas de la construcción tradicional y la investigación de la arquitectura popular y vernácula han sido los objetivos prioritarios de nuestro trabajo.

Los primeros proyectos que tuvimos oportunidad de desarrollar se llevaron a cabo con financiación de la Comisión Interministerial de Ciencia y Tecnología (CICYT). El primero, desarrollado en los años 1995 y 1996, se centró en el "Desarrollo de Técnicas de Intervención adecuadas para la recuperación de los muros de tapial en el patrimonio arquitectónico", financiándose como

Fuente de Aldeanovilla, excavada y documentada en uno de los talleres de arqueología del CIAT

una Acción Especial del Plan Nacional de I+D. A continuación, pusimos en marcha otra Acción Especial con la ayuda del Programa Nacional de Medio Ambiente para la "Determinación del rendimiento y coste energético en la construcción de cerramientos de fábrica de adobe, bloque de tierra comprimida y entramado, para su aplicación en proyectos de desarrollo sostenible y política medioambiental", que se terminó en 1998. La propuesta tenía como objeto la demostración científica de las ventajas de la construcción con tierra en sus aplicaciones actuales mejoradas, partiendo de las cualidades bioclimáticas y sostenibles que ya eran conocidas tradicionalmente. El trabajo se repartió entre el análisis constructivo de las viviendas tradicionales de la comarca Nordeste de Segovia y las pruebas de laboratorio en el Instituto Eduardo Torroja del CSIC, la Escuela de Arquitectura de Madrid, y las instalaciones del propio Centro de Investigación de Arquitectura Tradicional, cuyo ámbito geográfico y climático se utilizó como referencia.

Hemos trabajado también con la ayuda del CYTED, el Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo, creado en 1984 para fomentar la cooperación científica y tecnológica. Con su apoyo se puso en marcha la red PROTERRA, un proyecto nacido en 1998 cuyo primer objetivo era el de "promover y asesorar acciones que implicasen la utilización de la tierra como material de construcción". En el marco de este proyecto tuvo lugar la celebración de la Asamblea Internacional de PROTERRA y el II Seminario Iberoamericano de Construcción con Tierra (SIACOT), que se desarrollaron en la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid y en el CIAT en septiembre de 2002, lo que fortaleció de forma decisiva la actividad del CIAT al ámbito de la investigación en el campo de la construcción con tierra cruda.

En este campo hemos trabajado en iniciativas tan importantes como el "PROYECTO SOS TIERRA" (2014-2018), liderado por investigadores de la Universidad Politécnica de Valencia con la participación de especialistas de la Universidad Politécnica de Cataluña, la Universidad de Granada, la Universidad de Sevilla, la Universidad Politécnica de Cartagena y la Universidad Politécnica de Madrid, financiado por el Ministerio de Economía y Competitividad bajo el título "La restauración y rehabilitación de arquitectura tradicional de tierra en la Península Ibérica. Líneas guía y herramientas para una intervención sostenible" y que enlaza con proyectos anteriores, como el "PROYECTO RESTAPIA" (2010-2014), centrado en "La restauración de la arquitectura de tapia en la Península Ibérica. Criterios, técnicas, resultados y perspectivas", impulsado por el mismo equipo y centrado en el estudio de la restauración del Patrimonio

monumental construido mediante el empleo de la técnica del tapial, un campo de investigación en el que el CIAT ya venía trabajando desde la década de 1990.

Por otra parte, desde el año 2009 hemos trabajado de forma sistemática en la elaboración del inventario y el catálogo de la arquitectura tradicional de distintos municipios de la Sierra Norte de la Comunidad de Madrid, en la cual nos encontramos en este momento desarrollando el estudio del paisaje cultural y el Patrimonio edificado del municipio de Montejo de la Sierra, donde se han conservado muestras muy representativas del "arte de la construcción de la piedra seca", declarada Patrimonio de la Humanidad en diciembre de 2018. Estos trabajos de inventario y catálogo –que arrancaron con un proyecto para el estudio del Patrimonio arquitectónico de carácter etnográfico de los municipios de Torremocha de Jarama, Torrelaguna, Redueña y El Atazar, en el marco del Programa de ayudas públicas a Universidades madrileñas para realizar proyectos y estudios de documentación sobre el Patrimonio Histórico de la Comunidad de Madrid– han tenido desde entonces continuidad por encargo de la Dirección General de Patrimonio Cultural de la Comunidad de Madrid, a la que queremos agradecer la confianza que ha depositado en nuestro equipo.

También hemos participado en la redacción del *Plan Especial de Patones de Arriba*, elaborado entre 2009 y 2015 para la gestión de uno de los conjuntos protegidos más señalados en el campo de la arquitectura popular de la Comunidad de Madrid, un trabajo que enlazamos en los años 2014 y 2015 con el del estudio tipológico de la arquitectura tradicional del área madrileña del Parque Nacional de la Sierra del Guadarrama, para la que propusimos un avance de ordenanzas estéticas de aplicación en sus municipios. Y también hemos tenido en esta etapa la oportunidad de participar en el estudio de los restos del primitivo molino de papel de la Cartuja de El Paular, en Rascafría (2017-2018), un interesantísimo conjunto preindustrial hidráulico que abastecía a las imprentas madrileñas en los siglos XVII, XVIII y XIX.

Aplicación de muestras de revoco con diferentes granulometrías de arena local y varios pigmentos naturales

Durante los años 2012 y 2013 llevamos a cabo igualmente el estudio sistemático de los recursos de Patrimonio cultural de la Mancomunidad de municipios de "Nuestra Señora de Hornuez", un exhaustivo trabajo con financiación de la Unión Europea (programa Leader) que ha tenido como principales resultados, además de la actualización del propio inventario del Patrimonio cultural edificado, la elaboración de un diagnóstico de paisaje de los dieciocho núcleos correspondientes a los doce municipios que la integran, la edición de un documental en formato DVD que, bajo el título *En primera persona: el Patrimonio de la Tradición en la Mancomunidad de Hornuez* (Segovia) (Fundación Diego de Sagredo, 2019), permite acercarse al Patrimonio de carácter inmaterial de esta comarca y, finalmente, la publicación del libro *Paisaje y Patrimonio en el nordeste de Segovia. La Mancomunidad de Hornuez* (Fundación Diego de Sagredo, 2021).

Arquitectura tradicional en Valdevarnés

Transferencia del conocimiento

La función social de la Ciencia constituye uno de los grandes paradigmas de nuestro tiempo. Nadie puede dudar que la educación y la investigación son cruciales para el bienestar y el desarrollo, de la misma manera que la innovación y la transferencia de los resultados obtenidos en las universidades y en los demás organismos públicos de investigación resultan ser de una importancia decisiva para nuestro futuro. La transferencia del conocimiento comprende un extenso conjunto de actividades dirigidas a la difusión y la aplicación de los hallazgos, las experiencias y las capacidades en investigación, desarrollo e innovación (I+D+i) fuera del ámbito académico, tanto por los distintos sectores productivos como por nuestras administraciones públicas. La transferencia no debe confundirse con la simple transmisión del conocimiento mediante la publicación, la divulgación o la enseñanza; sino que se trata, sobre todo, de incorporar el conocimiento a una cadena de valor para que genere un verdadero retorno a la comunidad.

Desde el CIAT, en la línea señalada por la Universidad Politécnica de Madrid para dar traslado a los sectores productivos del conocimiento científico-tecnológico que se produce en el seno de la comunidad universitaria, podemos contribuir a distintos niveles y en muy diversos foros, de manera que nuestras instituciones, los diferentes agentes públicos y privados y toda la sociedad en su conjunto puedan hacer suyos, en último término, los resultados del trabajo que hacemos. Deseamos colaborar a esa misión haciendo nuestro el conocido lema "piensa globalmente, actúa localmente" y queremos informar y contribuir a concienciar a los ciudadanos sobre los principales desafíos a los que se enfrenta nuestro Patrimonio Cultural, un valioso legado compartido que, si se protege, se conserva y se gestiona bien, puede también ayudar a paliar algunos de los graves problemas que, como el de la despoblación del medio rural, tanto nos preocupan en el momento actual.

Paisaje en la zona noreste de la provincia de Segovia. Vista de Barahona de Fresno

Si bien durante estos veinticinco años se han desarrollado actividades de transferencia muy diversas, cabe resaltar la activa participación del CIAT en la redacción del *Plan Nacional de Arquitectura Tradicional*, un documento de referencia elaborado desde el año 2010 por la Subdirección General del Instituto del Patrimonio Cultural de España (IPCE), dependiente de la Dirección General de Bellas Artes del Ministerio de Cultura y Deporte. Nuestro compromiso en la elaboración misma del Plan, que fue aprobado en el año 2014, y también para el desarrollo de su seguimiento, ha sido firme y constante. Fruto de esta labor puede reseñarse la publicación de la *Declaración de Boceguillas. Principios para el estudio, la protección y la conservación de la Arquitectura Tradicional* (Nobuko, 2012), publicada en español, inglés, francés e italiano, como resultado de los encuentros internacionales promovidos por el Centro con el apoyo de la Fundación Diego de Sagredo, en los que participaron importantes investigadores, gestores, profesores y otros especialistas de este campo del conocimiento.

Entre las actividades de difusión que hemos llevado a cabo puede destacarse nuestra participación en algunas exposiciones, como la gran exposición que sobre la obra del arquitecto Francis Kéré, nacido en Burkina Faso y formado en Alemania, se celebró en las salas del Museo ICO, en Madrid, del 3 de octubre de 2018 al 20 de enero de 2019. Bajo el título de "Francis Kéré. Elementos Primarios", el profesor Luis Fernández-Galiano, comisario de la exposición, proponía como estructura principal de la muestra la relación de la obra de Kéré con los elementos primarios de la Arquitectura identificados por el arquitecto y estudioso alemán Gottfried Semper en el siglo XIX. Entre estos elementos primarios se encontraba el muro y la gran plataforma de adobe construidos por los estudiantes de Arquitectura del "III Curso- Taller de Construcción con Tierra" que tuvo lugar en nuestra sede de Boceguillas en julio de 2018.

También debe mencionarse la muestra "El corredor ferroviario del Directo Madrid-Burgos: una ventana al Patrimonio", celebrada en la Escuela Técnica Superior de Ingenieros Industriales y en la de Ingenieros de Caminos, Canales y Puertos de la Universidad Politécnica de Madrid en los meses de marzo y abril de 2019, y que constituye uno de los resultados del proyecto de investigación "Los conjuntos patrimoniales como activos turísticos de la Comunidad de Madrid. Problemas y oportunidades en perspectiva territorial". Esta exposición sirvió para acercar al público a la dimensión patrimonial de este corredor ferroviario desde una perspectiva territorial, señalando los principales elementos del valioso legado natural y cultural de las áreas por las que transcurre, todas ellas de un altísimo valor paisajístico, en las que se integran bienes de muy distinta naturaleza que permiten realizar un recorrido histórico muy representativo y de larga duración

En este sentido, nos sentimos especialmente orgullosos de la estrecha colaboración que mantenemos tanto con los Ayuntamientos de los municipios en los que trabajamos como con otras importantes instituciones provinciales (Diputación Provincial de Segovia, Instituto de la Cultura Tradicional Segoviana "Manuel González Herrero", Real Academia de Historia y Arte de San Quirce de Segovia), pero también regionales, nacionales, europeas e iberoamericanas, con el convencimiento de que una de las labores más importantes en el campo de la investigación es la propia transferencia de resultados, para lo cual es imprescindible construir y fortalecer los cauces que permitan una comunicación fluida y permanente entre la comunidad científica y la sociedad civil.

El equipo de profesores e investigadores vinculado al CIAT constituye, naturalmente, nuestro activo más importante. Con su esfuerzo, su trabajo infatigable y su ilusión hacen posible el cumplimiento de todos nuestros objetivos. A todos, desde aquellos que tienen mayores responsabilidades en la planificación y la programación de nuestras actividades hasta los que contribuyen a las mismas como conferenciantes, colaboradores o invitados, queremos agradecerles el compromiso y el apoyo que han dado al proyecto.

En este sentido, no puedo dejar de incluir aquí unas palabras de especial recuerdo, reconocimiento y gratitud a Luis Maldonado Ramos (1957-2017), catedrático de construcción de la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid, con quien tuve el privilegio de compartir la creación y la dirección del CIAT hasta su toma de posesión como Director de la Escuela de Arquitectura en el año 2008. Fallecido el 21 de agosto de 2017, Luis desarrolló una parte substancial de su trabajo como investigador en el campo de la arquitectura y la construcción tradicionales, dirigiendo importantes proyectos en el ámbito de la construcción con tierra, en el que era uno de los grandes especialistas españoles. Maestro de arquitectos, dejó innumerables testimonios gráficos sobre la Arquitectura Popular de muchas provincias españolas y, de forma muy destacada, sobre la Construcción Tradicional de la Sierra de Ayllón, a la que dedicó su Tesis Doctoral, centrada en el estudio de la Arquitectura Negra de Guadalajara y defendida en el año 1989. Gracias a la generosidad de Sandra Arpón de Mendívil, su mujer, y de Alejandra, Luis y María, sus hijos, la Fundación Diego de Sagredo y el CIAT son hoy los depositarios de su biblioteca profesional y de su interesantísimo archivo fotográfico. Su legado académico, intelectual y humano nos acompañará siempre.

Arquitectura popular en Valdevacas de Montejo

Para terminar, deseo dejar constancia de nuestro agradecimiento a las instituciones que han hecho posible el desarrollo del proyecto desde su creación: el Ayuntamiento de Boceguillas (Segovia), la Diputación Provincial de Segovia, la Consejería de Fomento de la Junta de Castilla y León y la Unión Europea, a través del Programa Leader, gestionado en nuestra comarca por la Coordinadora para el Desarrollo Integral del Nordeste de Segovia (CODINSE). La Fundación Diego de Sagredo ha aportado al proyecto su biblioteca y su fondo documental, continuamente enriquecido desde entonces con las donaciones y las adquisiciones de los profesores, investigadores y colaboradores del centro. El respaldo de la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid y el apoyo de todas estas instituciones ha hecho posible el desarrollo de un programa de actividades fructífero y provechoso, del que dejan cumplida constancia las memorias de actividades que se han publicado (1996-2010 y 2011-2020).

La ilusión y el esfuerzo de muchos han logrado poner en marcha un proyecto que sigue al servicio de los mismos ideales que lo hicieron posible y que le han dado sentido: el estudio, la comprensión, la protección y la difusión de los valores de la tradición que integran y dan forma a un Patrimonio Cultural complejo y compartido, que se expresa a través del Paisaje, la Arquitectura y la Construcción. Contribuir a la conservación de ese valioso legado ha sido, y seguirá siendo, la misión más importante del Centro de Investigación de Arquitectura Tradicional.

Biography | Biografía | Biografia

Fernando Vela Cossío

Doctor en Geografía e Historia por la Universidad Complutense de Madrid. Es Catedrático del Departamento de Composición Arquitectónica de la Escuela Técnica Superior de Arquitectura de la Universidad Politécnica de Madrid, donde enseña Historia de la Arquitectura y el Urbanismo y Arqueología de la Arquitectura. Arqueólogo profesional en ejercicio desde 1988, ha dirigido trabajos de excavación arqueológica y de investigación histórica en yacimientos, monumentos y conjuntos históricos en España y en Iberoamérica. Es director del Centro de Investigación de Arquitectura Tradicional (CIAT), miembro de número del Instituto del Patrimonio Cultural de la Universidad Ricardo Palma (Perú) y académico correspondiente de la Real Academia de Historia y Arte de San Quirce de Segovia, del Instituto de España.

La iglesia de Nuestra Señora de la Asunción en Castillejo de Mesleón

Aritz Díez Oronoz, Imanol Iparraguirre Barbero

The Architect's Drawing

El dibujo del Arquitecto

O desenho do Arquiteto

Abstract | Resumen | Resumo

In this article, drawing is described as one of the main tools an architect has to face the delicate situation that their trade is currently going through, for it serves as a medium to channel their own concerns and transcend the pragmatism that dominates the profession. They are the spear and the shield used to defend the values of Architecture, to protect the strength of their own work, their way of understanding and feeling the trade, and the way to keep a bond of continuity with the old masters upon which our work inevitably rests.

El dibujo se presenta en este escrito como una de las principales herramientas del arquitecto para hacer frente a la delicada situación en la que se encuentra actualmente su oficio, ya que es el medio por el que encauzar las propias inquietudes y trascender el pragmatismo que domina en la profesión. Se trata de la lanza y el escudo con los que defender los valores de la Arquitectura, con los que custodiar la fortaleza del propio trabajo, del propio modo de entender y sentir el oficio, además de la forma de mantener un vínculo de continuidad con todos aquellos antiguos maestros sobre los que descansa inevitablemente nuestra labor.

O desenho apresenta-se neste escrito como uma das principais ferramentas do arquiteto para lidar com a delicada situação na que se encontra atualmente o seu ofício, já que é o meio pelo qual encaminhar as próprias inquietudes e transcender o pragmatismo que domina na profissão. Trata-se da lança e do escudo com os que se pode defender os valores da Arquitetura, com os que se pode custodiar a fortaleza do próprio trabalho, do próprio modo de entender e de sentir o ofício, para além da forma de manter um vínculo de continuidade com todos aqueles antigos mestres sobre os que repousa inevitavelmente o nosso labor.

La delicada situación en la que se encuentra hoy la Arquitectura se manifiesta en la ausencia de un mínimo acuerdo sobre lo que ésta representa y la relación que establece con cuanto ha significado hasta ahora. El espíritu técnico que la invade, la insistencia de las instituciones por disolverla e integrarla entre las ingenierías, su creciente normativización, incluso el desacierto de algunos sectores del propio oficio por fragmentarla, ya sea por escalas o por antigüedad –urbanismo y arquitectura, obra nueva y restauración–, y de cosificarla mediante adjetivaciones perversas –bioclimática, pasiva, paramétrica … – ha dinamitado su significado, hasta el punto de volverla irreconocible.

Coincidimos con Teodoro Anasagasti cuando señalaba hace ya casi un siglo que la arquitectura "es en sus principios esencial" y que con la "baraúnda de tanta preparación –con la carga de tantos apéndices técnicos y obstáculos normativos, actualizaríamos nosotros– se la deprime y aniquila" (Anasagasti 1995: 174). Tal nos parece que sigue ocurriendo, de un modo más intenso y normalizado si cabe, tanto en la enseñanza en nuestras escuelas como en el ejercicio diario del oficio. Enseñanza y oficio que, frente a la amenaza que supone la continua parcelación y ultraespecialización de los conocimientos que forman parte la Arquitectura, deberían buscar certezas, reagruparse en torno a los tres pilares que han servido de fundamento a nuestro oficio desde sus orígenes: el dibujo, el proyecto y la construcción, a los que el resto de conocimientos –cuyo valor no negamos– deberían servir y estar subordinados. La historia y la composición, entendidas como soporte activo del oficio, subordinadas al dibujo y al proyecto, y el resto de los conocimientos técnicos, en cuanto disciplinas útiles para resolver las funciones y problemáticas concretas de la arquitectura, a la construcción.

Fig. 1. *Elisha in the Chamber on the Wall*, William Blake, 1820. Grafito y acuarela sobre papel (Londres: Tate Britain)

Este equilibrio –ahora roto–, que consideramos indispensable a la hora de transmitir una idea concreta de nuestro oficio a las siguientes generaciones de arquitectos, cobra más importancia al afrontar el propio ejercicio del oficio con responsabilidad y coherencia. Frente a la técnica y la burocracia, que han desvirtuado nuestro trabajo al expandir hasta lo inconcebible las tareas normativas y administrativas, resulta imprescindible buscar puntos de apoyo, soportes con los que dar espacio, y sobre todo tiempo, a un ejercicio pausado y consciente del oficio.

Es en este contexto que consideramos indispensable el papel del dibujo para la labor cotidiana del arquitecto. Hablamos de un dibujo entendido más allá de su cometido más pragmático –el de definir y comunicar el proyecto–, desempeñado como fin en sí mismo. Se convierte así en un medio por el que encauzar el "pensar de los ojos" y el "pensar de la mano" (Spengler 1947: 30), con el que dar espacio y vida a las ideas, con la que superar y trascender los cometidos mundanos ajenos a cuanto significa y requiere la arquitectura a los que nos intenta circunscribir la profesión. Ese dibujo –en esto no hay duda– para su gestación exige tiempo, un desarrollo pausado, una labor en cierta medida solitaria, en la que nos asemejamos a la figura de la Elisha de William Blake, recogida en su estudio, flexionada sobre la mesa e iluminada y acompañada por las musas (Fig.1).

Se trata en definitiva de una *forma mentis* ajena al sentido utilitarista y mercantilista que lo invade todo: "El hombre moderno, universal, es el hombre apurado, no tiene tiempo, es prisionero de la necesidad, no comprende que algo pueda no ser útil; no comprende tampoco que, en el fondo, lo útil puede ser un peso inútil, agobiante" (Ionesco 1961). Resulta evidente que este sentido limitado de la "utilidad" ha hecho mella –como en tantos otros oficios otrora también honrados– en la Arquitectura, y se ha llevado consigo casi todo cuanto nuestro oficio tiene de humano, de importante para la vida (Kallifatides 2019: 29).

El Dibujo se presenta en este sentido como bálsamo sanador, capaz de convertir aquello que busca en algo hecho mirando con el alma, y tiene un fin concreto, el proyecto. Parafraseando a Paul Valéry, es capaz de transformar ese "principio que se llama utilidad" por "eso que se busca bajo el nombre de belleza" (Valéry 2000: 65), capaz de protegernos de una cotidianeidad que se presenta, ahora más que nunca, embrutecedora, a través del cultivo pausado de un camino propio.

Y es que la doble condición de nuestro oficio, su equilibrio entre los valores y el fin material de la arquitectura, se refleja también en el dibujo. Una característica propia del dibujo del arquitecto es, de hecho, la de tener un claro valor artístico –estético– sirviendo al mismo tiempo como un documento técnico –pragmático–. Esto tiene inicio en el Renacimiento, gracias a una profunda renovación del modo de concebir el espacio que se remonta al *Trecento* italiano y que fue desarrollada a lo largo del *Quattrocento*, cuando cristalizó en unas precisas leyes geométricas que hoy día conocemos como perspectiva lineal (Panofsky 1927). Gracias a esta revolución, con decisivas consecuencias también para la definición de la figura del arquitecto, la representación del espacio arquitectónico se liberó del pragmatismo que la acotó durante la Edad Media y se abrió a nuevos y fecundos recorridos. De limitarse a las funciones estrictamente constructivas a las que estaba ligada –trazas de montea, replanteos geométricos, dibujos de cantería, etc…– el dibujo pasó a postularse como uno de las principales herramientas para la reflexión de los arquitectos e impulsó tanto la renovación artística del Renacimiento como el éxito de la representación espacial de la arquitectura.

Gracias a las primeras pinturas en las que la belleza propia del espacio se constituye en uno de los principales objetivos del artista, la Arquitectura misma se convirtió en un objeto de representación. No es casual la difusión que tuvieron a lo largo del Renacimiento las arquitecturas pintadas –*architetture ficte*– que muestran el interés y el valor que tomó la arquitectura durante este renacer de las artes y la cultura europea (Chastel 1965: 9). Como muestra de ello: las ciudades idealizadas de Roma o Jerusalén situadas en los fondos de las pinturas de Masaccio o Mantegna, las todavía misteriosas perspectivas urbanas de las *Città Ideali* de Urbino, Baltimore y Berlín (Fig. 2), las hermosas escenografías arquitectónicas de las pinturas de Piero della Francesca o los relieves con fondos urbanos de Francesco di Giorgio, e incluso verdaderos manifiestos de una nueva idea de la Arquitectura como son el templo de los *Desposorios de la Virgen* de Rafael Sanzio o su utilización del interior del nuevo San Pedro como fondo escénico de *La Escuela de Atenas*.

Fig. 2. *La Ciudad Ideal*, Fra Carnevale (atribuido). 1480. Témpera sobre tabla (Baltimore: Walters Art Museum)

Al mismo tiempo que la representación del espacio en la pintura se estructuraba en reglas precisas, el dibujo de arquitectura se vio influido por una lógica geométrica análoga que consiguió unificar el sistema de representación en la arquitectura. Este sistema, recuperado de Vitruvio por Leon Battista Alberti, fue también recogido por Rafael Sanzio en los tres *modi* que enunció en su carta al Papa León X: "la pianta, o –vogliam dire– el dissegno piano; la seconda si è la parete di fuora, con li suoi ornamenti; la terza è la parete di dentro, pur con li suoi ornamenti" (Visconti 1840: 31). Esto es: la planta, la fachada y la sección, las tres proyecciones ortogonales del espacio que desde entonces han constituido la esencia y característica más particular del dibujo del arquitecto. Unos *modi* que, sin duda, tenían mucho que ver con las tres *species dispositiones* descritas por Vitruvio –tomadas a su vez de las *ἰδέαι* griegas– que eran: la *ichnographia* o planta, la *orthographia* o alzado, y la *scaenographia* o perspectiva (Vitruvio 1.2.2)[1].

De este modo, el dibujo arquitectónico se instituyó como un motivo autónomo en el que la belleza misma del dibujo y su eficacia para expresar el espíritu de las arquitecturas pensadas se convertían en un objetivo ineludible para el arquitecto. A partir de este momento, el edificio construido dejó de ser el único testimonio tangible de su labor y el dibujo sirvió a los arquitectos como puente para superar –al menos sobre el papel– los plazos y obstáculos de la obra, incluso para idear y dejar constancia de proyectos cuya realización se antojaba una quimera.

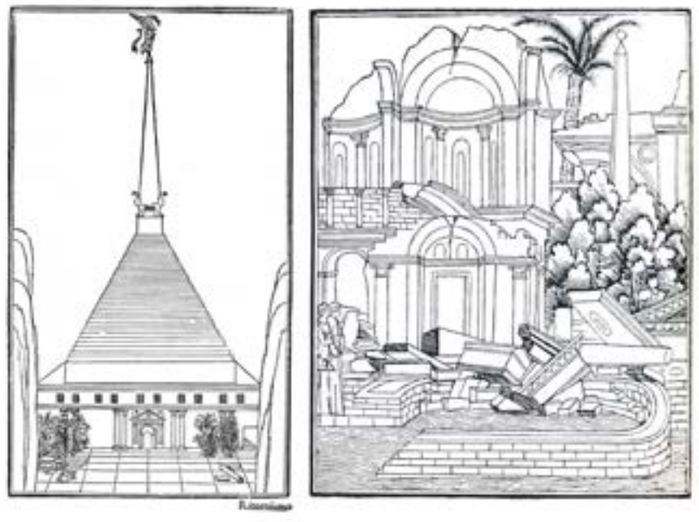

Fig. 3. Arquitectura onírica: edificio en pirámide con obelisco y paisaje con edificios en ruinas, *Hypnerotomachia Poliphili*, Francesco Colonna, 1499. Xilografía

La importancia tomada por el dibujo arquitectónico multiplicó las maneras en las que la arquitectura podía ser transmitida y difundida: las arquitecturas imaginarias podían superar los límites materiales impuestos por la construcción, los proyectos frustrados quedaban documentados gracias a sus dibujos preparatorios, incluso las arquitecturas perdidas podían volver a la luz a través de su reconstrucción gráfica. Basten como ejemplos precoces de estas nuevas posibilidades las arquitecturas oníricas del anónimo ilustrador de la *Hypnerotomachia Poliphili* (Colonna 1499) (Fig.3), o el provecho obtenido de esta nueva herramienta de expresión por Sebastiano Serlio o Andrea Palladio, de cuyas arquitecturas tendríamos una visión muy parcial si no fuera por la publicación de sus tratados (Serlio 1537-1551; Palladio 1570).

Fue el mismo Serlio quien dejó por escrito el lamento sobre lo ingrato de nuestro oficio si se tiene en cuenta aquello que uno es capaz de idear y lo poco que finalmente se realiza[2], abrumado por las dificultades que plantean la circunstancias para llevar a término las ideas y proyectos que se nos presentan. El dibujo actúa para Serlio, al igual que lo hace para nosotros, como consuelo frente a una realidad del oficio que a menudo se presenta frustrante y embrutecedora, como recurso por el que ver en parte consumados aquellos proyectos que desde el inicio se intuye que quedarán confinados al papel (Fig.4).

Fig. 4. Arquitectura en ruinas: portada del Libro III de *I Sette libri dell'architettura*, Sebastiano Serlio, 1540.

Desde estos orígenes comenzó un emocionante recorrido en el que el dibujo, entendido en el sentido hasta ahora descrito, acompañó al arquitecto en su oficio como herramienta con la que pensar y expresar su visión de la Arquitectura. Resultaría abrumador señalar siquiera los ejemplos más sobresalientes de esta historia del dibujo arquitectónico: desde las variaciones tipológicas del tratado de Francesco di Giorgio, a las plantas, oportunamente idealizadas, de las villas y palacios de Andrea Palladio; las arquitecturas confinadas al papel de Étienne-Louis Boullée, Claude-Nicolas

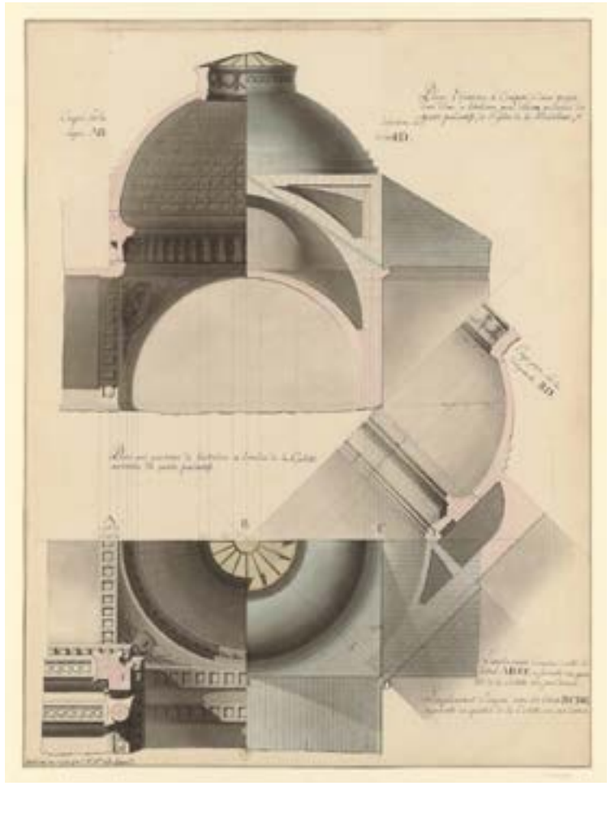

Fig. 5. *Proyecto de una cúpula a la italiana para la iglesia de la Madeleine en Rouen*, Jean-Jacques Lequeu, 1775. Tinta y acuarela sobre papel (París: Biblioteca Nacional de Francia)

Ledoux o Jean-Jacques Lequeu (Fig.5); las arquitecturas compendiadas en los tomos del *Sammlung architektonischer Entwürfe* de Karl Friedrich Schinkel (Fig.6); los precisos y muy hermosos dibujos técnicos de Henri Labrouste –testimonio de hasta qué punto la técnica y la construcción pueden aportar a la belleza de la Arquitectura (Fig.7)–; las síntesis constructivas de Choisy; las axonometrías invertidas de James Stirling; el grafismo *naif* de Aldo Rossi o los precisos alzados de Giorgio Grassi. Cualquiera de ellos podría encabezar el elenco de aquellos dibujos que aportan un trazo particular a este relato gráfico de nuestro oficio y que para nosotros están entre los más queridos.

Es evidente que en todos ellos queda implícita la voluntad de ir más allá del proyecto representado, pues subyace en ellos una voluntad por perseguir la belleza del propio dibujo y de reivindicar, con insistencia, una idea al mismo tiempo propia y universal de la Arquitectura. Reflejan una decisión consciente de no limitarse simplemente al dibujo, y mucho menos a los aspectos más pragmáticos del proyecto, sino de transmitir el propio modo de sentir el oficio, de modelarlo a través de la práctica del dibujo.

Todo dibujo realizado con pasión contiene esta componente que transciende su materialidad, que supera el plano más pragmático de la profesión y que entronca con la esencia de nuestro oficio. Se trata de una componente intangible, inefable, difícil de transmitir de un modo que no sea a través del propio dibujo, que es inherente a su expresión y que representa su verdadero valor. "Se dibuja con la mente y no con las manos" declaraba irritado Miguel Ángel en una misiva a uno de sus comitentes (Buonarroti 1542). Esta es justamente la esencia de la cuestión: el dibujo arquitectónico pensado en este sentido no se fundamenta en el uso de la mano –del ordenador, en términos actuales– sino que se dibuja con el apoyo y estímulo de todas las reflexiones, ideas, valores y sentimientos que cada uno hace propios con esfuerzo y perseverancia y que finalmente terminan por plasmarse, a través de la herramienta, embebidos de los valores intangibles que constituyen la esencia y belleza de los dibujos.

Fig. 6. *Perspectiva de la iglesia de Friedrichswerder en Berlín, Sammlung architektonischer Entwürfe*, Karl Friedrich Schinkel. 1820-40. Grabado a tinta sobre papel

Pues, como señala Oswald Spengler en su célebre ensayo *El Hombre y la Técnica*, "no se trata de la fabricación de cosas" –de herramientas, debe entenderse en su contexto–, "sino del manejo de ellas; no se trata de las armas, sino de la lucha" (Spengler 1947: 15). El dibujo se presenta en este contexto como lanza y escudo con los que defender los valores de la Arquitectura, con los que custodiar la fortaleza del propio trabajo, del propio modo de entender y sentir el oficio.

En definitiva, no se trata de esa cuestión técnica, a la que tozudamente se trata de reducir la Arquitectura en nuestro tiempo. No se trata tampoco de un problema circunscrito a los medios materiales por los que se expresa el dibujo de arquitectura, sino de los fines y valores que subyacen en ella. Como jóvenes arquitectos comprometidos con el futuro de nuestro oficio, defensores de una continuidad en la experiencia de la arquitectura, creemos realmente importante reivindicar esta idea del dibujo arquitectónico como un valor actual. Defender que este modo de entender la

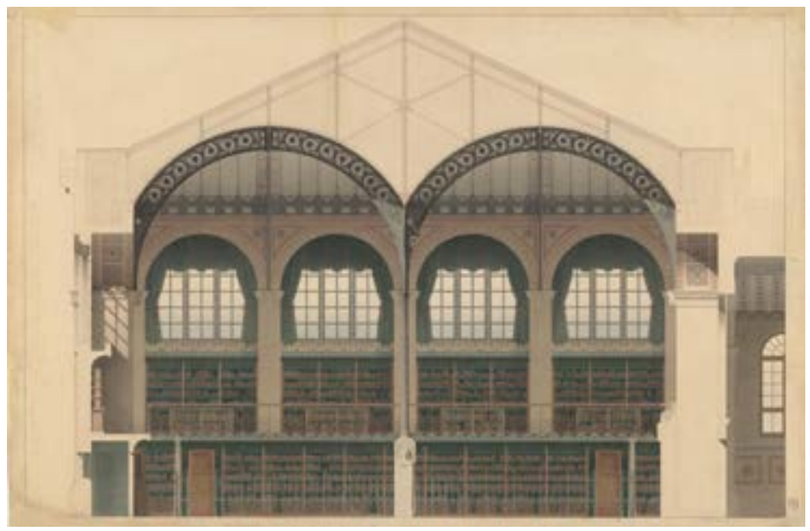

Fig. 7. *Sección transversal de la biblioteca de Sainte-Geneviève en París*, Henri Labrouste, 1838-50. Grafito y acuarela sobre papel (París: Biblioteca Nacional de Francia)

Arquitectura y su principal medio de expresión, el dibujo, forma parte de la esencia de nuestro oficio desde sus orígenes, constituye el principal vínculo que nos une con los grandes maestros desde el Renacimiento hasta hoy en día y representa la principal herramienta de salvaguardia frente una realidad cada vez más extraña y adversa, ajena a cuanto ha representado y debe seguir significando este arte al que nos entregamos, la Arquitectura.

[1] El texto original en latín dice así: *Species dispositionis, quae graece dicuntur ideae, sunt hae: ichnographia, orthografia, scaenographia. Ichnographia est circini regulaeque modice continens usus, e qua capiuntur formarum in solis arearum descriptiones. Orthographia autem est erecta frontis imago modiceque picta rationibus operis futuri figura. Item scaenographia et frontis et laterum abscendentium adumbratio ad circinique centrum omnium linearum responsus* (Vitruvio 1.2.2).

[2] Las palabras de Serlio dicen así en el texto original del tratado: *[…] affinchè ciascuno possa aver qualche cognition di quest'arte, che non è men dilettevole a l'animo, pensando a quel, che si ha a fare, che ella si sia a gli occhi, quando ella è fatta* (Serlio 1540: III).

References | Referencias | Referências

Anasagasti, Teodoro. 1995. *La enseñanza de la Arquitectura*. Madrid: Instituto Juan de Herrera.

Buonarroti, Michelangelo, 1542. Carta a un Obispo desconocido de octubre de 1542. In Corsaro, Masi (ed.), *Michelangelo Buonarroti, Rime e Lettere*. Milán: Bompiani.

Chastel, André. 1965. *Italia 1460-1500. El gran Taller*. Madrid: Aguilar.

Colonna, Francesco. 1499. *Hypnerotomachia Poliphili*. Venecia: Dominico de' Franceschi.

Kallifatides, Theodor. 2019. *Otra vida por vivir*. Barcelona: Gutenberg.

Ionesco, Eugène. 1961. *Comunicación para una reunión de escritores franceses y alemanes. Notas y contranotas. Estudio sobre el teatro, 1965*. Buenos Aires: Losada.

Ordine, Nucio. 2013. *La utilidad de lo inútil*. Barcelona: Acantilado.

Palladio, Andrea. 1570. *I quattro libri dell'Architettura di Andrea Palladio*. Venecia: Dominico de' Francheschi.

Panofsky, Erwin. 1927. *Die Perspektibe als "Symbolische Form"*. Leipzig: Teubner.

Serlio, Sebastiano. 1537. *I Sette libri dell'architettura. Libro IV: Regole generali di architettura*. Venecia: Pietro de Nicolini di Sabbio.

Schinkel, Karl Friedrich. 1820. *Sammlung architektonischer Entwürfe*. Berlin: Wittich.

Serlio, Sebastiano. 1540. *I Sette libri dell'architettura. Libro III: Le antiquità di Roma*. Venecia: Pietro de Nicolini di Sabbio.

Spengler, Oswald. 1947. *El hombre y la técnica y otros ensayos*. Madrid: Austral.

Valéry, Paul. [1923] 2000. *Eupalinos o el arquitecto. El alma y la danza*. Madrid: La balsa de la Medusa.

Visconti, Pietro Ercole. 1840. *Lettera di Raffaello d'Urbino a Papa Leone X*. Roma: Tipografia delle Scienze.

Vitruvius Pollio. 1912. *De architectura libri decem. Translated by Fritz Krohn*. Leipzig: B.G. Teubner.

Biographies | Biografías | Biografias

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Es doctor arquitecto y profesor de Proyectos en la Escuela Técnica Superior de Arquitectura de la Universidad del País Vasco (UPV/EHU). Ha realizado investigaciones sobre la ciudad histórica y el Renacimiento italiano, con su tesis doctoral *Una Bella sfida formale: La génesis de una nueva forma arquitectónica de la fortificación por parte de los grandes arquitectos del Renacimiento italiano*. Actualmente desarrolla su investigación dentro del Grupo de Investigación "Bulevares y Alamedas: los primeros espacios verdes en el País Vasco". Desde 2016 colabora con Imanol Iparraguirre y juntos han recibido el Award for Emerging Excellence in the Classical Tradition (2019) en reconocimiento a su trayectoria dentro de la arquitectura tradicional que incluye dos primeros premios en el Concurso Richard H. Driehaus de Arquitectura por sus proyectos para Grajal de Campos (2017) y Trujillo (2018).

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Yasmine Elmajzoub

Beirut Heritage Initiative: Safeguarding the City's Built Heritage After the August 4, 2020, Port Explosion

Beirut Heritage Initiative: Salvaguardar el patrimonio construido de la ciudad tras la explosión del puerto el 4 de agosto de 2020

Beirut Heritage Initiative: Salvaguardar o património construído da cidade após a explosão portuária de 4 de Agosto de 2020

Abstract | Resumen | Resumo

The devastating explosion in Beirut's port on August 4, 2020 will forever be engraved in the memory of the Lebanese people. Within moments, a city with over 5,000 years of history was in ruins. Aside from the terrible casualties, the blast impacted one of the largest concentrations of heritage buildings in the city, dating from the 19th and 20th centuries. For this reason Beirut Heritage Initiative (BHI) was established in an attempt to help restore the city's built heritage and to preserve both the urban and the social fabric of the damaged neighborhoods. BHI's first mission was focused on emergency works such as rapid sheltering and consolidation of damaged buildings to prevent further damage due to the winter weather. After this emergency phase, BHI has engaged in partial reconstructions to enable vulnerable inhabitants to return to their homes, and a third phase has focused on full restoration projects for highly damaged buildings.

La devastadora explosión del puerto de Beirut el 4 de agosto de 2020 quedará grabada para siempre en el recuerdo de los libaneses. En unos minutos, una ciudad de más de 5000 años de historia se convertía en ruinas. Aparte de la enorme cantidad de víctimas mortales y heridos, la explosión había afectado a una de las mayores concentraciones de edificios históricos de la ciudad, que databan de los siglos XIX y XX. A partir de ahí nació la Beirut Heritage Initiative (BHI) con el fin de intentar ayudar a restaurar el patrimonio construido de Beirut y conservar el tejido urbano y social de los barrios asolados. La primera misión de BHI se centró en las obras más urgentes, como proteger y consolidar rápidamente los edificios dañados para evitar mayores destrozos durante las tormentas invernales. Tras la fase de emergencia, BHI participó en reconstrucciones parciales que permitieran a los habitantes vulnerables regresar a sus hogares, mientras que la tercera fase de la intervención se ha centrado en proyectos de restauración integral de edificios muy dañados.

A explosão devastadora do porto de Beirute, a 4 de Agosto de 2020, ficará para sempre gravada na mente do povo Libanês. Em poucos minutos, a cidade com mais de 5.000 anos de história estava em ruínas. Para além do arrebatador número de mortos e feridos, a explosão tinha visado uma das maiores concentrações de edifícios históricos da cidade, que remontam aos séculos XIX e XX. Foi por esse motivo que a Beirut Heritage Initiative (BHI) nasceu, na tentativa de ajudar a restaurar o património construído da cidade e de preservar tanto o tecido urbano como social dos bairros desolados. A primeira missão da BHI centrou-se em obras de emergência, tais como a criação rápida de abrigos e a consolidação dos edifícios danificados, para evitar danos subsequentes durante as tempestades de inverno. Após a fase de emergência, a BHI participou em reconstruções parciais que permitiriam aos habitantes vulneráveis regressar às suas casas, enquanto que a terceira fase de intervenção se centrou em projectos de restauração integral de edifícios altamente danificados.

Introduction

Said to be the third-largest non-nuclear blast in world history, the Beirut port explosion killed more than 200 people and injured over 6,500 others. More than 60,000 offices and homes were destroyed, displacing over 100,000 people.

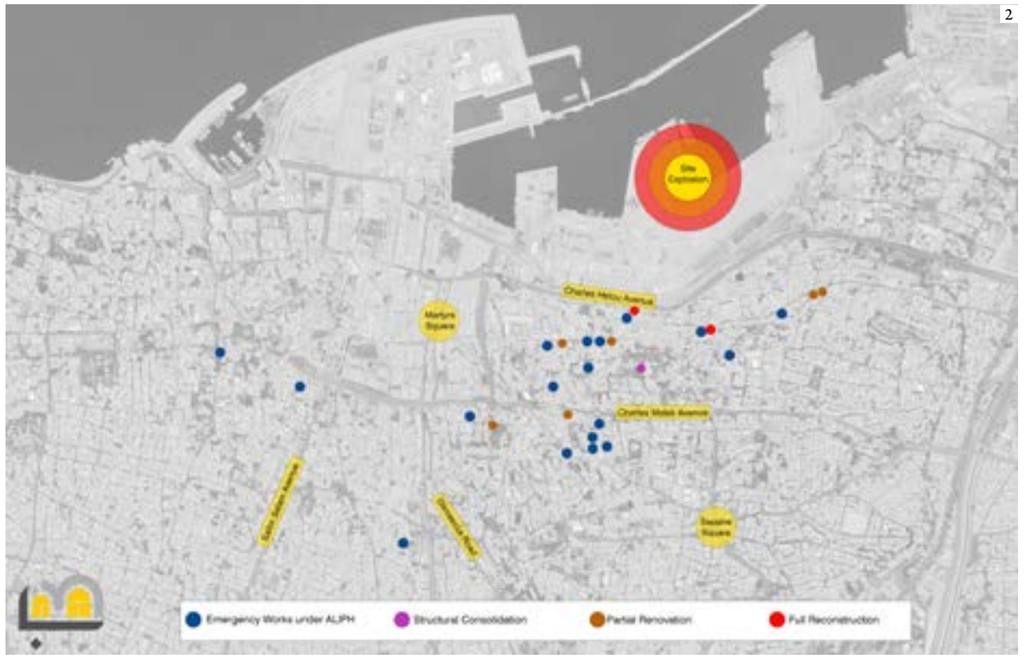
Heritage buildings suffered their share of destruction as nearly 1,000 houses, apartment buildings, and mansions of the 19th-century Ottoman period, and modern heritage buildings of the 1930s-70s were ravaged.

The neighborhoods most affected, such as Gemmayzeh, Mar Mikhael, and Ashrafieh, that have the highest concentration of built heritage, are home to people from different cultural and social backgrounds. With their cultural, educational, touristic, and artisanal facilities, these neighborhoods contribute much to Beirut's intangible heritage.

1

1: Map of the damages of the Beirut explosion (NASA)

2: BHI Beirut Map projects (Yasmine Dagher)



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BHI's mission and objectives

Beirut Heritage Initiative (BHI) was launched a few days after the port explosion as an independent and inclusive collective for assisting in the restoration of Beirut's destroyed built and cultural heritage. Organized around a team of experts, professionals, and NGOs specialized in cultural heritage and with complementary skills, BHI took on the role of mediator between the residents of affected homes and official bodies to facilitate the issuing of restoration and reconstruction permits from the Directorate General of Antiquities and the Office of the Governor of Beirut.

What remained of Beirut's built heritage from the 19th and 20th centuries was what had stood the test of time and survived the voracity of real estate developers. After the blast, Beiruti residents and community became more aware of the importance of rescuing their built heritage, as it plays a significant role in preserving our city's historical and cultural identity. BHI's mission thus focuses on the protection of this heritage and Beirut's socio-economic fabric. It seeks a sustainable revitalization of the damaged neighborhoods with the highest concentration of heritage clusters, including Ottoman stone and red-tile houses, French Mandate buildings, and early Modernist apartment blocks.

Building typology, materials, and key features

The Lebanese vernacular home has undergone several stages of evolution. A typical traditional Beiruti building of the 19th-century Ottoman period revolves around a central hall oriented to the north. Its layout allows for natural cross ventilation and adequate lighting of interior spaces. The central hall acts as the main circulation area with various rooms on the east and west sides. Amenities such as the kitchen and bathrooms were integrated during this period into the floor plan, with the kitchen being covered with a stone vault to mitigate fire hazards. Typically, at the northern end of the central hall is framed by a triple arch that opens up to a Carrara marble balcony mounted by wrought iron balustrades imported from Great Britain or France and held over limestone corbels or wooden beams with metallic trusses. We also find that the central hall is separated from the *liwan*, the room located at the southern side of the house, by a set of internal triple arches.

These houses are built of sandstone (*ramli*) quarried from the city's outskirts and the bearing walls are either left bare or plastered with lime render. The sloping roofs of these buildings are constructed from *Cedrus libani* beams imported from Turkey and locally known as *qotrani* wood. These complex pyramidal truss systems are topped with red clay tiles imported from Marseille, France.

Plan of the typology (Maroun Khadra)

Legend: 1 Staircase, 2 *Liwan*, 3 Multipurpose room, 4 Central hall, 5 Kitchen, 6 Entrance

The first-floor ceilings are typically made of *Cedrus libani* beams and joists covered by wooden planks. The upper-floor ceiling under the pitched roof is referred to as a *Baghdadi* ceiling and is made of thin wooden latticework plastered with lime and gypsum. The *Baghdadi* ceilings of mansions and upper-class homes have lavishly decorated cornices and reliefs with hand-painted frescoes and a central medallion over a hanging chandelier. As for the windows, doors, and shutters, they are all made of cedar (*qotrani*).

As to floor finishes, the tiles widely used for the central hall and *liwan* are of Carrara marble from Italy. In more elaborate houses, marble tiles are framed by black basalt strips and belts creating an elegant contrast with the white marble. The remaining rooms tend to have a limecrete render, locally known as *adseh*, consisting of lime, sand, pebbles, and water. Once it is polished with a smooth river stone to reveal the colored pebbles, it is then sealed with a thin layer of olive oil soap for a smooth waterproof finish. Limecrete was later replaced by colorful patterned cement tiles or red terracotta. Kitchen floors were finished with limestone *furni* tiles known for their strength and durability.

During the French mandate in the 1920s, the central hall plan persisted with a few modifications including the early use of concrete. After Lebanon's independence in 1943, the typology of houses began to change as the separation of private and common areas within them through transitional spaces and corridors became more evident. Around the same time, the symmetry of traditional houses was abandoned and floor plans and also facades became often asymmetrical. As of the mid-1950s, the international style was introduced into Lebanese architecture and new zoning and building laws reframed the types and esthetics of Beiruti houses.

After the introduction of concrete in the 1930s, the use of sandstone gradually receded. Modern heritage buildings built between 1940 and 1970 were constructed entirely of concrete with additional floors. Window frames and shutters were made of either wood or metal and wall finishes ranged from plain cement plaster to Tyrolian or Kratz plaster. As for floor finishes, cement tiles with colorful geometric patterns were adopted in interiors, with designs that gradually became more minimalistic.

1: Example of a totally destroyed pitched roof
2: Reconstruction of the king post
3: Reconstruction of the timber frame
4: Installation of the red clay tiles


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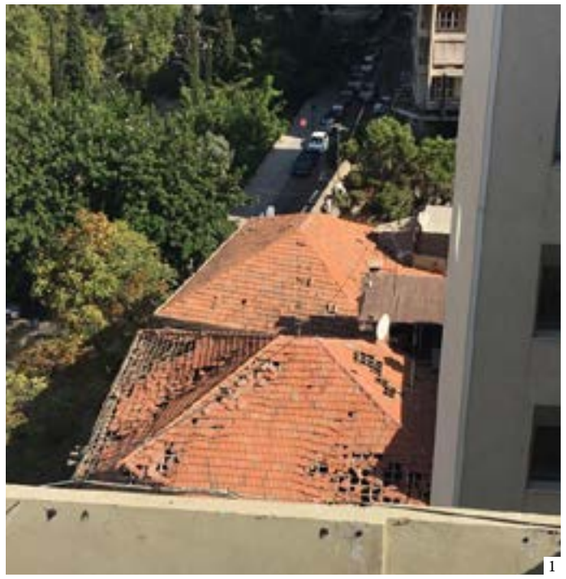
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1: Damaged roof tiles
2: Tile replacement
(1,2: Youssef Kassar)

Emergency sheltering and shoring work

Shortly after the blast, BHI received a grant from the International Alliance for the Protection of Heritage in Conflict Areas (ALIPH) to conduct emergency shoring and sheltering work. In coordination with the Directorate General of Antiquities (DGA) and Beirut Built Heritage Rescue (BBHR20), BHI executed twenty-two interventions on nineteen heritage buildings.

Our sheltering interventions varied according to the degree of roof damage. For example, where the damage was confined to broken red clay tiles on a pitched roof, they involved replacing tiles. If the wooden beams and rafters of a pitched roof were severely damaged, a temporary tarpaulin cover was installed to protect the remaining structure. As to modern heritage buildings of the 1930s-60s with reinforced concrete roofing, the intervention involved repairing damaged screed and waterproofing layers.

Finally, two of the pitched roofs previously covered with tarpaulin and an additional small roof are being fully rebuilt under the same grant.

1: Top view of the destroyed pitched roof
2: Covering of the pitched roof with temporary tarpaulin
3: Sheltered roof and triple arched bay
(1, 2: Live Love Beirut (LLB) 3: Dia Mrad)


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Reconstruction of iconic triple-arched windows

As mentioned earlier, the triple-arched bay is an iconic feature of a traditional Beiruti building. Since this feature is usually located on the building's northern façade, which faces the port and the sea, it was one of the first elements to be wrecked by the explosion. The destruction of these arches left the interior of houses exposed and their structure vulnerable.

BHI was able to restore this unique architectural feature in two heritage buildings. The first step was to rebuild the sandstone parapets and Carrara marble columns with their capitals. Then the damaged limestone corbels or wooden beams supporting the 4 cm thick Carrara marble balcony slab were restored and wrought iron balustrades installed. Then the sandstone arches were reconstructed with the help of wooden molds to ensure that the measurements were precise. Finally the parapets were plastered with lime.

1: The collapsed triple arches of Saifi 242 (Dia Mrad)
2 & 3: Reconstruction of the triple arches (Yasmine Elmajzoub)
4: Sorting of the salvaged triple arches' sandstones (Dia Mrad)
5: The reconstructed triple arches and Carrara marble balcony (Yasmine Elmajzoub)

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1: Medawar Shoreline 1890 (Beirut Heritage Facebook page)
2: Shoreline Cluster (Yasmine Dagher)

Full renovations in heritage clusters

For optimal impact in maintaining the city's social and urban fabric, BHI adopted a "cluster strategy" aimed at forming partnerships with other NGOs for restoring sets of heritage buildings within a cluster rather than individual structures. This strategy allows the inhabitants of the cluster to return, bringing it back to life.

The Shoreline Cluster

Before the construction of Charles Helou Avenue and the port's expansion in the 1960s, the buildings within this cluster stood on the abrupt shorefront of Medawar, overlooking the bay of St. Andrew. Today the cluster includes thirty-five buildings, located less than 500 m from the port.

BHI's contribution will be in the center of this cluster at Medawar 479, a heritage building known as the "Blue House" for its conspicuous color. The first two floors were built in the early 1900s and the third in the 1920s. Due to its proximity to the port explosion, the building suffered great damage.

A generous grant allocated to BHI by the Honor Frost Foundation will enable the building to be fully restored with the scope of work including structural consolidation such as stone-crack stitching and anchoring of slabs, reconstruction of the pitched roof and of the north façade, repair of the cedarwood windows and doors, interior and exterior finishes such as lime plaster and paint, and mechanical, electrical, and plumbing work.

The restoration is to follow the guidelines of a thorough study commissioned by the DGA and conducted by architect-restorer Joe Kallas, who will also be a consultant on the project. A tender was launched by BHI to select an adequate contractor and works are due to start in mid October 2021.

The Gholam Cluster

Named after the family that once lived here, the Gholam Cluster is less than 1 km from the explosion site, with six heritage buildings. BHI is currently restoring one of these at Rmeil 722 in collaboration with another NGO, Together Li Beirut, which will be rehabilitating three other buildings in the same cluster.

Located at the junction of Gemmayzeh and Mar Mikhael, Rmeil 722 was built between 1860 and 1900, with a ground-floor commercial premises and two residential floors. As its street is aligned with the port, the building was greatly damaged.

In October 2020 BHI covered the building's roof under a grant from ALIPH to prevent further collapse, and in April 2021, BHI was able to secure funding from multiple donors for the building's full restoration. The work is following the guidelines of a study by the BBHR architect-restorer Pierre Ghanem, commissioned by the DGA and funded by the German Archeological Institute (DAI).

1: Rmeil 722 north facade after the blast (Dia Mrad)
2: Rmeil 722 north facade after restoration

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The scope of the restoration includes the dismantling and rebuilding of the sandstone north façade, the reconstruction of the *qotrani* pitched roof with its red clay Marseille tiles, the rebuilding of the traditional Baghdadi ceilings of wood latticework and lime plaster, the repair of the *qotrani* windows and doors with their original accessories, and interior and exterior lime plaster and paint finishes.

To date, 90% of the works have been completed and the building is due to be reopened by mid October 2021.

1: Dismantling of damaged north facade sandstone walls
2: Sorting of the dismantled triple arches on the first floor (Dia Mrad)
3: Stitching of sandstone wall cracks
4: Rejointing of the north facade stone with lime mortar
5: Rehabilitation of the original wooden doors

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Cover of the manual *Houses of Beirut 1860-1925* (Houda Kassatly)

Moreover, a grant has been allocated for the refurbishment of the Gholam public stairs within the same cluster by the French culture and ecological transition ministries.

Publications and workshops

A generous grant from Fondation de France has enabled BHI to publish two technical manuals, one on the restoration of heritage buildings built in 1860-1930 and another on buildings dating from 1930-1970. Part of the grant was also allocated to organizing seminars and courses on the restoration processes and conducting site visits and technical assessments of affected heritage buildings.

All these ventures target heritage homeowners, architects, engineers, contractors, and craftspeople involved in the restoration process. Easy access to this knowledge will facilitate the proper restoration and preservation of these damaged buildings and the inhabitants of the restored homes and businesses will be able to return and settle once again in their neighborhoods. Consequently the city, its social life, and the economic cycle will be revived.

References | Referencias | Referências

Assi, Naji. 2021. Introduction to Modern Heritage 1925 - 1970. https://www.youtube.com/watch?v=aoDkZz74hio&t=995s (Consulted on 06/09/2021)

Beirut Heritage Initiative. 2021. Who we are. https://beirutheritageinitiative.com/who-we-are/ (Consulted on 06/10/2021)

Chahine, Nathalie; and Dagher, Fadlallah (dir.). 2021. *Houses of Beirut 1860 - 1925: Restoration Manual*. Beirut: Al - Ayn. https://beirutheritageinitiative.com/restoration-manual/ (Consulted on 06/09/2021)

Dagher, Fadlallah. 2021a. Introduction to the Beiruti Houses 1860 - 1925. https://www.youtube.com/watch?v=Fw3JUKMB2l4 (Consulted on 01/09/2021)

Dagher, Fadlallah. 2021b. Finishes: Plaster, Handrails and Flooring. https://www.youtube.com/watch?v=o8h52TblTSM (Consulted on 15/09/2021)

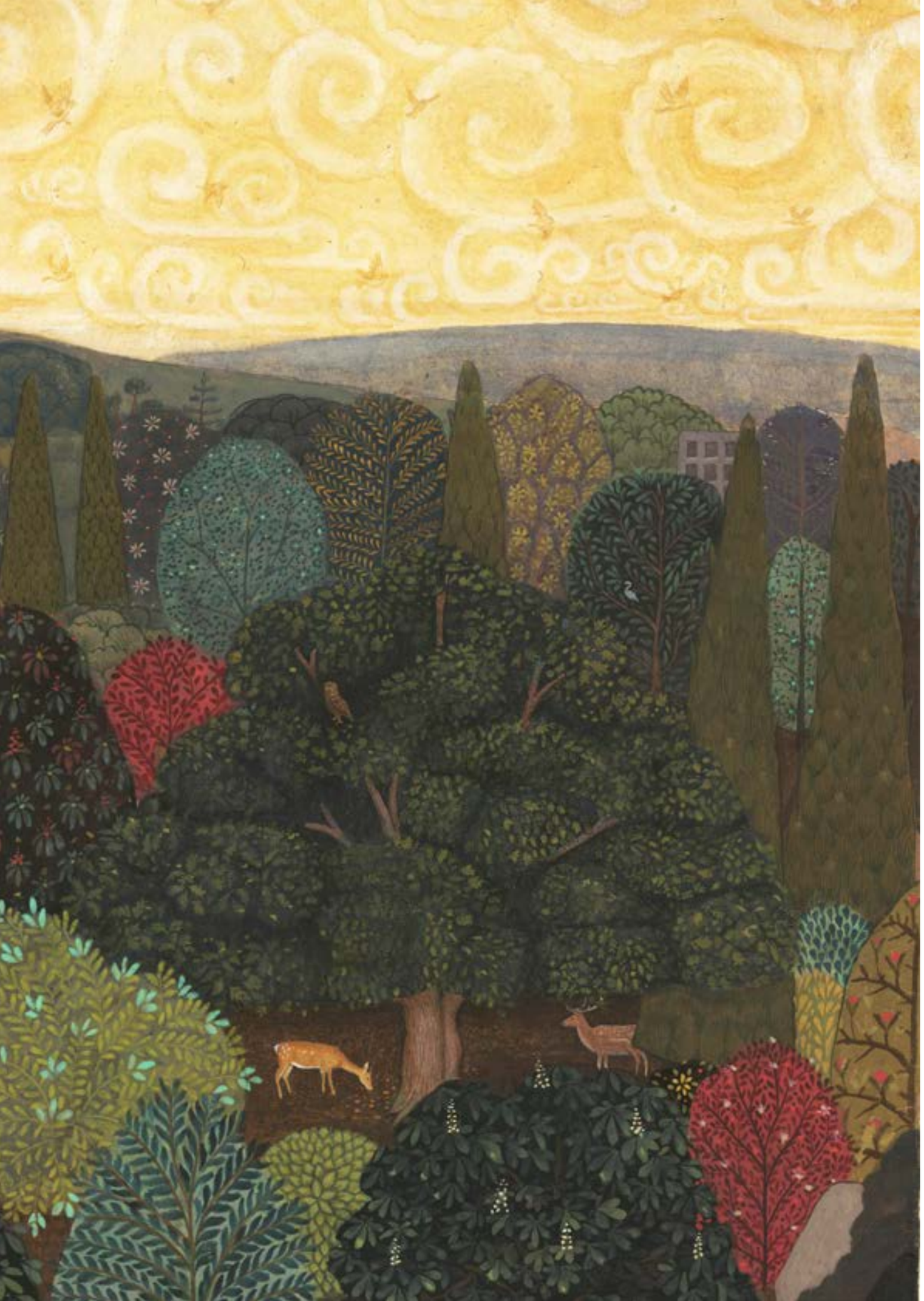
Jabr, Abdul-Halim. 2021. Heritage Buildings and clusters in the fabric of the City. https://www.youtube.com/watch?v=OpA0KwHWND0 (Consulted on 05/09/2021)

Biography | Biografía | Biografia

On behalf of Beirut Heritage Initiative:

Yasmine Elmajzoub

Yasmine holds a bachelor's degree in Architecture from the American University of Beirut. Her experiences working with architecture firms in Beirut in recent years have helped her identify and pursue an interest in heritage preservation and sustainable and participatory design. Her interest in built heritage and vernacular architecture has led her to participate in restoration and conservation workshops in Italy and Morocco, where she has been working with the NGO Terrachidia. Yasmine was involved with BHI from the start as a volunteer and currently manages its Field Operations team and projects, which she coordinates with the various stakeholders involved in restoration projects.



Research Papers | *Artículos científicos* | *Artigos científicos*

Javier de Mingo García, Ángel María Martín

Strapwork Wooden Domes: History, Design and Proposed Development with Spherical Geometry and the Rules of the Trade as a Basis

Cúpulas en la carpintería de lazo: Historia, trazado y propuesta de desarrollo con la geometría esférica y las normas del oficio como base

Cúpulas na carpintaria de laço: História, traçado e proposta de desenvolvimento com a geometria esférica e as normativas do ofício como base

Keywords | Palabras clave | Palavras chave

Joinery, Architecture, Trigonometry, History of Construction, Wood

Lacería, Arquitectura, Trigonometría, Historia de la construcción, Madera

Laçaria, Arquitetura, Trigonometria, História da construção, Madeira

Abstract | Resumen | Resumo

Strapwork wooden domes are a rare type of joinery: only six such examples exist in the world. Maybe this is why, until recently, there have been few texts that allow us to understand their layout and constructive system. Our research goes beyond a mere formal analysis of the "half oranges", for they also study other constructions that combine strapwork joinery and spherical geometry. Regarding the latter, there was extensive knowledge that was hardly ever applied in joinery. Today, in order to provide continuity to a trade that we seek to recover, we propose the development of domes based on polyhedral symmetry that respond to the strict layout of the strapwork wheels, and to the constructive logic of the *carpintería de lo blanco* (Mudejar joinery).

Las cúpulas de lacería constituyen una rareza dentro de la carpintería de lazo, puesto que sólo existen seis ejemplares a nivel mundial. Quizás por ello, hasta tiempos recientes, siempre escasearon los textos que permitieran la comprensión de su trazado y su sistema constructivo. Nuestra investigación trasciende el mero análisis formal de las "medias naranjas", ya que se rastrean otras construcciones que aúnan lacería y geometría esférica. Sobre ésta existían abundantes conocimientos que apenas fueron aplicados en carpintería. Hoy, como continuación de un oficio que se pretende recuperar, proponemos el desarrollo de cúpulas basadas en la simetría poliédrica, que obedecen el estricto trazado de las ruedas de lazo, a la vez que a la lógica constructiva de la carpintería de lo blanco.

As cúpulas de laçaria constituem uma rareza dentro da carpintaria de laço, dado que apenas existem seis exemplares a nível mundial. Talvez por isso, até tempos recentes, sempre escassearam os textos que permitissem a compreensão do seu traçado e do seu sistema construtivo. A nossa investigação transcende o mero análise formal das "meias laranjas", já que se rastreiam outras construções que reúnem a laçaria e a geometria esférica. Sobre esta existiam abundantes conhecimentos que apenas foram aplicados na carpintaria. Hoje, como continuação de um ofício que se pretende recuperar, propomos o desenvolvimento de cúpulas baseadas na simetria poliédrica, que obedecem ao estrito traçado das rodas de laço, e ao mesmo tempo que a lógica construtiva da carpintaria estrutural.

Introducción y antecedentes

Las cúpulas de lacería hechas en madera, también denominadas "medias naranjas" dentro del oficio de la carpintería de lo blanco, son construcciones de sección ultrasemicircular, en las cuales su composición estética y estructural está basada en una sucesión de ruedas de lazo intercaladas o no con otras formas, que permiten la continuidad visual del trazado ornamental.

A tenor de dicha descripción, solo se tiene constancia de seis cúpulas en todo el mundo que cumplan dichos condicionantes. Por orden cronológico, serían: los dos cupulines del Patio de los Leones de la Alhambra; la del Salón de Embajadores de los Reales Alcázares, en Sevilla; la de la Casa de Pilatos, también en Sevilla; la del desparecido Palacio de los Cárdenas de Torrijos, hoy en el Museo Arqueológico Nacional de Madrid; y finalmente, la del Convento de San Francisco de Lima.

A pesar de su escasez, su importancia dentro de la carpintería de lo blanco era fundamental, puesto que saber trazar una media naranja era una prueba exigible a quien quisiera obtener el grado de geométrico, el más alto del oficio. Ello no significaba que existiese un único camino para construirlas, puesto que entre los seis ejemplares existentes se observan cuatro métodos de trazado y de montaje distintos.

Salvo las cúpulas de la Alhambra, las demás son apeinazadas, es decir, construidas a base de camones colocados en direcciones paralelas a los meridianos que dividían la superficie esférica en husos, los cuales se montaban de forma independiente. Sin embargo, los ejemplares granadinos son diferentes, tanto en su concepto estructural como geométrico, ya que se trata de cúpulas ataujeradas que usan como sustrato compositivo un poliedro proyectado sobre la esfera.

Estudios sobre cúpulas de lazo

En cuanto a estudios sobre las cúpulas de lacería, por un lado están los tratados de carpintería del siglo XVII de Diego López de Arenas y Fray Andrés de San Miguel[1], escritos cuando aún se realizaban armaduras de lazo, y por otro, los textos que a partir del siglo XX han pretendido estudiar las cúpulas y a su vez descifrar los tratados anteriores.

En el primer tratado, publicado por López de Arenas (1633), se intenta realizar una explicación del proceso de trazado de una media naranja apeinazada, el cual contiene tantos errores que lo hacen impracticable (Fig. 1). En el segundo tratado, siete años posterior, San Miguel (1640) realiza una aproximación gráfica al desarrollo plano de una esfera, obviando temas constructivos de la lacería.

Así pues, con dos tratados que no desgranan los pormenores de las cúpulas, los autores posteriores se enfrentaban a la tarea adicional de verificar sus afirmaciones. Prieto y Vives (1932) fue el primero en hacerlo, y, además de señalar los errores de Arenas, descifró particularidades geométricas de los cupulines de la Alhambra desde un punto de vista matemático, sin incidir en cuestiones propias de la carpintería. Después de él, diversos estudios sobre cúpulas

de lazo han intentado recuperar saberes nunca escritos, por lo que sólo mediante análisis formales y constructivos se pudo llegar a conclusiones válidas.

Nuere, usando la lectura dibujada, aplicada a los manuscritos de Arenas (Nuere 1985) y San Miguel (Nuere 1980), también dio testimonio de sus imprecisiones, y propuso un análisis constructivo de las medias naranjas que permitió el montaje de un gajo a tamaño real (Fig. 2). Posteriormente, Candelas-Gutiérrez (2000) escribió sobre el tema de las bóvedas y cúpulas de madera en los tratados, para después analizar la cúpula del Salón de Embajadores (Candelas-Gutiérrez 2001). Por último, en Nuere *et al.*(2020), se analizó minuciosamente la cúpula de Torrijos, y se llegó a conclusiones aplicables al resto de las medias naranjas (Fig. 3).

Figura 1: Representación de una media naranja en el tratado de Arenas (López de Arenas 1633)

Figura 2: Esquema para el desarrollo plano de un gajo esférico (Nuere 1985)

Figura 3: Montaje de un gajo sobre los camones principales en la cúpula de Torrijos (Nuere *et al.* 2020)

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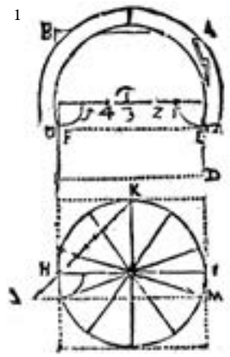

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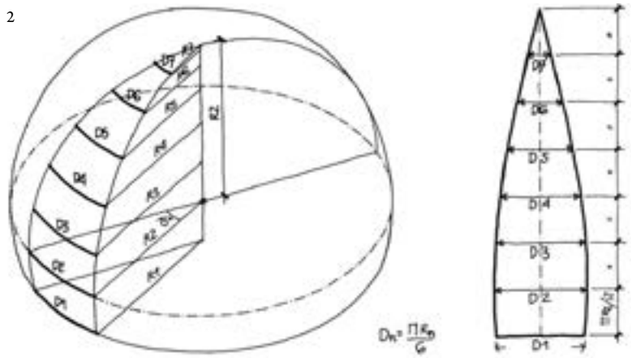

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La carpintería de lo blanco y las cúpulas

No existe documentación sobre el proceso que dio lugar a las cúpulas de lazo, aunque contando con las armaduras presentes en España y sus cronologías, podría rastrearse una evolución desde las primitivas techumbres de lazo a cuatro aguas hasta las medias naranjas, representantes del apogeo del oficio.

En cualquier caso, la aproximación formal a la esfera, mediante la fragmentación de faldones y paños, creó armaduras de creciente complejidad, basada en poliedros con caras obtenidas por rotación alrededor de un eje. En un principio, las armaduras rectangulares dieron lugar a las ochavadas, añadiendo vertientes oblicuas respecto a las ortogonales. Incluso surgieron techumbres doceavadas y dieciseisavadas. En cuanto a la dimensión vertical, también existió una fragmentación que fue desde los tres paños habituales de las armaduras de par y nudillo hasta los cinco o siete paños. Así, el aumento de vertientes y paños aproximaba las armaduras hacia la forma esférica progresivamente, con la lacería contenida en las diferentes caras del poliedro, y sin abordar el cómo trazar ruedas de lazo sobre una esfera.

Por otro lado, la carpintería ya había generado formas curvas mediante el uso de camones, con multitud de bóvedas que los utilizan (Hurtado 2012). Tampoco hay que ignorar la carpintería de ribera, cuya tecnología para elaborar cuadernas navales, si bien no era usada en edificación, tampoco es descartable que diera lugar a una transferencia de conocimientos entre ambos gremios. Sin embargo, no existen antecedentes de armaduras de lazo que usaran camones antes de la realización de las medias naranjas.

Cúpulas de lazo *lefe*: las medias naranjas

Las cuatro cúpulas de lazo apeinazado que subsisten comparten una misma tecnología y trazado, con algunas matizaciones entre ellas. El principal punto en común es el uso del trazado lefe, compuesto por ruedas de diez brazos que se unen entre sí, usando solo azafates redondos (Nuere 2008), esto es, con la longitud del *costadillo* igual a la de la media *aspilla*.

La trama básica que une los centros de las ruedas del trazado *lefe* es una malla rómbica cuyos ángulos agudo y obtuso son 72º y 108º respectivamente. En cada centro se cruzan dos líneas de la trama, provocando que cada rueda esté rodeada de otras cuatro semejantes de manera directa, y de dos de manera indirecta. Al igual que cualquier otra trama de lazo, necesita formas adicionales a las ruedas para poder completarse, pero es la única en la que esas formas son azafates idénticos a los que usan las propias ruedas. Quizás por ello está considerado como el más perfecto de los trazados de lazo (Fig. 4).

Figura 4: Silueta del huso esférico de una cúpula sobre el trazado de diez lefe

Figura 5: Representación plana de un gajo, desarrollada sobre un meridiano limítrofe entre dos gajos adyacentes (Enrique Nuere)

Figura 6: Representación plana de un gajo, desarrollada sobre el meridiano central del gajo (Enrique Nuere)

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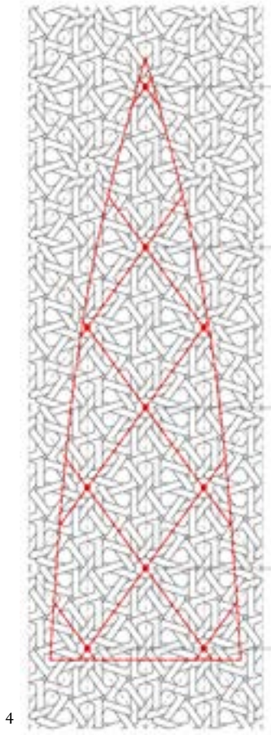

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Figura 7: Sección de una media naranja por un plano vertical diametral (Nuere *et al.* 2020)

Desarrollo geométrico y construcción

En las tres medias naranjas españolas se subdividieron las superficies esféricas en doce husos meridionales compuestos por camones que al unirse en la clave de la cúpula, generaban una rueda de doce brazos, a pesar de que el resto del trazado fuese de diez (Figs. 5 y 6). Por otra parte, al estar los camones imbricados en la lacería, guardaban la misma proporción de *calle y cuerda*, y alojaban entre sí los sinos de las ruedas que servían de base de la trama, y cuya separación coincidía con la diagonal larga de la trama rómbica (denominada "módulo" en el artículo).

Los bordes de cada gajo quedaban delimitados por los camones principales, debido a que en ellos la lacería era canónica y se introducía en el resto del gajo partiendo de dichos bordes, trazada a imitación del lazo de diez plano, con sus mismos cartabones. Así, al llegar al eje central del huso, las dos tramas colisionaban y se realizaba una zona de ajuste coyuntural para dar continuidad al trazado (Fig. 7).

Los ejemplares subsistentes

A continuación se realiza una descripción de las características más elementales de los ejemplares de media naranja que aún subsisten:

- Cúpula del Salón de Embajadores de los Reales Alcázares

Construida en 1427 por el carpintero Diego Ruiz (González de León 1844), con trazado a *calle y cuerda* y un arco formado por 3,5 módulos. Su diámetro es de 9,28 metros y su bolsor de 0,36 metros. Los gajos se interrumpen a 1,22 m. de la clave, y el casquete esférico superior está compuesto como una pieza unitaria e independiente de los mismos (Candelas-Gutiérrez 2001). La escuadría de los camones es de 10 x 14 centímetros (Fig. 8).

- Cúpula de la escalera principal de la Casa de Pilatos

Construida en 1538 por el carpintero Cristóbal Sánchez, con trazado a *calle y cuerda* y un arco formado por 3 módulos. Su diámetro es de 6,38 metros y su bolsor de 0,89 metros Al igual que en la cúpula anterior, los gajos se interrumpen a cierta distancia de la clave, y el casquete superior es independiente (Albendea 2011). Los camones miden aproximadamente 6,5 x 9 centímetros (Fig. 9).

- Cúpula del torreón noreste del Palacio de los Cárdenas

Construida en 1499, de autor desconocido, con trazado a *calle y cuerda*, y un arco formado por 3,5 módulos. Su diámetro es de 5,2 metros y su bolsor de 20 centímetros.

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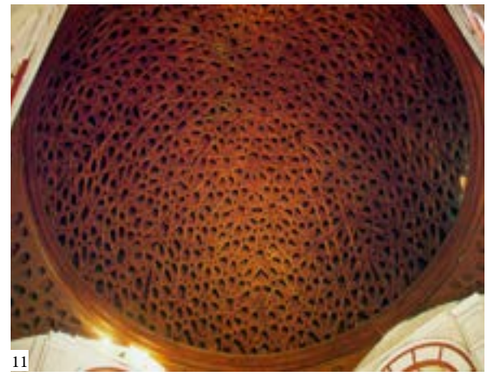

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Figura 8: Cúpula del Salón de Embajadores de los Reales Alcázares.
Figura 9: Cúpula de la escalera principal de la Casa de Pilatos.
Figura 10: Cúpula del torreón noreste del Palacio de los Cárdenas.
Figura 11: Cúpula de la escalera del Convento de San Francisco de Lima.

Posee una subestructura oculta en el trasdós formada por camones principales de 9 x 7 centímetros, en la que se insertan los gajos (Nuere *et al.* 2020). La escuadría de los camones de los gajos es de 5,5 x 9 centímetros (Fig. 10).

- Cúpula de la escalera del Convento de San Francisco de Lima

Reconstruida en 1973 tras su derrumbe, por el carpintero Juan de Dios Muñoz, con trazado a *calle y cuerda*, subdivisión en 8 gajos y un arco formado por 3 módulos. Su diámetro aproximado es 9,6 metros, y, según las descripciones, el arco que describe su sección es menor que un semicírculo (San Cristóbal 2006). Su sistema constructivo simula una armadura apeinazada, tras las cual está el entablado y una capa externa de hormigón armado (Fig. 11).

Cúpulas de lazo basadas en geometría esférica: Cupulines del Patio de los Leones

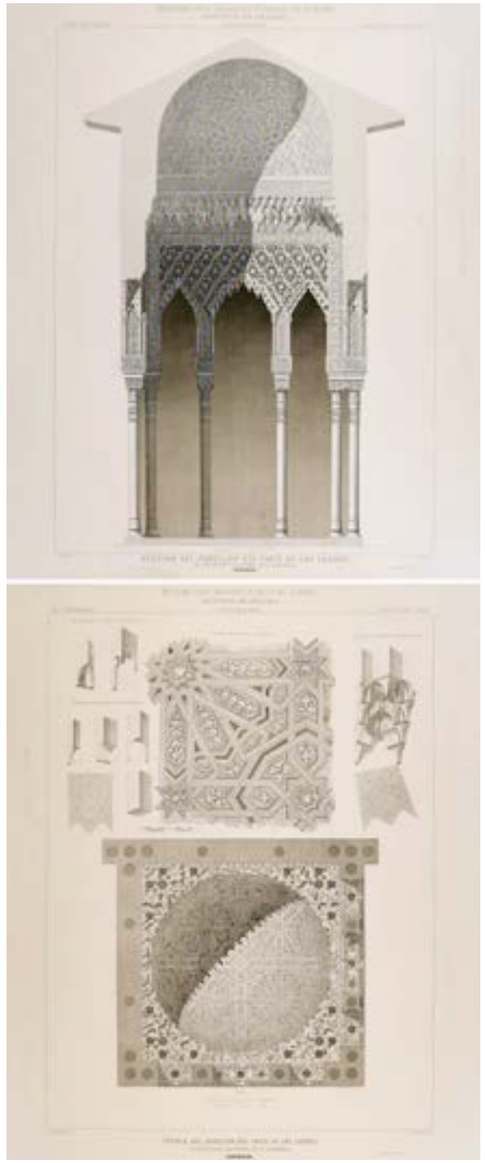
Construidos a finales del siglo XIV, poseen un diseño basado en la trigonometría esférica, de manera que la lacería discurre en paralelo a la proyección de un octaedro truncado sobre una esfera circunscrita, con sus caras hexagonales falsamente elongadas en pirámides de cinco triángulos equiláteros y uno isósceles (Makovicky y Fenoll 2000).

Las ruedas de lazo presentan unos inusuales 11 brazos, a pesar de que el diseño parte de una trama plana de ruedas de 12 con una apertura entre sí de 30º. Al hacer coincidir el centro de la rueda en un vértice del poliedro generador, sucede lo siguiente: la esquina de la cara cuadrada (90º) abarca 3 brazos de la rueda, mientras que en las 4 triangulares equiláteras (60º) abarcan 2 cada una, resultando 8 brazos, que sumados todos hacen 11 en total. En los vértices que unen las caras triangulares equiláteras con la isósceles, la

distribución sería de 2 brazos por equilátera y uno por la isósceles, que de nuevo sumarían 11 (Fig. 12).

Como es habitual, se necesitan formas adicionales a las ruedas para mantener la continuidad, que no obstante, al repetirse con regularidad y sortear con elegancia la indivisibilidad del número 11, hacen de esta cúpula un prodigio de la lacería aplicada a la geometría esférica.

Figura 12: Cúpula del Pabellón del Patio de los Leones. Monumentos Arquitectónicos de España (dibujo de Nicomedes de Mendívil, grabado por Joaquim Pi y Margall, Real Academia de Bellas Artes de San Fernando)



El inevitable pragmatismo de la carpintería permitía eludir las imperfecciones geométricas que contenía el poliedro de base. De ello fue consciente Prieto y Vives (1932), que calculó cada uno de los triángulos, llegando a la conclusión de que los que parecen equiláteros no lo son, y que en realidad las cúpulas suponen un "caso típico de geometría aproximada, compuesta con grandísimo ingenio" (Fig. 13).

Constructivamente, son cúpulas ataujeradas con tablas que forman la esfera sobre las que se crea la lacería a base de cintas de poco grosor. Posteriormente, se marcaban sobre las tablas las formas del lazo, para luego cortar y replantear las cintas "in situ". Es en esta fase del proceso en la que se tuvo que aplicar la proyección del octaedro truncado sobre la esfera, para, una vez definidos los centros de las ruedas, proceder a trazar el resto de las figuras mediante paralelas a las proyecciones de las aristas.

Cúpulas de lazo en Oriente Medio

La lacería como decoración arquitectónica en Oriente Medio adquirió a partir del siglo XII un gran nivel de complejidad y de variedad de modelos, utilizándose incluso en superficies esféricas. Así cúpulas, mihrabs, y altorrelieves de piedra incluyeron lacería, siendo especialmente interesantes aquellos cuya concepción utilizó la simetría poliédrica como base de trazado (Bonner 2016). En un orden de complejidad, podemos citar las siguientes:

- Cúpula noreste de la Mezquita del Viernes en Isfahán

Construida en fábrica a finales del siglo XI, con un diseño que parte de la proyección de un dodecaedro sobre una esfera. Es la primera cúpula conocida que utiliza un poliedro para realizar un diseño de geometría no euclídea.

- Mihrab de la Mezquita de Maqam Ibrahim al-Sufli en Aleppo

Elaborado a finales del siglo XIII, actualmente desaparecido y del que se conserva testimonio gráfico. Presentaba un cuarto de esfera realizado en madera, con un trazado de estrellas de 6 y 5, inscritas en la proyección de un icosaedro truncado (Fig. 14)

Figura 13: Poliedro básico del trazado de los cupulines de la Alhambra (Interpretación del dibujo de Makovicky E. y Fenoll Hach-Alí, 2000)

- Mihrab de la Madrasa de Halawiyat en Aleppo

Realizado a mediados del siglo XII, el cuarto de esfera que corona el nicho posee un trazado de lacería esférica con una combinación de ruedas de 9 y 8 en la proyección de un octaedro.

- Altorrelieves en Susuz Han, Hatuniya y Karatay (Turquía)

En el sudoeste de la actual Turquía, durante el siglo XIII, aparecieron semiesferas en altorrelieve con decoración de lazo en las portadas de diversas madrasas y caravasares. En Susuz Han aparecen ruedas de ocho situadas en los vértices de la proyección de un octaedro. En la Madrasa de Hatuniye, son ruedas de seis brazos ocupando el casquete semiesférico, y finalmente, el lazo de diez en combinación con el de ocho se utiliza en las semiesferas de la Madrasa de Karatay.

Cúpulas de fábrica de arcos cruzados en España

Las cúpulas de arcos cruzados surgieron en España a mediados del siglo X, en la Mezquita de Córdoba, para posteriormente difundirse tanto en Al Ándalus como en Castilla (Huerta y Fuentes 2010). Se diferencian respecto a las cúpulas de lazo en que son de fábrica y el único elemento que puede asimilarse a una estrella de lazo está en la clave, aunque su geometría y su proceso constructivo las colocan como precedentes de aquellas.

Por lo general, estas cúpulas partían de una base cuadrada y todas sus nervaduras describían arcos de igual radio que podían estar contenidos en una superficie esférica en determinados casos, como por ejemplo, en la *maqsura* de la Mezquita de Córdoba, en la Mezquita del Cristo de la Luz, o en la cúpula de la iglesia de Nª Sª de la Oliva en Lebrija (Fig. 15), entre muchas otras. Para ello, era condición indispensable que los arcos estuviesen contenidos en planos cuya distancia al eje central fuese la misma. No obstante, ninguna de estas cúpulas incluye estrellas o ruedas adicionales a la de la clave.

La geometría esférica y su aplicación a la lacería

Obviamente, los conocimientos que poseían carpinteros, alarifes u otros tipos de artesanos, distaban en gran medida de los que pudieran tener matemáticos o astrónomos. Sin embargo, un indicio de que podía existir transferencia entre ciencia y arte en cuanto a la geometría esférica está en la existencia de cúpulas y esferas de lazo precisamente en territorios en donde aquella estaba muy desarrollada, como Persia o Al Ándalus. En el caso hispano, es probable que la labor de personajes como Azarquiel, Al Jayyani o Jabir Ibn Aflah, precursores de la trigonometría esférica entre los siglos XI y XII, y, sobre todo, el alto nivel cultural reinante, hicieran posible la aparición de las misteriosas cúpulas de la Alhambra. No obstante, no existe a día de hoy prueba alguna del método empleado para su creación, ni de su procedencia.

Como se puede deducir de los diferentes ejemplos de cúpula analizados anteriormente, a lo largo de la historia, las pocas construcciones que han solapado formas esféricas y trazados de lacería han seguido fundamentalmente dos estrategias para hacerlo: la división en husos y la simetría poliédrica.

<u>División radial de husos esféricos</u>

Esta opción ha sido la más socorrida debida a su pragmatismo, y ya se ha descrito parcialmente en el apartado de las medias naranjas. Aunque era necesario solventar cuestiones relacionadas con la geometría esférica en cuanto

Figura 14: Mihrab de la Mezquita de Maqam Ibrahim al-Sufli en Aleppo (Sir K.A. Cameron Creswell, https://collections.vam.ac.uk/item/O1252727/the-lost-carved-wooden-mihrab-photograph-creswell-keppel-archibald, consultado el 10/03/2021)

Figura 15: Cúpula de la iglesia de Nuestra Señora de la Oliva, Lebrija (Pablo MS, https://commons.wikimedia.org/wiki/File:Bóveda_mudéjar.jpg, consultado el 01/03/2021)

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a los camones estructurales, lo cierto es que la lacería se trazaba como si fuese plana, puesto que el número de gajos en que se dividía la esfera (en general doce), provocaba que cada uno de ellos fuese relativamente estrecho y pudiera obviarse su curvatura azimutal al introducir el lazo.

Los patrones geométricos de lacería se adaptaban al gajo, pero la regularidad del trazado se interrumpía en los límites del mismo y la continuidad se resolvía por simetría. Las cuatro medias naranjas conservadas están realizadas por éste método, que afecta no solo a la traza del lazo que las decora, sino también a su estructura, pues está concebida mediante una disposición radial de camones que siguen la dirección de los husos en que está dividida la esfera.

Simetría poliédrica

Se denomina simetría poliédrica a la introducción de un sistema geométrico basado en la proyección de un poliedro sobre una esfera circunscrita al mismo. Dicha proyección, de tipo central o gnomónica, consiste en radiar las aristas del poliedro desde el centro de la esfera hasta la superficie de la misma, de manera que se obtiene lo que algunos autores denominan un poliedro esférico (Nejad, Azizipour 2020), es decir, un mosaico formado por arcos que subdividen la esfera en regiones o polígonos esféricos. Los poliedros que pueden utilizarse son aquellos que son convexos y poseen todos sus vértices tangentes a una misma esfera, por lo que cabe mencionar los platónicos, los arquimedianos, los sólidos de Catalan y algunos sólidos de Johnson, así como los domos geodésicos de cualquier frecuencia.

La utilidad de este procedimiento reside en usar las caras del poliedro como contenedores de un trazado de lazo, cuyas direcciones coincidan total o parcialmente con sus aristas, para que así la proyección traslade dicho trazado del plano a la esfera. Obviamente, cualquier recta proyectada de forma gnomónica sobre la esfera se transformará en un arco de círculo máximo, por lo que surgirán deformaciones en todo lo relativo a ángulos y paralelismos, que dejan de conservarse (Fig. 16).

A pesar del interés geométrico y visual que ofrece la simetría poliédrica para los patrones de lazo en cúpulas esféricas, ha sido aplicada en contadas ocasiones. A diferencia de las cúpulas formadas por husos esféricos, en las que la lacería queda interrumpida, la simetría poliédrica permite la continuidad de la traza, además de innumerables combinaciones posibles de trazados que en el plano bidimensional no funcionarían.

El trazado esférico de la lacería: Geometría canónica en desarrollos a *calle y cuerda*

En la carpintería de armar española se aplicaron patrones decorativos islámicos de lazo con tal fortuna que a la postre se modificó la disposición de los elementos de las armaduras para adaptarla a ellos. Así, por ejemplo, la elección del ángulo de pendiente en una cubierta modificaba a su vez el ángulo diedro entre faldones adyacentes, y como la lacería había de adaptarse a él, sólo determinados diseños encajaban con ese encuentro.

Con el tiempo, se fue estableciendo que las características "canónicas" en lacería tenían tres puntos principales: las ruedas debían tener sus brazos paralelos para permitir su encaje en pares y nudillos; los *azafates* de las ruedas de 6, 7, 8, 9 y 10 brazos tenían que ser redondos; y finalmente, la relación del grosor de las cintas de las ruedas y su separación debía ser a *calle y cuerda*, es decir, la separación era el doble de su grueso (Fig. 17). Además, en los trazados regulares de lazo subyace siempre un patrón geométrico asimilable a tramas de cuadrados, triángulos, pentágonos, etc. (Duclós 1992), de gran ayuda a la hora de tener todo el diseño bajo control geométrico.

Por último, el uso de *azafates* redondos permite definir unívocamente el radio de la rueda, puesto que la relación entre el radio y la anchura del brazo (unidad de lazo), es

Figura 16: Icosaedro proyectado sobre una esfera circunscrita

Figura 17: Rueda canónica de ocho brazos, con las longitudes de la media aspilla y el costadillo iguales

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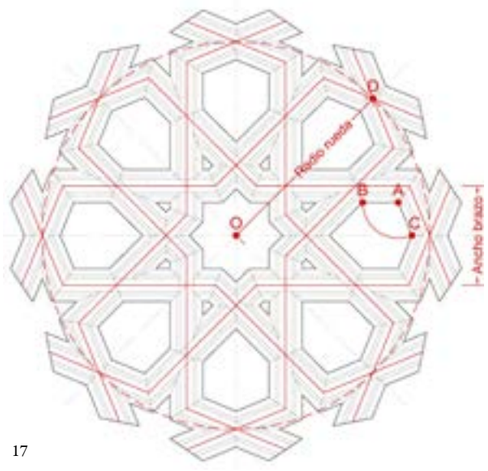

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característica de cada rueda. Una vez conocida esa relación, se puede determinar la anchura de los brazos de una rueda conociendo su radio, y viceversa.

Correspondencia con la geometría esférica

Como ya se ha comentado, la proyección gnomónica de la cara de un poliedro a la superficie esférica circunscrita es la estrategia elegida para la adaptación de los modelos de lacería a espacios cupulares. A su vez, el método usado para que las ruedas de lazo pasen a formar parte de la superficie esférica consiste en la elección del poliedro adecuado para alojar ruedas o porciones de rueda en sus caras de manera que la traza sea continua entre las mismas. Para ello es imprescindible que las porciones de rueda cuyo trazado discurra por diferentes caras partan de una rueda con el mismo número de brazos, y que, si su centro coincide con un vértice del poliedro, el ángulo descrito por las aristas sea múltiplo o submúltiplo del que describen dos brazos de la rueda. En estos casos, las ruedas de un determinado número de brazos, sobre la esfera pasan a perder brazos, en función de la rueda y el poliedro escogido.

Por ejemplo, la trama en la que puede inscribirse una combinación de ruedas de 9 y 12 es triangular equilátera. Si se aísla uno de los triángulos de la trama, vemos que en cada ángulo queda un brazo completo central, y dos medios, uno en cada extremo del ángulo. Al componer un icosaedro, con 5 triángulos equiláteros por cada vértice, veremos 10 brazos en su proyección. Así pues, la combinación de ruedas de 9 y 12 se transforma en una de 9 y 10 al proyectar las caras del icosaedro contenedor del trazado sobre la superficie esférica (Fig. 18).

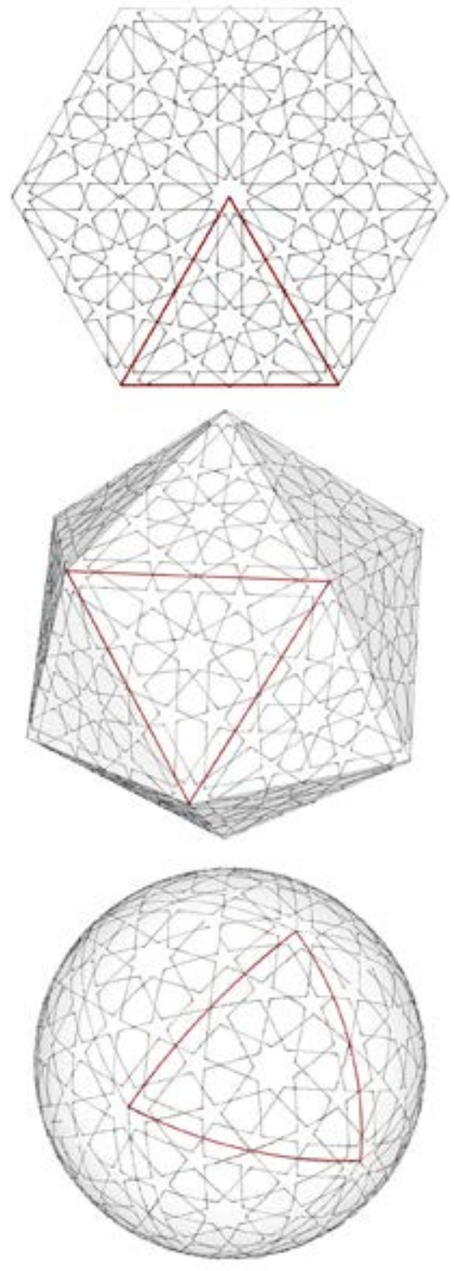
Cualquier trazado que genere un patrón asimilable a un sólido platónico será adecuado para ser adaptado a la superficie esférica, ya que permitirá su repetición por simetría polar respecto de ejes que vayan del centro de la esfera a los vértices.

Rectificación y modificaciones de ángulos

En la superficie esférica, los ángulos canónicos de las ruedas de lazo únicamente se mantienen en el punto central de los sinos, puesto que, al estar contenidas en un casquete esférico, los ejes de sus brazos son arcos definidos por tres parámetros: radio, longitud y ángulo esférico entre ellos. Cuantas más ruedas de lazo por unidad de superficie, menor será la longitud de dichos arcos, y, por tanto, mayor la aproximación de los ángulos esféricos a los ángulos legítimos de la superficie plana. Por otra parte, el ángulo esférico que existe entre los ejes de los brazos no se conserva en la intersección de las cintas que materializan las ruedas, debido a que la distancia que separa ambos elementos obliga a que exista cierta diferencia.

El eje del camón es un arco con radio y centro igual al del eje del brazo, es decir, está contenido en la superficie esférica, pero forma parte de un plano distinto al del eje del brazo, lo que implica que no serán paralelos. Estos dos planos forman un ángulo cuyo arco es la separación de ambos ejes en un punto, que estará en la mitad del radio de la rueda para minimizar la distorsión producida por la falta de paralelismo entre los ejes.

Figura 18: Secuencia de generación de un trazado de 9 y 10 sobre una esfera, usando un icosaedro de base



Con las premisas anteriormente descritas, se puede determinar el ángulo de encuentro entre los ejes de los camones, bien mediante cálculo trigonométrico, bien mediante aplicaciones informáticas. Finalmente, dicho ángulo sería el usado en taller para la realización de los ensambles correspondientes.

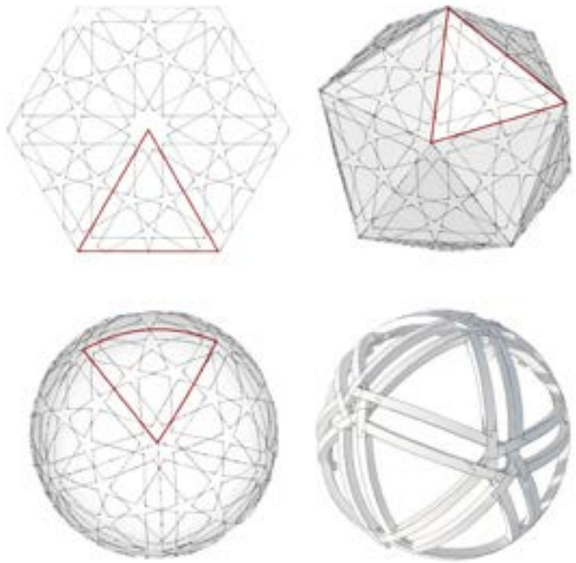


Figura 19: Generación de un trazado de 10 sobre una esfera mediante proyección de un icosaedro y módulo de estructura triangular adaptado al mismo

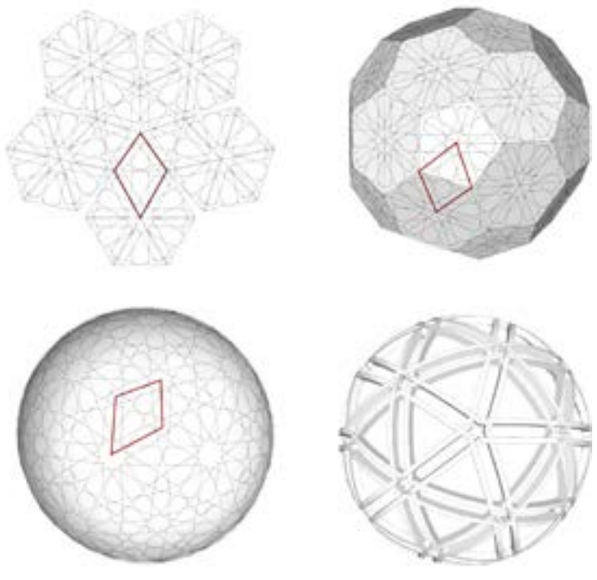


Figura 20: Proyección de un trazado de 10 y 12 sobre una esfera mediante un icosaedro truncado y estructura adaptada al mismo mediante un pentaquis-dodeacaedro

Cálculo de la *cuerda* a partir del radio de la esfera

Históricamente, la lacería de las medias naranjas siempre fue canónica, por lo que las variables que quedaban al arbitrio del diseño eran el bolsor y los módulos de lazo que describía el arco de la sección. Por ello, una vez establecidas, sólo restaba calcular el grosor de la *cuerda*, lo cual era relativamente fácil, puesto que sólo había que dividir la longitud del arco horizontal de la base del gajo, que era conocido, entre el número de *cuerdas* que cabían. Habitualmente rondaba las 24 *cuerdas*, de manera que el grosor de las mismas, en función del radio de la esfera, podía ir desde los 5,5 centímetros de la cúpula de Torrijos, hasta los 10 centímetros de la de los Reales Alcázares.

En cuanto a diseños basados en geometría esférica, el icosaedro suele ser el poliedro más utilizado, por lo que el trazado se compone mediante la proyección de cada una de sus 20 caras, que pasan a ser triángulos esféricos. Puesto que la longitud de los lados de cada triángulo esférico es conocida y proporcional al radio de la esfera, se puede calcular el radio de las ruedas incluidas en su superficie y, por tanto, el grosor de la *cuerda* elegida, definida por la unidad de lazo. Un proceso análogo puede seguirse con cualquier otro poliedro en el que se pueda establecer una relación de proporción entre los arcos proyectados, las ruedas y sus unidades de lazo.

Estructura de las cúpulas de lazo canónicas

La búsqueda de estructuras efectivas en la construcción de cúpulas de lacería se fundamenta en adaptar los camones principales a patrones que se repitan en la totalidad de la superficie. A continuación, se describen los desarrollos más representativos de estructuras adaptadas a la geometría de lazo esférico.

- Ruedas de 10

El módulo estructural reproduce la división de triángulos equiláteros esféricos que surgen de la proyección del icosaedro sobre la esfera, cuya curvatura define la de los camones (Figs. 19 y 26). Estos se sitúan a una distancia del eje que coincide con las divisorias, y tanto el grueso como la distancia quedan determinadas según la distribución de *calle y cuerda* elegida. El ensamble entre camones se realiza a media madera, prolongando el cruce para que se complemente con el módulo triangular adyacente, mientras que la unión entre módulos se produce por el solapamiento de la prolongación de los empalmes de cada triángulo.

- Ruedas de 10 y 12

En esta cúpula, el módulo se adapta a la proyección de un pentaquisdodecaedro sobre una esfera, de manera que al unir los centros de las caras de un icosaedro truncado obtenemos el módulo triangular isósceles que será la estructura principal (Fig. 20). Así, en los dos vértices iguales del triángulo se sitúan los sinos de la rueda de 12, y en el tercero, el sino de la rueda de 10 (Fig. 27).

- Ruedas de 9 y 10

Su trama de lazo, basada en un icosaedro y vista anteriormente (Fig. 18) se combina con un módulo estructural que sigue las directrices de un triacontraedro rómbico. Su trazado es sencillo, pues basta con unir cada centro de los triángulos esféricos equiláteros de un icosaedro esférico con sus vértices. El rombo resultante delimita un patrón de lacería de ruedas de 9 y 10. Los camones que forman el rombo esférico (Fig. 21) se solapan desde el cruce de cada vértice y se les quita media sección de forma alterna, mientras que los otros dos centrales se cruzan a media madera y se ensamblan, también de esta forma, con los anteriores. La disposición de los ensambles hace que sean autoportantes, lo que facilita su replanteo y posterior montaje (Figs. 28 y 29).

- Ruedas de 10 y 9

Como en el caso anterior, la división esférica en rombos de un triacontraedro delimita el módulo estructural (Fig. 22). La diferencia estriba en el número de ruedas que cada rombo posee, ya que en este modelo se sitúa una rueda de 10 en el centro del rombo, cuatro medias en los lados, otras dos cuyos sinos se alojan en los vértices más agudos, y, por último, dos más, éstas de 9, colocadas en los ángulos obtusos. Los camones del cruce central van doblados, y los ensambles con los camones del perímetro del rombo posibilitan que la estructura de cada módulo sea autoportante como en la cúpula de ruedas de 9 y 10 (Figs. 30 y 31).

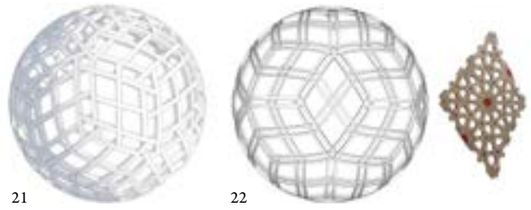


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Figura 21: Estructura basada en la proyección de un triacontaedro rómbico, adaptada al trazado de 9 y 10

Figura 22: Estructura basada en un triacontaedro rómbico, adaptada al trazado de 10 y 9, e intradós de un módulo completo

Inclusión del lazo en los módulos estructurales

Una vez configurada la estructura principal con la unión de los módulos, la labor de lazo seguirá el recorrido marcado por la estructura. La ley no escrita de la lacería obliga a que el trazado ha de pasar de forma alterna por encima y por debajo en cada cruce. Para ello se desarrollaron recursos técnicos y visuales que facilitaron su aplicación, como fueron el agramilado y el encuentro emboquillado de las cintas. Trasladar ambos aspectos al entramado estructural de la cúpula resulta complicado y laborioso, sobre todo cuando el número de ruedas es elevado, o si la alternancia de los empalmes no concuerda con la del lazo.

Hemos realizado, sin embargo, ejemplos en los que ha sido posible trazar, agramilar y emboquillar empalmes en los camones estructurales en una cúpula de 10 y 12 (Fig. 25). La exactitud de los encuentros afecta no solo a la

Modulación y ensamble de la estructura esférica

Los diferentes modelos de lacería y de relaciones de *calle y cuerda* dan lugar a gran variedad de alternativas en función de condicionantes como las dimensiones de la estancia o la escuadría disponible. En función de la unidad de lazo de cada rueda y del número de ruedas de cada modelo, podemos elaborar una tabla en la figuran los gruesos por diámetro que tiene cada modelo (Fig. 23) y la luz resultante al establecer una cuerda de 10 cm. (Fig. 24), muy próxima a los usos tradicionales.

Figura 23: Trazados esféricos de lazo, con indicación del número de gruesos por diámetro, para una distribución a *calle y cuerda*

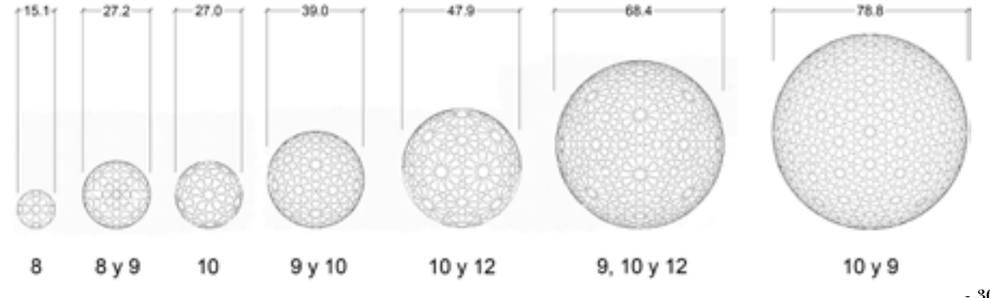


Figura 24: Tabla de valores de los diferentes trazados, con gruesos por diámetro, diámetro resultante para *calle y cuerda*, y para calle de 3 gruesos

Modelo	Gruesos/Ø	Ø (calle=2 c.)	Ø (calle=3 c.)
8	15,1	1,5 m.	2,0 m.
8 y 9	27,2	2,7 m.	3,6 m.
10	27	2,7 m.	3,6 m.
9 y 10	39	3,9 m.	5,2 m.
10 y 12	47,9	4,8 m.	6,3 m.
9, 10 y 12	68,4	6,8 m.	9,1 m.
10 y 9	78,8	7,9 m.	10,4 m.

Figura 25: Módulo estructural apeinazado para una cúpula de ruedas de 10 y 12

superficie del intradós sino también a los perfiles, por lo que en su construcción hay que observar el ángulo de corte, que solamente en los encuentros ortogonales seguirá la dirección del radio esférico.

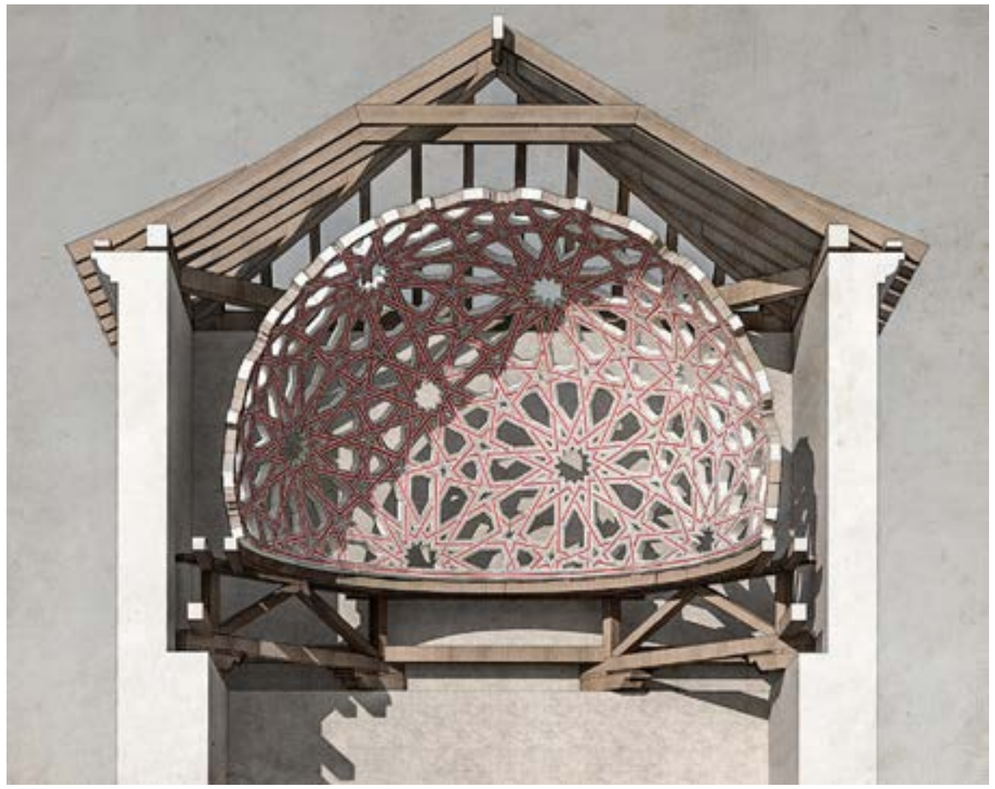
Para soslayar esta dificultad, otro método adoptado en la implementación de la lacería, es la de adosar al intradós de la estructura, la labor de lazo en escuadría de pequeña sección. Esta técnica permite la exacta adaptación de ornamento y estructura y a su vez acoplar los elementos secundarios de sección completa al recorrido estricto del lazo.

Conclusión

Como hemos visto, la carpintería de lazo desarrolló sistemas para la elaboración de cúpulas basadas en la división en husos meridionales, al margen de la simetría esférica, que, a excepción de los cupulines de la Alhambra, sólo tuvo un ligero desarrollo en Medio Oriente. Nuestra propuesta toma dicho método como base para realizar cúpulas de lazo cuyas enormes posibilidades formales y estructurales, aún dentro de lo novedoso, aluden a la tradición constructiva del oficio carpintero, y suponen el perfeccionamiento de una tradición artesanal cuya belleza y técnica constructiva están en plena sintonía con la historia y la cultura hispanas.

Por tanto, consideramos que esencialmente el aporte original hispano a la carpintería de lazo consigue la máxima aproximación posible de la lacería canónica apeinazada a la superficie esférica (Fig. 32), situación que hasta la

Figura 32: Hipótesis constructiva de la sección vertical de una cúpula apeinazada de ruedas de 10 y 12



fecha no ha tenido lugar o no ha trascendido. Ello supone el haber barrido los poliedros y los trazados compatibles y por lo tanto susceptibles de poder ser usados en una esfera. Además, como hemos demostrado, su realización es técnica y materialmente posible, y para ello pueden usarse medios al alcance de un profesional de nivel medio. Únicamente es imprescindible seguir una metodología de diseño precisa, fundamentada en el uso de los mencionados poliedros esféricos, sin los cuales la continuidad homogénea del lazo sería imposible.

[1] San Miguel, Fray Andrés. 1640. Manuscrito. Conservado en la Universidad de Texas en Austin.

Figura 26: Unión de 5 módulos estructurales de una cúpula de ruedas de 10

Figura 28: Extradós de la maqueta de una cúpula de ruedas de 9 y 10

Figura 30: Extradós de una cúpula de ruedas de 10 y 9

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Figura 27: Intradós de la maqueta de una cúpula de ruedas de 10 y 12

Figura 29: Intradós de la maqueta de una cúpula de ruedas de 9 y 10

Figura 31: Proceso de montaje de una cúpula de ruedas de 10 y 9, apreciándose tanto la estructura como el intradós de lacería

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References | Referencias | Referências

Albendea Ruz, María Esther. 2011. *La Carpintería de lo Blanco de la Casa de Pilatos de Sevilla*. Tesis doctoral. Sevilla.

Bonner, Jay F. 2016. The Historical Significance of the Geometric Designs in the Northeast Dome Chamber of the Friday Mosque at Isfahan. *Nexus Network Journal*, 18: 55–103.

Candelas-Gutiérrez, Ángel Luis. 2000. Bóvedas de madera: ¿se pueden construir según describen los tratados?. En Graciani García, Amparo (ed.), *Actas del Tercer Congreso Nacional de Historia de la Construcción*, vol. 1, 193-204. Sevilla: Sociedad Española de Historia de la Construcción.

Candelas-Gutiérrez, Ángel Luis. 2001. Geometría y proceso constructivo de la cúpula del Salón de Embajadores. *Apuntes del Alcázar de Sevilla*, 2: 5-25.

Duclós Bautista, Guillermo. 1992. *Carpintería de lo blanco en la arquitectura religiosa de Sevilla*. Sevilla: Diputación Provincial.

González de León, Félix. 1844. *Noticia artística, histórica y curiosa de todos los edificios públicos, sagrados y profanos de esta muy noble ciudad de Sevilla*. Sevilla: Imprenta de José Hidalgo.

Huerta, Santiago; y Fuentes, Paula. 2010. Islamic domes of crossed-arches: Origin, geometry and structural behavior. *Arch' 10. 6th International Conference on Arch Bridges*. Fuzhou: College of Civil Engineering.

Hurtado Valdez, Pedro. 2012. *Bóvedas Encamonadas: Origen, Evolución, Geometría y Construcción entre los Siglos XVII y XVIII en el Virreinato de Perú*. Tesis doctoral inédita. Madrid: Universidad Politécnica de Madrid.

López de Arenas, Diego. 1633. *Breve compendio de la carpintería de lo blanco y tratado de alarifes*. Sevilla: Luis Estupiñán.

Makovicky, Emil; y Fenoll Hach-Alí, Purificación. 2000. Structure of the domes of pavilions in the Patio de los Leones, the Alhambra: a distorted octacapped truncated octahedron. *Boletín de la Sociedad Española de Mineralogía*, 23: 37-41.

Nejad Ebrahimi, Ahad; y Azizipour Shoubi, Aref. 2020. The Projection Strategies of Gireh on the Iranian Historical Domes. *Mathematics Interdisciplinary Research*, vol. 5, 3: 239-257.

Nuere Matauco, Enrique. 1980. *La carpintería de lazo. Lectura dibujada del manuscrito de Fray Andrés de San Miguel*. Málaga: Colegio Oficial de Arquitectos de Málaga.

Nuere Matauco, Enrique. 1985. *La carpintería de lo blanco. Lectura dibujada del primer manuscrito de López de Arenas*. Madrid: Ministerio de Cultura.

Nuere Matauco, Enrique. 2008. *La carpintería de armar española*. Madrid: Munilla-Lería.

Nuere Matauco, Enrique; Candelas-Gutierrez, Ángel Luis; y de Mingo García, Javier. 2020. Análisis constructivo de la cúpula de madera del desaparecido Palacio de los Cárdenas en Torrijos (S. XV). *Informes de la Construcción*, vol. 72, 559.

Prieto y Vives, Antonio. 1932. La carpintería hispano-musulmana. *Arquitectura*, 9-10: 265-302. Madrid: Colegio Oficial de Arquitectos.

San Cristóbal Sebastián, Antonio. 2006. *Nueva visión de San Francisco de Lima*. Lima: Institut français d'études andines.

Biographies | Biografías | Biografias

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Klaus Zwerger

Recognizing the Similar and Thus Accepting the Other: The European and Japanese Traditions of Building With Wood

Reconocer lo semejante para aceptar lo diferente: Las tradiciones europea y japonesa de construcción en madera

Reconhecendo o semelhante, aceitando assim o outro: As tradições europeias e japonesas da construção em madeira

Keywords | Palabras clave | Palavras chave

Identity, Perception, Pragmatic building solutions, Building cultures, Typology

Identidad, Percepción, Soluciones constructivas pragmáticas, Culturas constructivas, Tipología

Identidade, Percepção, Soluções de Construção Pragmáticas, Culturas de Construção, Tipologia

Abstract | Resumen | Resumo

This article shows that building issues have not been tackled fundamentally differently in Europe and Japan despite large cultural differences. Different cultural expressions must not necessarily be equated with different thinking. The paper contrasts two apparently contradictory views. Numerous analyses of Japanese "otherness" in "Western" as well as local perception dominate the literature. But the results of extensive architectural field surveys seem to indicate the contrary. These results show similar and equal backgrounds and conditions resulting in similar and equal building types and techniques. They show that our ways of addressing a task are prompted by pragmatism. Broadly identical solutions were developed worldwide long before globalization. Yet this realization does not allow us to conclude that equal appearances can be taken to be equal in content.

Este artículo muestra que la forma de afrontar los problemas de construcción no era esencialmente distinta en Europa y Japón, a pesar de las grandes diferencias culturales. Expresiones culturales diversas no implican inevitablemente formas diferentes de pensar. Este artículo compara dos hechos aparentemente contradictorios. Una amplia gama de análisis de la "otredad" japonesa en la percepción "occidental", así como en la autóctona, domina el discurso científico. Los resultados de exhaustivas investigaciones arquitectónicas sobre el terreno parecen demostrar lo contrario. Estos resultados ponen de relieve que antecedentes y condiciones similares e iguales dan lugar a tipologías de edificios y técnicas constructivas similares e iguales. Además, demuestran que los métodos para afrontar una tarea están predominantemente marcados por el pragmatismo. Por todo el mundo se desarrollaron soluciones idénticas mucho antes de la globalización. Sin embargo, este descubrimiento no debe llevarnos a la conclusión de que un mismo aspecto puede evaluarse igualmente en cuanto a su contenido.

Este artigo mostra que o confronto com os problemas presentes na construção não foi abordado de forma fundamentalmente diferente na Europa e no Japão, apesar das grandes diferenças culturais. As diferentes expressões culturais não devem ser inevitavelmente equiparadas com um pensamento diferente. O artigo coloca em oposição dois factos aparentemente contraditórios. Uma vasta gama de análises da "alteridade" Japonesa na percepção "Ocidental" bem como indígena domina o discurso científico. Os resultados de extensos estudos arquitectónicos de campo parecem provar o contrário. Estes resultados realçam que alguns antecedentes e condições que são semelhantes e iguais, dão lugar a tipologias de construção e técnicas de construção que também são semelhantes e iguais. Revelam que os métodos utilizados pelas pessoas para enfrentar uma tarefa são fortemente guiados pelo pragmatismo. Soluções globalmente idênticas foram desenvolvidas por toda a parte muito antes da globalização. No entanto, esta constatação não nos permite concluir que aparências iguais podem ser avaliadas igualmente em termos de conteúdo.

Introduction

This article is based on a paper presented on the 150th anniversary of the 1869 Friendship Treaty between Austria and Japan at a symposium held in Vienna in 2019. Its subject matter is still applicable and unfortunately topical. Recklessly pursued egoism and self-interest have driven humanity into a dead-end. On realizing this, many seek support and guidance from leaders perceived as charismatic, and despite bad historical experiences they blithely sign up to strategies involving bogeymen and conspiracy theories. Politics needs strong voices proclaiming that humans basically think equally, behave equally, and feel equally all over the world.

"Friendship" can be a euphemistic term. The aforesaid Friendship Treaty was more about economic and political interests such as had been asserted in China not long before than an amicable accord. Starting with the opium wars, Western colonial powers submitted China to their benefit over the 19th century. When they sought to repeat the strategy in Japan, the Meiji Restoration government did all it could to escape this fate. They were convinced that their only chance was to study and understand Western methods and interests, fearing that Japan's experience would be like China's. The resulting Iwakura Mission is legendary, though unknown to a wider public (Nish 1998; Pantzer 2002). What is well known are the several world exhibitions at which Japan presented itself as matching its European and North American hosts, allowing Westerners to become more familiar with the Japanese nation.[1] Japan's self-presentations are striking indications of its rapidly changing self-perception and self-awareness. The consequences are well known. Japan generated surprise and fascination. Its culturally distinct "otherness" was perceived and cultivated at home as well as sought from abroad (Edlinger 2008; Schiermeier 2014).[2] A perceived Japanese identity came into being.

"Self-perception" and "identity" are key terms in our approach here. A few architectural references that made Japanese "otherness" a subject of discussion as of the opening of the country in 1868 are cited as examples. Our selection deliberately does not give a coherent picture. Thus the various views will not be classified or assessed. This broad picture is contrasted with personal observation. A variety of architectural details seem to prove that the same building tasks generated the same results in both Europe and Japan. Brief analyses of juxtaposed examples show also that the similarity does not stop with appearance. We conclude cautiously that the theory of otherness is at odds with similar thinking as expressed in building practice.

The "other"

Many studies and much literature deal with the so-called "other" (e.g. Yoshiaki 1995; Löffler 2015b).[3] Statements such as: "Only an insular people – an isolated people – can limit itself by building with one single structural material, that is to say wood, so consistently for 2000 years" (Nitschke 2002: 15) cement stereotypes about difference. Authors emphasizing the paradoxical culture and complexity of Japan's society find "a high degree of adaptability" in its citizens (Bognar 1988b: 148). The advice on how to deal with this and the conclusions drawn are diverse: "Thinkers working in the contemporary styles of Western philosophy are often ill-trained in and therefore neglectful of Eastern forms of thought" (Ibid.: 162).

Heinrich Engel criticizes "Western publications on Japanese architecture [looking for] affirmation of current theories [instead of showing] serious attempts to uncover the real backgrounds" (Engel 1964: 24). Roland Barthes supports him by asserting: "This city [Tokyo] can be known only by an activity of an ethnographic kind: you must orient yourself in it not by book, by address, but by walking, by sight, by habit, by experience; here every discovery is intense and fragile, it can be repeated or recovered only by memory of the trace it has left in you" (Barthes 1983: 36).

Bruno Taut's writings were influential along the same lines. As Astrid Edlinger says about Taut: "He finds in Japan what he is looking for, as he is only looking at what matches his vision" (Edlinger 2008: 66). Manfred Speidel agrees: "Taut made himself the advocate for that, what he regarded as 'proper' Japanese, and outlawed everything not belonging to it" (Speidel 2009: 171). Taut had drawn attention to historic architectures barely noticed by locals at the time of his stay in Japan. Calling the Katsura villa a "Japanese architectural wonder of the world" (Speidel 2003: 92), he managed to impress the locals with his comments and accounts of their architecture's exceptionality.

Another quotation from Taut himself shows the problem of apodictic judgments by those who have managed to win confidence by their sensitive appreciation of unfamiliar surroundings: "It is simplicity and freshness [...] that is typical of Japan, not the Japan spoilt by undigested influences and broken and degenerated by imitation" (Taut 1937: 84). Those who might have felt most supported politically by this were probably less happy to accept a foreigner's view as supportive. Ironically, Taut's statement could have been written in one of the aggressive nationalists' political pamphlets. But Taut's statement is at the least questionable – a novice's view of a foreign country.

The actively driven opening of Japan was not to everybody's taste. "History tells us that phases of rapid [...] changes have always been experienced as destabilizing, uncomfortable and irritating" (Herrle 2008: 11). Many undereducated people and those unwilling to make the efforts required in times of change tend to fall victim to simplifying nationalistic solutions. They are open to the notion that others have caused their disadvantaged situation. Beate Löffler got to the heart of this on describing different worlds of perception: Japan "took from the 'imagined empire' of the West whatever was needed" (Löffler 2015a: 100) to ward off the dreaded colonization. It is no surprise that the Japanese felt disparaged when the Japan of the late 19th century was seen by the West as "mostly a source of inspiration, not one of applicable knowledge" (Ibid.). Much the same applied to those invited by the Japanese government to teach and to build: "For the architects and civil engineers [Japan] was a place to earn money and to get large, prestigious public projects built to further career opportunities" (Ibid.).

Having spoken of "the other", we cannot ignore "Japan-ness" and "Japanese-ness" (Ciorra et al. 2016: 67–68), portraying the distinguished other. Peter Herrle writes about French influence in North Africa having created the "Arabesque" in order to express "the local" (Herrle 2008), showing that this creation of an awareness of an "own" – in this case – architecture is far from an exclusive phenomenon.

The Japanese themselves coined the term *Wayo*. During the Kamakura period new building styles were introduced into Japan from China. By the late 12th century the architectural techniques and building methods imported from Tang China had become so natural (having been altered and adapted to Japanese taste) that Japanese people regarded traditional representative architecture of the *Wayo* style as Japanese. Botond Bognar interestingly suggests that this can happen in an unintended way: "Consecutive rebuildings after numerous fires provided the opportunities for [...] changes, often referred to as a process of 'Japanisation'" (Bognar 1988a: 17).

On the other hand, Japan underwent wholly local architectural developments. Shinto shrines are examples of representative architecture, and *minka,* commoners' houses, are vernacular buildings. To return to the doubtful statements quoted above, these were classified by Bruno Taut as "essentially un-Japanese" (Taut 1936: 14).

There are still people convinced of the notion that Japan's culture relies on copying and improving. This may be supported with numerous examples of historic architecture brought from China to Japan, though again we may speak of a "source of inspiration".

Inspiration also went the other way. A good example is Vincent van Gogh's copy of Hiroshige's *Sudden Shower over Shin-Ōhashi bridge* (Fig. 1). Van Gogh copied the composition and his personal ingredients are a *kanji* frame and the Japanese characters displaced out of the picture. Looking at the images side by side and knowing of the summer downpours in Japan and of Van Gogh's electrifying depiction of light, we can recognize innovation in Van Gogh's copy very much as innovation was described by the Roman scholar Macrobius.[4]

Similarly, in an exhibition at the Vienna Museum of Applied Arts dedicated to Koloman Moser, the Austrian painter, graphic artist and co-founder of the Viennese Secession, two of the works on show were an original *katagami*, a dyeing stencil and an upholstery fabric entitled *Waves at Play* (Fig. 2), produced by the Backhausen company. The similarities are striking. Actually we seem to see a copy, and there is no

need to say which picture was modeled on the other. On looking closely we realize that there are also differences. Moser changed the distribution of the frolicking fish in the turbulent water. On careful inspection we detect several more alterations in the copy, or rather simplifications. My impression is that the Backhausen fabric calms the more vivid and vigorous original, perhaps through its coloring. The Backhausen fabric uses four colors whereas the paper-dyeing stencil could have served for a two-tone textile. Moser probably suited his design to the different expressive possibilities inherent in the different materials (though this is pure layman's speculation).

As mentioned, Japanese people also realized that they were perceived as "other" in Western eyes, and took advantage of this. As an example, it is amusing to read Arata Isozaki's account of how former ordinary craftsmen eventually became artists and their products turned into art objects (Isozaki 2011: 4).

So to what extent is Japanese art and architecture, as a cultural expression of a people, a theoretical construct of otherness?

Visual similarity

My research subject is historical wood architecture, contrasting developments in East Asia and Europe. Usually I describe the variously obvious differences. In this paper I turn the spotlight on closeness and relationships expressed in common basic ideas, equal realizations, and common intentions, i.e. similarities.

My first example is *Todai-ji shōsō-in* (Fig. 3). This is a very old architectural type which has symbolic status in Japanese architectural history and is widely seen as typically Japanese. It reminds us of other similar storehouses built as log buildings, all elevated from the ground. We can assume that this was to protect the stored goods from rainwater and rising damp and to ventilate under the floor. All other storehouses of this type are much smaller, usually on a square plan. Although covered by just one hip roof, the three-part division of the main body leads us to ask why the central part was filled in with planks and not executed as a log structure. We do not know why, but we were told that this central part is a later addition. So what can we assume about what the building looked like before its alteration?

Before speculating, we may take a look at this *Hōryū-ji kofuzo* (Fig. 4). The structure is significantly different. The plastered walls in a timber-frame structure clearly indicate that this building should be seen as an import from China. This applies to the way of building, though I could not say about the building type. The *Hōryū-ji kofuzo* ground plan (Fig. 5) shows what we could only assume from the previous image, as access restrictions preclude a comparable view of Todai-ji shōsō-in. In this plan we see a clear separation of two compartments by a distance as wide as the length of the enclosed spaces. The ground plan explains the installation of doors in a lengthwise axis beneath the overarching roof. This format allows a use of the store taking into account the stored items' vulnerability to the elements. Full use is normally made of the inner space of storehouses, so the handling of goods inside can be restricted and it is useful for the layout to include a large outer covered area for shelter. Whether for cereals or any other valuable items, as in the case of T*odai-ji shōsō-in*, goods need to be protected when taken out of the store and put into it.

If we now return to the *Todai-ji shōsō-in* photo, what Japanese scholars have found becomes evident. The central

1a: Sudden *Shower over Shin-Ōhashi bridge and Atake*, Ando Hiroshige, Cleveland Museum of Art (Wikipedia, consulted on 17/02/2021)

1b: *Bridge in the rain after Hiroshige*, Vincent van Gogh, Google Art Project (Wikipedia, consulted on 17/02/2021)

Figure 2a. *Katagami* (Museum of Applied Arts in Vienna)

Figure 2b. Design for a carpet for the company Backhausen, Koloman Moser (Museum of Applied Arts in Vienna).

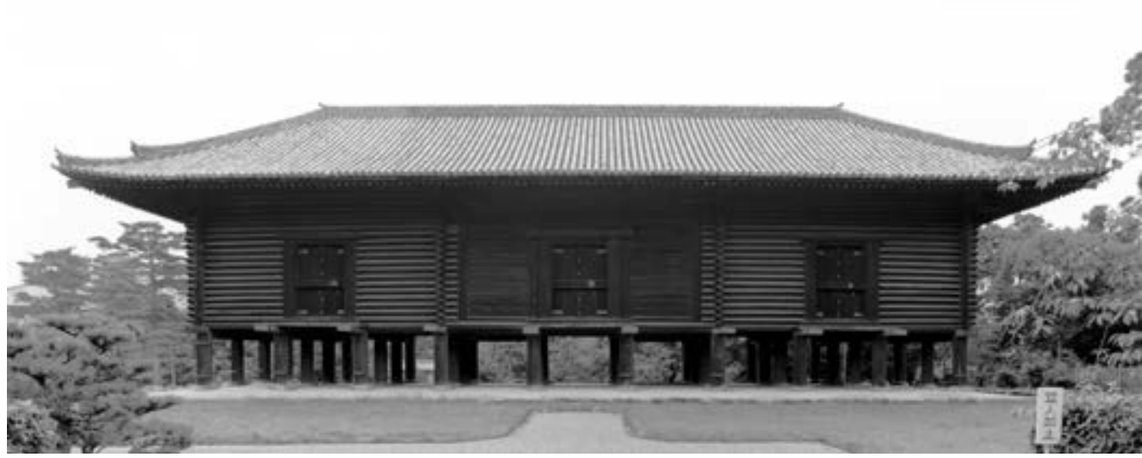

Figure 3. *Todai-ji shōsō-in* in Nara

Figure 4. *Hōryū-ji kofuzo* in Ikaruga

part was added later and was responsible for the doors being cut into the facade, altering the original positioning. The original door openings must be assumed to have been in the same positions as those seen in the *Hōryū-ji kofuzo.*

We may now look at the aforementioned similarities between Japanese and European architectural examples.

Let us take the example of a storehouse from Finland (Fig.6). We immediately see similarities, primarily in the three-part composition. We also see that this storehouse is not raised off the ground – for in Finland there is plenty of snow but little torrential rain, and in particular much drier air than in Japan. Again, storage space is valuable. Stores were always built with more care than other outhouses, and if they could have two stories, they did. But the typological similarity is beyond question. It is intriguing to find a near-identical storehouse structure executed in both Europe and Japan.

Dendrochronology has turned history upside down. *Todai-ji shōsō-in* is a striking example. According to the website

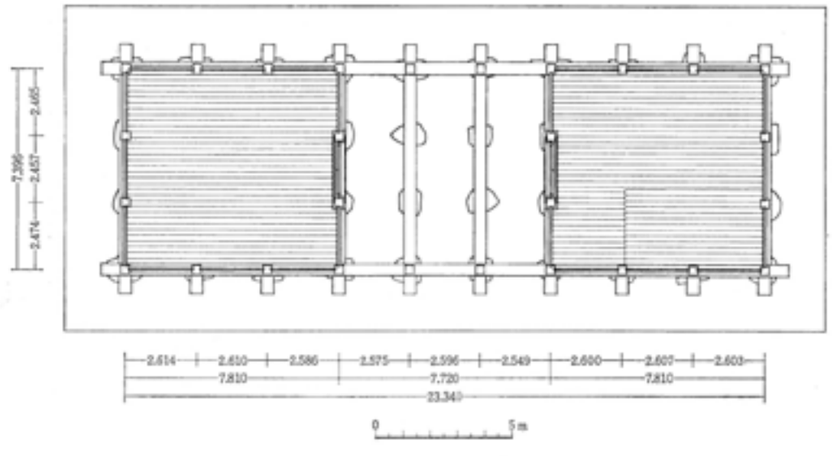

Figure 5. *Hōryū-ji kofuzo* ground plan (Ando 1991: 79).

of Kunaicho, the Imperial Household Agency, research by Mitsutani Takumi in 2003 and 2006 indicates that the central part was erected together with the northern and southern *azekura* stores in the mid-8th century (Mitsutani 2003, 2006, 2016). But this does not prevent there being an affinity, especially if we consider the term *narabi kura* – used for the storehouse type common in the Nara period and referring to the *shōsō-in* type without a closed central part.

As a further example, let me present another building at the Todai temple complex: the *shōrō* or belfry (Fig. 7).

Like the *shōsō-in* of Todai, the belfry survived the fire of 1567,[5] thus retaining elements of the *daibutsu* style. This building is designated as a national treasure for its age, its structure, and perhaps also its bell. And though its structural base may well not be the reason for this distinction, let us focus on this.[6]

Figure 6. Storehouse in the open air museum in Seurasaari in Finland

Figure 7. *Todai-ji shōrō* in Nara

Todai-ji shōrō is not a one-off building type, so I take the example of *Chion-in daishōrō* to zoom in on the point of interest (Fig. 8). The Chion temple belfry shows significant structural differences as compared to that of the Todai temple. It was built in 1678, i.e. much later. Yet the jointing of crossing sill beams and corner posts is just the same as that of the earlier example.

Again I offer a matching European counterpart in order to show that carpenters created similar solutions worldwide as long as these were suitable and no external factors[7] prevented such developments: the stave church of Hopperstad in Norway (Fig. 9). We can assume that there was no Japanese-Norwegian cultural exchange prior to this building task. According to dendrochronological tests with various results, scholars assume this church to have been erected between the 11th and 12th centuries. Now let us focus on a corner post of the core section. This area was surrounded by an ambulatory recognizable by the pent

Figure 8. Bell tower of Chion-in in Kyoto

Figure 9a. Stave church in Hopperstad, Norway
Figure 9b. Corner pillar of the church in Hopperstad

roofs around the core. Four heavy sill beams rest on a stone foundation. The sills are interconnected by half-notches near their ends, creating a rigid frame. The corner post is cross-cut at its bottom end (like that in Fig. 10). The forked ends clasp the jointing point of the crossing sills and the recessed notches fix the beams in position. The ingenuity of this joint lies in its protective nature. As the interconnection of the horizontal beams is protected against intrusion of water, especially at their vulnerable ends, the joint material is perfectly shielded. This joint serves two functions: the post protects the interconnection of three structural members and holds them secure. This jointing method is applicable in any other comparable situation and is found not just in representative buildings but also in dwellings (like that in Fig. 10).

Our next examples are raised storehouses in a different context: Amami Oshima, an island between Kyushu and Okinawa (Fig. 11). Rice storehouses had to resist typhoons

Figure 10a. Farmhouse in the open air museum in Bygdoy, Norway
Figure 10b. Drawing of the corner joint of a Norwegian stave church

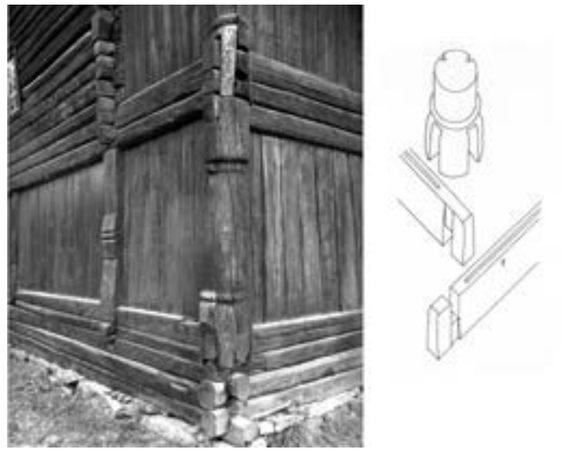

Figure 11. Rice storehouses in Yamatohama

with wind speeds of 200 km/h and the building design and elevation had to be suited to this. And as in Japan, storehouses in Europe were built on pillars of variable height (Fig. 12). An elevated storehouse in Japan, like in Europe, must address one main issue: how to keep the stored items dry and ventilated. The pillars were designed to protect the stored goods and also the structure itself, and if people wanted to use the sheltered space below, they had to raise the building high enough to leave enough room. Structurally it is quite demanding to raise the center of gravity upward. The Japanese temple storehouses shown above held exquisite treasures, but common stores are intended for cereals, and if just one filled basket weighs some 70 to 80 kg, we can imagine the weight on an ordinary storehouse floor. Cereals were stored directly on the floor, and keeping such staple foods in good condition as long as possible involved a challenge. The solution developed was to raise the whole storehouse, thereby preventing the floor from absorbing the ground's humidity. The problem of humid air could not be removed but it could be mitigated. As the pillars raised the whole structure, the outer surface area increased significantly and the wind aerated the floor as well as the walls.

Figure 12a. Espinaredo, Spain
Figure 12b. Bosco Gurin, Switzerland
Figure 12c. Stübing, Austria
Figure 12d. Bygdoy, Norway

Figure 13a. Wood church in Bogdan Voda, Romania
Figure 13b. The 5-storied pagoda at Haguro san

Figure 14a. Gable side of a store house in Aki shi
Figure 14b. Gable-sided facade of a dwelling house in Trogen, Switzerland

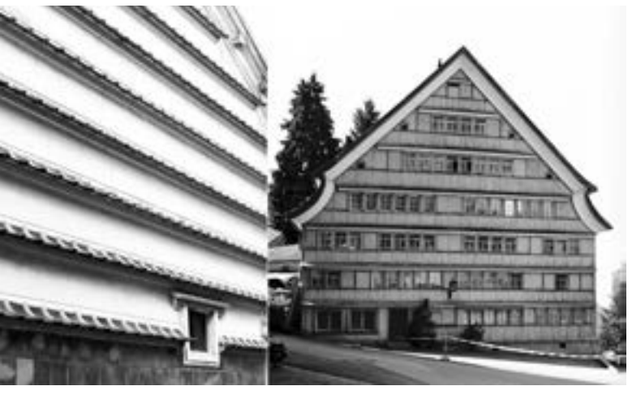

Figure 15a. Detail of a corner of *Tōshōdai-ji hozo* in Nara
Figure 15b: This log building in Kruszyniany, Poland, is built of halved logs. The advantage of flat inside walls cannot offset the building's poor execution

We also find similarities in the way buildings are roofed (Fig. 13). The best protection for wood against the rain and sun is, as for humans, an umbrella or parasol. The better we are covered, the more protected we feel, for a small umbrella keeps only our head dry. But if it is too large it will be heavy and blown about, and tall people with umbrellas tend to get wet anyway. We can change our clothes, but buildings deteriorate if they are constantly exposed to the elements. So carpenters build structures with sufficient roofing to protect both head and body.

Consider townhouses (Fig. 14). As they normally stand close to one another, they require specific solutions. In Aki shi, a town on the south coast of Shikoku, torrential rain during typhoons forced the inhabitants to develop serial rain gutters, one above the other. Their houses' structural skeletons were walled and covered with earth, as a mere additional coat of plaster was deemed insufficient to protect the earth from rainwater. Trogen, a town in Switzerland, appears to have suffered from heavy rain as well. Here the houses were also skeleton structures, covered on the outside with decorative wooden paneling. The paneling was intended to shield the house structure itself, as attached pent roofs protruding far enough to be effective would deprive the windows of light. Comparable to the Japanese solution, a form of construction was developed with slightly protruding rain gutters above each row of windows in order to drain off at least some of the rain via drip moldings above each row.

Our next example is exceptional for its inconspicuousness. I return to a detail of the wall of a Japanese temple storehouse (Fig. 15). At first sight the beams seem to be cut triangularly, but in fact the edges are chamfered. Having beam above beam in a log structure with the contact area reduced to a line gives one an uneasy feeling, and the invisible joints are rather complex. But this does not disqualify this kind of building. Japanese carpenters seem to have taken pleasure in challenging tasks. The bemused question of a Western scholar concerns the idea behind it: what sense can there be in stacking logs in such an unstable way? One answer taking account of wood's properties would be that triangular sections were split out of logs and so this arrangement would prevent any drying of cracks and use the material in the most efficient way. Careful examination does not support this theory. Only dendrochronological verification would allow us to tell if the logs in the photo are originals or replacements. If the logs are original, our split-log theory would be disproven. If the logs are from repairs or reconstructions, we can say nothing about what the original logs looked like. But this example can be compared to the kind of log wall to be found in an area of Poland that evidently experienced a wood shortage. It is no accident that all the beams are extremely short and with spiral growth, but we do not know if this is linked to the erection of walls of halved timbers. Again we find logs stacked edge to edge. In both the Japanese and the Polish examples there is a flat surface inside. The Japanese example is today visible

Figure 16. This painting shows a Japanese storehouse from 12th century (Seckel 1959: 109)

only in temple or shrine compounds, whereas the Polish example has no pretension to being a treasure chamber. We do not know whether the Japanese detail was also used for ordinary storehouses in former times. But a reference here could be the storehouse depicted in a *Shigi san engi* picture scroll from the late 12th century (Fig. 16). In this scroll a storehouse features in a story about a rich man and the monk Myōren. In the storehouse shown, all the logs have a square section, but they are not stacked one flat surface on another. As in the temple storehouses, they are assembled edge on edge.

A recently completed research program that gave rise to this paper gives us a last example (Zwerger 2020). Wherever it was impossible to dry ripe grain directly in the fields, drying racks had to be erected (Fig. 17). This could be for reasons of climate, topography, grain type, and so on. Just by looking at pictures, it is not so easy to tell which rack is Japanese and which European (Fig. 18). Japanese farmers were able to create these drying devices independently, and temporarily. European farmers had the same idea. The sometimes huge yet simple racks could and did become actual architectural buildings under certain circumstances (Fig. 19). The most elaborate examples combine a dwelling house, a storehouse, or a stable with drying racks around it (Fig. 20). These mature structures could not be built by farmers themselves, as their erection required the know-how of professional carpenters. Sometimes, even without erecting temporary drying racks, farmers used similar makeshift solutions for drying (Fig. 21).

Figure 17. Single drying racks need braces against the wind, and these have to be installed in a way that does not make the rack difficult to handle (Abfaltersbach, Austria)
Figure 18. The extremely steep slopes in the Takikawa-mura area allow bracing on only the upper side

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Figure 19a. Drying ladders can be hung around house walls (Mattling, Austria)

Figure 19b. They can also be attached to a storehouse as structurally connected double racks, with all elements thus combined under one roof (Prelaško, Slovenia)

Figure 19c. Double drying racks under a carpenter-made roof can stand over a storehouse (Podsreda, Slovenia)

Figure 19d. They can also be attached to a farmhouse, creating a combined dwelling, stable, storehouse, and drying rack (Dobrava, Slovenia)

Figure 20a. This double cereal drying rack with storage space under the roof makes use of the open gable for extra hanging capacity (Shirakawa-mura)

Figure 20b. At harvest time, farmers erect drying racks temporarily round their houses, making use of the warmth reflected by the walls (Tamugimata)

Figure 20c. By contrast with the previous example, these drying racks do not support the roof. And unlike the example from Tamugimata, these racks are structurally integrated in the storehouse (Ogi-machi)

Figure 20d. This drying rack surrounds a fire-protected storehouse in Miyamori-mura. The rack supports the overhanging gable and eaves while the roof's main weight rests on the storehouse

Figure 21a. These makeshift structures are erected in hours. They need scarcely any maintenance. They consume no material apart from rope. Once dismantled, the place is left as it was before. Economy and ecology at their best! (Sanpoku machi-Ogoto)

Figure 21b. Takayanagi machi

Figure 21c. Takayanagi machi-Tochigahara

Figure 21d. Nakanokuchi mura

Conclusion

If the examples presented here were mixed up, it would be challenging for many to guess correctly which building is European and which Japanese. All the structural details are similar at first sight, though naturally close inspection reveals significant differences of composition.

The reason for putting Japanese and European examples side by side is to show strikingly similar solutions expressing identical ways of thinking. This is especially observable in elements which are less subject to cultural influence.

I leave all explanations of how and why aside, and just conjecture about a shared logical reasoning.

I would like to return to my introductory considerations. Friendship requires appreciation, acceptance of the "other", no matter whether the "other" is created artificially, constructed by erroneous assumptions, or has real differences.

In connection with the Japanese and European storehouses we mentioned above or the storehouses clad with drying racks, we might have spoken of *ma*, the Japanese term for "the space in between" (Snodgrass 2004; Vergese 2003), using it to emphasize that visually equal appearances must not be mistaken for equal realities. Nonexistent terms do not demonstrate the inexistence of what they refer to; what they show is that awareness of perception can develop in very different ways.

The "other" remains strange as long as it is insufficiently known. What is needed is to support scientific exploration of all phenomena that serve a growing together; a confluence respecting different approaches based on different cultural educations but which initially and ultimately respond to the same basic realities. Walter Gropius was another voice among the purely personal interpreters of Japanese architectural peculiarities (Gropius 1967: 83, 100). I doubt he would repeat some of his words today, yet I subscribe to one of his statements without hesitating: "The physical world has become too small to allow ourselves to go on living in parallel ignorance of each other" (Ibid., 82).

I propose that it may be interesting to develop the investigation of architectural expression emphasizing similarity and likeness and not just focusing on "otherness". Yet we must not err as in the examples we criticized and present pure visual impressions of similarity as actual equality. The contrasted European and Japanese artefacts raise the question of to what extent they are equal.

On launching such an investigation we will also have to reconsider "our" artifacts. The reason is given in the headline of an interview with Gion Caminada: "To feel our own differently in a new context" (Schoper 2017: 17).

However, this investigation should not be confined to architecture. For as Adolf Muschg says: "Each culture captures the construction of perception underlying its world in its language. Entirely different worlds are the result of a comparison, even though they might match seemingly on their surface" (Muschg 2007: 211).

[1] The first world exhibitions presenting Japan, as a participant, to a world audience were held in London in 1862, in Paris in 1867, and in Vienna in 1873. For Vienna, see Zwerger, 2007-08.

[2] Oscar Wilde made a mocking yet refreshing comment in 1891: "Do you really imagine that the Japanese people, as they are presented to us in art, have any existence? If you do, you have never understood Japanese art at all. The Japanese people are the deliberate self-conscious creation of certain individual artists. […] In fact the whole of Japan is a pure invention. There is no such country, there are no such people." (Wilde 2019: 24-25)

[3] The range of discussion on this topic is great.

[4] "We ought to imitate bees, if I can put it that way: wandering about, sampling the flowers, they arrange whatever they've gathered, distributing it among the honeycomb's cells, and by blending in the peculiar quality of their own spirit they transform the diverse kinds of nectar into a single taste." (Macrobius 2011, *Conviviorum primi diei Saturnaliorum/The festivities of the first day of the Saturnalia*, sentence 5)

[5] During a skirmish between the Miyoshi and Matsunaga clans, most buildings in the temple complex were burned down in 1567.

[6] Photographs showing the technical inner life were taken during repair work; see Nara Bunkazai Hozon Jimusho 1967, figs. 164-166.

[7] The interdependence of climate and culture is wonderfully described by Tetsuro Watsuji.

Figure 22. Črni Vrh, Slovenia

References | Referencias | Referências

Ando, Ryosuke. 1991. *Nara rokudaiji daikan; Horyuji I*. Tokyo.

Barthes, Roland. 1983. *The Empire of Signs*. Translated by Richard Howard. New York: Hill and Wang.

Bognar, Botond. 1988a. Archaeology of a Fragmented Landscape. In Papadakis, Andreas (ed.), *Japanese Architecture*, 15-25. London: Academy Editions.

Bognar, Botond. 1988b. The Japanese Order of Things: Notes on Humanism and the Man-Environment Relationship in Japan. In *Form, Being, Absence: Architecture and Philosophy*, 2, 148-162. New York: Rizzoli International.

Ciorra, Pippo; and Ostende, Florence. 2016. Japaneseness. *The Japanese House: Architecture and Life after 1945*, 67-83. Venice: Marcilio Editori.

Edlinger, Astrid. 2008. The Japanese Example – or the Art of Appropriation. In Herrle, Peter et al. (eds.), *Architecture and Identity*, 57-71. Berlin: Lit.

Engel, Heinrich. 1964. *The Japanese House: Tradition for Contemporary Architecture*. Rutland: Tuttle.

Gropius, Walter. 1967. *Apollo in der Demokratie*. Mainz: Kupferberg.

Herrle, Peter. 2008. Architecture and Identity? Steppenwolf and the Carriers of Change. In Herrle, Peter et al (eds.), *Architecture and Identity*, 11-22. Berlin: Lit.

Isozaki, Arata. 2011. *Japan-ness in Architecture*. Cambridge: MIT Press.

Löffler, Beate. 2015a. The Perpetual Other. Western Architecture in the Western Imagination. *International Journal for History, Culture and Modernity*, vol. 3, 3: 82-112.

Löffler, Beate. 2015b. Beständiger Wandel. Japanische Architektur als interpretatorische Verfügungsmasse (1850-2015). In Picht, Laura et al. (eds.), *The Limits of Change. Was ist der Wert der beständigen Dinge?*, 197-213. Berlin: Neofelis Verlag.

Macrobius, Ambrosius Theodosius. [431] 2011. *Saturnalia*. Edited and translated by Kaster, Robert A. Cambridge: Harvard University Press.

Mitsutani, Takumi. 2003. A Dendrochronological Investigation of Construction Materials Used in the Shosoin Repository. *Bulletin of Office of the Shosoin Treasure House*, vol. 25: 81-84. https://shosoin.kunaicho.go.jp/en-US/bulletin?p=3 (consulted on 16/02/2021).

Mitsutani, Takumi. 2006. A Dendrochronological Investigation of Construction Materials Used in the Shosoin Repository. *Bulletin of Office of the Shosoin Treasure House*, vol. 28: 66-70. https://shosoin.kunaicho.go.jp/en-US/bulletin?p=3 (consulted on 16/02/2021).

Mitsutani, Takumi. 2016. A Dendrochronological Investigation of Construction Materials Used in the Shosoin Repository (III). *Bulletin of Office of the Shosoin Treasure House*, vol. 38: 81-88. https://shosoin.kunaicho.go.jp/en-US/bulletin?p=2 (consulted on 16/02/2021).

Muschg, Adolf. 2007. Wegbeschreibung minimal. In Wolfsberg, Kunstmuseum (ed.), *Japan und der Westen. Die erfüllte Leere*, 211-219. Köln: DuMont.

Nara Bunkazai Hozon Jimusho (Ed.). 1967. *Kokuhō Tōdaiji Shōrō Shūri Kōji Hōkokusho*. Nara: Nara Bunkazai Hozon Jimusho.

Nish, Ian. 1998. *The Iwakura Mission in America and Europe. A New Assessment*. Richmond: Japan Library.

Nitschke, Günter. 2002. Architektur und Ästhetik eines Inselvolkes. In Schittich, Christian (ed.), Im *Detail: Japan. Architekten, Konstruktionen, Stimmungen*, 15-35. Basel: Birkhäuser.

Pantzer, Peter. 2002. *Kume Kunitake: Die Iwakura-Mission. Das Logbuch des Kume Kunitake über den Besuch der japanischen Sondergesellschaft in Deutschland, Österreich und der Schweiz im Jahre 1873*. München: Ludicium Verlag.

Schiermeier, Kris. 2014. Imitation oder Innovation? Van Goghs Japonaiserien und die japanische Kunst der Meiji-Zeit. In Irvine, Gregory (ed.), *Der Japonismus und die Geburt der Moderne. Die Kunst der Meiji-Zeit*, 140-165. Leipzig: Seemann.

Schoper, Tom. 2017. Ähnlichkeit und Differenz. In neuem Kontext das eigene anders spüren. In *Ein Haus. Werk - Ding - Zeug?*, 17-49. Wien: Passagen Verlag.

Seckel, Dietrich. 1959. *Emakimono*. Translated by Maxwell Brownjohn. London: Jonathan Cape.

Snodgrass, Adrian. 2004. Thinking through the gap: The space of Japanese Architecture. *Architectural Theory Review*, vol. 9, 2, 65-85.

Speidel, Manfred (ed.). 2003. *Bruno Taut. Ich liebe die japanische Kultur. Kleine Schriften über Japan*. Berlin: Gebrüder Mann.

Speidel, Manfred. 2009. Nachwort. In Taut, Bruno. Nippon mit europäischen Augen gesehen. Berlin: Mann.

Taut, Bruno. 1936. *Grundlinien der Architektur Japans*. Tokyo: Kokusai Bunka Shinkokai.

Taut, Bruno. 1937. *Houses and People of Japan*. Tokyo: Sanseido.

Tetsurō, Watsuji. 2017. *Fūdo; Wind und Erde: Der Zusammenhang zwischen Klima und Kultur*. Berlin: Matthes & Seitz.

Verghese, George. 2003. The Way of the Detail in Japanese Design. *IDEA Journal*, vol. 4, 1: 161-172.

Wilde, Oscar. [1891] 2019. *Intentions*. GlobalGrey. https://www.globalgreyebooks.com/intentions-ebook.html (consulted on 14/02/2021).

Yoshioka, Hiroshi. 1995. Samurai and self-colonization in Japan. In Pieterse, Jan N. (ed.), *The decolonization of imagination*, 99-112. London: Zed Books.

Zwerger, Klaus. 2007-08. Präsentation japanischer Baukultur im Wien des 19. Jahrhunderts. *Archiv*, 57/58: 18-220.

Zwerger, Klaus. 2020. *Cereal Drying Racks: History and Typology of Wood Buildings in Europe and East Asia*. Basel: Birkhäuser.

Biography | Biografía | Biografia

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Klaus is an Associate Professor at the Institute of Architecture and Design at the University of Technology in Vienna (TU Wien), Austria. He has been granted three long-term scholarships to work as a guest researcher at Todai (University of Tokyo). He has been invited as a guest professor to Hosei University in Tokyo, held several lecture series, and run numerous seminars and workshops at various universities in China and Europe. As of autumn 2021 he is professor at SEU in Nanjing. Working as a joiner and carpenter, he collected experience with wood. His scientific research is focused on historic timber architecture. He specializes in comparative East Asian and European building traditions and has published widely on this topic. His most recent monograph was published in 2020.

Petra Gruber, Kingshuk Datta

Construction Aspects in Ethiopia's Architectural Traditions: A Comparative View

Aspectos constructivos de las tradiciones arquitectónicas de Etiopía: Una visión comparada

Aspectos de construção nas tradições arquitectónicas da Etiópia: Uma visão comparativa

Keywords | Palabras clave | Palavras chave

Comparative research, Architectural typologies, Vernacular architecture, Sub-Saharan architecture, Traditional building

Investigación comparada, Tipologías arquitectónicas, Arquitectura vernácula, Arquitectura subsahariana, Construcción tradicional

Investigação comparativa, Tipologias arquitectónicas, Arquitectura Vernacular, Arquitectura Subsaariana, Construção Tradicional

Abstract | Resumen | Resumo

The traditional architecture of Ethiopia is manifold and spreads over a wide range of climatic zones and topographies, serving a diversity of societies. Within these contexts, the architectural traditions that have emerged show extraordinary quality and adaptability. All basic kinds of building construction can be found in diverse Ethiopian building cultures and types. In this paper, selected examples of this rich heritage, from massive stone buildings to nomadic tents, are presented and analyzed as regards their tectonic aspects and materials, and cultural interpretations are proposed. Our methodology is a comparison of building features, sizes, and spans together with materials, details, and resulting structural performance, based on documented traditional types. Comparison of building cultures that are similar even though ostensibly unrelated can highlight aspects of convergent development; alternatively, they may suggest unknown or underappreciated historical cultural exchanges and influence.

La arquitectura tradicional de Etiopía es muy variada, se extiende por amplias zonas climáticas y diferentes topografías y presta servicio a diversas sociedades. En estos distintos contextos han surgido tradiciones arquitectónicas que muestran unas extraordinarias calidad y capacidad de adaptación. En Etiopía, todos los tipos básicos de construcción pueden encontrarse en sus diversas culturas. En este artículo se presentan y analizan algunos ejemplos elegidos de este rico patrimonio, desde edificios de piedra masivos hasta tiendas de nómadas, se consideran sus aspectos tectónicos y se proponen interpretaciones materiales y culturales. La metodología presentada en los análisis de este documento consiste en una comparación de las características constructivas, las dimensiones y los huecos, así como de los materiales, los detalles y el funcionamiento estructural resultante a partir de la documentación y los registros de tipologías tradicionales. La comparación de culturas constructivas que son similares, aunque también ostensiblemente distintas, puede poner de relieve aspectos de desarrollo convergente; alternativamente, pueden indicar intercambios culturales e influencias históricas desconocidos o poco valorados.

A arquitectura tradicional da Etiópia é múltipla e distribui-se por uma vasta gama de zonas climáticas e diferentes topografias, servindo uma diversidade de sociedades. Dentro desses diferentes contextos, surgiram tradições arquitectónicas que exibem uma qualidade e adaptação extraordinárias. Na Etiópia, todos os tipos básicos de construção de edifícios podem ser encontrados numa diversidade de culturas. Neste artigo, é apresentada e analisada uma selecção de exemplos deste património rico - desde edifícios de pedra massivos a tendas nómadas - no que diz respeito a aspectos tectónicos, e são propostas interpretações materiais e culturais. A metodologia utilizada nas análises deste artigo é uma comparação de características, dimensões e vãos de construção, assim como materiais, detalhes e desempenho estrutural resultante, com base em documentação e registros de tipologias tradicionais. A comparação de culturas de construção que são semelhantes, embora ostensivamente não relacionadas, pode destacar aspectos de desenvolvimento evolutivo convergente; alternativamente, podem sugerir trocas e influências culturais históricas desconhecidas ou subvalorizadas.

Introduction

Architectures materialize within the constraints of geo-environmental conditions, available resources, and social, political, spiritual, and other collective aspirations to the perpetuation of cultures, including building traditions. Research into traditional architecture provides information on the contexts and the boundary conditions that generated the "living" architectures of today. Architecture here is understood to encompass all of the built environment, including building traditions that evolved without central planning, controlled authorship, patronage, or formal training, growing out of multi-generational shared experience of "making", accruing incremental refinement and evolving into distinct material and visual cultures.

The rich heritage of architectural building traditions in Ethiopia has so far been documented only in part, and an exhaustive compilation remains to be made. Many of those traditions have been driven to the brink of extinction by rapid socioeconomic developments, and so it is timely to focus on their documentation, investigation and preservation.

From an architectural perspective, typological research is based on the documentation of specific dwellings and ensembles in order to arrive at a generic description of building types. This paper refers to broad research, and extensive documentation of many building cultures is still needed. The approach taken here is a phenomenological, qualitative comparison of building types, construction characteristics and features, referring either to exemplary single buildings documented by the authors or to referenced work by other researchers in the field.

The perspective of building construction is interesting in that it integrates the influencing factors of technical knowledge and craftsmanship, spatial relations, and available materials and resources. Building processes are usually also integrated with local customs and intangible heritage, further connecting this field with sociocultural studies. While building processes may be self-evident, detailed descriptions are scarce and beyond our scope, as are the aesthetic quality, sociocultural relevance, and adapted usage of the various types.

Comparison with international examples provides a wider context for understanding these architectures and suggests convergent as well as dissimilar aspects of evolutionary development in the types studied.

Comparative analysis of construction types in Ethiopian traditional architecture

Ethiopia is a large tropical country and due to its diverse topography and varying elevations, it includes a range of climatic subzones – arid, semi-arid, tropical, savannah, and even sub-alpine. Much of Ethiopia lies at altitudes of more than 2000 m and has a tropical monsoon climate, with fairly uniform mild temperatures all year. In its lower regions, in the east and south, the climate is significantly hotter and drier. This great diversity has implications in geology, vegetation, precipitation and the availability

Figure 1: Map of Ethiopia with the different regions and ethnicities (Ethiopia Tourism Corporation 1981)

and performance of building materials, and thus results in a highly pluralistic ecosystem of building traditions, materials, and visual cultures.

Distinct building traditions have evolved over millennia owing to the diverse ethno-cultural identities in this large country. The construction types to be found vary greatly, ranging from lightweight nomadic one-room dwellings to massive stone and even rock-cut edifices. The Ethiopian Tourism Commission map in Figure 1 gives a broad view of the country and of its main cultural groups.

In the following sections, a selection of building cultures will be briefly presented and categorized by construction type. This overview and the types presented are by no means an exhaustive description of Ethiopian traditional architecture, but they give an insight into the great variety of building cultures present. The selection includes types experienced by the authors, students, and colleagues that are in some ways unique, as well as others that are comparable with traditions found in neighboring countries or whose characteristics evoke building traditions in other parts of the world.

The analyzed types with the corresponding communities and locations are:

1. Lightweight nomadic structures: Afar, Mursi and Dassanech.

2. Lightweight fixed and woven structures: Dorze and Sidama.

3. Timber structures: Konso/Xonsita.

4. Massive stone structures: Tigrinya.

5. Hybrid building with timber and adobe: Chikka construction in the Oromia region.

6. Hybrid building with timber and stone: Axumite construction in the Tigray region.

7. Cave structures: Churches primarily in the Tigray region.

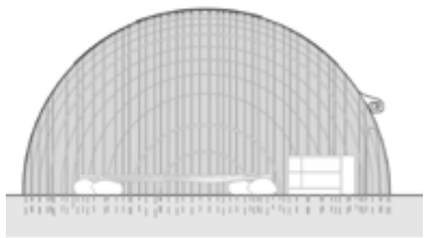
1 Lightweight nomadic structures: The Afar and Mursi

1.1 The Afar

The Afar are a nomadic people living in northeast Ethiopia in the border region of the Danakil desert between Eritrea and Somalia, in a hot and arid environment. They have a pastoralist lifestyle, so their villages are temporary settlements along cattle routes. Thus livestock enclosures and houses are cyclically abandoned and reused upon return.

Figure 2: Afar home, so-called *Deboita*, around Logya area (Alice Eigner 2011)

Figure 3: Grid shell made of sticks bound together founded in the ground (Alice Eigner 2011)



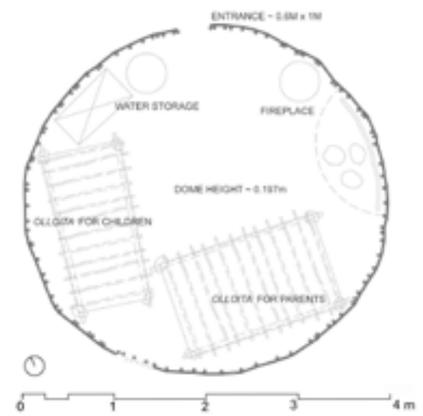


Figure 4: Plan and section of typical construction of an Afar Deboita house (Emilia Chocian 2012)

Their usual dwellings are portable dome tents with a single space for both sleeping and cooking called *deboita*. This has a simple yet elaborate and expansive domed structure with a framework of sticks bent and wound together with strips of dried animal skin and covered with woven mats of palm leaves, and nowadays also with plastic and tarpaulin (Figs. 2, 3 and 4). The height of *deboitas* varies but is rarely greater than 2 m. The adjacent house is sometimes connected with a small annex entrance. All components of *deboitas* are carefully made to be disassembled and packed onto handmade saddles on camels and donkeys (Fig. 5).

1.2 The Mursi and Dassanech

The Omo is one of Ethiopia's largest rivers and its lower valley with its many ethnicities is undergoing change with development, shifts in land use, tourism, and government resettlement efforts. Living along the Omo and its tributary the Mago, in southern Ethiopia near Kenya, the Mursi are a nomadic agro-pastoralist people mostly known for their elaborate body decorations with paint, plants and other materials, and their womenfolk's ceramic lip plates. Though theirs is a hot and semi-arid mountain environment, Mursi dwellings are similar to Afar ones, only less refined and detailed as they are not transported. The Mursi use sticks arranged centrally and covered with grass thatch (Figs. 6 and 7). Other tribes in southern Ethiopia, for example the semi-nomadic Dassanech, also live in domed dwellings.


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Figure 5: Afar group moving with camels and donkeys carrying the entirety of the household

Figure 6: Mursi house in the Omo Valley in South Ethiopia

Figure 7: Structural grid made of radially arranged branches bent and tied at the apex

Their villages are located along the Omo river and the north shore of lake Turkana in Kenya and can consist of 5 to 30 houses, built by women for their nuclear families. Nowadays, besides plant material, they also use tarpaulin, plastic sheeting, and sheet metal as thatch (Figs. 8 and 9).

1.3 Comparison with the Hadza in Tanzania

The Hadza are a small tribe of hunter-gatherers living in central northern Tanzania around Lake Eyasi in the central Rift Valley and on the neighboring Serengeti plateau. They are one of the last remaining such tribes worldwide and have inhabited the area for centuries. Their houses consist of domed structures built with sticks, tree bark and living plants, covered with grass and other plant material. The structures are makeshift but allow amply for sleeping and cooking. A variation of this dwelling has twin domes with a connecting entrance (Figs. 10 and 11). A feature unique to the Hadza shelter is the integration of living plants in the primary structure as a support for the sticks forming the dome framework (Fig. 12).

Domed dwellings are a frequent building type of nomadic people and can be found in many parts of sub-Saharan Africa. They are usually made with locally available plant material and the structure height is limited to some 2 m. Most dwellings are too small for standing upright inside. Portable structures such as the Afar dwellings are more elaborate and elements such as building sticks and covering woven mats are carefully selected and crafted.


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Figure 8: Dessanech shelter of stick framework covered with fresh vegetation tied up and tarpaulin covers

Figure 9: Dessanech storage building, a small cylindrical volume often made in the so-called *Chikka* technique from wood and clay plaster, lifted from the ground onto a rectangular wooden platform. Storage buildings of similar kind are found throughout South Ethiopia

Figure 10: Shelter of the Hadza with twin domed "rooms" connected by an entrance

Figure 11: Tree bark and timber bound

Figure 12: Arrangement of living plants as a base for the construction of Hadza dwellings


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Figure 13: Dorze house made of bamboo around Arba Minch area

Figure 14: Dorze house under construction with horizontal sticks as a temporary scaffold for access

Figure 15: Interior of the house under construction

Figure 16: Few rigid elements like the door frame of bundled split bamboo

Figure 17: Traditional house in Luang Prabang, Laos, made of a timber primary structure and woven bamboo walls

2 Lightweight, tied and woven structures: Dorze and Sidama

2.1 The Dorze

The Dorze are a small sedentary ethnic group living in the Arba Minch area of southern Ethiopia. Their architecture is built almost entirely with split bamboo and has a distinct characteristic format (Fig. 13). The diameter and height of these structures easily attain 8 m. The Dorze are renowned for their weaving craftsmanship, shown even in their dwellings, resembling round woven baskets. The vertical bamboo sticks are simply embedded in the ground, and the elaborate weaving pattern is designed for a peaked dome shape. An equally organically shaped entrance annex is attached to the main dome (Figs. 14 and 15). The thatch is made of plant leaves and can be repaired and renewed. The interior of large houses is subdivided by woven bamboo walls (Fig. 14). The details of openings are crafted with rigid bundles of bamboo (Fig. 16).

2.2 The Sidama

In comparison, the houses of the Sidama people in a nearby region have a similar structure type with a different, onion-shaped dome held up internally by a timber pillar. Woven bamboo houses form a unique construction typology worldwide. The material is very sustainable, as bamboo is a fast-growing plant that thrives in many climates. Especially in the tropics, bamboo is most commonly deployed in construction in woven mats forming walls, such as for example in Thailand and Laos (Fig. 17).

3 Timber construction: Konso community in the eponymous World Heritage region

3.1 The Konso

The UNESCO World Heritage Konso Cultural Landscape in the south-west highlands of Ethiopia is an arid region of settlements fortified with stone-walled terraces. The Konso architecture is noteworthy in that it represents a rare example of an indigenous fortified settlement paired with unique wooden building types. The villages consist of dry-stone terraces with timber buildings, thus requiring both stone and timber craftsmanship (Fig. 18). The intrinsic relationship between architectural features and sociocultural norms is observable in the spatial differentiation of open areas, containing a network of pathways between private compounds and gathering places, with wooden stelae representing ancestors. The architecture features a range of building types, with spatial layouts and construction methods suited to their function and usage (Weldekian 2015). Notable among these are the storage and assembly buildings spread about the villages.

Figure 18: A fortified village in the Konso region on top of a hill with concentric terraced arrangement and adjacent agricultural land

Figure 19: *Paffta* house with two-tiered open plan and storage under one roof

Figure 20: Doubling of construction element in the center with the central pillar of the platform and the central pillar of the roof

Figure 21: The space under the roof is used by the community men for meeting (Garedew M. Weldekian)

Figure 22: Plans at ground level and first floor level, elevation and section of a typical *Paffta* type communal house (Garedew M. Weldekian)

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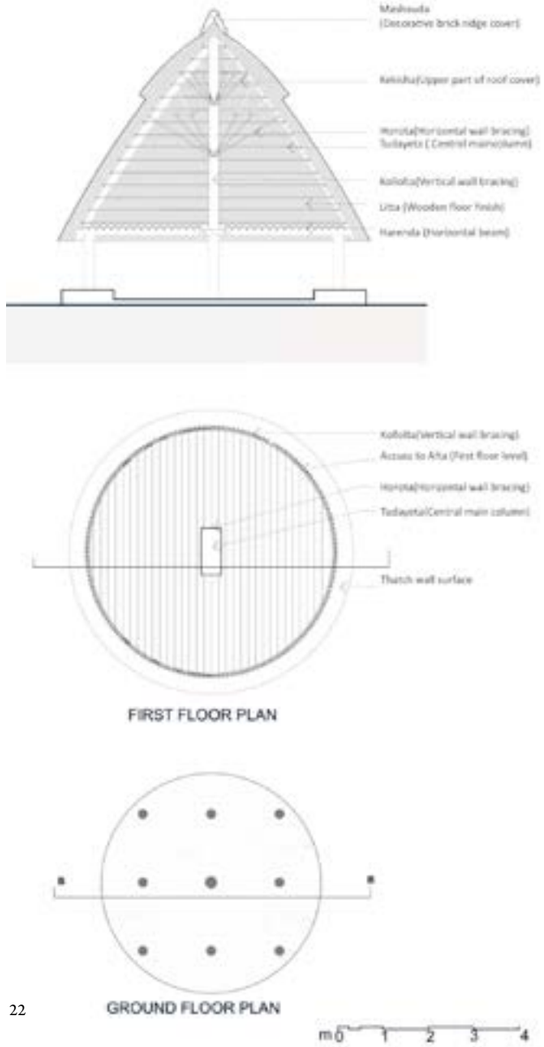

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In the Konso region, the *paffta* is a communal house consisting of a raised stone base, a timber platform on pillars and a large roof space supported by a central pillar. The space under the platform is not high enough for standing upright but allows for comfortable sitting on the stone base (Figs. 19 and 20). The roof space is accessible and used for storage. The construction elements for the platform and the central pillar of the roof are theoretically aligned, as can be seen in plans and images (Figs. 21 and 22).

3.2 Comparative analysis with Sulawesi and Sumatran communities

Different building traditions in Southeast Asia, such as the architecture of the Toba Batak in Sumatra and the Toraja in Sulawesi, both large islands in the Indonesian archipelago, feature similar building types and similar methods for food storage and meeting spaces. These buildings have different roof shapes but apply the same concept of vertical functional differentiation. In western Indonesia, a variation of the corresponding dwelling is a storehouse called *Sopo* (Fig. 23). In the case of Toba Batak communities in Sumatra, dwellings face storehouses along the main axes of villages.

Figure 23: Traditional Toba Batak *Sopo* on Samosir island, Sumatra, Indonesia, a building type for rice storage with a raised platform used for congregation (Erich Lehner)

Figure 24: Longitudinal Section through a typical Toba Batak *Sopo* structure (Gaudenz Domenig, *Tektonik im Primitiven Dachbau*: 149)

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Specific construction aspects of traditional architecture in Indonesia are described by various researchers (Schefold et al. 2004) and include the combined characteristic roof assembly and platform structure. In many building traditions, both structure types are present and spatially overlap in the substructure below or even in the living area. The main difference between the Toba Batak and the Konso traditions is in the raised timber platforms and the extent of refinement in woodwork and orientation. Covered platforms for shelter and meeting are a common type across the world, but the parallels between Indonesian and Konso architecture in function and structure are striking. Information is lacking on the historical development of these types but considering the geographical distance, they are assumed to have evolved separately in convergence, based on similar agricultural lifestyles, similar sociocultural organizational structures, and similar climate and availability of resources.

4 Massive stone and hybrid structures: Tigray region

4.1 The Tigrinya

The built environment of northern Ethiopia is characterized by rural farmhouse types integrated into an agricultural landscape. The prevailing building material is stone, and due to the arid climate, timber is scarce and valuable. So the use of timber is restricted to that needed for roof structures, lintels and doors. These flat-roof buildings and settlements blend entirely into the landscape. (Fig. 25) The homesteads consist mostly of two distinct buildings arranged around a courtyard enclosed by a stone wall, with stables and shelters for livestock. The traditional farmhouse called *hidmo* shares structural features with the famous traditional rock churches of the Gheralta mountains (Nobuhiro 2015). The walls consist of dry-stone masonry plastered inside with earthen render. Collapsed buildings reveal a dual-wall technique providing an inner and outer shell, with an unsmoothed stone surface and filling inside. The few openings are made with timber lintels and are often ornamentally framed with white lime paint (Fig. 26). The roof structures are hierarchically layered so that the main pillars and beams are probably the only elements needing to be brought from other regions, where timber in such dimensions still grows.

It is worth noting that in simple rectangular houses the main beam follows the longer middle axis, and is therefore supported by one or two pillars (Fig. 27). With this primary structure, the secondary beams need to span only half the room width and can therefore be sourced locally from the eucalyptus that is cultivated by many farmers. The filling between the beams can consist of branch materials. In more elaborate timber structures, branches are laid in a diagonal arrangement. The timber structure is then covered with layers of soil and gravel. The transition between wall and roof bears a conspicuous detail: just above the secondary beams of the roof structure, overlapping stone slabs

are laid in such a way as to project from the wall surface, thus forming a continuous linear cornice surrounding the building (Figs. 28 and 29). These layers of stone slabs double up as rainwater protection and sun shading for the walls and, by extension, for their built-in timbers. In many cases, plant material has been seen to be used to additionally cover the roof surface, or plants are grown on the flat roofs.

4.2 Comparative analysis with communities in the Asir region of Arabia

Despite their simplicity, the structures and details of the building traditions in the Tigray region are akin to those found in Saudi Arabia, especially in the southern Asir region, bordering with Yemen. The farmhouses there are also dispersed over terraced farming landscapes. They have a dual use as both living and working spaces but


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Figure 25: Landscape of traditional hamlet around Wukro area in Tigray region, North Ethiopia

Figure 26: Entrance to a dwelling in Hawzien with the outer wall sheltering a stable

Figure 27: Large farmhouse in Hawzien. Roof construction with two main timber pillars, a main middle beam with rows of secondary beams, and built-in seating along the walls.

Figure 28: Traditional church building in the Gheralta region. Some parts are cut into the rock and other parts are built up of stone masonry, with rows of flat stone slabs that protect the plastered walls from rain

Figure 29: Roof detail with flat stone slabs protruding from the walls to protect against rain

are much larger in scale, covering a few hundred square meters and up to three floors. These homesteads are also clustered in ensembles and enclosed within dry-stone walls (Sieghartsleitner 2010) (Fig. 30).

Buildings are constructed in locally available materials: stone, loam and timber. Wall structures are vertically differentiated into dry-stone walls for ground floors called *zabur*, and *mikmak* in upper floors. This is wet-loam building with layers of 50-80 cm needing no formwork, molds or specific tools – a widespread method of traditional construction in Africa. Specific to the buildings found in the Asir region are the courses of flat stones marking the construction layers. Farmhouse facades are thus typically structured horizontally, with small wall openings interrupting the pattern (Figs. 31 and 32). As in Tigray, the margins of openings are painted. Another typical feature of Asir architecture is roof protrusions. The earthen wall structure is protected from rain and the ground-floor stone walling prevents damp from reaching the earthen parts. As the wall thickness becomes thinner in the upper floors, the


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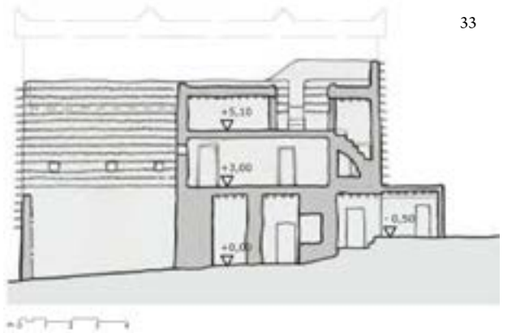

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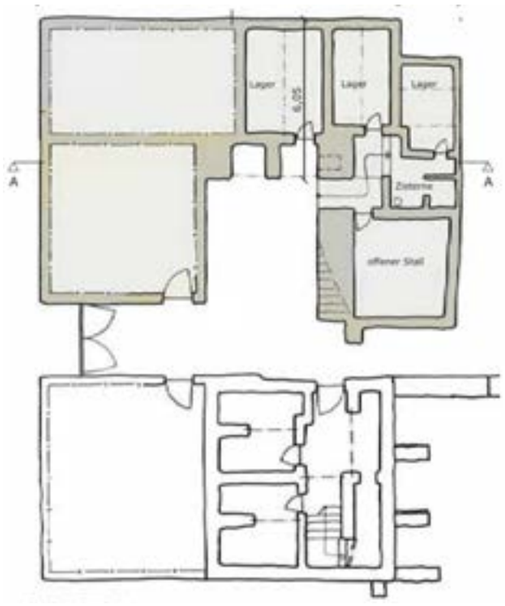

Figure 30: Traditional farmhouse ensemble in the Asir region of Saudi Arabia

Figure 31: Facade detail with rows of slightly overlapping flat stone slabs as rain protection

Figure 32: Facade detail with dry stone wall on ground floor and Zabur adobe building technique with rows of flat stone slabs on the upper floors.

Figure 33: Plan of the ground floor and section through the entrance courtyard of a typical Asir house measured on-site (Alexander Sieghartsleitner 2010)

walls look inclined, giving the buildings their characteristic trapezoidal appearance (Fig. 32). This can also be observed from scale drawings of a typical Asir house (Fig. 33).

Such earthen construction is not common in Ethiopia, but the use of earth in plaster mixes, called the *chikka* technique, is widespread. The features common to the building traditions of Saudi Arabia and of northern Ethiopia can be attributed to a centuries-long diffusion process in the Red Sea area (Breton 2015). The currently closed borders and difficult political situation in the region are alien to such traditional exchanges.

5 Hybrid structures: Axumite construction

5.1. Axum

Axumite architecture dates back centuries and can today be studied in just a few churches in northern Ethiopia, Debre Damo being the most famous and reportedly the oldest, from the 6th century (Fig. 34, Friedlander, 2015). Axumite construction is characterized by alternating layers of stone masonry and horizontal timber, with crossbeams protruding and framing wall openings with characteristic "monkey heads" (Figs. 35 and 36). In the hilly areas of Debre Damo, the crossbeams are arranged systematically, resulting in an additional pattern on facades. The stone-slab layer, creating a horizontal cornice on the facade, is also present here. A more pronounced example is the Yemrehana Kristos church in the Lalibela area, from the mid-12th century (Friedlander 2015), located in a cave under a large rock overhang. The church and the adjacent buildings are built in the Axumite tradition, in masonry with timber beams carefully laid and connected at the ends. The ratio between masonry and timber is roughly 1:3, with beams about 15 cm high and plastered masonry parts slightly protruding, suggesting an initially unplastered stone facing. From a structural perspective, the crossbeams with "monkey heads" are connected to the horizontal beams and thereby not only facilitate wall openings but also add to the stability of the thick stone walls by holding the inner and outer shells together. The masonry between the beams is made of small horizontally arranged flat stones, laid with mortar and plaster. The fact that large parts of the closed side walls lack timber beams suggests a primary function as load-dispersing elements for wall openings, and in the case of Yemrehana Kristos perhaps also decorative purposes (Figs. 37 to 41).

Figure 34: 6th century Enda Abuna Argawi church (also, Za-Mika'el 'Aragawi) within the Debre Damo monastery in Tigray. Classical Axumite construction with horizontal wool layers and protruding cross beams (Luel Yitbarek)

Figure 35: Reconstruction of typical Axumite stone masonry with horizontal timber layers and protruding cross beams, called "monkey heads" (Hans Helfritz 1972)

Figure 36: Elevation of Enda Abuna Argawi church (Hans Helfritz 1972)

Figure 37: Yemrehana Kristos church in the Lalibela region, mid-12th century, with classical features of Axumite architecture: horizontal layering of masonry and wood, rows of windows and edge parts of the building projecting out


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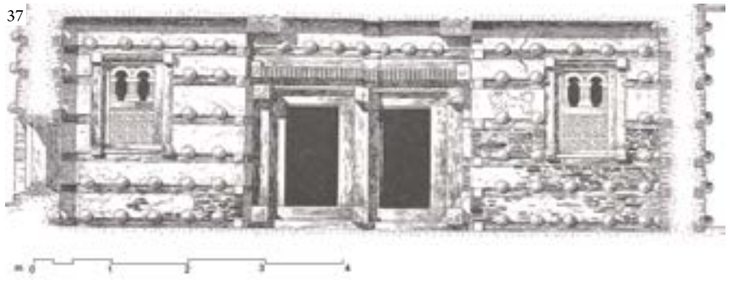
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Figure 38: Adjacent building to the church, with wooden structure dissolving in the side wall

Figure 39: Facade detail with carved frieze, door and window openings frames with wood and prominently protruding cross beams

Figure 40: Facade detail with stone masonry and timber beam

Figure 41: Facade edge detail with overlap joint and protruding plaster façade

5.2 Comparative analysis with communities in the Hejaz region of Arabia

In contrast to the uniqueness of Axumite construction, this use of masonry with alternating timber layers is widespread in the traditional architecture of Saudi Arabia, especially in the Hejaz region along the Red Sea coast. The old town of Jeddah, the trading port and entrance to Mecca, was built entirely of coral limestone and timber. Historically, Al-Balad, in Jeddah still has wonderful examples of intricately built multistoried merchant houses (Fig. 42). Locally sourced and dressed coral stone is used for building high load-bearing walls and foundations, interspersed with timber for structural support in horizontal layers, roofing, windows, doors, and the famous *roshan* and *mashrabiya* (Figs. 43 and 44). Several authors have described the traditional Jeddah building technology, and the example presented here was extensively documented in the Trabasa project (Gruber and Eissa 2014). The Al-Nawar house represents classical building construction with mainly coral-stone masonry, used in large blocks and reinforced with horizontal timber beams at distances of 80 to 120 cm, depending on the location of wall openings (Fig. 45). The ground-floor plan and section through the courtyard show the spatial hierarchies of typical Hejaz architecture (Fig. 46).

The timber layers enable load distribution within walls and provide a grid for design flexibility in fenestration allowing visual porosity and privacy while inhibiting thermal exchange. One conservation issue for this unique built heritage is the disintegration of coral stone and timber over time. The integration of contemporary building materials together with water and electricity supply due to rapid but haphazard modernization also presents challenges to these heritage settings (Fig. 47).

On comparing the architecture of old Jeddah with the Axumite building tradition, we notice the following: the same building principle is applied – horizontal layering of masonry and timber, with timber as reinforcement. Lengths and widths of walls are reinforced with overlapped connecting joints. The horizontal layering accommodates wall openings. But protruding crossbeams (monkey heads) are a distinct feature of Axumite construction. Construction is on very different scales and with different materials. In the Axumite tradition, small-scale dry masonry is used, and the ratio between masonry and timber is about 3:1. In Jeddah, the stones are cut, and brick masonry is used with mortar. The distance between timber layers is roughly 50-80 cm, and the architecture in Jeddah is multistoried.


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Figure 42: Old town of Jeddah, Al-Balad, in Saudi-Arabia

Figure 43: Locally cut coral stone masonry with horizontal wooden layer

Figure 44: Facade with traditional wooden grids on windows and balconies (so-called *Mashrabiyas* or *Roshans*)

Figure 45: Al-Nawar house in Jeddah, with a typical courtyard situation and a large meeting room, the so-called *Iwan*, to the right. Clearly visible is the horizontal layering of wood coral masonry and wall niches

Figure 46: Onsite measured drawing showing the ground floor plan and the section through the courtyard of the Al Nawar house, Jeddah (Gruber and Mahmoud 2014)

As the Red Sea region has had centuries of cultural exchange, it is not surprising to find similarities in building construction. Horizontal layering is a specific construction type not widely encountered. Together with other similarities in Saudi Arabian and Tigrinya architecture, this construction principle is assumed to have spread through a diffusion process. Archaeological research on vernacular architecture is required to test this assumption and could tell us about the direction of information flow.

Conclusion

As stated above, an exhaustive discussion of the abundant building typology present in Ethiopia exceeds the scope of one paper. The most common types, such as hybrid construction with timber and earth or the *chikka* technique, are still used in vernacular praxis throughout the country, though such continuing traditional building types in the Ethiopian highlands are also beyond our scope.

From our analysis we may conclude that:

There are unique construction types and elements, such as horizontal timber layers embedded within masonry and stone slabs used for cornices, that suggest diffusion processes around the Red Sea cultural area. But for some construction types, such as the woven bamboo structures of the Dorze community in the Chencha region, no comparative architectural models have been found worldwide.

A comparative analysis with the vernacular architecture of other world regions shows that construction types in Ethiopia seem to reflect the scarcity of resources, have slightly coarser craftsmanship, and tend to use less elaborate ornamentation.

Analysis of traditional Ethiopian architectural typology has relevance beyond its specific place and time in view of these types' inherent adaptiveness, aesthetic quality, sociocultural integration, and sustainable material use. Moreover, an interesting example of a recent translation of traditional construction methods can be found at the ZOMA museum in Addis Ababa (Assegued and Sime 2002).

Extensive documentation of Ethiopian architectural types should ideally follow after overarching comparative studies such as ours, and archaeological research is needed to trace the various diffusion processes.

Acknowledgments

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Figure 47: Destroyed building in the old town of Jeddah, which shows the building construction

References | Referencias | Referências

Assegued, Meskerem; and Sime, Elias. 2002. Zoma Museum. https://www.zomamuseum.org/zcac-addis-2.html (consulted on 12/7/2021).

Breton, Jean-François. 2015. *Les bâtisseurs des deux rives de la mer Rouge*. Addis Ababa: Centre français des études éthiopiennes.

Domenig, Gaudenz. 1980. *Tektonik im Primitiven Dachbau*. Zurich: ETH Zürich.

Ferng, Jennifer. 2015. Elemental Vernacular: Designing Beyond Human Authorship. *Architectural Theory Review*, vol. 20, 3: 291-295. DOI: 10.1080/13264826.2015.1195479

Friedlander, María-José; and Friedlander, Bob. 2015. *Hidden treasures of Ethiopia*. London: I.B.Tauris.

Gruber, Petra; and Eissa, Mahmoud. 2014. Old town of Jeddah. Results of the building survey of the Al-Nawar house. *Architectura*, 1: 1-16.

Last, Jill. 1981. *Ethiopians and the Houses they live in*. Addis Ababa: Ethiopian Tourism Commission.

Rieger-Jandl, Andrea. 2013. *Tradition in transition: reflections on the architecture of Ethiopia; with a special focus on the Afar region*. Vienna: IVA-ICRA.

Schefold, Reimar; Nas, Peter; and Domenig, Gaudenz. 2004. *Indonesian houses: Tradition and Transformation in Vernacular Architecture*. Singapore: Singapore University Press.

Sieghartsleitner, Alexander. 2010. *Traditionelle Bauformen im Westen Saudi-Arabiens, Eine Gegenüberstellung der Altbauten von Jeddah und der Lehmbauten des Asir*. Diploma Thesis. Vienna: Vienna University of Technology.

Shimizu, Nobuhiro. 2015. An Analysis of the Construction Method of Emperor Yohannes IV's Buildings in Tigray Region, Ethiopia. In Naredra Bondla, James; G. C. Smidt, Wolbert; Furusaki, Yoko; and Bekerie, Ayele (eds.), *Cultural Landscapes of Ethiopia: Conference Proceedings*. Mekelle: Mekelle University Printing.

Weldekian, Garedew Mengesha. 2015. *Transformation of Konso Vernacular Houses*. Master Thesis. Addis Ababa: EiABC Addis Ababa University.

Biographies | Biografías | Biografias

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Petra is an architect with a strong interest in inter- and transdisciplinary design. Apart from her professional work as an architect, she holds a PhD in Biomimetics in Architecture from the Technische Universität Wien, Austria, and has been a Research Fellow at the Centre for Biomimetics at Reading University, UK. She has taught Biomimetics in Energy Systems at the University of Applied Sciences in Villach, Austria, and delivered lectures and workshops at universities across the globe. As Visiting Professor for Architectural Design and Building Science, she set up a master's program in Advanced Architectural Design at the Addis Ababa University in Ethiopia. Her research ranges from projects for the European Space Agency on lunar base design informed by folding principles from nature to arts-based research on the translation of growth principles from nature into proto-architectural spatial solutions. Dr. Gruber has also been based at the Myers School of Arts and the Department of Biology for the Biomimicry Research and Innovation Center BRIC at the University of Akron.

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Kingshuk Datta, MArch, is a doctoral candidate at the Technische Universität Wien, Austria, researching computational speculations based on Hindu-Buddhist sacral architectures. He holds a Master's in Advanced Architecture Design from the David Green Studio at Oxford Brookes University, UK. He is a licensed architect in India and has worked and lectured extensively. His research and works are informed by the pluralistic nuances embedded within visual and material cultural practices and the decolonization of architectural production methods.

Selena Anders

Digitally Documenting the Transformation of the Eternal City. Cities in Text: Rome

Documentar digitalmente la transformación de la Ciudad Eterna. Cities in Text: Rome

Documentação digital da transformação da Cidade Eterna. Cities in Text: Rome

Keywords | Palabras clave | Palavras chave

Maps, Architecture, Mobile Application, Urban Form, Urban History

Mapas, Arquitectura, Aplicación para móviles, Forma urbana, Historia urbana

Mapas, Arquitectura, Aplicação Móvel, Forma Urbana, História Urbana

Abstract | Resumen | Resumo

Historical guidebooks and maps of Rome provide both an architectural narrative and a snapshot of the city at distinct historical moments. The Historic Urban Environments Lab at the University of Notre Dame (HUE/ND) combined these resources to create *Cities in Text: Rome*. This interactive research tool was designed to analyze the complex layers of the Eternal City. It provides access to the digital representation of guidebooks produced in the sixteenth, seventeenth, and eighteenth centuries. These works have been transcribed, translated, and linked with historic and present-day maps, photographs, and drawings presented on a website and mobile application (hue.nd.edu). The project led to several discoveries, including identifying the existing remains of Rome's medieval residential façade porticoes, which were measured, drawn, and mapped. The work contributes to an understanding of the evolution of Rome's cityscape, including its medieval fabric wholly ignored in these guides but still visible today.

Las guías y mapas históricos de Roma proporcionan una narración arquitectónica y una instantánea de la ciudad en distintos momentos históricos. El Laboratorio de Entornos Urbanos Históricos de la Universidad de Notre Dame (HUE/ND) combinó estos recursos para crear *Cities in Text: Rome*. La herramienta de investigación interactiva se diseñó para analizar los complejos estratos de la Ciudad Eterna y nos permite acceder a la representación digital de guías publicadas en los siglos XVI, XVII y XVIII. Estas obras han sido transcritas, traducidas y vinculadas a mapas, fotografías y dibujos actuales e históricos que se presentan en el sitio web y en una aplicación para móviles (hue.nd.edu). Gracias al

proyecto se hicieron varios descubrimientos, como la identificación de las ruinas de pórticos de fachadas residenciales de la Roma medieval que se midieron, dibujaron y cartografiaron. El trabajo ayuda a comprender la evolución del paisaje urbano de Roma, incluida su fábrica medieval, completamente ignorada en esas guías pero que sigue siendo visible en la actualidad.

Os guias e mapas históricos de Roma fornecem tanto uma narrativa arquitectónica como um retrato da cidade em momentos históricos distintos. O Laboratório de Ambientes Urbanos Históricos da Universidade de Notre Dame (HUE/ND) combinou estes recursos para criar *Cities in Text: Rome*. Esta ferramenta interactiva de investigação foi concebida para analisar as camadas complexas da Cidade Eterna. Permite o acesso à representação digital de guias produzidos nos séculos XVI, XVII, e XVIII. Estas obras foram transcritas, traduzidas e associadas a mapas, fotografias e desenhos históricos e actuais, apresentados num website e aplicação móvel (hue.nd.edu). O projecto levou a várias descobertas, incluindo a identificação dos vestígios dos pórticos da fachada residencial medieval de Roma, que foram medidos, desenhados e cartografados. O trabalho contribui para uma compreensão da evolução da paisagem urbana de Roma, incluindo o seu tecido medieval, que é totalmente ignorado nestes guias, mas ainda hoje é visível.

Introduction and Methodology

Cities in Text: Rome provides access to historic travel literature and the buildings and monuments they describe virtually. Few cities are as well documented as Rome. Hundreds of travel guides were produced from the 15th to the 19th century encouraging informative tourism. These antique guides are underutilized today – primarily due to lack of availability. Most are housed in rare book collections at academic institutions. By physically removing barriers to their usage, Rome's development can be visualized chronologically in the form of a website and mobile application. The digital platforms allow its users to view Rome dynamically, peeling back its layers and experiencing its urban and architectural renovation through three hundred years of history (Fig. 1). The unique combination of historical texts (in Italian and English), digital images, and mapped itineraries allows one to unravel Rome's complex history.

Figure 1: Digitally layered view of the Porta del Popolo taken from the Via Flaminia, combining Giuseppe Vasi's engraving and contemporary photography (HUE/ND)

To construct a robust resource capable of displaying content from various points in time, the team partnered with the Library of the American Academy in Rome (AAR). Three historical guides to the Eternal City were selected from the AAR's Barbara Goldsmith Rare Book Room and digitized. The books include Bernardo Gamucci's *Le Antichità della Città di Roma* (1565), Federico Franzini's *Descrittione di Roma Antica e Moderna* (1643), and Giuseppe Vasi's *Itinerario Istruttivo Diviso in Otto Giornate* (1777). These specific works were chosen for the quality of their scholarship, observations, illustrations, and itineraries. When examined together, they provide a comprehensive verbal and visual account of the city's monuments. These include the villas, gardens, vineyards, ancient ruins, temples, baths, aqueducts, palaces, churches, cafes, religious convents, monasteries, schools, colleges, seminaries, boarding schools, hospitals, hospices, and prisons.

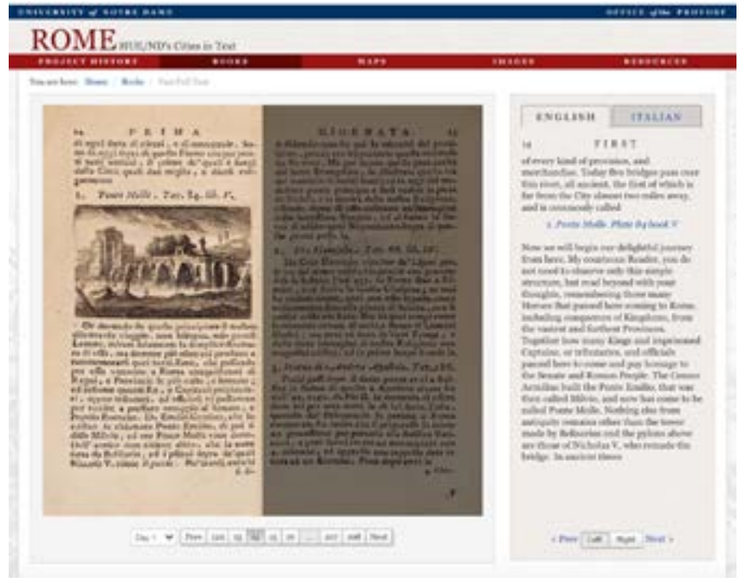
Once the books were selected and digitized, each text's daily itineraries were then physically mapped on-site with hand-held GPS units. Photographs and videos were taken along

Figure 2: Drawing of the Church of S. Niccolò in Arcione, demolished in the first quarter of the nineteenth century Drawing by Madeline Fairman, HUE/ND)

the paths outlined in the texts. Moreover, students made drawings of the buildings identified by each of the authors that are no longer standing today. The students undertook extensive library and archival research to find historical drawings, photographs, and other essential material to represent the demolished structures accurately (Fig. 2). The books were then transcribed in Italian and translated into English (Fig. 3). The data collected and produced during the first phase of the project was then used to create the website and mobile application content.

To accurately visualize the topographical changes that emerged in the city from the 18th century to the present day, the team chose to layer a contemporary city map and satellite views with Giovanni Battista Nolli's *Nuova Pianta di Roma* (1748) (Fig. 4). Nolli created the first authentic portrait of a city with this work, capturing Rome's essence like no other *veduta* (view) of its time, providing precise measurements of the most iconic ancient, Renaissance, and Baroque monuments. Moreover, it conveys Rome's medieval remnants, much of which was destroyed following Italy's unification and well into the first half of the 20th century, especially in the *rioni* (districts) of Monti, Sant'Angelo, and Campitelli. The ichnographic plan remains one of Rome's most accurate surveys ever realized and precisely documents the city's complex palimpsest while celebrating the overall architectural and urban achievements manifest in the metropolis throughout its history. What boldly emerges in Nolli's plan is the contemporary city's unique relationship with its ancient past. Nolli's work is an ideal record to digitally overlay with the present-day city map to allow users of the website and mobile application to toggle between the Rome of today and the 18th century (Fig. 5). The plan is a perfect companion to Vasi's *Itinerario* because it depicts the city at the exact moment it is being described. The Rome of Nolli and Vasi was much different from the metropolis observed and described by Gamucci and Franzini, yet utilizing Nolli's map together with the 16th

Figure 3: Giuseppe Vasi's digitized text with Italian transcription and English Translation of the Ponte Milvio (HUE/ND)



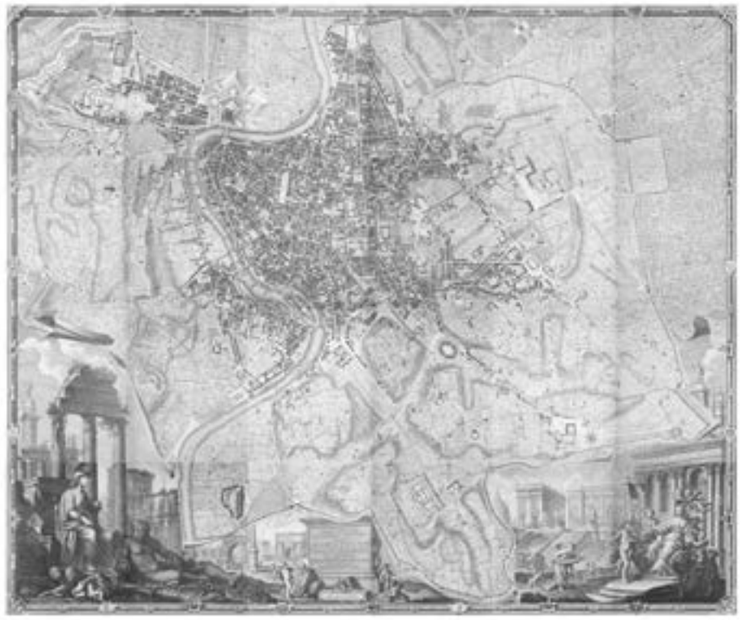


Figure 4: Giovanni Battista Nolli, *Nuova Pianta di Roma*, 1748 (HUE/ND)

and 17th-century author's texts, one can see how much the physical landscape of Rome evolved over the centuries. The team is currently adding additional map layers from other centuries to make the topographic transformation over time easier to identify.

Roman Guidebooks and Urban Topography

Rome, the Eternal City, has captured the imagination of travelers for over two millennia. From its ancient ruins to its sacred Christian monuments, visitors have flocked to this famed metropolis to study its art and architecture. Guides to the city's wonders were produced as early as the 8th-9th centuries CE, such as the Einsiedeln manuscript, which included a collection of Latin and Greek inscriptions, followed by twelve itineraries that traversed the center of Rome and several extramural sites. Four of the itineraries begin at St. Peter's Basilica, indicating that the manuscript would have been written for pilgrims. Accommodations and other charitable facilities were concentrated in the Borgo near the Basilica, making it an epicenter for medieval travelers (Liverani 2013: 25-28). The manuscript also described the city's walls and Easter ceremonies, ending with a small collection of poems and epitaphs. The Einsiedeln manuscript was one of the first records chronicling ancient and Christian monuments (Blennow 2019: 33).

In the 12th century, the *Mirabilia Urbis Romae* (Marvels of the City of Rome) provided visitors with essential information about its complex history, including its classical remains and Christian monuments. It was divided into three main sections. The first of which organized buildings by type, including palaces and temples. The second part was dedicated to tales from pagan and Christian Rome. The third provided an itinerary that listed monuments encountered along one's journey, beginning at St. Peter's, passing through the center, and ending in *rione* Trastevere.

After 1420 when Pope Martin V re-established the papacy in Rome, learned visitors descended on the Eternal City in increasing numbers to study its antiquities. Flavio Biondo published his guide, *Roma Instaurata*, in 1446 in response to the growing interest in the study of Rome's built history. Biondo's text was the first to reconstruct the ancient city and included modern buildings. The book was arranged both topographically and typologically. These historic guides offer a unique glimpse into the past, allowing contemporary readers to understand how the city was viewed, traversed, and analyzed historically. The itineraries were primarily concentrated within the metropolis's walled confines, with few excursions beyond them to visit famous pilgrimage sites. These guides established a standard for describing the Eternal City and its ancient and Christian monuments, often overlooking its most ubiquitous feature, its residential fabric. The lack of documentation of the city's medieval domestic architecture in these historical guides and those chosen to develop *Cities in Text: Rome* prompted the team to pay particular attention to and document this elusive feature of Rome's architectural heritage. Leading to the identification of Rome's semi-hidden porticoes, which the team documented and mapped, contributing a visual record of these historical structures as they stand today.

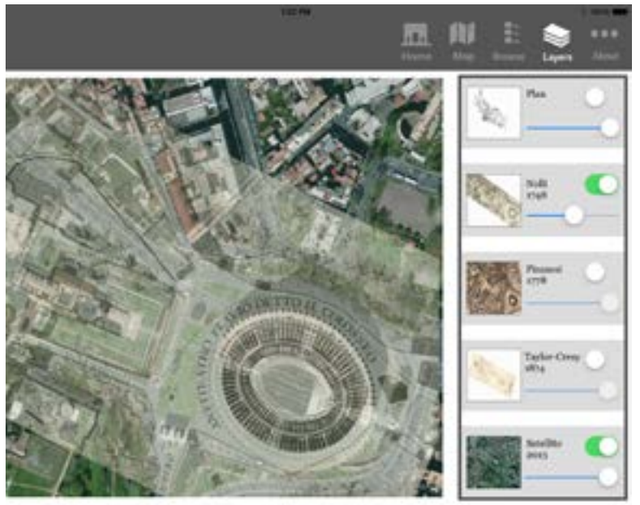


Figure 5: Layered Rome map depicting the Colosseum area today with Nolli's map of 1748 (HUE/ND)

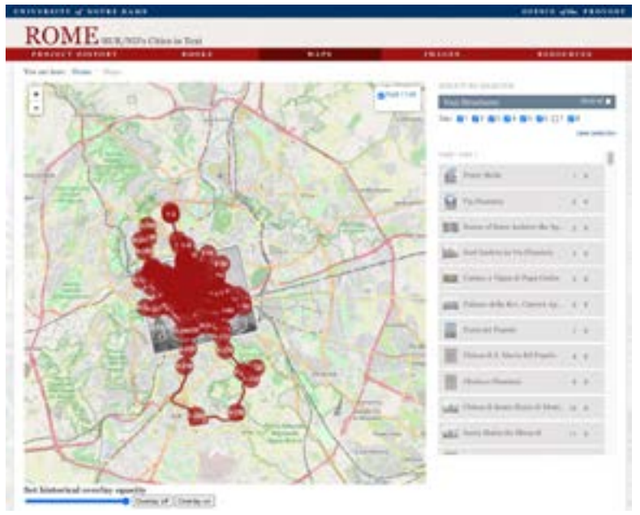


Figure 6: Giuseppe Vasi's itinerary, indicating the sites covered inside and outside the Aurelian Walls. Each red dot is numbered and corresponds to the monuments described in Vasi's texts. The red line indicates the path between each place discussed in the eight days of itineraries found in the text (HUE/ND)

A vital aspect of this project was on-site data collection. The team surveyed each of the itineraries outlined in the three texts. Over 200 kilometers of Rome was traversed by foot in fifteen days, covering sites both inside and outside the city's walls to faithfully reconstruct the authors' urban experience intended for their readers. Of the three texts documented, Vasi's was by far the most comprehensive and instructive itinerary, which recorded over 400 monuments and urban spaces, which fluidly brought readers through the city's center and its surrounding countryside (Fig. 6). Unlike Gamucci and Franzini, Vasi's curated tour included famed structures and newly built prisons, workhouses, hospitals, and theaters. He even invites people to leave the city's chaos behind to enjoy the surrounding countryside, villas, and pilgrimage sites while indicating gastronomical delights at cafes and restaurants.

Vasi's guidebook was the most innovative as it served as the second publication of a four-part opus dedicated to Rome, which included his 1. *Delle Magnificenze di Roma Antica e Moderna* (1742-1761) 2. *Itinerario Istruttivo Diviso in Otto Giornate* (1763 and 1777) 3. *Propsetto della Alma Città di Roma* (1765) and 4. *Nuova Pianta di Roma* (1781). Vasi first experimented with typology as the organizing principle of his *Magnificenze* comprised of ten books organized by subject; he then used topography to arrange his eight-day guide to Rome. He masterfully links the sites visited in his *Itinerario* back to his previously published *Magnificenze* and its 250 incredible views of Rome. The *Itinerario* and its seventy-four small-scale *rametti* served as a portable supplement to his more prominent and expensive *Magnificenze*. His famous *Prospetto* is a sweeping panorama of the city, which he indicates in his guide, was taken from the highest point of the Corsini Palace's gardens. It provides a numbered index of 390 items displayed in the view. The structures identified were divided into eight days to corresponds with his previously published *Itinerario*. Vasi's last and least appreciated work was his *Nuova Pianta di Roma*, a large format pictorial map of the city first published at a much smaller scale in his *Itinerario* (Fig. 7). Vasi's guide served as the hinge of his entire artistic oeuvre dedicated to Rome's documentation and visualization.

Figure 7: Giuseppe Vasi's Rome map with twenty locations numbered to orient his readers (HUE/ND)

Preliminary Findings. Identification of Architectural and Urban Transformation with *Cities in Text: Rome*

Combining the digitized texts of each travel guide, including their illustrations and mapped itineraries, the website and mobile application provide easy access to the visualization of the transformation of the appearance of Rome's monuments and urban form. In some cases, the guides capture famed structures' disappearance from the cityscape, including the Trevi Fountain (designed by Leon Battista Alberti), the Septizodium, and the Arco di Portogallo to name a few. In their description of the Trevi Fountain, Franzini and Vasi provide illustrations of Alberti's 15th-century design (Fig. 8). In the 17th century, Alberti's fountain was eventually demolished to make room for Bernini's creation of a new sculptural embellishment to terminate the celebrated water source (Pinto 1985: 13). Bernini's unfinished project was then redesigned and completed by Nicola Salvi in the 18th century. The Trevi Fountain design by Salvi was completed merely a few years before the first edition of Vasi's *Itinerario Istruttivo* and is shown as complete in Nolli's map even though it was still under construction while he was surveying Rome (Fig. 9)..

Gamucci and Franzini provided documentation of ancient structures that are no longer standing today, including the Septizodium. The wall fountain was erected by the emperor Lucius Septimius Severus at the Palatine Hill's base in 203 CE. The three-story columnar façade served as a grand visual terminus to the via Appia (Fig. 10). The remaining portions of the Septizodium were pulled down some twenty years after Gamucci's publication in 1588 by the architect and engineer Domenico Fontana following Pope Sixtus V's orders to demolish the ancient remains. The entire work was gone by 1589, with its salvaged material reused in other architectural projects throughout the city, including the chapel Sixtus V built in the basilica of S. Maria Maggiore (Coarelli 2014: 155). Despite the monument's disappearance, Vasi stops at the former location of this ancient structure on day five of his itinerary, describing its three orders of columns, some of which were made of porphyry and others fluted marble. He notes that the structure threatened to collapse during Sixtus V's time, which led him to dismantle the ruin and use the salvaged material for other works (Vasi 1777: 308-309). The text and images of the Septizodium provide vital historical records of the monument's appearance and insight into the materials used in its construction. The guides also provide valuable information regarding the importance of the monument's position in antiquity, which provided a visual terminus for a significant urban artery.

In book three of Gamucci's guide, readers are introduced to the Arco di Portogallo (Gamucci 1569: 151-152) (Fig. 11). The arch was one of three that spanned the Via Lata (present Via del Corso) and located at the intersection Via delle Vite. It was demolished in 1662 to amplify and regularize the street; a plaque now records its original location (Coarelli

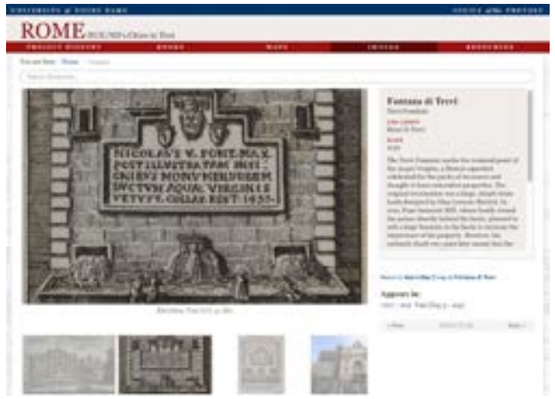


Figure 8: Giuseppe Vasi, view of the wall fountain in the Piazza di Trevi attributed to Alberti, 1777. The fountain was demolished in the previous century, yet Vasi utilizes existing drawings to give the fountain a sense of scale and monumentality (HUE/ND)

Figure 9: View of Nicola Salvi's Trevi Fountain identified in Vasi's itinerary indicated on the Nolli map (HUE/ND)

Figure 10: View of the Septizodium at its former location at the Palatine Hill base (HUE/ND)

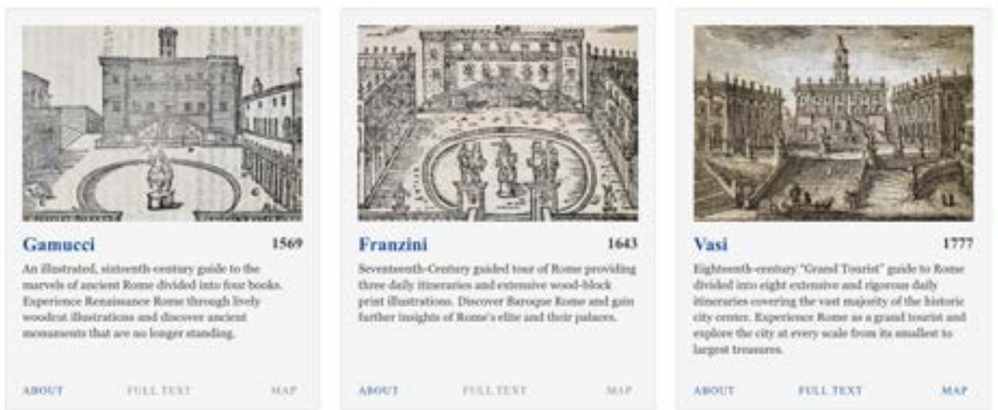
Figure 11: View of the Arco di Portogallo at its former location along the Via del Corso (HUE/ND)

2014: 255-257). The two relief panels that adorned the arch included scenes of the emperor Hadrian's exhortation and his wife Sabina's apotheosis. They were later moved to the Museo dei Conservatori, as Vasi indicated during his guided tour of the newly opened museum on Capitoline Hill (Vasi 1777: 66). The discussion of the Arco di Portogallo in the text of all three authors underlines its significance as an ancient architectural feature situated along the Via del Corso that is now lost.

Gamucci's texts combined with the illustrations produced by his collaborator and compatriot Giovanni Antonio Dosio provide a record of Rome's transformation at a critical point in history when major building campaigns were being executed following the city's sack in 1527. The period's exciting building activity is expressed in the description and visualization of the Capitoline Hill produced some months before the publication of the first edition of the guide in 1565 when Michelangelo transformed the famed site. Michelangelo was initially asked to design a new oval base for the ancient statue of the Roman emperor Marcus Aurelius, moved by Pope Paul III from the Lateran to the Capitoline in 1538 and then commissioned to redevelop the entire piazza and its surrounding buildings. Dosio's woodcut includes the piazza's balustrades which Michelangelo already completed between 1561 and 1564. The piazza's oval steps executed in 1564 are also shown with the equestrian statue of Marcus Aurelius on its newly designed base situated in the center. The medieval facade of the Palazzo Conservatori is maintained even though its demolition had already begun in 1563. Michelangelo's new façade was not yet completed, and rather than depict a construction site; the author chose to represent the medieval portico of the old palace façade (Ackerman 1961: 54-74). Michelangelo's double ramp stair in front of the Palazzo Senatorio was executed from 1544-52 and described in Gamucci's text down to the architect's use of the Doric order framing the central niche and the ancient sculptures repositioned to accentuate the new architectural centerpiece. However, the façade of the Palazzo Senatorio was not yet complete and still retained its medieval battlements. The *Cities in Text: Rome* website and mobile application allow one to move between Gamucci, Franzini, and Vasi's images and description of the Capitoline Hill while having additional access to modern scholarship and views of the site (Fig. 12).

Moreover, Michelangelo's use of ancient sculpture in the decoration of the Capitoline Hill, such as the Trophies of Marius, can be found in both Gamucci and Franzini's text situated in their original location before the illustrious architect removed and recycled them in his architectural project (Fig. 13). Franzini even provides a hypothetical reconstruction of their original appearance. By identifying the actual location of the Trophies of Marius and Michelangelo's subsequent removal and reuse of the

Figure 12: Gamucci, Franzini, and Vasi views of the Capitoline Hill (HUE/ND)



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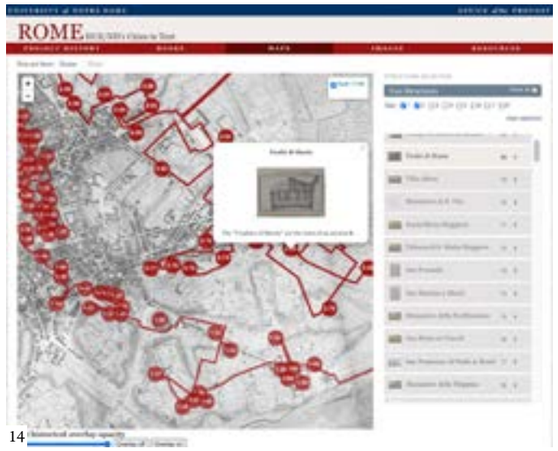

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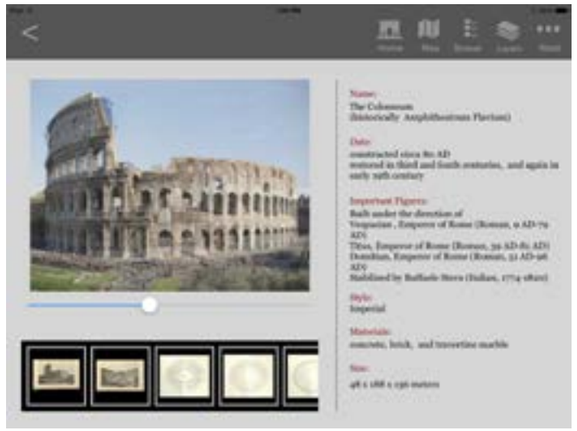

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Figure 13: Gamucci's view of the original location of the Trophies of Marius (HUE/ND)

Figure 14: The Trophies of Marius's original location on the Nolli map, located at the present-day Piazza Vittorio Emanuele II

Figure 15: Church of S. Maria Liberatrice in the Roman Forum, now demolished (HUE/ND)

Figure 16: View of Giuseppe Valadier's restoration of the outer ring of the Colosseum with transparency feature on, showing how the Colosseum looked before his intervention (HUE/ND)

ancient sculptures, one can better understand the treatment of antiquities in Renaissance Rome and how they were dismantled and reused for later building projects (Fig. 14).

Rome's seven pilgrimage churches' architectural evolution is also visible when comparing Franzini and Vasi's illustrations. Franzini's drawings were produced before many of the city's medieval facades were masked by 17th and 18th-century architectural interventions. Moreover, one can quickly identify the countless religious structures that were eventually destroyed, including their locations and appearances, mapped on the website and mobile application (Fig. 15). What becomes immediately apparent when working with this historic data on-site or when examining these texts alongside a contemporary map is the extent of Rome's later architectural and urban transformation in the 19th and 20th centuries. Giuseppe Valadier transformed Rome's most prominent structures and urban spaces in the first quarter of the 19th century. With *Cities in Text: Rome*, this often overlooked architect's restoration of the Ponte Milvio and its bridgehead, design of the Piazza del Popolo, and restoration of the Arch of Titus and Colosseum are easily identifiable (Fig. 16). The extensive acts of *sventramenti* carried out following Italy's unification and well into the first half of the 20th century are immediately apparent, as is the city's urban expansion both within and outside the city walls.

In addition to capturing visual remnants of Rome's urban fabric that are now lost, the authors of these texts, such

Figure 17: Giuseppe Vasi, illustration of Plautilla Bricci's Villa del Vascello. The Villa is the one to the right of the scene with twin towers (HUE/ND)

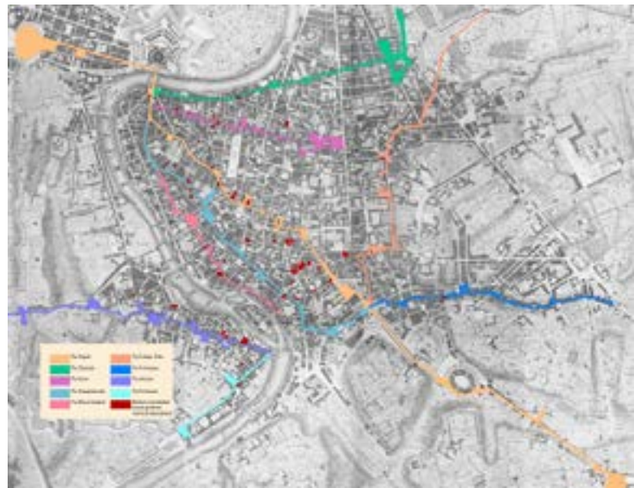
as Vasi, identify artists and architects that have somehow fallen under the radar of architectural scholarship. One name rediscovered in the early 1990s by scholars who have identified her drawings in archival records held in Rome and Turin is the celebrated Roman Baroque architect and painter Plautilla Bricci (1616-1705). Unlike Bricci's principal patron, who denied her the credit she deserved for her design of his Villa del Vascello (completed 1665; destr. 1849), Vasi credits her as the architect of the Villa (Fig. 17). He also celebrates her painting and architectural design of the chapel of S. Luigi in the French national church of S. Luigi dei Francesi (Vasi 1777: 252 and 384). He gave credit and recognition to the first woman to practice architecture whose name and work have survived to the present day (Lollobridgida 2017: 19). Bricci's inclusion in Vasi's text is merely one example of many that underline how little his guide has been studied over the centuries, where one of architectural history's most compelling practitioners has remained unobserved while existing in plain sight.

Potential Uses of *Cities in Text: Rome*. Documentation of the Architecture Left Out of the Guidebook Tradition: Discovering Rome's Medieval Residential Façade Porticoes

The *Cities in Text: Rome* website and mobile application are not merely an online index of architectural and urban data but also an analytical research tool that can lead to significant discoveries. During the development of and subsequent utilization of the website and mobile application, the team became increasingly interested in the parts of Rome's urban fabric that were continuously edited out of the historical texts and illustrations examined in this study. Noting that medieval residential architecture was almost entirely ignored. Further inquiry into a specific medieval building type frequently encountered during the project's documentation phase led to the team's identification of fifty-six extent residential façade porticoes within the Aurelian Walls in eleven *rioni*. Moreover, twenty-six of these structures were identified in eight *rioni* in historical records and archeological reports housed in the Archivio di Stato di Roma (ASR), the Museo di Roma, and the Archivio Segreto Vaticano (ASV). Finding there to be a lack in historical documentation of the façades of these existing medieval structures, each of these buildings was measured, drawn, photographed, mapped, and ready to be added to the resources section of the *Cities in Text: Rome* platform.

Identification and mapping of the visible remains of Rome's medieval residential façade porticoes and those documented in historical views and archival sources contribute to a greater understanding of the primary urban sequences and processional routes along which these porticoes stand. Examining this mixed-use building type reveals the extensive commercial activity present in medieval Rome (Fig. 18). At the architectural scale, a clear

Figure 18: Ancient and medieval street networks with medieval residential façade porticoes visible and demolished in red (author's drawing overlaid on Nolli map)



and comprehensive construction culture is visible and not limited to residential architecture but carries over to churches and other religious and civic structures. Analysis of these buildings resulted in the author's identification of four distinct subtypes of residential porticoes (Fig. 19). The reuse of ancient *spolia* reworked by medieval masons was systematized and cohesive when examined as a group. Construction patterns also emerged, illuminating medieval building culture and the quantity of certain ancient Roman materials such as large blocks of white marble used for architraves, capitals, and bases. The Ionic capital's frequent use appears to be executed by skilled masons that attempt to communicate the ancient precedent they took inspiration from (Fig. 20).

Type I of the four distinct categories or subtypes of residential porticoes recognized in this study is the trabeated one and is most likely the earliest form of residential colonnade constructed in Rome (Figs. 21-22). The oldest extant example of a similar type of residential structure is the Casa dei Crescenzi, built between 1040 and 1065 by Nicolò di Crescenzio (Barbanera and Pergola 1997: 301). The sophisticated use of *spolia* along the surface of the building indicates a conscious effort by the owner of the house to visually display fragments from ancient buildings in a celebratory manner to underline the social status of the Crescenzi family while emulating antique Roman buildings. Eight existing trabeated residential porticoes were identified in seven *rioni*, built a century after the Casa dei Crescenzi. According to Patrizio Pensabene and Lorenzo Quilici, the most probable precedents for these domestic structures are Catholic churches' narthexes built in Rome during the 12th and 13th centuries; thus, these trabeated examples can also be dated to around the same period. Examples include the narthexes of San Giovanni e Paolo, San Giorgio in Velabro, and San Lorenzo Fuori le Mura, dating from the 12th century (Pensabene 2009: 80). The architectural elements common to these religious structures also exist at the residential scale and include adherence to the use of Ionic capitals. There is only one example of a trabeated portico in the case studies examined that does not exclusively use Ionic capitals and includes a simply carved Composite one at the corner of the building (Via di S. Bonosa, 22). Medieval builders would have been employed in ecclesiastical and domestic architecture projects during this period, using similar details and construction methods to develop sacred and secular buildings. As indicated at the Casa dei Crescenzi, classical elements and *spolia* included along the facades of buildings underlined the wealth and elevated status of the owner whose building they adorned as they did for the churches of the period.

Classical proportions associated with the use of the ancient Ionic order were not found in the medieval examples noted in this study. Only an architrave is present with a sometimes ornately carved cornice. Column shafts also lack the necessary relationship of base diameter to the overall height of the order and its entablature. Horizontal blocks of white marble were taken from ancient Roman buildings and re-carved to provide a coherent decorative system in several of the structures identified in the study. In the example of the Casa Bonadies and the house on Via Capo di Ferro, ancient buildings' carved cornices were reused. The white marble of the Ionic capitals was taken from ancient buildings but re-carved by medieval masons. Only in a few cases was material taken directly from late antique buildings without significant modification, such as those found at the Palazzo Mattei in Trastevere. The Ionic capitals' carving's regularity and orderliness clarify that specific workshops were responsible for their production. Only a few examples in this study depart drastically from the standard model of an Ionic capital in Rome, including those found at the Casa Bonadies and one of the capitals of the Palazzo Ginnasi (see Fig. 20). The single-shaft stone

Figure 19: Four distinct types of residential façade porticoes were identified

Figure 20: Collection of Ionic capitals that were identified in this study

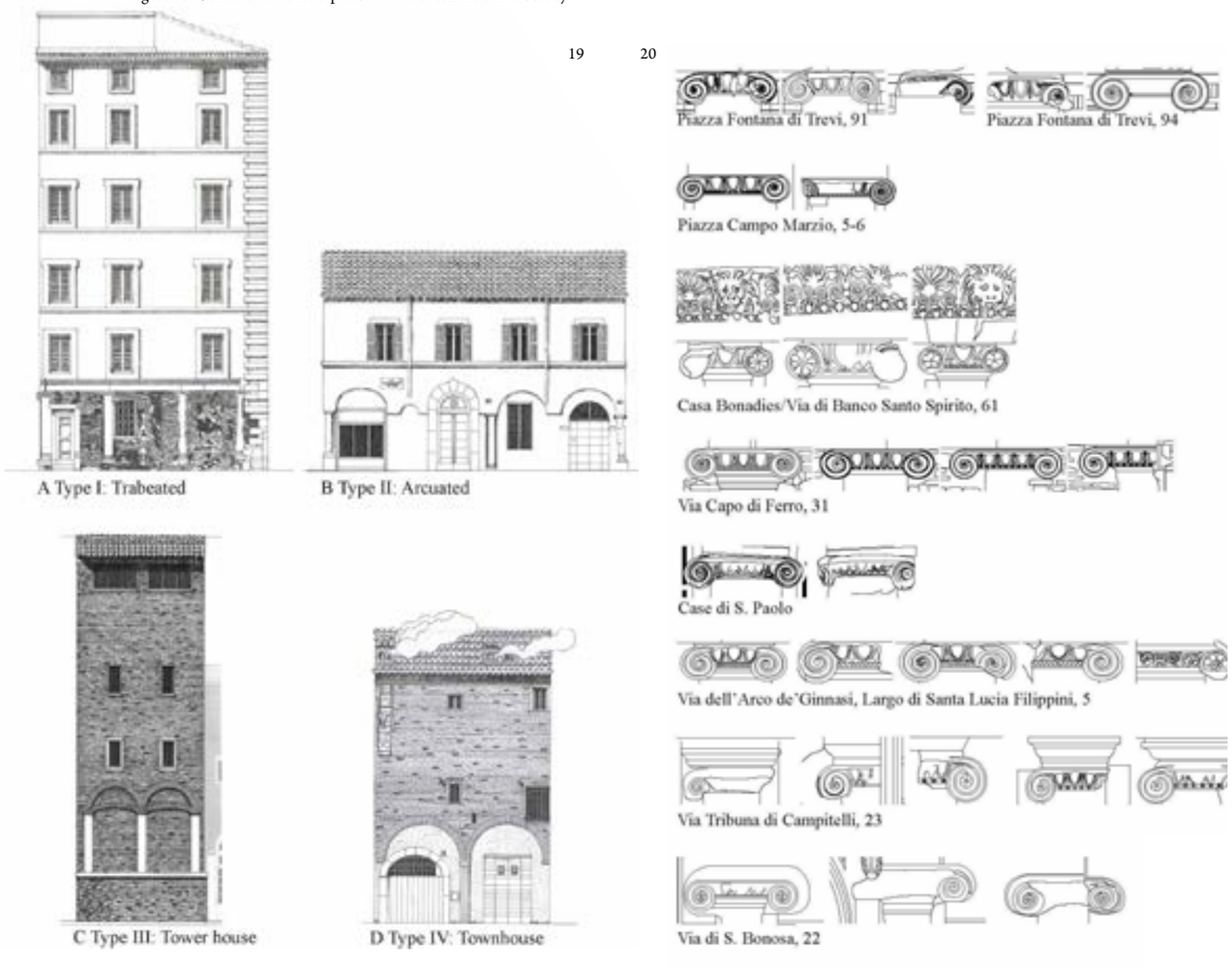


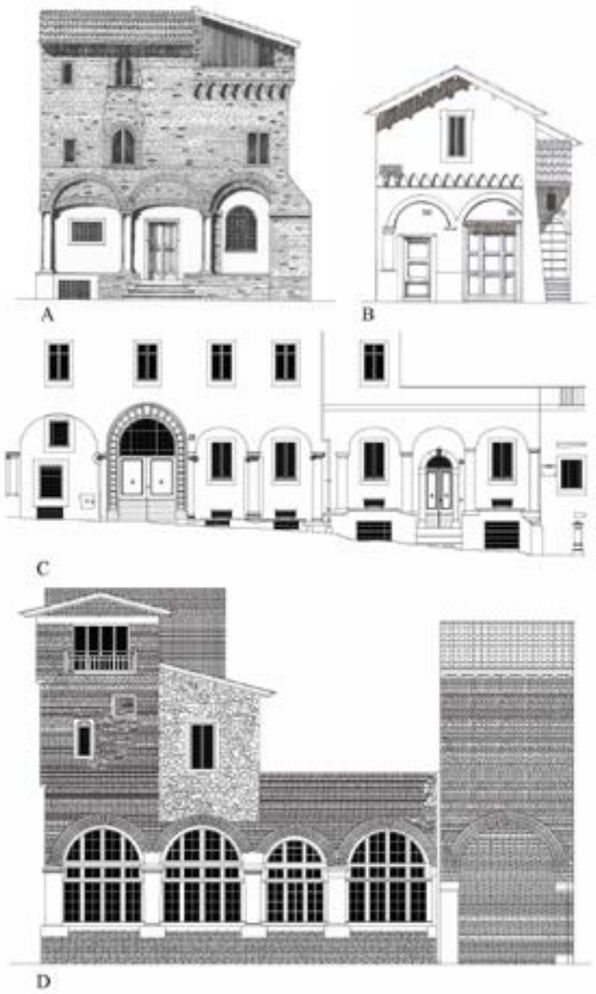
Figure 21: Trabeated porticoes: A. Casa Bonadies/Via di Banco di Santo Spirito, 62 B. Via di Capo di Ferro, 31 C. Via dei Giubonnari, 64 D. Via di S. Bonosa, 22

Figure 22: Trabeated porticoes: A. Piazza Fontana di Trevi, 91, 91 B. Via dell'Arco de'Ginnasi, Largo di Santa Lucia Filippini, 5

columns were taken directly from ancient monuments and carved or adjusted only slightly to meet the needs of the new buildings they adorned. The abundance of grey granite columns found in this study signifies this material's prolific use in ancient Rome. The other reused materials commonly found in the column shafts examined in this study were red granite and *cipollino* marble. Ancient column bases were often used as-is from antiquity or are currently not visible. The examples of carved medieval column bases were either simple plinths or variations of those from antiquity.

The observance of a specific architectural language along residential facades in Rome in the 12th and 13th centuries appears to have been a strict priority, manifest in both religious and residential structures. According to Alberti, "The portico of the highest citizen ought to be trabeated, and that of the ordinary man arched; both should preferably be vaulted" (Alberti 1988: 300). Alberti's observations were based on the building practices he was familiar with that were most prevalent in the 14th and 15th centuries. As Pensabene notes, trabeated porticoes' cost was higher due to the difficulty in procuring marble or stone members long enough to span the entire length of a portico uniformly. The arcuated portico in brick, on the other hand, was much cheaper and easier to make and absorbed irregularities in the size of openings and heights of columns better than its trabeated counterpart (Pensabene 2009: 80).

Figure 23: Arcuated porticoes: A. Piazza di Santa Cecilia, 19 B. Via della Lungaretta, 160-161 C. Via Tribuna dei Campitelli, 23, 23 B. D. Case di San Paolo, 4-7



Type II is referred to here as the arcuated portico. It was made of a series of brick arches that run along the façade of a residence, supported by single-shaft columns with either Ionic capitals, a carved abacus, or a combination of the two (Fig. 23). Like the first type, the arcuated portico has its equivalent in medieval church construction and is still visible today along the façade of Santo Stefano Rotondo. Of the medieval residences examined in this study, twenty-five existing arcuated porticoes were recognized in seven *rioni*. The arches either spring from an Ionic capital or a simple abacus and, in some cases, an impost block. As noted by Pensabene, the arcuated system of porticoes from antiquity to the Middle Ages was a much more affordable construction method. The brick arch was thus cost-effective and flexible, accommodating irregularly sized openings. Column shafts were always made of despoiled materials, and single-shaft stone columns were either short and stout or tall and slender. In some cases, ancient column bases were employed; in others, medieval builders carved new ones. Columns sit directly on the ground or a base or are elevated on a marble slab.

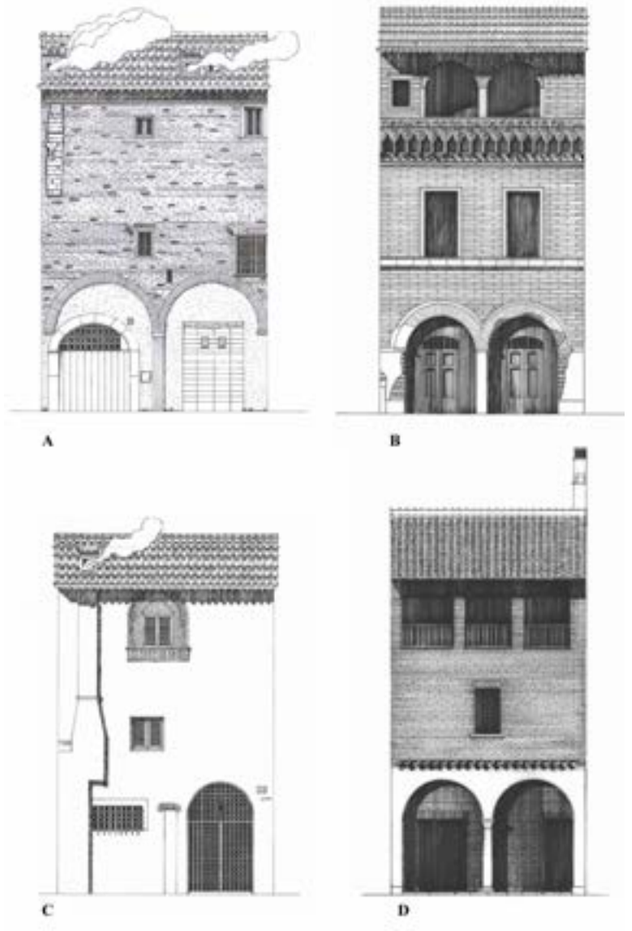
Type III, the tower-house portico, is found at the base of medieval towers, creating an arcuated permeable base to an otherwise defensive and closed structure. In this study, two of these were noted and located in two *rioni* (Fig. 19C.). Type IV, the townhouse portico, comprises two arched openings supported by a single-shaft column capped by an Ionic capital or carved abacus (Fig. 24). According to Piero Tomei, this is the residential type from which the Renaissance *casa a schiera* (townhouse) emerges. It is datable to the end of the 14th to the first half of the 15th century. Five examples of this type were found in two *rioni*. Of the fifty-six structures discussed, seventeen could not be classified under any of the subtypes mentioned due to the fragmentary nature of the portico elements that are visible, the rest being hidden beneath layers of stucco.

Renaissance approaches to palace design in the 15th and 16th centuries, coupled with city planning efforts focused on the widening and straightening streets, as visible in Rome's historical guides in this study and visible in the Nolli plan, wholly altered the medieval fabric of the city. These developments led to the widespread closure of private residences' façade porticoes and the relocation of semipublic space into the courtyard. This transformation permanently altered the physical fabric of the city and its relationship with domestic life.

Conclusion

Cities are not built in a day. They are the result of years of development and change. No other city in the world expresses this concept more clearly than Rome. Thousands of years of continuous urban development make Rome one of the most important centers for studying the built environment. *Cities in Text: Rome*, the website and mobile application, allows users to rediscover the Eternal City while providing a visualization of its monuments as they stood in the 16th, 17th, and 18th centuries. The digital tool allows one to experience Rome's complex transformation with the click of a button while standing in front of the historical monument or urban space they are studying or from anywhere in the world. Over 400 of Rome's sites are documented, geo-located, visualized, and accessible electronically. The project aims to provide a digital research tool for studying the built environment while stimulating new research questions and discoveries. The HUE/ND team's documentation of these guidebooks revealed a lack of representation of Rome's medieval residential architecture. In response, the team chose to explore one of the least familiar features of medieval residential architecture in Rome, the façade portico, contributing to the first systematic documentation of these historic structures' existing remnants. The results of this research will soon be shared in the website's resources tab, allowing one to gain a better understanding of a building type that has continued to evolve over the centuries with the city itself, standing the test of time while remaining overlooked and almost completely forgotten.

Figure 24: Townhouse porticoes: A. Via Arco della Pace, 10 B. Via dell'Orso, 11 C. Casa della Fornarina, Via di Santa Dorotea, 20 D. Casa di Fiammetta, Via dei Coronari, 157



References | Referencias | Referências

Ackerman, James Sloss. 1961. *The Architecture of Michelangelo*. New York: Viking Press.

Alberti, Leon Battista. 2000. *On the Art of Building in Ten Books*. Translated by Joseph Rykwert, Neil Leach, and Robert Tavernor. Cambridge: MIT Press.

Barbieri, Patrizio. 2011. Music-Selling in Seventeenth-Century Rome: Three Inventories from Franzini's Bookshops. *Ricercare*, vol. 23, 1-2: 131-173.

Bevilacqua, Mario. 2004, *Nolli, Vasi, Piranesi: immagine di Roma antica e moderna: rappresentare e conoscere la metropoli dei lumi*. Roma: Artemide.

Blennow, Anna Holst; and Rota, Stefano Fogelberg. 2019. *Rome and the guidebook tradition from the middle ages to the 20th century*. Boston: DeGruyter.

Bury, John. 1987. El Greco's books. *The Burlington Magazine*, vol. 129, 1011: 388-391.

Casper, Andrew R. 2011. El Greco's Christ Healing the Blind. *Zeitschrift für Kunstgeschichte*, vol. 74, 3: 349-372.

Coarelli, Filippo. 2014. *Rome and environs: an archaeological guide*. Berkeley: University of California Press.

Coen, Paolo. 2019. *The Art Market in Rome in the Eighteenth Century a Study in the Social History of Art*. Leiden: Brill.

Coen, Paolo. 2007. *Le magnificenze di Roma nelle incisione di Giuseppe Vasi*. Rome: New Compton.

Franzini, Federico. 1643. *Descrittione di Roma Antica e Moderna*. Rome: Andrea Fei.

Gamucci, Bernardo. 1569. *Le Antichità della città di Roma*. Venezia: Giovanni Varisco.

Krautheimer, Richard. 2000. *Rome: Profile of a City, 312-1308*. New Jersey: Princeton University Press.

Lollobrigida, Consuelo. 2017. *Plautilla Bricci: pictura et architectura celebris: l'architettrice del Barocco Romano*. Rome: Gangemi editore SpA international.

Magnuson, Torgil. 2004. *The Urban Transformation of Rome 312-1420.* Stockholm: Paul Astroms.

Maier, Jessica. 2013. Giuseppe Vasi's Nuova Pianta di Roma (1781): Cartography, Prints, and Power in Settecento Rome. *Eighteenth-Century Studies*, vol. 40, 2: 259-279.

Parshall, Peter. 2006. Antonio Lafreri's Speculum Romanae Magnificentiae. *Print Quarterly*, vol. 23, 1: 3-28.

Pensabene, Patrizio. 2009. I portici nelle case medievali di Roma. In Bernard, Jean-François, Bernardi, Philippe; and Esposito, Daniela (eds.), *Riempiego in Architettura*, 67-93. Rome: Ecole Française de Rome.

Pugliese, Antonia. 1999. Roma: Una casa medievale scomparsa nel rione Monti a via dell'Agnello. *Archeologia Medievale*, 26: 353-363.

Quilici, Lorenzo. 1982-1983. Strutture antiche e medioevali nelle case all'imbocco di via capodiferro. *Bullettino della Commissione Archeologica Comunale di Roma,* 88: 255.

Rhodes, Dennis Everard. 2019. *Una Tipografia del Seicento fra Roma e Bracciano: Andrea Fei e il Figlio Giacomo*. Rome: Edizioni di Storia e Letteratura.

Rossetti, Sergio; and Belleudi, Dario. 2000-2004. *Rome: A bibliography from the Invention of the Printing Press through 1899*. Firenze: L. S. Olschki.

Spezzaferro, Luigi. 1973. La politica urbanistica dei Papi e le origini di via Giulia. In Salerno, Luigi; Spezzaferro, Luigi; and Tafuri, Manfredo (eds.), *Via Giulia una utopia urbanistica del 500*, 18-19. Rome: Stabilimento Aristide Staderini.

Tait, Alan Andrew. 1978. Inigo Jones's "Stone-Heng". *The Burlington Magazine*, vol. 120, 900: 154-159.

Tice, James; and Harper, James Gordon. 2010. *Giuseppe Vasi's Rome: Lasting Impressions from the Age of the Grand Tour*. Eugene: University of Oregon Press.

Tomei, Piero. 1977. *L'architettura a Roma nel Quattrocento*. Rome: Multigrafica.

Varriano, John. 1992. Plautilla Bricci "architettrice" and the Villa Benedetti in Rome. In Millon, Henry Armand; and Munshower, Susan Scott (eds.), *An Architectural Progress in the Renaissance and Baroque,* 266-279. University Park, Pa.: Pennsylvania State Univ.,

Vasi, Giuseppe. 1777. *Itinerario Istruttivo Diviso in Otto Giornate*. Rome: Nella Stamperia di Arcangelo Casaletti.

Vasi, Mariano. 1847. *New Guide to Rome and the Environs According to Vasi and Nibby*. Rome: Luigi Piale.

Biography | Biografía | Biografia

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Neelima Yadav, Navanil Chattopadhyay

Traditional Vernacular Architecture of Kumaon: The Case of the Hill Towns of Munsiyari, Uttarakhand

La arquitectura vernácula tradicional de Kumaon: El caso de los pueblos de montaña de Munsiyari, en Uttarakhand

A arquitectura vernacular tradicional de Kumaon: O caso das povoações da montanha de Munsiyari, em Uttarakhand

Keywords | Palabras clave | Palavras chave

Cultural Heritage, Kumaoni Architecture, Traditional Knowledge Systems, Barpatiya Tribes, Urban Patterns

Patrimonio cultural, Arquitectura kumaoni, Sistemas de conocimiento tradicionales, Tribus barpatiya, Tramas urbanas

Património Cultural, Arquitectura Kumaoni, Sistemas de Conhecimento Tradicionais, Tribos Barpatiya, Padrões Urbanos

Abstract | Resumen | Resumo

Munsiyari is a region located at an altitude of 2,200 meters in the hilly state of Uttarakhand, India. The eponymous town is surrounded by twenty-two villages mostly inhabited by Bhotiya tribes, who once formed a community that traded with those crossing from India to Tibet, though this trade came to an abrupt end with the 1962 Sino-Indian war. Owing to the region's prosperity, the villages exhibit a very interesting typology of hill architecture. This architectural identity is also a manifestation of a geographical and cultural response to a difficult terrain. Our study was carried out as part of the preparation of a dossier for inventorying the Kailash sacred landscape with the aim of documenting the present state of the traditional vernacular heritage of the selected indigenous community for the UNESCO nomination of the wider region. That thorough documentation process was used as a means of analyzing local vernacular heritage and its current situation, and with a view to offsetting the rapid transformation of the past two decades.

Munsiyari es una región situada a una altitud de 2200 metros en el montañoso estado de Uttarakhand, en la India. La pequeña ciudad del mismo nombre está rodeada de 22 aldeas habitadas en su mayoría por las tribus bhotiya de la región, que en otros tiempos eran comunidades de comerciantes para aquellos que atravesaban India en dirección al Tíbet. Las actividades comerciales cesaron repentinamente en 1962, tras la guerra sino-india. Debido a la prosperidad de la zona, los pueblos presentan una tipología muy interesante de arquitectura de montaña. Esta identidad arquitectónica es además una manifestación de la respuesta geográfica y cultural de los habitantes de este difícil terreno. El estudio se realizó como parte de la preparación de un dosier sobre el paisaje sagrado de Kailash, a fin de documentar el estado actual del patrimonio vernáculo tradicional de la comunidad autóctona y presentarlo para la candidatura a la UNESCO de una región más amplia. El exhaustivo proceso de documentación ha servido como herramienta para

analizar las tradiciones locales y su situación actual y para ayudar a equilibrar la rápida transformación de las dos últimas décadas.

Munsiyari é uma região situada a uma altitude de 2200 metros, no estado montanhoso de Uttarakhand, Índia. Esta pequena cidade epônima está rodeada por vinte e duas aldeias que são maioritariamente habitadas pelas tribos Bhotiya da região, que foram outrora a comunidade mercantil para as pessoas que faziam a travessia da Índia para o Tibete. As actividades comerciais chegaram a um fim abrupto após a guerra sino-indiana de 1962. Devido à prosperidade nesta região, as aldeias apresentam uma tipologia muito interessante de arquitectura de montanha. Esta identidade arquitectónica é também uma manifestação da resposta geográfica e cultural dos habitantes neste terreno difícil. O estudo foi realizado como parte da preparação de um dossier para registar a paisagem sagrada de Kailash, com o objectivo de documentar o estado actual do património vernacular tradicional da comunidade indígena que foi seleccionada para uma nomeação pela UNESCO de uma região mais ampla. O processo exaustivo de documentação tem sido utilizado como ferramenta de análise das tradições locais e da sua situação actual, e para ajudar a equilibrar a rápida transformação das duas últimas décadas.

Introduction

Kumaon is one of the two regions and administrative divisions of the Indian state of Uttarakhand, the other being Garhwal. The region includes the districts of Almora, Bageshwar, Champawat, Nainital, Pithoragarh, and Udham Singh Nagar. It is bounded to the north by Tibet, to the east by Nepal, to the west by Garhwal, and to the south by the Tarai.

As part of the Himalayan range, the region has a predominantly hilly landscape and undergoes harsh weather especially in winter, when the temperature can drop below zero. Some of the mountain peaks within Kumaon are among the loftiest of the mighty Himalayas. These peaks are also considered sacred by Hindus and are visited on religious pilgrimage: Nanda Devi at 7,817 meters, Badrinath at 3,300 meters, Kedarnath at 3,553 meters, Trisul Parvat, etc.

The people of Kumaon are broadly known as Kumaonis and most of them speak the Kumaoni language. There are various local dialects of Kumaoni across the various districts. Owing to its history and to the migrations over the years, the local population includes migrants from the plains of other Indian states and people of Tibetan origin who settled here in search of trade or as an escape from the wars of the plains.

Figure 1. Map showing the state of Uttarakhand and its regions of Kumaon and Garhwal (Uttarakhand Solidarity Network)

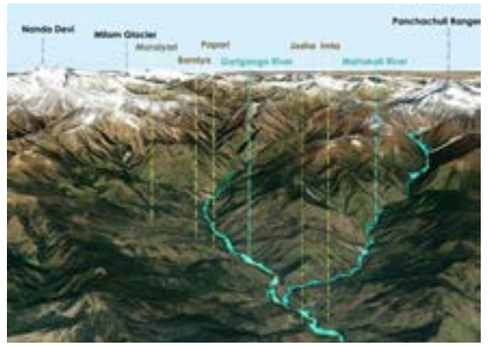

Figure 2. Three dimensional topographical diagram showing the major geographical features and villages documented

Munsiyari, as the collection of villages on the right bank of the Gori river are called, is in Kumaon district, inhabited by the local Bhotiya people as their winter retreat and storage site for trade with the lower sub-division of Kumaon. It is twelve miles from Girgaon, eighty-one miles from Almora, and eight miles from Lilam.

Munsiyari is strategically situated in the foothills of the Himalayas and was the winter home of traders with China traveling via Milam Glacier. The traders' caravans would cross from India into Tibet by the high passes of Utna Dhura and Kungribhingri La.

Methodology

As theoretical background, our research takes key points from various international cultural heritage documents that highlight the values of traditional vernacular architecture and heritage, among which we may cite: *Recommendation on the Safeguarding of Traditional Culture and Folklore* (Mexico, 1989), *Nara Document on Authenticity* (Nara, Japan, 1994), and *Charter on the Built Vernacular Heritage* (Mexico, 1999). All of the above include vernacular architecture as a significant form of expression of traditional culture. These documents highlight the importance of such settlements as living cultural landscapes and this aspect must be taken into consideration in the development of conservation approaches. They also define built vernacular heritage as a direct response to the functional, social and environmental conditioning factors of a community and as the product of traditional building systems, crafts and techniques.

Our research project essentially created a database on the present state of the traditional vernacular heritage of the selected indigenous community. The study involved comprehensive documentation of architectural heritage along with a detailed account of the region's history, geography, culture, and people, and their current status as a community. The various forms of information collected were: oral surveys carried out in the field with people about their knowledge of building; a descriptive record based on inventories filled in on site with various details of buildings, their construction, usage and present condition, along with socio-cultural data collected so as to understand the region as a sacred landscape; a record of basic architectural sketches of floor plans, sections, and elevations of the buildings studied along with detailed documentation and drawings of representative examples of the types identified; a photographic record based on a sequential approach to buildings and consisting of images taken from views of them in their context and landscape, with their scale, interior and exterior elevations, and detailed images of the various construction details; and also the traditional construction system and present construction trends in the region.

To better understand the traditional vernacular architecture, buildings were studied in their geographical setting with their anthropological context, available resources and construction techniques. Our study also assesses the present state of buildings, the threats this architecture faces and its possible way forward.

Figure 3. Team doing documentation in the villages of Munsiyari

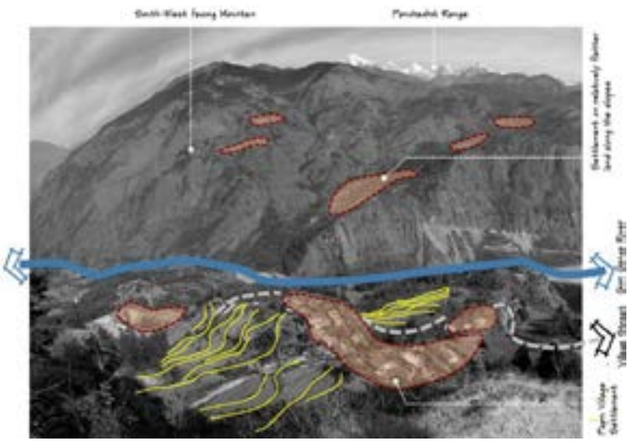

Figure 4. Analytical sketch showing the major geographical features and settlement, near Papri village

Figure 5. Conceptual diagram showing the historical route to Mount Kailash, the major geographical features and the international boundary of the tri-nation region

Cultural landscape of Munsiyari

The region of Munsiyari is in the upper Himalayan belt, with a temperate climate and high rainfall. It is covered with dense forest and scenic parcels of irrigated terraces. The outstanding features of the landscape are its numerous mountain ridges and the great valley of the Gori Ganga river.

The villages are located at the base of the mountains on comparatively flat land. The area around them has been converted into stepped terraces for growing rice, maize, vegetables, fruits, and other local cereal crops in the summer season, i.e. April to September. These villages also exhibit exemplary architecture corresponding to their culture and livelihood and which has helped them endure the adverse weather in these hills.

The region can be seen as a "continuing cultural landscape", as it is still closely associated with the traditional way of life, and some of its natural elements retain powerful religious associations. It also exhibits significant material evidence in the form of residential architecture representative of its evolution over time.

The larger region covered by the study is an associative cultural landscape, i.e. the landscape is associated with Mount Kailash by virtue of a strong religious link, being a pilgrimage circuit connecting India, Nepal, and China. The Samuchi Kund near Milam, a pool in the Gori river upstream of the village, is another major sacred site. The whole region is dotted with religious sites with both natural and cultural properties. The natural element comprises various sacred peaks with distinct mythological associations, named after deities or religious tales, e.g. Adi Kailash, Nanda Devi, Trisul Parvat, etc. The cultural properties include the numerous Hindu temples, also significantly located below the various peaks mentioned above.

The Barpatiyas

The people of this region are locally known as the Barpatiyas, part of the wider trading community of the Bhotiyas. The Bhotiyas are also known as "Tibetan immigrants" in written records from the British period (pre-1947). They would have crossed the border centuries ago in search of good pasture for their cattle and their origins would have helped them to later become key figures in the cross-border trade between India and Tibet.

Bhotiyas can easily be distinguished from those inhabiting the region prior to their arrival in Kumaon by their physical features. As Edwin Felix Thomas Atkinson said, in the northern *parganas* (districts), the frame is shorter and stouter and the complexion comparatively fair; while in the south, the stature is taller, the figure sparer and the complexion sallow (Arkinson 1881: 122).

The Barpatiyas around Munsiyari practice Hinduism and their customs and rituals are informed by those of the indigenous population. They are basically worshippers of *Devi* (a female Hindu goddess), though they also worship other Hindu gods and celebrate all the major Hindu festivals other than *Holi*. In the *Devi* worship ritual, animal sacrifices are offered even today, and the animal is later consumed by the locals as *prasad* (offering).

A major ritual for the Barpatiyas is the *Khoda Pooja* (praying rite), in which a number of Barpatiya villages participate together. The *Devi* is carried on a *palaki* (palanquin) borne on participants' shoulders from one village to another, including all the surrounding Barpatiya villages. Once the ritual is over, the *Devi* is instated in a new village where she will remain for a year until the next ceremony. Each village gets to keep the *Devi* every eight years. The deity is welcomed with great celebration, with a goat usually being sacrificed. The ritual has also played a role in the layout of Barpatiya settlements, as there is always an unobstructed pathway laid out up to the house of the village head, where the deity will be instated for the year. This central house has a medium-size open courtyard which is the site of various religious rituals.

The Bhotiya tribe traded mainly carpets, blankets and woolen clothes woven by women, as well as items such as tobacco, tea, coffee, barley, and rice. There is also historical evidence of trade in agricultural equipment, copper products, and medicines. A key trading point was the Bada Haat, a big market in the present-day town of Uttarkashi working on the barter system, the mainstay of the local economy. When trading was at its height, from May to October traders would go to the high mountain villages of Milam, also known as their summer abode. They would move back to the lower, southern part of Kumaon for the rest of the year to avoid the deep snows and avalanches which often roll down from one or the other of the mountains in the vicinity.

Hence trade flourished until the Sino-Indian war of 1962, when it abruptly ended with drastic changes in the whole region leading to mass unemployment in many trading tribes. Today the menfolk have taken up other jobs in the nearby cities and the women look after their houses and farms.

Traditional vernacular architecture in Munsiyari is greatly influenced by socio-cultural practices, religion, climate and availability of raw materials. Culture and social practices have affected the patterns both of settlements and of individual dwellings. The villages are hamlets of ten to fifteen houses strategically spread along small portions of flat land in the mountainous terrain. To fully apprehend their architecture, it is important to understand the villages in their setting and how natural resources have shaped the vernacular style.

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Figure 6. A Barpatiya woman in her thirties

Figure 7. A sketch showing the relation between the Temple and, in the background, the Nanda Devi peak

Figure 8. Traditional woollen thread making

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Setting of villages and settlement patterns

The Barpatiya villages in Munsiyari are sited in the landscape so as to make optimal use of the available flat land and direct sunlight and to avoid direct wind, while keeping in view the ownership of a source of fresh water. So the siting of these villages may be understood by taking a look at some physical aspects.

Given the harsh winters, sunlight is crucial, so villages are always sited on the sunniest slopes. Next comes the availability of a source of fresh water (*dhara*), i.e. glacier water from higher slopes. These water sources are also related to religious activities in the villages and are considered sacred.

Due to the steep terrain and rocky character of the newer Himalayas, there is a scarcity of comparatively flat land for habitation. Stepped terraces are usually cut into the mountain slopes and then carefully dammed with stone walls and vegetation as reinforcement to prevent erosion. Such terraces require a less rocky hillside with soil for cultivation. As the Bapatiyas are highly dependent on their own produce for their subsistence, alluvial soil is particularly appreciated.

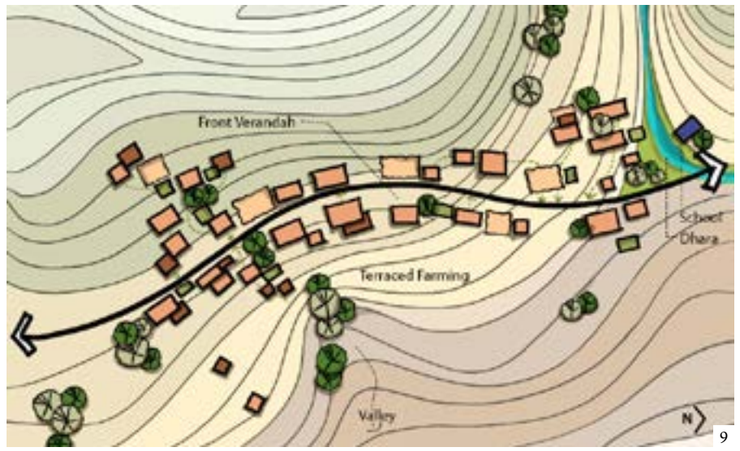

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Figure 9. Conceptual sketch showing a Barpatiya village in its setting

Figure 10. View from the village entrance

Figure 11. Picture showing the vicinity of farm lands from dwellings

Figure 12. A view of Harkot, a Barpatiya village

Figure 13. Barpatiya residence in its setting

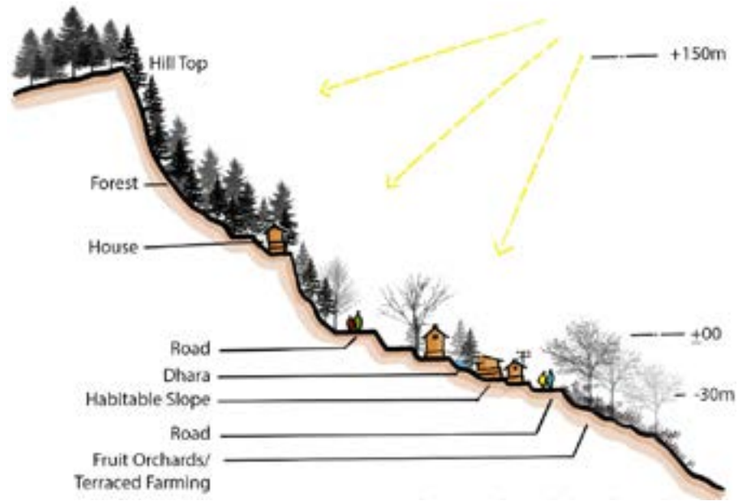


Figure 14. Basic section showing various key elements of a village in Harkot village, Munsiyari

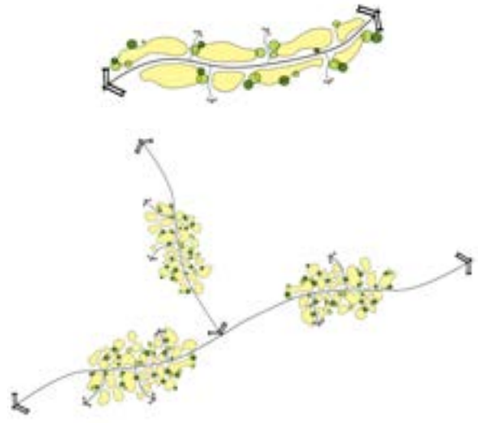
As for the villages themselves, there are two main types of settlement identified in this region:

The linear pattern of settlement is common in the lower Himalayas. This involves some fifteen to thirty houses along the contours of the hillside. Since there is very little flat land, lateral growth along one contour line is favored. The villages of Harkot, Barniya, and Papari are examples of this category.

The nucleated settlement pattern is seen mostly in the upper Himalayas. These settlements are mainly determined by water sources, around which a cluster is formed. These clusters are also segregated according to the caste system, leading to sub-clusters of different castes at short distances from each other. Each cluster comprises no more than four to six households. Examples of villages in this category are Imla and Josha, at an altitude of 2,500 meters.

Many settlements are planned around a central axis, normally a ridge. The houses are dotted along the ridge linearly, connected with the central pathway running through the village. This axis is commonly a stone causeway about two feet wide from which small raised paths lead to the houses. The causeway has a path for cattle (called *guna*) at a lower level than the human walkway (known as *bat*). This level difference also facilitates rainwater runoff. Another common feature of these settlements is the *gadhera*, or wastewater channel.

Figure 15. Sketch plans showing a linear and a nucleated settlement patterns



Architecture

The architectural typology in these villages is limited to residential units. The shrine is located in the house of the village head, usually also the oldest house. This is commonly the central node of the settlement and exhibits detailed wooden carvings and rich ornamentation. There is also a shrine located at the entrance to the village to guard the villagers from harm.

Given the cold and dry climate and the extreme winters, openings are small and few in number so as to reduce the flow of cold wind, and the open spaces such as the verandah and *patagan* (front court) are designed to capture the sun's warmth. The presence of livestock on the lower floor also helps maintain warmth in the house. The sloping roofs help shed snow in the winter and prevent water accumulating during the monsoon. The locals also use a native grass called *selum* to cover the sloping roof. This helps regulate the warmth inside the house and also facilitates the melting of snow in winter.

Each Barpatiya house (*ghar* or *kur*) is entered from an open verandah (*majhyal*), which if open is called *chajj* and if closed is known as *chak*. It is located on the first floor and runs along the front of the house, serving as a multipurpose space for drying seeds, keeping cattle, washing, etc., enclosed with a low front wall.

The rear of the house, not facing the sun, is usually sealed, with no windows or other openings.

There is usually a lower terrace in front of the verandah where vegetables and fruit trees are planted.

The lower story (*goth*) is used for keeping cattle. In houses with more cattle the *goth* may be a separate one-story house or annex connected with the front open area and also having a slender verandah (*gothmal*).

The first-floor verandah has windows overlooking the courtyard. The number of windows shows the scale of the house and the window ornamentation – usually delicate latticework creating a screen-like effect – is linked to the dwellers' prosperity. There are three types: *ekdari*, with a single opening, or single-shutter window; *dodari*, or double-shutter window; and *tibari*, with three shutters. Dwellings with a *tibari* usually house the headman or some other personage.

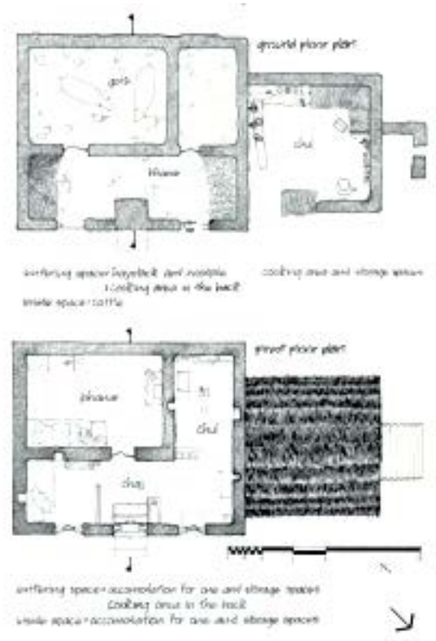


Figure 16. Ground and first floor plans of a Barpatiya dwelling showing living spaces

Figure 17. Photographs showing the facade and window details

Figure 18. Measure elevation drawing of a Barpatiya house

A door is called *kholi*; a room, *khand*; the front reception room, *tiwari*; the raised wooden place for sitting in the evening, *chaunro*; the space behind the house, *kuriya*; a row of houses together, *bakhal* or *kholo*; and a group of houses in a separate cluster, *tand* (Atkinson 1881).

Individual dwellings have a shallow stone foundation, one to three feet deep, commonly of large stones extracted locally; a rubble-masonry wall made of slate (*pattar*) and coated with mud plaster (made with red soil); and the roof (*pakh*) is a timber truss finished with local slate. Mud is mixed with cow dung and other organic additives for thermal insulation. The flooring is made of wooden planks supported with wooden trunks as beams and then smeared with a paste of cow dung and clay mixed on every second or third day. The floors of rooms are covered with a rug of stitched jute bags and a bamboo mat. Doors and windows are commonly made of *loheta* and *surai*, and in some cases of *kedar* (deodar cedar), sal tree, tun wood, or rosewood.

Figure 19. Drawing showing a blow up view of typical house of the region

Figure 20. A Barpatiya house in its setting showing the *chauk* (courtyard) in front and the *kuriya* (space behind the house)

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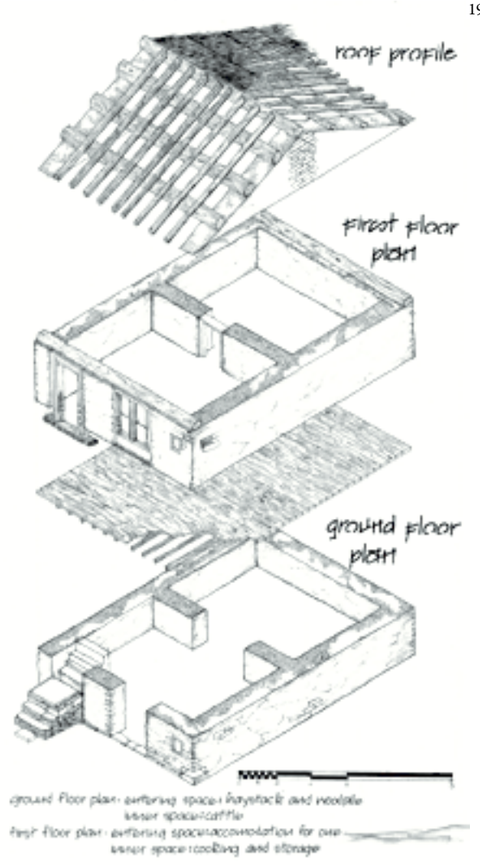

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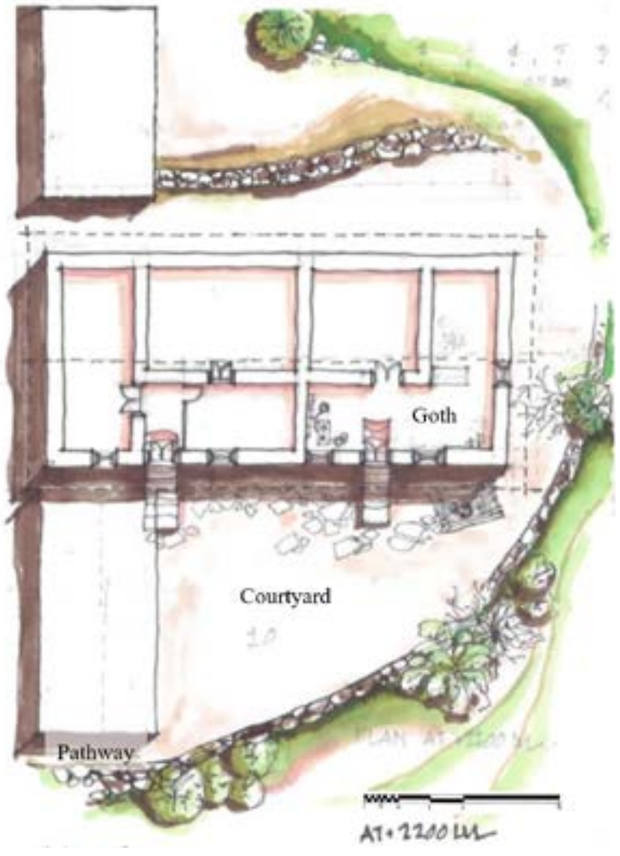
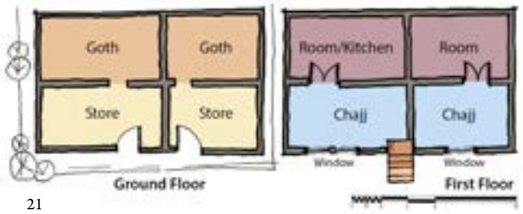


The construction of these dwellings was traditionally a family and communal affair. Members of the extended family and community members usually lent a hand with the building.

Traditional vernacular dwelling typology

We may categorize the traditional dwellings in four major types according to their scale and spatial division. These types are based on the house plan and only the fourth type, belonging to the village head, may be linked to a particular economic status.

The first type is the most common form found in our study. Its width is about 1.2 times its depth. The house is divided on both floors into four equal parts. In this plan, all of the ground floor is used for keeping cattle, whereas the first floor has three multipurpose rooms and a kitchen-cum-granary.



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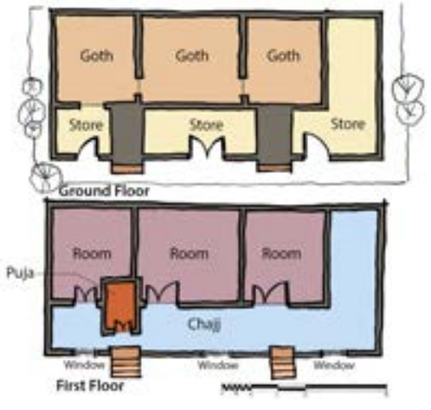

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Figure 21. Single line sketch plan of first typology of Barpatiya dwelling

Figure 22. Single line sketch plan of second typology of Barpatiya dwelling

Figure 23. Single line sketch plan of third typology of Barpatiya dwelling

Figure 24. Single line sketch plan of forth typology of Barpatiya dwelling

In the second type, the width of the house is again about 1.2 times its depth. But the plan is divided into two unequal portions. The front portion occupies a quarter of the depth of the house and the rear portion the other three quarters. The ground floor has a *goth*, divided for cows (wide *goth*) and goats (narrow *goth*). The first floor has a large room along with a front sitting area for entertaining guests (the *chajj*), and a kitchen space to the right.

In the third type, the width of the house is about 1.5 times its depth. Its plan is also divided into two unequal portions. The front portion occupies roughly a quarter of the house's depth and the rear the other three quarters. The ground floor consists of three *goths* of equal width. The first floor has a long *chajj* and a grain store in the front and two rooms in the rear. To the right of the house is an annex housing the kitchen on the ground floor and with space for an additional room on the first floor.

The fourth dwelling type is that of the most prosperous families. The house is about twice as wide as deep and is often richly decorated with wood carvings on its façade. The ground floor is divided into three equal *goths* and the last one on the right is used as storage space. On the top floor, which follows the same layout, there are three rooms with a space to the right for a kitchen. The front portion in this house is also the *chajj* (the guest parlor) and there is a storage space in the right-hand corner. In most such houses there is another room where the village deity is kept.

Wooden carvings

Oral history has it that woodcraft was brought to the Kumaon hills by migrants from Gujarat and Saurashtra fleeing the wars of 1778-1818, who then settled in these parts with their knowledge of woodcarving (Walton 1990: 79).

The woodwork and masonry employed are richly and skillfully carved in the principal houses. In olden times, wood carvings on the façade were seen as symbols of the dweller's prosperity.

The documented villages show a rich variety of woodcraft in their built forms. These rich wood-carving details vary but contain similar motifs, such as plant designs and also at times a depiction of a Hindu deity in the upper middle part of a door. Some decorative motifs are also seen on fascia boards and even on roof eaves.

Examples of carefully detailed traditional woodwork can still be found in Bhotia villages in the Johar, Vyas, and Chaudas valleys, and in villages such as Milam, Pongu, Garbyang, Gungi, Sosa, Sidang, Nabhi, and King, with a different character from that of lower regions. The woodwork in these villages has more motifs with Tibetan, Nepalese and even

Figure 25. Carved wooden window from a house in Harkot village, Munsiyari

British influence, largely as a result of exposure to cross-border trade and exchanges of goods up to the 1960s.

Carvings were traditionally executed by the *shilpkar*, who in most cases formed a community within the village. Sadly, not one person with this skillset was encountered during our study in the villages around Munsiyari. These traditional skills are now looked down upon, since there are not many employment opportunities for them in cities and towns, and little by little they are disappearing.

Current situation

The vernacular architecture of this region has been undergoing rapid transformation, especially in the past decade. The advent of roads and piped water supply, changes in construction materials, extensive migration to cities, etc. are a few of the many factors leading to an almost irreversible change in these villages and their settings. As the vernacular style is not just the built form but also its geographical setting and anthropological context, depending on the available local resources and construction techniques, a loss in any of these aspects is equally critical.

There is not much dialogue happening about balancing the old and the new. Currently in India there is no legal body or guiding document to support the necessary conservation of the unique architectural expressions of each region in its distinctive setting. Instead, the main trend is one of vernacular "museumization", basically turning these living cultures into relics.

Conclusion

Our study shows that there needs to be a strategy to monitor transformation in such a way that future development activities benefit from the traditional knowledge system built up in this region.

In particular, at least the following research areas should be explored in depth in order to take advantage of that knowledge: These traditional dwellings have withstood many earthquakes without substantial damage, and so the construction system's seismic performance should be studied. The thermal insulation properties of the traditional dwellings is also exceptional, so an in-depth study of building materials available today and liable to achieve similar properties should be conducted.

Moreover, retrofitting rather than demolition and reconstruction should be promoted. As the original materials that these houses are made of are becoming scarce, it is important to develop models for integrating modern-day amenities into the traditional structures while preserving their character.

But the model for transformation must emphasize the empowerment of locals, especially women (as the sole breadwinners in most of these communities). New solutions would draw on materials that could be sourced locally so that these activities could become a means of skill development and revenue generation for the locals.

Acknowledgements

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References | Referencias | Referências

Atkinson, Edwin Felix Thomas. 1881. *Gazetteer of the Himalayan Districts of the North-Western Provinces*. New Delhi: Cosmo.

Chatterjee, Bishwa Bandhu. 1977. Literature on Bhotias of Kumaun-Garhwal and a Bibliography. *Indian Anthropologist*, 7, 2, 125-137. Calcutta: Indian Anthropological Association.

Dabral, Shiv Prasad. 1965. *Uttarākhaṇḍa kā itihāsa*. Garhwal: Veer Gatha Prakashan.

Deshpande, Ahtushi. 2015. Trekking to the Milam Glacier in Uttarakhand. *Outlook Traveller*. https://www.outlookindia.com/outlooktraveller/destinations/trekking-to-the-milam-glacier-in-uttarakhand/ (Consulted on 25/03/2017 and 05/09/2020).

Johnson, Russell; and Moran, Kerry. 1990. *Kailas: On Pilgrimage to the Sacred Mountain of Tibet*. London: Thames & Hudson Publication.

Kak, Manju. 2016. *In the shadow of Devi Kumaon: Of a Land, a People, a Craft*. New Delhi: Niyogi Books.

Raha, Manis Kumar. 1979. Stratification and Religion in a Himalayan Society. In Fisher, James F. (ed.), *Himalayan Anthropology*. The Hague: De Gruyter Mouton.

Randhawa, Mohinder Singh. 1970. *The Kumaon Himalayas*. New Delhi: Oxford and IIBH Publishing Co.

Sinha, Awadesh Coomar. 1983. *Studies in the Himalayan Communities: Text & Context*. New Delhi: Books Today.

Thakur, Laxman Singh. 1990. The Khaśas: An Early Indian Tribe. In Kusuman, Kakkaraveettil Kumaran (ed.), *A Panorama of Indian Culture*, 285-293. New Delhi: Mittal Publications.

Tibet Guru http://www.tibetguru.com/ngari/attractions/mt-kailash/ (consulted on 25/03/2017 and 05/09/2020).

Traill, George William. 1991. Statistical Sketch of Kumaon. In Joshi, Maheshwar P. et al (ed.), *Himalaya: Past and Present*. Almora: Shree Almora Book Depot.

Uttarakhand Solidarity Network. 2012. *Thematic Map Library*. http://uttarakhand.org/library/maps/ (consulted on 15/03/2021).

Walton, Henry George. 1989. *The Gazetteer of Kumaon Himalayas*. Delhi: Natraj Publishers.

Biographies | Biografías | Biografias

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Pedro P. Palazzo

Vernacular Patterns in Portugal and Brazil: Evolution and Adaptations

Patrones vernáculos en Portugal y Brasil: Evolución y adaptaciones

Padrões vernaculares em Portugal e no Brasil: Evolução e adaptações

Keywords | Palabras clave | Palavras chave

Traditional Architecture, Urbanism, Urban Form, Architectural Composition, Typology

Arquitectura tradicional, Urbanismo, Forma urbana, Composición arquitectónica, Tipología

Arquitectura Tradicional, Urbanismo, Forma Urbana, Composição Arquitectónica, Tipologia

Abstract | Resumen | Resumo

Traditional towns in Portugal and Brazil have evolved a finely tuned coordination between, on the one hand, modular dimensions for street widths and lot sizes, and on the other, a typology of room shapes and layouts within houses. Despite being well documented in urban history, this coordination was in the last century often interpreted as contingent, a result of the limited material means of pre-industrial societies. But the continued application and gradual adaptation of these urban and architectural patterns through periods of industrialization and economic development suggests that they respond both to enduring housing requirements and to piecemeal urban growth. This article surveys the persistence of urban and architectural patterns up to the early 20th century, showing their resilience in addressing modern housing and urbanization requirements.

Las ciudades tradicionales de Portugal y Brasil han conseguido una coordinación perfectamente ajustada entre, por una parte, las dimensiones modulares de la anchura de las calles y el tamaño de las parcelas y, por otra parte, una tipología de formas de habitaciones y distribuciones dentro de las viviendas. A pesar de estar bien documentada en la historia urbana, durante el siglo pasado esta coordinación a menudo se interpretó como algo contingente y resultado de los limitados recursos materiales de las sociedades preindustriales. Sin embargo, la aplicación continuada y la adaptación gradual de estos modelos urbanos y arquitectónicos en periodos de industrialización y desarrollo económico indican que responden tanto a requisitos persistentes de las viviendas como a un crecimiento urbano gradual. Este artículo estudia la persistencia de los modelos urbanos y arquitectónicos hasta principios del siglo XX, mostrando su capacidad para solucionar las necesidades de la vivienda y la urbanización modernas.

As cidades tradicionais em Portugal e no Brasil desenvolveram uma coordenação bem sintonizada entre, por um lado, dimensões modulares para a largura das ruas e tamanhos dos lotes, e por outro, a tipologia das formas e disposições dos quartos no interior das casas. Apesar de bem documentada na história urbana, esta coordenação foi, durante o século passado, frequentemente interpretada como contingente e como resultado dos recursos materiais limitados das sociedades pré-industriais. No entanto, a contínua aplicação e adaptação gradual destes padrões urbanos e arquitectónicos ao longo de períodos de industrialização e desenvolvimento económico sugere que eles respondem tanto às necessidades habitacionais persistentes como ao crescimento urbano fragmentado. Este artigo analisa a persistência dos padrões urbanos e arquitectónicos até ao início do século XX, mostrando a sua resiliência no que toca a fazer face às exigências da habitação moderna e da urbanização.

Introduction

In this article I examine patterns of urban development in the traditions of the Portuguese-speaking world. I seek to identify bodies of knowledge, practices, and regulations prevalent from the 13th to the mid-20th century offering examples of decentralized economic and regulatory controls over urban space, resulting in emergent systems of urbanism. These decentralized processes are not entirely at odds with the design of new towns, however. The interaction between vernacular development patterns and planned urban forms is a recurring feature in Portuguese and Brazilian towns and cities.

As of the mid-19th century, these systems have contended with fast, overarching changes in regulation and theory that have put their resilience to the test. The rapid urban growth in the global South since the 20th century has been addressed predominantly through theories and policies stressing centralized planning and economies of scale, by both governments and the private sector. In Brazil, the enactment of a "one size fits all" federal law on urban policy nearly twenty years ago is acknowledged to have resulted in the spread of boilerplate zoning codes across medium-sized towns as well as in massive public-private partnerships that have effectively outsourced urban planning to large corporations or even to banks. This has come at the expense both of democratic policymaking and of the agency of peripheral actors, such as small builders and communities excluded from formal land ownership.

In contrast, traditional Portuguese urbanism is predicated on few abstract regulations and, more importantly, a shared body of knowledge made up of both vernacular and "classical" principles. Most planning decisions are of necessity entrusted to engineers and builders on the ground acting on general guidelines provided by local or central authorities, especially in the broad expanses of colonial Brazil. Standard modules for such design measures as the laying out of street widths or block and lot sizes were widely understood by builders. In spite of the high-profile urban renewal and expansion projects of the late 19th century, modelled on Haussmann's Paris or Anglo-Saxon garden cities, much of the urban fabric in Portugal and Brazil continued to be laid out in the piecemeal fashion of Portuguese tradition well into the 20th century, if not up to the present.

Rather than considering the peripheral survival of traditional urbanism as an inconsequential remnant on the sidelines of progress, I assert its legitimacy as a means of achieving resilient and sustainable cities within the socioeconomic reality of peripheral building cultures. I do so by documenting its historical patterns with an emphasis on vernacular and decentralized knowledge being leveraged by centralized planning measures, as well as on working-class housing programs from the mid-19th century onwards. This general aim is pursued by establishing a typological series of traditional urban fabrics evidencing the persistence and slow transformation of urban forms and building patterns.

Methods and sources

This study takes a cue from Miguel de Unamuno's concept of "intrahistory", translated into architectural scholarship in 1947 by Fernando Chueca Goitia and akin to Fernand Braudel's concept of *longue durée*: not just a description of events taking place over long periods of time but a methodological emphasis on the slow unfolding of social processes over the fast motion of discrete "facts". Trends in art and architectural history have since rather belied Chueca Goitia's assertion that "art history (...) is purely intrahistory" (1981: 45), but this study is a reminder that the continuity of traditions is one such long-term unfolding of historical processes, and thus a legitimate aspect of architectural history, theory, and practice.

The empirical methods of the British and Italian schools of urban morphology are promising for the reconstruction of genealogies of the patterns and processes of typological development over long periods, beyond the conventional periods defined by changes of style in "high art". These methods can provide indirect hints as to poorly documented features such as socioeconomic arrangements, and in turn establish the continuity and resilience of urban patterns (Oliveira 2016). The Italian school of procedural typology provides a large part of the theoretical groundwork regarding the possibility of establishing morphological genealogies of vernacular and traditional urban patterns (Cataldi 2015).

The analysis presented here thus assumes that making sense of typological continuity over centuries is both possible and legitimate as an endeavor in architectural history. In the methodological framework of urban morphology and procedural typology outlined above, prevalent urban and architectural forms can be discerned through visual analysis of plans. Tabulating abstract measurements for statistical analysis is not only unnecessary in this method but also risks obscuring a concrete understanding of the urban space focused on the clustering of patterns and the emergence of morphological districts (Raspi Serra and Acconcia, 1990). The persistence of spatial and topological relationships among elements – general lot shapes, block arrangements and configurations, and street and square hierarchies – may be inferred by visual inquiry with documentation (Conzen 2018). The goal of this analysis is not only to derive local morphological and syntactic patterns but also to pinpoint similarities and typologies prevalent among urban developments across time and space.

This study draws mainly on graphical evidence of urban areas in Portugal and Brazil. These graphical sources were collected from earlier research, municipal planning offices, and extant historic drawings from original plans or later surveys preserved in archives. A number of new towns and urban extensions from the mid-to-late 19th century, laid out by engineers, surveyors, and builders, provide evidence of the continued use of traditional modules and their adaptation to local conditions. Because there are few extant drawings from much of the 19th century, discerning these modules involves reconstructing original land subdivision patterns from present-day conditions. Yet many towns in Brazil lack reliable cadastral maps, hampering our ability to conduct statistical analysis and error estimation from a set of precise measurements. In any case, the assumption that there may somewhere be historical towns preserved in a mythically pristine condition has led many architectural interpretations astray; even such iconic heritage sites as Ouro Preto, in Brazil's Minas Gerais state, underwent significant rebuilding and lot consolidation in the 19th century (Vieira 2016).

Vernacular roots of Portuguese urban traditions

This study evidences a significant continuity in urban and building modules used in Portuguese and Brazilian towns from the 13th to the 20th centuries. As of the origins of modular urban design in Portugal in the 13th century, a limited set of lot and street dimensions dominated town planning. A first major inflection in these standards occurred in the third quarter of the 18th century with an attempt to shape urban form in response to systematic spatial planning. But lot dimensions and house types underwent little change until the late 19th and early 20th centuries, when the adoption of the metric system as well as the advent of positivist ideals of urban hygiene caused major changes in lot sizes and plan layouts. Even so, some aspects of traditional house types subsisted until the 1960s.

Portugal was part of the Roman imperial province of Lusitania, later ruled by successive waves of Germanic and North African nobility. It is thus quite representative of the broader trends in urban history across the western Mediterranean region. Roman agrarian colonies (Caniggia 1997) did not make enough of an imprint on the Portuguese landscape to condition later development, so as in most of western Europe, the default Portuguese urban type is the linear village around a high street (Panerai 2012).

In Fernandes's reconstruction of the ideal type, the village coalesces around a focal point or landmark, such as a church, market, or entrance to a castle (Fernandes 2014). In the high-street scheme (Fig. 1 [a]), the very deep lots around the main thoroughfare (*rua da frente*) and secondary axes (Fig. 1 [b]) have secondary frontages resulting in a back street (*rua de trás*) on either side, as described by Teixeira (2012). A sequence of cross streets develops to link these parallel roads, forming large urban blocks (Fig. 1 [c]). These blocks are eventually threaded by alleys (*travessas*) linking the cross streets (Fig. 1 [d]), leading to the mature, dense build-up of the

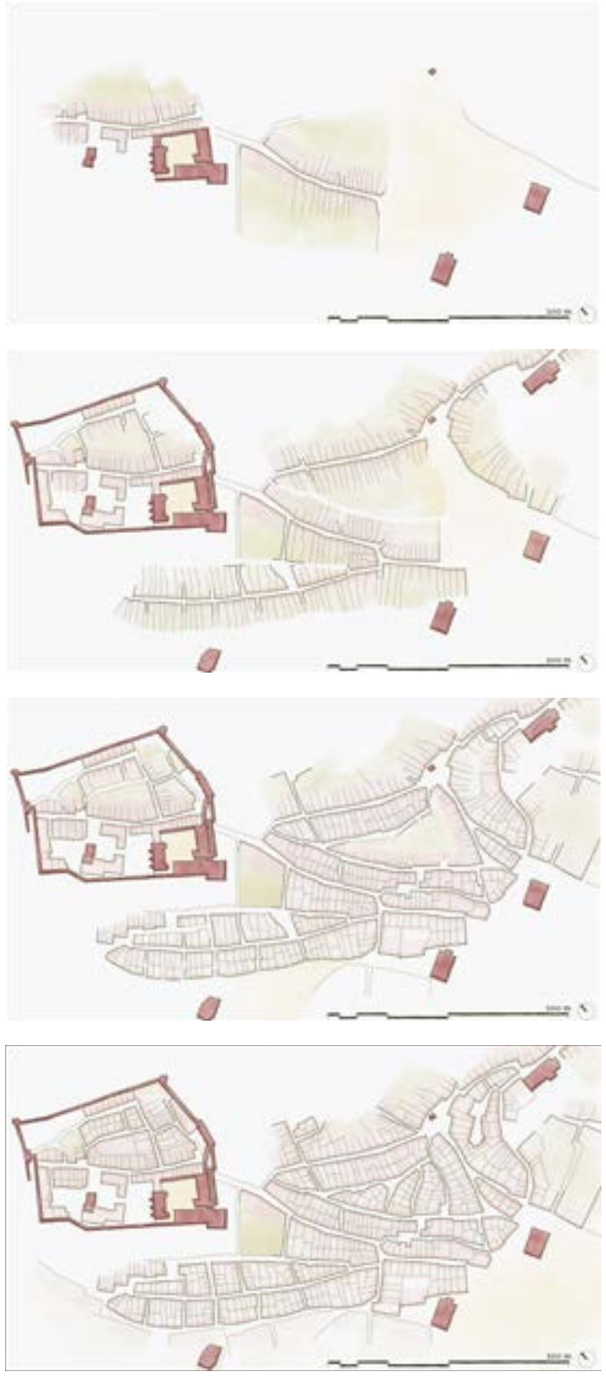

Figure 1. Reconstructed urban plan of Castelo de Vide, Portugal. a: initial development along the high street before the 13th century; b: opening of secondary and cross streets, late 13th century; c: development along back alleys and perimeter blocks, 14th century; d: threading of perimeter blocks with alleys, 15th century or earlier

town core (Fernandes 2014). Since most Portuguese urban areas originated as hill towns, the high street often takes the form of a spindle, with a binary network of main thoroughfares adding further diversity to the fabric. This system forms hierarchical networks of streets and districts – each one a "block of blocks", as it were, according to Robert Orr (2018)[1] – able to support diverse uses and social classes within relatively small areas.

Alongside the "organic" high-street village type developing through Portuguese and Brazilian history, there were three major episodes of centrally mandated urban planning and design, quite evenly spaced in time, each prompted by the crown's drive to defend, populate, and manage Portugal's growing territory:

1. Mid-13th century: *bastide*-type new towns were designed to secure Portugal's borders with the kingdoms of Castile and León, as well as to promote food security in the young realm;

2. Early 16th century: urban growth and overseas expansion promoted new standards of parcel planning by both the crown and private developers;

3. Late 18th century: the recognition of Portugal's independence and of its colonial possessions required an efficient and graphically "rational" new town planning policy.

The cumulative effect of these three episodes was not only to establish a Portuguese and Brazilian tradition of planned yet adaptable new towns (Lobo and Simões Júnior 2012), but also that the modular dimensions of these new-town lots became standard in vernacular building practice. This is likely to have occurred because such measurements were widespread to begin with and so were adopted in planned towns, although the present state of archaeological knowledge does not allow us to make assumptions about this.

Portuguese urban development modules up to the 18th century

In the 13th century, Portuguese kings began a policy of populating and fortifying their borders through the foundation of new towns – *vilas novas* or *vilas reais* – akin to the French and English *bastides* in southern France and to the *villas reales* in Castile and León. Luisa Trindade has shown that these Portuguese new towns operated on similar planning principles as their better-known European kin (Trindade 2009). The Portuguese *vila nova* can be said to be a fortified high-street village with a regular geometric plan and controlled allotment of land. Caminha, on a promontory at the northern border, one of the earliest and best-preserved examples, is organized around a straight high street, two back streets and two cross streets. The whole is encircled by a wall. As in many *bastides*, the church is sited away from the central crossing near one of the gates, where it can be reached easily from the environs. The market square and town hall are located at the opposite end of the high street (Fig. 2). Though there is a geometric principle behind the plan, its implementation is clearly dictated by expediency rather than any strict observance of orthogonality, and the edges of the town are required to bend to the military requirements of fortifications fitting the terrain.

The *vila nova* layout established and observed certain geometric procedures so as to ensure regularity and equal distribution of urban lots. These urban plans were executed in a modular scheme based on whole-number ratios of the traditional Portuguese measurement unit: a hand span or *palmo* (abbreviated to "p."), equal to about 22.5 centimeters. 5 p. is equal to one Portuguese yard or *vara*, measuring 1.12 meters. The *vara* seems, in fact, to be the least multiple actually used in most urban plans. At Caminha, according to the reconstruction proposed by Trindade (Fig. 3), the basic elements of urban design are streets 15 p. wide (3.4 meters) and lots 25 p. (5.6 meters) wide by 60 to 75 p. (13.5 to 16.9 meters) deep (Trindade 2009: 323–28).

Other commonly used lot frontage dimensions are 20 p. (4.5 meters) and 30 p. (6.75 meters). This range offers lot sizes convenient for a diversity of use cases, from tiny houses – often with no more than one or two square rooms – to stately terraces or flats. As is the case in many Mediterranean building traditions, Portuguese urban house types consist of various arrangements of roughly square cells, up to 30 p. in length. The most common plan types for a lot 20 to 25 p. wide are either simple dwellings or shops with a longitudinal *enfilade* of up to three cells or a differentiated arrangement of two large rooms at the front and back, with a string of small rooms in between, accessed from a side hallway (Fig. 4).

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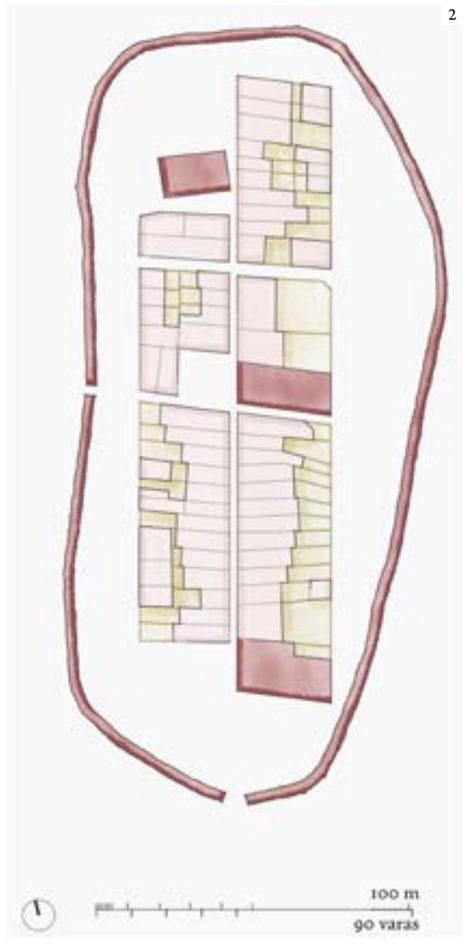

Figure 2. Reconstructed foundation town plan of Caminha, 13th century (author's drawing after Trindade 2009: 157)

Figure 3. Reconstructed modular parceling of Caminha, 13th century (author's drawing after Trindade 2009: 328). Units: 1 *palmo* = 22.5 cm and 1 *vara* = 5 *palmos* = 1.125 m

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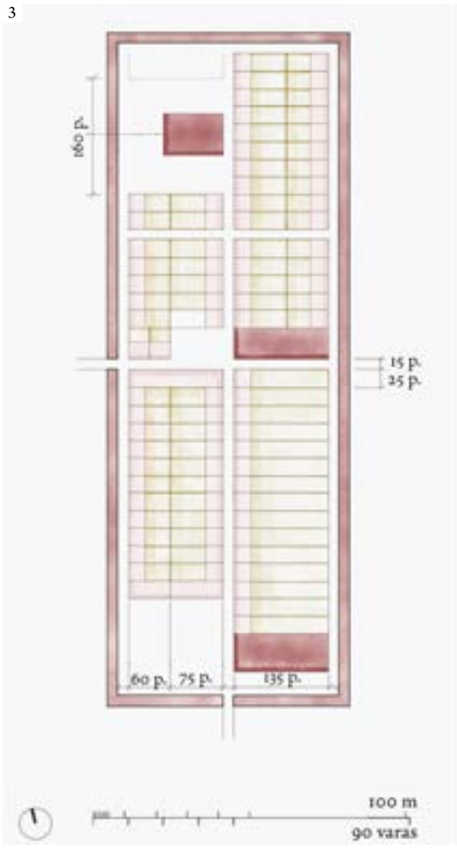

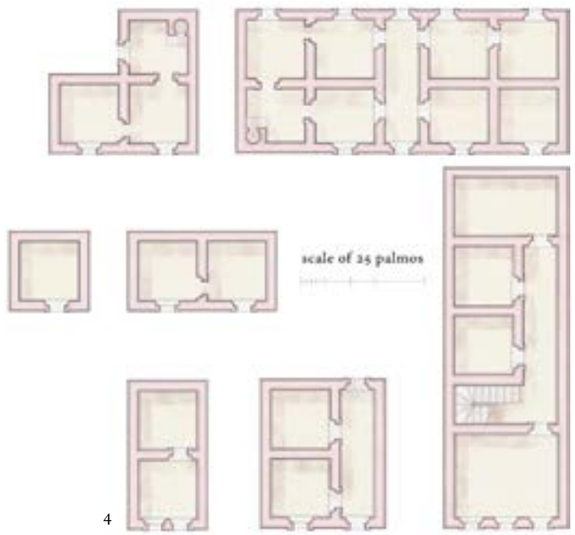

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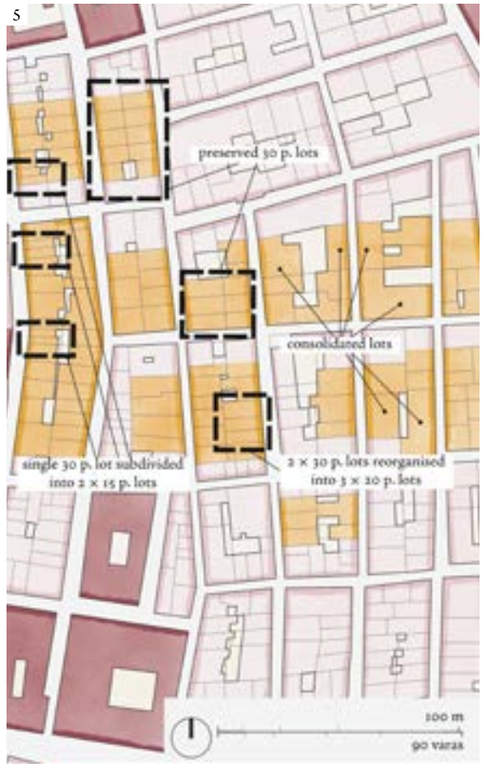
Figure 4. Mediterranean cell house generating traditional house types common in southern Portugal and Brazil. Middle left: basic cell layouts; top: suburban foursquare and rural farmhouse; bottom: narrow urban house and side-hallway townhouses.

Figure 5. Bairro Alto, Lisbon, developed from the 16th century. Yellow: traces of the original 30 × 60 p. lots from the 16th-century development; dark red: former stately mansions and civic buildings; pink: urban fabric that cannot be reconstructed to the original 16th-century modules

Relatively broad and shallow lots, 30 p. wide by 60 p. deep, are a particular standard of rural subdivision in Portugal, known as *chão* (Carita 1994). Hence they figure prominently in suburban expansions, such as in Lisbon's 16th-century *extramuros* development known as Bairro Alto (Carita 1994: 47-48). Two 30 × 60 p. lots can be conveniently subdivided into three 20 p. lots for low-income housing or grouped to hold a courtyard block of flats or a stately house (Fig. 5); the latter case is attested in Bairro Alto in the 18th and 19th centuries, whereas the former occurs in 19th-century suburban subdivisions in Rio de Janeiro, Brazil.

Transitional urban patterns

The foundation of *vilas reais* saw a resurgence in the third quarter of the 18th century. A protracted animosity with Spain, for reasons of colonial dominance and dynastic legitimacy, made King José I (reigned 1750–1777) and his chief minister, the Marquis of Pombal, keen on asserting Portugal's political and territorial integrity. A string of new towns founded during this reign near every Spanish-Portuguese border – in both Europe and South America – signaled Portugal's ability to effectively control the territories that it claimed (Delson 1998) and responded to new ideas about the "rational" organization of territory, already being put in place in Spain (Oliveras 1998).



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Portuguese new towns such as Vila Real de Santo António (Fig. 6), at the mouth of the Guadiana river in the Iberian peninsula, show both the persistence of traditional land subdivision patterns and the changes occurring in the concept of "rational" planning. Vila Real de Santo António, founded in 1773, was laid out around a single central square by which both the town hall and the church are located; the market has its own dedicated building away from the square, now given over to civic and symbolic purposes. Here, unlike at Caminha, the engineers made a point of adhering strictly to the gridiron plan; it helps that the town was intended as a residential garrison and fishing port, while its fortifications are sited on higher ground.

To facilitate the movement of troops and goods, but also to highlight the clarity and monumentality of the town's plan, the streets are much broader than in the 13th-century new towns: at 40 p. wide, they are more than double the width of the Caminha streets and rather oversized for the single-story houses in the original plan. Also, due to a layout focused on the central square, with a generous width of 350 p., the street hierarchy of older planned towns is lost in Vila Real de Santo António. But despite all these transformations in 18th-century attitudes to urban design, lot sizes changed remarkably little. The same 25 p. frontages were used in 13th-century Caminha and in 18th-century Vila Real de Santo António, with only a slight reduction in depth, from 60 to 50 p. Exactly the same dimensions for the central square and lot frontages are used in the 1773 town plan for São Luiz do Paraitinga, a staging post on the road to the Brazilian gold mines (Derntl 2013). Street widths, however, are less consistent, ranging from 40 p. in Vila Real de Santo António to 60 p. in São Luiz do Paraitinga – an ample width first attempted in the post-earthquake rebuilding of Lisbon – and up to 100 p. elsewhere in colonial Brazil (Derntl 2013).

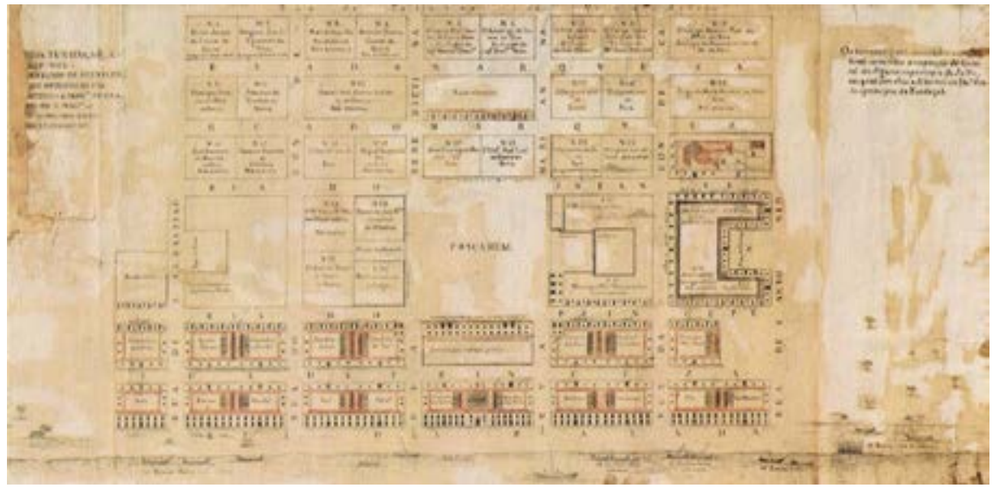

Figure 6. Plan of Vila Real de Santo António (José Sande de Vasconcelos, 1774)

These 18th-century efforts at spatial rationalization with carefully sited and planned new towns are also remarkable in that they seem to be the first designs in Portugal to mandate specific building types or particular placements for houses. Such matters appear to have been viewed as self-evident or less significant in earlier periods. The project for the rebuilding of Lisbon set the trend here, associating the regularity of the new city blocks and lots with the uniformity of regulation façades (França 1989). Similarly, a number of surviving drawings for new outposts at the Brazilian frontiers, such as that of Taquari in the south (Fig. 7), established simple façade designs letting one guess at the single-room layout behind.

Figure 7. Plan of the garrison town of S. José on the Tibiquary river, now the town of Taquari, Brazil (Manoel Vieira Leão, c. 1777. Arquivo Histórico do Exército, Rio de Janeiro)

Figure 8. Aracaju, Brazil. Design by Sebastião Basílio Pirro, 1854. Plan (detail) by Francisco Pereira da Silva, 1857 (National Library of Brazil, Rio de Janeiro)

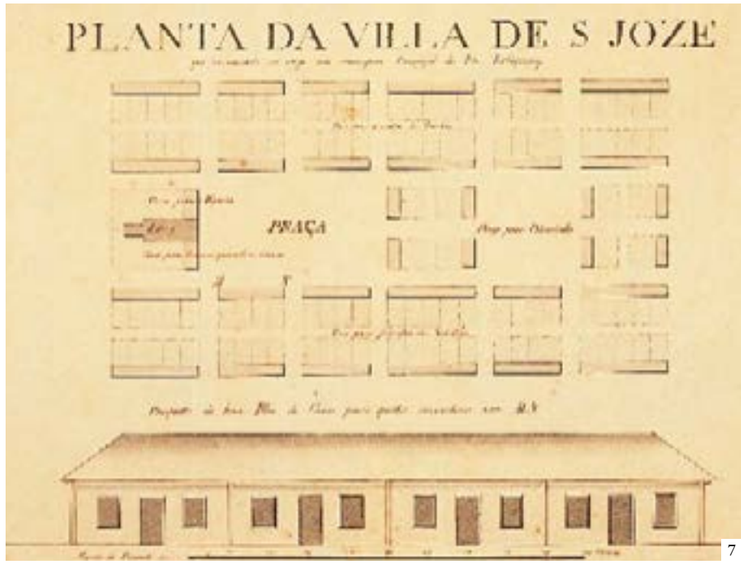

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Figure 9: Urban development on the former *rossio* of Rio de Janeiro: 100 p. thoroughfare (rua Larga de São Joaquim), 30 p. streets (rua de São Pedro and rua do Sabão) and 25 p. street (cross street), blocks mostly subdivided into 20 p. lots. Detail from a plan by Edward Gotto, 1871

Centralized spatial planning in Portugal and Brazil came to a sudden halt on the death of José I in 1777, not to resume for almost a century thereafter. But certain designs for new towns or extensions during this lull did carry on the principles and modules of Portuguese tradition. Royal and imperial new towns in Brazil, such as Niterói (1819) and Petrópolis (1843), evidence the continued use of 18th-century military engineering principles with strictly geometric layouts. As late as the 1850s, two new provincial capitals in Brazil, Teresina and Aracaju (Fig. 8), were planned using the 18th-century module of streets 60 p. wide forming a gridiron around a main square facing the river.

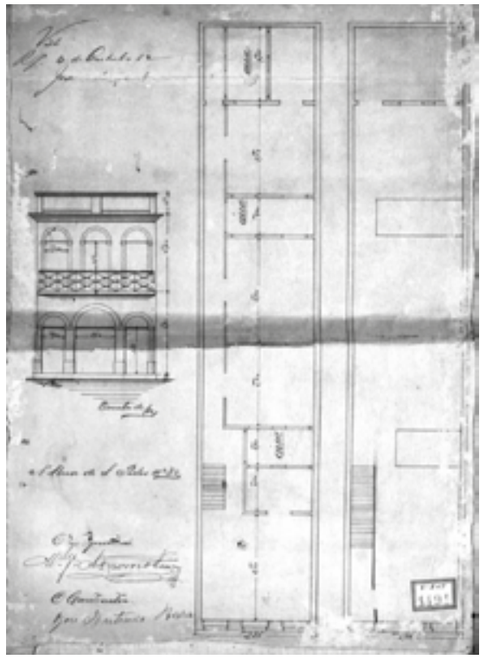
House types and fringe-belt development

The mid-19th-century urban growth of Rio de Janeiro also shows evidence of the persistence of traditional modules. These were used in the early 19th century in developing the *rossio*, a large fringe belt of public land west of the city center: its streets are 25, 30, and 100 p. in width and its blocks are subdivided, where pre-existing conditions so allow, into 20 p. lots (Fig. 9). This area grew into one of the densest and most socioeconomically diverse neighborhoods outside the city center and is also one of the best-preserved 19th-century districts. This is in part due precisely to the extremely fragmented ownership pattern of its narrow lots, which has prevented the consolidation required for large-scale redevelopment.

Farther west, mid-19th-century development on green fields introduced notable though short-lived variations in the form of lots measuring 15 and 18 p. (3.4 and 4 meters) for working-class rental. These extremely narrow lots sometimes stretch to great depths, creating *cortiços* (slums or tenements) akin to the contemporary *ilhas* in Oporto. But in Rio, these narrow lots were rapidly consumed by demand for bulkier apartment or commercial buildings. This short lifespan of ultra-narrow lots contrasts with the resilience of the 20 and 25 p. lots in the former *rossio*.

Haussmannian *percées* by the federal government in the first half of the 20th century ended up clearing several stretches of this area for the construction of large office buildings which compare poorly to the historic fabric in terms of diversity and pedestrian life. Yet these *percées* in the first decade of the 20th century demonstrate how resilient the Luso-Brazilian building traditions are. De Paoli noted that one of the goals of these early urban renewal projects was to force the consolidation of narrow lots into broader ones, at least 6 to 7 meters wide (a measurement reminiscent of the suburban Portuguese 30 p. lot?). Yet several such consolidated lots were redeveloped with two or more independent structures side by side rather than one large building (de Paoli 2013: 36). New mixed-use buildings granted planning consent between 1903 and 1908 often preserve the side-hallway plan type (Fig. 10; compare with Fig. 4).

Figure 10: Approved building application on rua de São Pedro, Rio de Janeiro, c. 1903 (Arquivo Geral da Cidade do Rio de Janeiro, Paoli 2013)



Effects of metrification on lot frontages

Meanwhile, in 1834, Portugal officially adopted the metric system, followed much later by Brazil in 1872. Metrification directly impacted construction trades and urban subdivision, not least because it was accompanied by a surge in new municipal and national regulation on building and urban development. Evidence of these changes is recorded in the urban fabric of the Portuguese city of Oporto, which grew significantly over the 19th century due to industrial development. The earlier growth lines, along pre-existing roads, exhibit traditional urban lot frontages 20 or 25 p. wide. On the rua do Almada, a new thoroughfare opened up in 1761 but only developed much later, on the other hand, lots are standardized at 5 meters wide (Fig. 11).

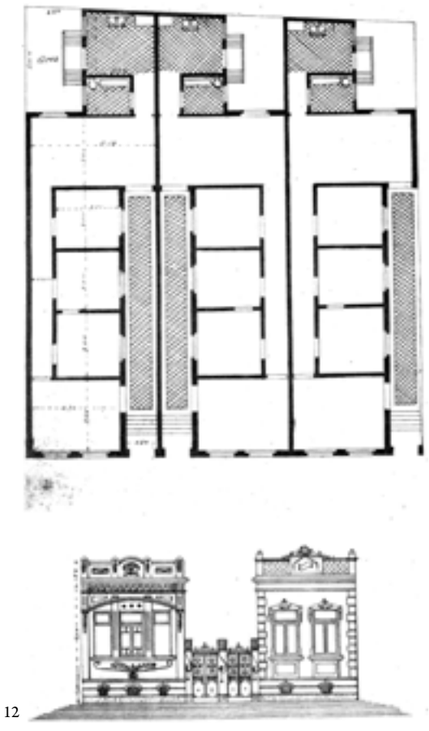
Metrification and the ensuing drive for ever-more comprehensive building regulations were also at play in early 20th-century São Paulo, Brazil's own industrial powerhouse. Carlos Alberto Cerqueira Lemos sees a positivistic will to "improve" low-income housing in that city (Lemos 1999). Turn-of-the-century regulations dealt chiefly with natural lighting and ventilation requirements in some (but at first not all) rooms of houses. This resulted first in conservative (and inconvenient) designs, where the side hallway became an open court; only later did actual side setbacks become common, requiring wider lots (Fig. 12).

While the example of São Paulo contributed to the spread of side-yard houses through Brazil in the early 20th century, Portuguese builders took a different approach to the requirement for natural lighting and ventilation. Several early 20th-century public and private developments, especially in the center and south of Portugal, experimented with a suburban housing type 8.5 to 9 meters wide made up of four cells arranged in a square, with or without a hallway. A number of variations on this type are to be found at Entroncamento, a railway junction town of the late 19th and early 20th centuries (Paixão 2016). These dwellings, designed by architects and

Figure 11: Different lot standards before and after metrification in Oporto. Base map by Augusto Carlos Teles Ferreira, 1892

Figure 12: Rental dwellings in São Paulo, c. 1900 (Lemos 1987)

11



12

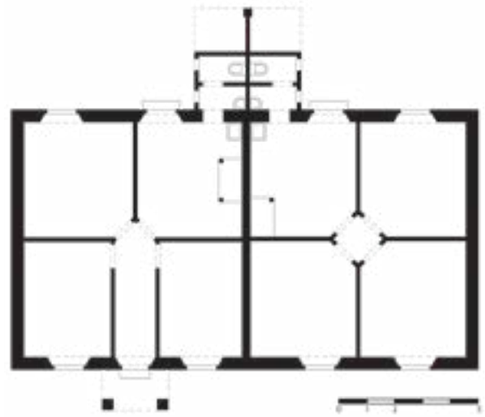


Figure 13: Two four-cell housing types in Entroncamento, 1925–1928 (Paixão 2016)

engineers, are arranged in pairs, evidencing a familiarity with contemporary garden-suburb concepts (Fig. 13). Their architectural style has often been dismissed as merely nostalgic, representing a superficial attachment to familiar visual cues and, worse, playing to conservative politics (Rosmaninho 2002-2003). Contrary to this interpretation, betraying a superficial study of the houses, these planned dwellings demonstrate an understanding of the long typological history of Portuguese houses and a conscious effort to adapt it to modern urban principles.

The increasing popularity of garden-city notions as well as a tendency to round up metric dimensions to 10-meter frontages ultimately put an end to this process. In the 1960s, the widespread use of 10-meter frontages encroached even on historic towns such as Ouro Preto (Fig. 14). But the damaging effect of this transformation on the character of traditional urban areas was not noticed by historic preservationists until much later, in the 1980s (Motta 1987: 114). By then, the exponential urban growth of the post-war era had already caused a major loss of character in such sites.

Figure 14: Unexecuted infill subdivision project in the Alto das Cabeças neighborhood, Ouro Preto, Brazil, 1965. Left: pre-existing conditions; middle: planning application; right: as approved by the National Heritage Institute, Iphan (redrawn in Salgado 2010, after Motta 1987)

Conclusion

I have surveyed the emergence and transformation of traditional urban and building patterns in Portugal and Brazil, focusing on recurring measurements and modules. These town-building traditions were quite stable for nearly five centuries, from the early 13th to the mid-18th century. Even as the spatial policies of "enlightened despotism" in Portugal imposed new, centralized and monumental urban forms on the landscape, these forms accommodated most of the existing practices regarding lot dimensions and house types. A crisis in traditional patterns arose with the adoption of the metric system in Portugal and Brazil in the 19th century, followed by the turn-of-the-century positivist approach of comprehensive urban and building regulation. Still, elements of traditional building types persisted well into the 20th century, only to fade away in the second half of that century.

Studies such as this one rely mostly on planned new towns and large urban expansions showing the interaction between top-down designs and bottom-up vernacular practice. So their most significant drawback is their reliance on a central "act of will" as evidence of the modularity of decentralized patterns. Urban infill and redevelopment can provide insights into the persistence of generic building types but the constraints of the existing fabric and land ownership patterns are likely to override any explicit choice of dimensional modules. On the other hand, these same constraints favor the continued use of plan layouts suited to existing lot sizes. A larger and more detailed body of architectural documentation might shed light on the relationship between these constraints and the dimensional limits that traditional building types can attain.

Customary measurement units play a significant part in the stabilization of urban and building types. The *palmo* (hand span) and especially its fivefold multiple the *vara* (yard) provide sensible, minimal modules for sizing construction elements and laying out urban units – most importantly, lot and street widths. Lots with widths of 20, 25, and 30 p. occur consistently up to the mid-19th century, both in developments planned and controlled by the state and in the private dynamics of suburban city extensions. These dimensions support specific building types consisting of linear arrangements of spatial cells with or without hallways that changed very little up to the late 19th century.

The successive shocks of metrification and positivist building regulations in the mid-to-late 19th century resulted in conspicuous changes in urban and building morphology as well as in the eventual split of the Luso-Brazilian tradition into separate national trends. Even historic preservation has done little to stem the decline of traditions, not least due to the prevailing emphasis in preservation theory and practice throughout the 20th century on upholding the fatalist distinction between "original" and "addition" rather than on protecting the continuous *process* giving rise to traditional urban areas. Despite this loss, traditional layouts continued to provide cultural references and models for new projects well into the first half of the 20th century. The spatial efficiency and functional flexibility of such types as the townhouse, endowed as of the late 1800s with a side yard, and the foursquare cell house, compare favorably to recent types of housing and urban development.

The long-term stability of Portuguese building modules is a case that, in our age so fond of "microhistory", reasserts the importance ascribed to "intrahistory" by Chueca Goitia and Braudel. Yet its value reaches beyond the domain of the historian's craft: it is a statement about the importance of continuity to design practice. The study of modules in urban and building development shows the resilience of morphological patterns and professional practices over time. Standardized street widths, lot sizes, and building types are valuable evidence of cumulative problem-solving; aimless experimentation and constant starting over from scratch, by contrast, have resulted in so many failed architectural and urban projects.

[1] I am grateful to Douglas Duany for introducing me to Orr's concept of a "block of blocks".

References | Referencias | Referências

Caniggia, Gianfranco. 1997. Analisi tipologica: la corte matrice dell'insediamento. In *Ragionamenti di tipologia: operatività della tipologia processuale in architettura*, 59–107. Firenze: Alinea.

Carita, Hélder. 1994. *Bairro Alto: Tipologias e modos arquitectónicos.* Lisboa: Câmara Municipal de Lisboa.

Cataldi, Giancarlo. 2015. Tipologie dell'abitare: Ipotesi evolutive e quadro metodologico. In *Arquitectura Tradicional no Mediterrâneo Ocidental: 1º Congresso Internacional, Mértola*, 38–47. Lisboa: Argumentum.

Chueca Goitia, Fernando. 1981. Invariantes castizos de la arquitectura española. In *Invariantes castizos de la arquitectura española. Invariantes en la arquitectura hispanoamericana. Manifiesto de la Alhambra*, 2nd ed., 15–153. Dossat Bolsillo 2. Madrid: Dossat.

Conzen, Michael P. 2018. Core Concepts in Town-Plan Analysis. In Vítor Oliveira (ed.), *Teaching Urban Morphology*, 123–43. The Urban Book Series. Cham: Springer. https://doi.org/10.1007/978-3-319-76126-8.

Delson, Roberta Marx. 1998. *Novas vilas para o Brasil-Colônia: planejamento espacial e social no século XVIII.* Translated by Fernando de Vasconcelos Pinto. Brasília: Alva, Ciord.

Derntl, Maria Fernanda. 2013. *Método e arte: urbanização e formação territorial na capitania de São Paulo, 1765-1811*. São Paulo: Alameda.

Fernandes, Sérgio Padrão. 2014. Fundação e evolução dos traçados urbanos: Matrizes elementares de assentamento e derivações complexas. In Dias Coelho, Carlos (ed.), *O Tempo e a Forma*, 70–93. Lisboa: Argumentum.

França, José Augusto. 1989. *A reconstrução de Lisboa e a arquitectura pombalina*. Lisboa: Instituto de cultura e lingua portuguesa, Ministerio da Educação.

Lemos, Carlos A.C. 1987. Ecletismo em São Paulo. In Fabris, Annateresa (ed.), *Ecletismo na arquitetura brasileira*, 69–103. São Paulo: Nobel/Edusp.

Lemos, Carlos A.C. 1999. *A república ensina a morar (melhor)*. São Paulo: Editora Hucitec.

Lobo, Manuel Leal da Costa; and Simões Júnior, José Geraldo (eds.). 2012. *Urbanismo de colina. Uma tradição luso-brasileira*. São Paulo: SciELO - Editora Mackenzie.

Motta, Lia. 1987. A SPHAN Em Ouro Preto: Uma História de Conceitos e Critérios. *Revista Do Patrimônio Histórico e Artístico Nacional*, 22: 108–22.

Oliveira, Vítor. 2016. *Urban Morphology: An Introduction to the Study of the Physical Form of Cities*. The Urban Book Series. Cham: Springer. http://www.springer.com/la/book/9783319320816.

Oliveras, Jordi. 1998. *Nuevas poblaciones en la España de la Ilustración*. Barcelona: Fundación Caja de Arquitectos.

Orr, Robert. 2018. Five Steps to Super Blocks. *Public Square*. https://www.cnu.org/publicsquare/2018/08/27/five-steps-super-blocks.

Paixão Nunes, Diogo Alexandre. 2016. *Os bairros operários da Companhia de Caminhos de Ferro Portugueses. O Caso do Entroncamento até à primeira metade do século XX*. Dissertação (Mestrado em Arquitectura). Porto: Universidade do Porto, Faculdade de Arquitectura. https://repositorio-aberto.up.pt/handle/10216/86446.

Panerai, Philippe. 2012. *Analyse urbaine*. Marseille: Parenthèses.

Paoli, Paula de. 2013. Uma outra cultura de edificar: a produção da nova arquitetura no Rio de Janeiro das reformas urbanas de Pereira Passos (1902-1906). *Revista do Arquivo Geral da Cidade do Rio de Janeiro*, 7: 15–44.

Raspi Serra, Joselita; and Domenico Acconcia (eds.). 1990. *Il concetto di centro storico: ricerca archeologica, recupero, conservazione, riuso, protezione dei Beni Culturali*. Milan: Guerini Studio.

Rosmaninho, Nuno. 2002–2003. A "Casa Portuguesa" e outras "Casas Nacionais". *Revista da Universidade de Aveiro – Letras*, 19/20: 225–50.

Salgado, Marina. 2010. *Ouro Preto: paisagem em transformação*. Dissertação (Mestrado em Arquitectura). Belo Horizonte: Universidade Federal de Minas Gerais, Escola de Arquitetura. https://repositorio.ufmg.br/handle/1843/MMMD-8QCLUV.

Teixeira, Manuel C. 2012. *A forma da cidade de origem portuguesa*. São Paulo: Editora Unesp.

Trindade, Luísa. 2009. *Urbanismo na composição de Portugal*. Tese em História da Arte. Coimbra: Faculdade de Letras da Universidade de Coimbra. https://estudogeral.uc.pt/handle/10316/13529.

Vieira, Liliane de Castro. 2016. Ouro Preto e o século XIX: o mito da decadência. *Revista CPC*, 22: 145. https://doi.org/10.11606/issn.1980-4466.v0i22p145-189.

Biography | Biografía | Biografia

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Pedro is an architect, architectural historian, and historic preservationist. He graduated in Architecture from the University of Maryland (2003) and completed his Ph.D. in Esthetics and Semiology of Architecture at the University of Brasilia (2010), where he has taught architectural history and theory since 2015. He is a former Coordinator of Museums and Historic Preservation in the Federal District (Brazil) Culture Department (2016) and visiting scholar at the University of Coimbra, Portugal (2019–2020). His research areas include traditional architecture and urban form in Portugal and Brazil, and the interfaces between classical and modern architectural theory.

Jaspreet Kaur, Renata Jadresin Milic

Translation and Continuity of Tradition: An Ongoing Dialogue in Aotearoa (New Zealand)

Traducción y continuidad de la tradición: Un diálogo permanente en Aotearoa (Nueva Zelanda)

Tradução e continuidade da tradição: Um diálogo contínuo em Aotearoa (Nova Zelândia)

Keywords | Palabras clave | Palavras chave

Auckland, Māori Architecture, Sense of place, Architectural Tradition, Identity

Auckland, Arquitectura maorí, Sentido del lugar, Tradición arquitectónica, Identidad

Auckland, Arquitectura Maori, Sentido de lugar, Tradição Arquitectónica, Identidade

Abstract | Resumen | Resumo

Though short, Aotearoa/New Zealand's history is rich and holds an abundance of knowledge preserved in the form of songs, beliefs, practices, and narratives that inform this country's unique place in the world as well as the identity of its people. This paper observes that with migratory history and a heritage of colonization, the people of Aotearoa/New Zealand express three identities: indigenous, colonial and migrant, all with a claim to appropriate representation in the country's built fabric. It discusses the current state of knowledge by looking at the history and architectural tradition manifested in Auckland, the largest and fastest-growing city in Aotearoa. It adds that further research is required to understand and develop an appropriate methodology to address Auckland's growing multiculturalism, which lacks adequate expression.

Aunque breve, la historia de Aotearoa-Nueva Zelanda es rica y encierra infinidad de conocimientos preservados en forma de canciones, creencias, prácticas y narraciones que explican el lugar único de este país en el mundo, así como la identidad de su gente. Este artículo de investigación muestra que, con la historia de las migraciones y de la colonización como patrimonio, la gente de Aotearoa-Nueva Zelanda expresa tres identidades: indígena, colonial y emigrante, que reclaman una representación adecuada en el tejido urbano Se plantea un debate en torno al actual estado de los conocimientos mediante el estudio de la historia y la tradición arquitectónica, que se pone de manifiesto en la ciudad de Auckland, la ciudad más grande de Aotearoa y la que más deprisa crece. Se sostiene que hace falta seguir investigando para comprender y desarrollar una metodología adecuada para abordar el creciente multiculturalismo de Auckland, que carece de una expresión adecuada.

Embora curta, a história de Aotearoa-Nova Zelândia é ainda assim rica, e detém uma abundância de conhecimentos preservados sob a forma de canções, crenças, práticas e narrativas que caracterizam a posição única deste país no mundo, bem como a identidade do seu povo. Este trabalho de investigação revela que, tendo como herança uma história migratória e de colonização, o povo de Aotearoa-Nova Zelândia expressa três identidades: Indígena, Colonial e Migrante, que reivindicam uma representação apropriada dentro do tecido construído. Inicia uma discussão em torno do estado actual do conhecimento, através do estudo da história e da tradição arquitectónica que se manifesta na cidade de Auckland, a cidade maior e com o crescimento mais rápido de Aotearoa. Argumenta que é necessária mais investigação para compreender e desenvolver uma metodologia apropriada na abordagem ao crescente multiculturalismo da cidade de Auckland, que carece de expressão adequada.

Introduction

This paper joins the ongoing discussion between architects and historians, both cultural[1] and academic, agreeing that Auckland has since its origins possessed qualities encouraging people to gravitate toward it. As a result, it is today one of the world's most culturally diverse and dynamic cities, yet at the same time it lacks an interpretative appreciation of its rich past, perhaps because almost half of its population was born elsewhere. This picture of Auckland as a place of migrants and immigrants reflects a fascinating and dynamic past shaped by the spirit of adventure, a tradition of voyaging and narratives rooted in a multicultural reality. As Stone explains,

> *Twenty-first-century Auckland is a city of considerable cultural diversity. It is well to remember that although Auckland, as we know it, was a European creation, it had from its very beginning a mixture of peoples* (Stone 2001: 286).

Consequently, Auckland is a "new home" for many of its citizens whose roots lie in their place(s) of origin and who lack a sense of belonging to this new place. This also means that Aucklanders are united in their migratory journeys to their new home, and have employed certain means of relating to it collectively.

With that in mind, we offer three initial observations. First, the architectural tradition of Aotearoa* New Zealand has three identities: indigenous, colonial and migrant; second, each asserts itself by manifesting its narratives; and third, all three identities have a claim to appropriate representation in its built fabric. Auckland, the fastest-growing and most diverse city in Aotearoa, is chosen as a case study. Our study aims to recognize and analyze patterns, techniques, theories, and methods used by these three identities to establish their "place" within the built fabric of the city.

This paper is divided into two sections. The first will look at Aotearoa/New Zealand's history and tradition and discuss early indigenous architectural traditions, followed by the development of Māori and colonial architecture as well as post-war architecture. The second will discuss the translation and continuity of tradition seen as manifestations of placemaking in the built environment. The continuity of tradition will be considered through traditional building, traditional craft techniques, and art.

We use *Te Reo* Māori language to illustrate the importance of the tongue in the culture and tradition of Aotearoa. The richness of *Te Reo* goes far beyond what appears in our paper; for more on this, see the *Glossary of Māori Architecture* by Dr Deidre Brown, taken as a guide to translate *Te Reo* here.

Aotearoa/New Zealand: history, tradition and architecture

The first human contact with the islands of New Zealand seems to have been made in the mid-1200s by Oceanic people descending from a place called Hawaiki in Polynesia. They named their newfound land *Aotearoa*: Land of Long White Clouds, on account of the large white clouds they saw drifting over the landmass. The indigenous oral tradition of preserving and passing on knowledge tells us that several fleets of canoes voyaged to Aotearoa in 1200-1300 BC from Polynesia (Brown 2009: 20). These early inhabitants formed tribes with identities linked to the *waka** that they navigated in. Their traditions were based on their collective knowledge, the experiences of their voyage, and their challenges and achievements. Their communal bonds were further cemented by the obstacles they faced in order to survive after landing on the shores of Aotearoa. They developed a culture of their own, initially like that of Polynesia. But it evolved with their ability to adapt to the unique geographical and ecological features of their new homeland.

Early indigenous architecture

A culture unique to Aotearoa became evident between 1500 and 1800 AD (Brown 2009: 20). This was a response to the presence of unprecedented environmental challenges as well as the availability of new resources and building materials which shaped Māori society and subsequently its architecture. Early accounts of vernacular architecture report semi-permanent dwellings whose inhabitants often moved from one place to another in search of food (Brown 2014). These dwellings were organized in groups of approximately 10 houses, each occupied by a single family (Fig. 1).

> *Houses could be round, rectangular or oval. They had a wooden frame covered with reeds such as* raupō *(bulrush),* toetoe *or* nīkau *palm leaves, and sometimes other materials such as bark. The earth floors were covered in tough flax mats, and the only furnishings were beds made of finer matting laid over fern leaves* (Brown 2014).

This architecture typology relates to the Polynesian roots of Aotearoa's early architectural tradition, with an important link between the *waka* canoe and the *whare** or *fale**, as "the 'upturning' of one [is] claimed to be the origin of the other" (Brown 2009: 24). In the Samoan version of this story, the *whare* or *fale* was built first, whereas in the Tongan version, the *waka* came first. It was then upturned and placed on poles for use as a shelter. "The construction methods, the skills and the decorations of these two fundamental artefacts are connected and (the narrative of) water and boats affect this architecture in many ways from (its) structure to (its mechanical and spiritual) connections" (Brown 2009: 25). This connection is demonstrated by a shared tradition of ornamental carving patterns and customs associated with the construction and use of *waka* and *whare*.

In the 15th century, permanent settlements called *pa* became prominent (Fig. 1). They occupied high ground and had trenches and fortifications to protect their inhabitants from inter-tribal warfare. *Pa* were supported by community gardens and trade as well as population growth, causing the architecture tradition to expand with new types called *wharepuni**, *pātaka** and *katua**, which though Polynesian in origin are unique to Aotearoa (Brown 2009: 28). *Wharepuni* (Fig. 2), dwellings for communal sleeping, were designed as simple rectilinear structures with gable roofs extending at the front to form a porch sheltering the main entrance (Morgan-Kohu and Roberts 2003). Such porches were designed in response to Aotearoa's climatic conditions as a "moderating zone between the smoky, dark interior and the outside world" (Brown 2014). Large roof overhangs were employed to shed rainwater efficiently and shelter the walls.

> *A* whare *consisted of a framework of timber, carefully notched, and lashed together with flax, the wall spaces being filled in with screens made chiefly of* kakaho, *the reeds of the* toetoe *plant* (Arundo conspicua) *and the whole being covered with bundles of* Rāupo (Typha angustifolia)*, bound on with strips of flax* (Phormium tenax) (Shand 1896).

Pātaka were designed and constructed in a similar manner as rectilinear elevated structures with a gable roof and a porch, serving as communal storehouses. *Pātaka* are notable for having intricate carvings ornamented with inlaid *pounamu** and *paua**, which communicated the

1

Figure 1: Pūtiki pā, illustration from the Alexander Turnbull Library (Ministry for Culture and Heritage)

2

Figure 2: "Wharepuni, Northland" (Te Ara)

wealth and status of a tribe to neighbors and enemies (Brown 2014). *Katua* (Fig. 3) on the other hand, were light-framed shelters for food preparation, built using timber and lashings and lined with *rāupo** and *harakeke**. Construction involved many tasks divided between the men and women of the community, with men performing the heavy jobs such as preparing, dressing and transporting timber logs, carving, and thatching. Women wove the *kākaho** panels, first collecting *toetoe** and harvesting *rāupo*, then treating, coloring and drying the fibers.

According to historical evidence, the term *Māori* identifies the indigenous people of Aotearoa, though those people did not identify themselves as *Māori* yet. As Deidre Brown explains:

> *It was not until the arrival of Abel Tasman in 1642, and of subsequent explorers (…) that Māori were forced to view their society as a single body that was indigenous to this land. This was a slow process, which took around two centuries to complete* (Brown 2009: 36).

Māori was the term used by the people of Aotearoa at this point in history to identify themselves collectively and vis-à-vis newcomers, whom they named *Pākehā*. The architecture discussed so far belongs to the Māori. We can conclude that the first thing the people of Aotearoa inherited from their early ancestors was the tradition of voyaging, adaptability and a communal sense of place as identity. Now we transition into a new era of identity and architectural tradition, as Aotearoa begins to be known as New Zealand.

3

Figure 3: Illustration showing the variety of Pātaka design, "Pātaka, 1840s", from the Alexander Turnbull Library (Te Ara)

Figure 4: Painting showing the signing of the Treaty of Waitangi in 1840, "Henry Williams and the Treaty of Waitangi", from the Alexander Turnbull Library (Te Ara)

4

After subsequent expeditions by various European explorers, Captain Cook of Great Britain (1728-1779) ventured to Aotearoa in 1769 and again in 1773 and 1777 (NZ History 2019). The land was claimed in the name of Queen Victoria as *New Zealand* after the signing of the Treaty of Waitangi – New Zealand's founding document named after the place in the Bay of Islands where it was first signed on February 6, 1840 (Fig. 4). The Treaty is an agreement in Māori and English made between the British Crown and about 540 Māori *rangatira**. However, the validity and purpose of this document have been a source of conflict over the years due to differences in translated meanings as well as its nonobservance by the colonial government (New Zealand Ministry for Culture and Heritage 2017). The details and use made of this treaty continue to be debated, with an ongoing dialogue over the nature of the relationship between Māori and *Pākehā*.[2]

Toward the end of the 18th century, the New Zealand Company began recruiting settlers in order to establish the British colony of New Zealand. The tradition of voyaging to a new land continued as migrants came to the shores of Aotearoa from Britain and its colonies in Africa, India, the Caribbean, Australia, and many allied countries. An introduction to new architectural types, styles and resources as well as social behaviors and religious beliefs brought by the British and their colonial cousins began to influence the Māori. This was a time of growth, stimulated by inspiration, availability of new resources and adaptation, but also of conflict, fueled by resistance, segregation and war.[3]

Māori architecture

Architecturally speaking, the diversity of thinking and resources present at this time gave rise to new architectural types in the Māori tradition: *wharenui** and *hākari**. The Māori combined the *mana** of the *pātaka* and the open plan of the *wharepuni* with an increased footprint to produce the *wharenui*, a flexible space used for congregational purposes such as inter-tribal meetings and large communal gatherings organized to discuss the issues of the day, such as the presence of Christianity, increasing numbers of *Pākehā* migrants, land sales to *Pākehā*, or the signing of the Treaty of Waitangi (Brown 2009: 38). Our next section relates a case study on *Te Noho Kotahitanga Marae* and a specific type of *wharenui* better known as a *whare whakairo* (Figs. 19 and 20). Although the terms *wharenui* and *whare whakairo* both refer to meeting houses and can be used interchangeably, there is a key difference between them:

> *The word* whakairo *means design or pattern, as well as to ornament with a design or pattern so it can be used to refer to carving, weaving, painting and tattooing… a* whare whakairo *is a house or a building transformed by the power of whakairo which in this case means carvings (*whakairo rakau*), woven panels (*tukutuku*) and painted patterns (*kowhaiwhai*)* (Skinner 2016: 16).

5

6

Figure 5: Illustration of Hākari Stage (Museum of New Zealand Te Papa Tongarewa)

Figure 6: Painting showing new settlers living in tents while their house is being erected, "Settlers under canvas", from the Alexander Turnbull Library (Te Ara)

The structure of *wharenui* and *whare whakairo* is very similar to that of *wharepuni*, as discussed above. But the *wharenui* is bigger in scale, and in the case of the *whare whakairo*, meticulous detailing and ornamentation is involved before the building process can begin, because the carvings are structural in nature. The carving, weaving and painted patterns are not arbitrary but rather a language communicating ancestral and communal narratives.

> *The Māori meeting house is a particular place where Māori feel a special sense of belonging and connection to the land, their ancestors, to history and to each other* (Skinner 2016: 14).

> *The building can be thought of as a human lying face down – the carvings on the gable at the front of the meeting house are the ancestor's face, arms and fingers; the porch is the brain, the door is the mouth and the window as the eye; carved and painted elements on the roof inside the building are the spine and the ribs, and the interior pillars in the centre of the meeting house are the heart… "this visualization of the house as an ancestor… brings together its individual members into a united organism sharing a common life and heritage"* (Skinner 2016: 16-17).

Hākari feasting stages facilitated communal and inter-tribal gatherings (Fig. 5). Unfortunately, there are no surviving examples of this structural type because *hākari* were used only temporarily. They were post-and-lintel assemblies built with timber and flax lashings as multi-level platforms that could be conical or pyramidal in form (Brown 2009: 39). The host tribe would erect the structure to welcome their guests and showcase their wealth and prosperity, and dismantle or abandon it after use.

Architecture of the 19th and 20th centuries

As mentioned, the New Zealand Company began recruiting settlers in Britain and its colonies after the signing of the Treaty of Waitangi. But residential architecture with international origins began to be a part of Aotearoa's built fabric from the 1820-30s. Christian missionaries and government officials were among the first to arrive. Some émigrés lived temporarily in canvas tents and others were housed as guests in *whare* by Māori, awaiting the completion of permanent dwellings. Transportable prefabricated homes and furniture were a popular choice at this time and were available in London as early as the 1820s, designed by the firm of Henry Manning (Fig. 6).

> *He invented a prefabrication system whereby grooved wooden posts were slotted and bolted into a floor plate carried on bearers. The posts carried the wall plate with supporting triangulated trusses. Standardized wooden cladding panels slotted between the grooved posts. The roof, doors, glazed windows, locks and other components were all included, and each building was pre-painted inside and out* (Schrader 2016: 77).

These were designed in a simple English country cottage style and featured a veranda which was later also a common element of colonial villas (Schrader 2016: 89). Prefab homes became a part of the luggage of many émigrés and were a familiar commodity in their new land. Early New Zealand towns, especially on South Island, also featured what is known as the *V-hut*: a simple gabled dwelling with a window and door at one end and a thatched or canvas roof (Schrader 2016: 86). Unfamiliarity with the New Zealand climate and perhaps also with the low thermal capacity of timber made these homes cold, draughty and unpleasant (Schrader 2016: 88). For this reason, the Māori-built *rāupo* houses became a preferred dwelling for settlers.

> *These houses were distinguished from* whare *by design and function. The walls were higher and featured external chimneys, small windows and hipped or gabled thatched roofs. These were hybrid dwellings, their design resembling a traditional English Cottage but built using traditional Māori materials and techniques. They cost about one-fifth the price of imported cottages and were warmer* (Schrader 2016: 82-83).

The presence of the colonial cottage is still evident (Fig. 7), however, and the *rāupo* house has not survived due to its flammability, as demonstrated in the 1842 fire of Wellington, which consumed 57 *rāupo* houses in 30 minutes and led to a decline of the type. In the 1860s the villa became a prominent aspect of the townscape of New Zealand's emerging cities and eventually turned into the


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Figure 7: A surviving colonial cottage built in 1849-52 in Mangere, Auckland

Figure 8: Three adjacent villas in Freeman's Bay, Auckland, showcasing, the Georgian (left), Victorian (middle), and Neoclassical (right) styles

Figure 9: Highwic Villa, in Epsom, Auckland, a surviving example of the Gothic Revival style

Figure 10: Alberton Villa in Mt. Albert, Auckland. Indian inspired verandas and turrets combined with the Victorian characteristics of the villa (Pinterest)

Figure 11: Brick-faced Villa in Freeman's Bay, Auckland. Note the Neoclassical fountain and Corinthian columns between windows

Figure 12: Villa in Confer Grove, Auckland, showing a mix of styles. Note the Tudor gable front popular in Medieval Welsh and British architecture, the Gothic fringe, and the semicircular arches

Figure 13: Villa in Conifer Grove, Auckland, showing possible Spanish influences

New Zealand villa, an adaptation of the pre-existing type to the local context. Initially mere replicas of British villas, they soon began to express regional characteristics such as a smaller footprint, limited ornamentation, use of timber as a primary building material even when tradition required brick or stone (in which case the facades were aesthetically presented as stone), and the addition of a porch or veranda.

> *The British structures were often of grand proportion in comparison to the NZ copies but possessed the same notable features including a rectangular footprint, hipped roofs with small eaves, symmetrical facades and regular windows. The NZ models usually added ground-floor verandas and had a central hallway with rooms on either side* (Era Designs 2016).

A variety of architectural styles were explored at this time, including the Georgian villa (Fig. 8), the Victorian villa (Fig. 8), Renaissance revival (Figs. 8 and 11), Gothic revival (Fig. 9), Queen Anne, and the Edwardian villa. While the dominant colonial architecture was British in style, other national styles were also present, namely Welsh (Fig. 12), Danish, Irish, Bohemian, German, French, Spanish (Fig. 13), Indian (Fig. 10), and Chinese. Their presence contributed to the culture, economy and urban ecology of New Zealand's cities, and to the styling of villas.

The New Zealand government's involvement in expanding settlement by establishing new industry and infrastructure in the early 1900s led to the development of affordable housing for workers, better known as New Zealand state houses (McKay 2013). These can be identified as detached suburban dwellings, with a weatherboard or sometimes a brick finish, a tiled roof and standardized windows: bigger windows with three panes and smaller ones with two.

> *The prevailing state house style originated [...] from Garden City planning with the houses generally adopting an appearance derived from the English Cottage style and you can even spot a bit of the Georgian [style] in some porches* (McKay 2013).

The early state house may be identified stylistically as a villa or bungalow (McKay and Stevens 2014: 14), whereas the medium-density housing and multi-story apartment blocks of the 1940s-50s show the influence of post-war émigré modernists, such as the famed Austrian architect Ernst Plischke (McKay 2013). This demonstrates the diversity and adaptability present. The initial focus was on *Pākehā* developments and "assimilation" of Māori in *Pākehā* society. This mindset did not change until the 1960s, when an influx of Pacifica migrations and the concentration of Māori in city centers made the government consider mainstream state housing also for Māori (McKay and Stevens 2014: 94).

The most interesting aspect of state houses is that many of them are not government housing; they just look like it. This is because other agencies such as Māori Affairs and the Education, Forestry, Police, and Public Works departments also produced affordable housing based on plans approved by the Housing Division. The government also offered cheap loans for housebuilding based on pre-approved plans (McKay and Stevens 2014: 12). Hence these houses are similar in design, construction, and materials. The state house, much like the New Zealand villa, became a familiar feature of New Zealand cities over time and is considered a part of their architectural heritage. The Lighthouse sculpture discussed in section two is an example of one.

Neoclassical style was adopted in the civic sector with enthusiasm and it remained popular well into the 20th century (Shaw and Morrison 1991: 41). The Neoclassical Auckland War Memorial Museum designed in 1929 by the practice Grierson, Aimer & Draffin, featuring New Zealand armed forces in action during the First and Second World

Figure 14: Dilworth Building at the corner of Queen Street and Custom's Street, in Auckland. This building was designed to frame the entrance to Queen Street from the sea. A second building was never completed. (Northern Club)

Figure 15: A typical street view in the central Auckland suburbs. Note the bungalow in the foreground and its neighboring villas

Figure 16: An example of an Art déco style Villa in Mt. Albert, Auckland

Figure 17: Art déco villa in Pt. Chevalier. Weatherboard finish instead of plaster

Figure 18: Symonds Street flats designed by the Government's Housing Division as rental apartments in the 1940's, proving the arrival of Modernism in New Zealand (Te Ara)


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Wars in its entablature (Stevens 2015); the neo-Gothic Supreme Court designed in 1868 by Edward Rumsey with carvings of public figures on its facade including the Ngapuhi chief Hone Heke (Schrader 2021); and the Dilworth Building (Fig. 14) designed by the firm Gummer & Ford in 1925-27 (Jones 2001), as one of two to frame the entrance to the city of Auckland, are all examples of the Neoclassical style adapted to the New Zealand context.

In the residential sector, the bungalow (Fig. 15), derived from the Hindustani *bangla,* became the dominant style of housing, especially in the 1920s (Era Designs 2016). It was followed by Art Deco (Figs. 16 and 17) in the 1930s, which remained popular until after the Second World War. The town of Napier has the most spectacular collection of Art Deco buildings in New Zealand. At this time, the built environment shifted rapidly from low-rise suburban to high-rise as international Modernism (Fig. 18) became dominant for commercial and institutional structures in Auckland and across the country. In post-war New Zealand a multicultural identity began to be asserted by émigrés seeking refuge here. The built environment responded to this appropriately as émigré architects, artists and designers began to explore their own respective styles, guided by Modernism, Expressionism and Brutalism, while also taking account of the natural context of their new home.

Continuity of tradition in Aotearoa/New Zealand architecture through traditional building, traditional craft techniques, and art

Much diversity of culture, technology and architectural tradition was brought to Aotearoa/New Zealand through the process of colonial settlement. Research has highlighted placemaking by continuity of tradition over the country's history, guided by key narratives of commemoration, biculturalism, diversity and connection with the natural landscape. In this section, case studies in the field of architecture, landscape design/urban environment and public art are presented as evidence of the continuity of architectural tradition in Aotearoa/New Zealand, prompted by the need for appropriate representation and a sense of identity.

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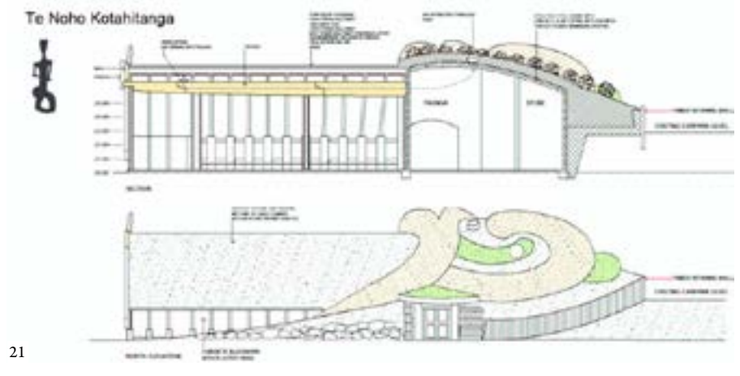

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Figure 19: An example of a Whare Whakairo, "Te Noho Kotahitanga" (Unitec)

Figure 20: Pukenga (left) and Ngākau Māhaki (right), "Te Noho Kotahitanga"

Figure 21: Section and north elevation of Ngākau Māhaki, "Te Noho Kotahitanga" (Unitec)

Traditional building: *Ngākau Māhaki - Whare Whakairo of Te Noho Kotahitanga Marae*, Auckland (2009), by Lyonel Grant

Our first case study concerns *Ngākau Māhaki*, the *whare whakairo* (carved meeting house) of *Te Noho Kotahitanga Marae* in Auckland (Fig. 19). It was opened to the public in 2009 and designed by the master carver Dr. Lyonel Grant (born in 1957) in the spirit of the traditional design ideology and building methods of Māori architecture, alongside contemporary design elements and modern technology (Unitec 2020). In Grant's work, tradition is understood as something flexible, adapting to different situations with different strategies. In his words (personal communication in 2021):

> *If you've had classical training, you can be so enamored with the tradition that you get subsumed by it. You end up becoming an imitator. The trick is to be an innovator because tradition is very powerful. You can easily be overwhelmed by it. A faithful copy of what the old people left isn't good enough anymore.*

As mentioned, a *wharenui* meeting house is used for communal congregation and for this reason it is always sited at the heart of an urban complex, facing an *atea* – an outdoor public space. The complex is called a *marae*. *Te Noho Kotahitanga Marae* has a total of four buildings: *Ngākau Māhaki*, the *wharenui*, *wharekai**, *maanaki*, and *pukenga* (Fig. 20), the Māori school designed by Rewi Thomson (1953-2016) in 1993 (Brown 2017). *Ngākau Māhaki* is the newest addition to the complex and reinforces the Unitec Institute of Technology's commitment to the Treaty of Waitangi by ensuring a Māori presence in its research and teaching facilities.

The position of this *whare* results from several factors. First, it faces the rising sun. The deceased are traditionally oriented toward the rising sun on burial, and as a *wharenui* is seen as the living embodiment of an ancestor, most of them have this orientation (L. Grant, personal communication 2021). The *whare* was also set out following a careful study of the site, with its natural features, flora and adjacent buildings. Thus it faces *Te Wai Unuroa* or *Wairaka*, a natural spring revered by local Māori. According to legend, a woman named Wairaka caused the spring water to burst out of the ground on stamping her foot on the spot while complaining of thirst. Māori see water as precious because of its importance to life, and so water and watery motifs are a part of all rituals and ceremonies (Grant 2009: 4). Rewi Thompson's *Pukenga* features a part of the spring meandering through the interior of the building, while *Ngākau Māhaki* faces it.

In the original concept for the *whare*, the back of the building was embedded in the landscape (Fig. 21). But due to budget and time constraints and institutional pressure to complete the project, this vision was not fully realized. Yet the careful siting of the *whare* shows that the place and its unique features were the conceptual drivers. Grant explains how (personal communication in 2021):

> *When I was preparing to choose the actual site, I obtained an aerial photograph of the general site. On closer inspection there were incidental features such as clumps of* manuka *and shadow play (...) that suggested an entity lying prone on the site. I decided to formalize that idea and create a* Manaia* *form that would incorporate the adjacent structures and literally become a body occupying the land – discernible overhead if one was to use Google Earth.*

It took eight years to materialize the vision of *Ngākau Māhaki*. Construction began by sourcing appropriate timber from a site 350 km south of Auckland (L. Grant, personal communication 2021). This was followed by the dressing of the timber members of the *whare* and then by meticulous carving. Each element is inscribed with *whakairo*: detailed carvings that represent selected narratives of communal identity and diversity. While traditionally Māori, the carvings tell stories about both Māori and non-Māori, thereby taking a step toward multiculturalism and creating a space for all to belong in.

> *I wanted to do something new, not just decorate a box, but create a showcase for our culture that's unique in the world. To do that I had to turn the clock back 100 years, look at the traditional techniques, and then work out how modern construction methods could be used to complement those techniques, given that this* wharenui *is maybe three times bigger than the classical model* (Unitec 2019).

Not every carving and pattern can be detailed here, but we may briefly describe the back wall, central pillar and front wall. The back wall features eleven carved figures standing in front of an infinite multitude and a *koru** pattern in the background. This *koru* is the alter ego of the *takarangi* that appears on the front wall, representing a swirling constellation-like presence of the heavens (L. Grant, personal communication 2021). The figures are structural elements carved in wood and the pattern on the wall is woven using flax which was then vacuum-pressed and affixed to the wall. This is *aria** and the figures are ancestors of the local *iwi* standing in front. We see past and present sharing the same space, with the wall acting as a thin veil between us and those who came before us.

The *poutokomanawa**, the central pillar, represents the signing of the Treaty of Waitangi in 1840. It is engraved with sections of the treaty and features two intertwined climbing vines symbolic of two communities coming together to create a new society (Grant and Unitec 2009). The treaty divides the *whare* into two parts. Narratives that took place before the treaty was signed are presented between the back wall and the *poutokomanawa*, and narratives taking

place after the treaty was signed are presented between the *poutokomanawa* and the front wall. These narratives are communicated through the way each *pou* is carved and where it stands vis-à-vis the chronology.

The interior of the front wall features a carved map of Auckland showing Mt. Albert and the neighboring suburbs. A carved *tahuhu** and a *takarangi** on the wall is revealed as the map peels off in the center. The *takarangi* relates to the swirling tides of *Waitemata* harbor. It reminds us that our history is infused in the landscape around us. It is still evident at the present moment and if we were to simply "peel off" suburbia, this knowledge would be revealed (L. Grant, personal communication 2021).

The design and structure of this *whare* features a combination of traditional building techniques, hand-carvings and modern media, employed together with a post-and-lintel system and traditional lashings. It is worth noting that this *whare* does not use modern joinery, and that all the carved elements are structural in nature. Every *pou** was carved before installation. Each one is different, representing a narrative in the story of this *whare* and its people. Similarly, each rafter was painted with traditional patterns before installation. The internal furnishings combine traditional woven interior panels and modern textiles. Carving and weaving patterns are a language in their own right and have been used as a means of preserving and passing on knowledge in the Māori tradition for centuries.

Crafting techniques: *Kopupaka Reserve*, Auckland (2016), by Isthmus Group

An example of continuity of tradition through traditional crafting techniques in Aotearoa/New Zealand today is the Kopupaka Reserve – a project making an eloquent gesture to Māori culture through design. Designed by non-Māori but with respect for Māori through engagement with them, the project is a case study using the *Te Aranga* Māori Design Principles. These are a set of outcome-based principles founded on intrinsic Māori cultural values and designed to provide practical guidance for enhancing outcomes for the design environment.[4]

Te Aranga *seeks to foster culturally appropriate responses to the built environments of Aotearoa/New Zealand, that are strongly grounded in the concepts of place and belonging intrinsic to* Te Ao Māori, *the Māori world* (New Zealand Institute of Landscape Architects 2016).

The Kopupaka Reserve is designed by Isthmus Group, a design studio said to be "guided by a set of principles and ideas that remove the boundaries between the disciplines of architecture, landscape and urban design, and based on deepening the relationships between land, people and culture" (Isthmus 2016). Kopupaka Reserve is a new form of a park including streams and wetlands in its design – a 22-hectare landscape made up of five stormwater wetlands (Frearson 2016). By including ecology, culture, community, and engineering in its design, it illustrates how urban growth and ecological restoration can combine to create new public space and develop a sense of place informed by Māori cultural values.

> *The Wetland respectfully acknowledges Māori Culture through design in translating the concept of* hinaki *(eel baskets), which innovatively takes on the architectural form of a river–wall system* (Frearson 2016).

The overall design refers to the history of the site – traditional activities and a history of food-gathering. The tradition of weaving is acknowledged and referenced, along with the architectural form of a *tuna** gathering basket (Frearson 2016). A series of timber structures around the edges of three ponds create forms that weave their way across the landscape (Figs. 22 and 23). The landscape narrative subtly but evidently guides the design. The innovative use of the crib-wall system of interlocking timbers (Fig. 24) is a simple yet sophisticated design response inspired by both elements. Thus the form adopted for the structural features of Kopupaka Reserve is a creative and cultural design expression – a continuum with the past that links architectural tradition into a cohesive narrative (Auckland Design Manual 2016). Here a subtle referencing rather than an overt application of a more traditional Māori design vocabulary is used to express belonging and place, still ensuring that Māori stories are told.

Figure 22:View of Kopupaka reserve

Figure 23: River wall of Kopupaka reserve (Isthmus)

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Figure 24 Weaving pattern of river walls constructed with timber

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Figure 25: *A Māori figure in Kaitaka cloak* by Molly Macalister (Our Auckland)

Continuity of tradition: *A Māori Figure in a Kaitaka Cloak* (1967), by Molly Macalister, and *Lighthouse* (2013), by Michael Parekowhai

Research has shown that both Māori and colonial settlers began building in Aotearoa with pre-existing architectural types adapted over time to the context of their new home, in a commemoration expressed by the architecture discussed thus far. Later generations of New Zealanders growing up with exposure to both indigenous and colonial identities express appreciation for both and have produced works that promote a bicultural identity. The two artworks discussed below are examples of this growing biculturalism, redefining commemoration.

A Māori Figure in a Kaitaka Cloak, by Molly Macalister (Fig. 25), stands tall at the edge of Auckland's busiest street, opposite the Edwardian Baroque ferry terminal (Alex Wiseman 1909-1912). Macalister was commissioned to design a sculpture expected to show a Māori figure standing in warrior pose looking tribal and perhaps unkempt. The actual sculpture caused quite a stir, as it shows a forceful and distinguished figure, probably inspired by *Apihai Te Kawau*, the chief of *Ngati Whatua*, looking out over the city and foreshore. He wears a chiefly cloak and bears a symbol of peace (Auckland Council 2020). This was the first public artwork by a female artist portraying Māori as on a par with the British founding fathers of New Zealand.[5]

The Lighthouse sculpture (Fig. 26) addresses the bicultural identity of New Zealanders with a full-scale replica of a two-story 1950s-style New Zealand state house built on the Auckland waterfront (Maude 2017). Inside is a large metal sculpture of Captain Cook sitting on a chair surrounded by colorful wall-mounted neon lights (Fig. 27). As mentioned, Cook is a notable figure in Aotearoa's history, already commemorated in place names and sculptures. Contrary to his traditional heroic representation, Parekowhai presents him in a contemplative pose, caged within the house. The public see him only by peering in through the windows, as if prying into his personal space. The neon lights glowing in the interior can be seen as the explorer's train of thought as he sits alone contemplating his life, his achievements, and perhaps his regrets.

Discussion of results and conclusion

Our paper has recalled the journey that brought people to Aotearoa and shaped its architecture. As discussed, Auckland, on an isthmus between two coastlines, with an intricate network of inlets, springs, creeks, and wetlands, has many desirable qualities making it a popular location for locals and migrants alike. Its most distinctive landmark is its volcanic field with 49 discrete volcanos, and though many have been quarried, 30 remain well preserved. Studies of the early architectural tradition of Aotearoa show that Auckland began its journey on the slopes of these volcanic cones as *pa* sites,[6] and it has continued to evolve over time with an influx of migrants.

Many years of struggle have carved the way for a bicultural national identity to be publicly accepted long after the

Figure 26: "The Lighthouse", by Michael Parekowhai (Pantograph Punch)

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Figure 27: An interior view of The Lighthouse (RNZ)

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signing of the Treaty of Waitangi. Efforts are still being made to establish this bicultural identity respectfully – two equal partners having their voices equally heard, sharing power so as to empower the community, respect values, and develop strategies together. But the migrant identity of Aotearoa has yet to be addressed appropriately. In this regard, Leonard Bell's book, *Strangers Arrive: Emigrés and the Arts in New Zealand*, presents a collection of artistic expressions and narratives that draw attention to the struggles, stories, and contribution of migrants.[7]

> *With thirty-nine percent of its population born overseas, [Auckland] city is revealed to be more diverse than Sydney, Los Angeles, London and even New York* (Tan 2016).

This growing diversity results in the continually changing picture of Auckland's cultural landscape, now with roughly 180 ethnic identities (Auckland Council 2018). This demographic can be categorized in five broad ethnic groups: European (of European origin), Wider Asian (of Asian and South-Asian origin), Māori, Pacifica, and MELAA (of Middle Eastern, Latin American, and African origin). A majority of Aucklanders (59.3%) identify as ethnically European, followed by the broad Asian category, at 23.1%. The next group is Pacifica, at 14.4 %, followed by those identifying as Māori, at 10.7%. The smallest category is MELAA, at 1.9% (Auckland Council 2018).

> *Auckland is home to people from many places, cultures and traditions. This rich diversity will continue to increase* (Auckland Council 2018).

The World Migration Report 2015 published by the International Organization for Migration (IOM) says that "we live in an era of unprecedented human mobility," allowing urban environments to be more ethnically diverse than before (IOM 2015). But current research shows that, though biculturalism is being explored in the architectural tradition of Aotearoa/New Zealand, an expression of multiculturalism is lacking. So the present moment requires architects, designers, and urban planners to engage with changing demographics and to represent them appropriately. Research has shown that the story of arrival is a strong narrative in the context of Aotearoa, which can be explored architecturally through historic knowledge and architectural tradition. The first part of our paper discussed Aotearoa/New Zealand's history, tradition and architecture with an overview of traditional architectural typology. Our second part looked at case studies that are potent examples of the continuity of tradition today, seen through traditional building, traditional craft techniques, and art – all providing a sense of belonging to the place that the people of Aotearoa identify with.

The case studies presented show that in Aotearoa today, the "sense of place" is based on experience and the coherence of locale, geographic features, architectural traditions, people, their customs, and personal experience. The realization of Māori identities in placemaking has great importance for Māori,[8] and indeed indigenous placemaking would take up another article. Still, the ongoing dialogue allows Māori and *Pākehā* to connect through the sharing and presenting of traditional crafts, methods, ideas, architectural forms, and technology. The dynamic of this relationship reflects the growth of biculturalism in New Zealand. As the city continues to evolve, a sense of place including the migrant identity of Aotearoa and also the expression of multiculturalism will doubtlessly be addressed appropriately. It will continue to rely on civic art and public space to provide freedom of expression, knowledge of history, and an opportunity to discover what the future holds.

Acknowledgments

We would like to express gratitude to our colleague Maia Ratana (architect, researcher and Māori advisor), whose guidance and support were invaluable for this paper. Her thoughtful insights, factual knowledge and advice helped Māori architecture to be represented appropriately as regards its culture and values.

We are especially grateful to Dr. Lyonel Grant (Māori master carver and sculptor; *Ngati Pikiao* and *Te Arawa*) for his generosity with his time and advice, helping us to learn about Māori architecture and culture.

[1] The difference between cultural and academic historians: Academics are "academically" accepted and credited to have knowledge on a given subject, accessible through presentations, publications and the like. With the term "cultural historians" we include Māori elders in the conversation as specialists with extensive knowledge of the subject but who may not have any published work. Such knowledge is usually passed down within a tribe orally as lessons and techniques as well as in the form of carvings. Access to this type of knowledge can be attained by being attuned to the cultural values and traditional practices of the tribe and respectfully engaging with its elders. In recent years, we have seen a new generation of Māori who have attained knowledge from their elders and are also thriving as researchers, academics and professionals; they are accepted and credited as knowledgeable in both worlds, and through them cultural knowledge is becoming more available to the academic world.

[2] We refer only briefly to the Treaty of Waitangi/Te Tiriti o Waitangi, as its complexity, the subsequent land confiscations, the New Zealand land wars, and the historical atrocities endured by Māori demands a full discussion which is unfortunately beyond our scope. On this subject, see Claudia Orange, *The Story of a Treaty* and *An Illustrated History of the Treaty of Waitangi*, Bridget Williams books, Wellington, 2004 (brief historical overviews); Michael Belgrave, Merata Kawharu and David Williams (eds.), *Waitangi Revisited: Perspectives on the Treaty of Waitangi*, OUP, Auckland, 2005; Department of Justice, *Principles for Crown Action on the Treaty of Waitangi*, Wellington, 1989; I.H. Kawharu, *Waitangi: Māori and Pākehā Perspectives of the Treaty of Waitangi*, OUP, Auckland, 1989; Paul Moon, *Te Ara Ki Te Tiriti: The Path to the Treaty of Waitangi*, David Ling, Auckland, 2002; Kevin O'Brien, Rebecca Kiddle, and Luugigyoo Patrick Stewart, *Our Voices: Indigeneity and Architecture*, ORO Editions, 2018.

[3] Colonization is an ongoing issue that has impacted generations and left many feeling lost in their own country, with a story that requires another article. For more on this, see Kevin O'Brien, Rebecca Kiddle, and Luugigyoo Patrick Stewart, *Our Voices: Indigeneity and Architecture*, ORO Editions, 2018. For a brief information to the mid-'80s when "there was no such 'thing' as Māori architecture", see Anthony Hoete, "Transcolonisation: 1990–2020", *Architecture Now*, https://architecturenow.co.nz/articles/transcolonisation-1990-2020/

[4] The purpose of this strategy is to support local *iwi* to demonstrate cultural approaches and perspectives in terms of how to manage and build on land, and to ensure Māori culture is valued and used appropriately. See more on this in Paul, Jacqueline. *Exploring Te Aranga Design Principles in Tāmaki*, 2016; "Te Aranga Principles", Auckland Design Manual. http://www.aucklanddesignmanual.co.nz/design-subjects/Maori-design/te_aranga_principles

[5] This is still seen as a racially insensitive event for various reasons, mainly because a Māori sculptor was not consulted.

[6] There are records of numerous *pa* sites existing in the Auckland isthmus in 1450–1840; see Bruce W. Hayward, *Prehistoric Pa Sites of Metropolitan Auckland*, New Zealand Geological Survey, Lower Hutt, 1983, http://www.thebookshelf.auckland.ac.nz/docs/Tane/Tane-29/2%20Prehistoric%20pa%20sites%20of%20metropolitan%20Auckland.pdf; Aileen Fox, *Maungakiekie: The Māori Pa on One Tree Hill*, Auckland, New Zealand: One Tree Hill Borough Council-Domain Recreation Reserve Board, 1984.

[7] For more on this, see Bell, Leonard. Strangers Arrive: Émigrés and the Arts in New Zealand, 1930–1980, Auckland University Press, 2017.

[8] Kiddle compares the ideologies underpinning pre-colonial *whānau* and *hapu* placemaking, centered on *whānau* (extended family) and *hapu* (sub-tribe) units, with colonial placemaking, premised on the conversion of communally owned land to individual property; see Rebecca Kiddle, "Contemporary Māori placemaking" in: Kevin O'Brien, Rebecca Kiddle, and Luugigyoo Patrick Stewart, *Our Voices: Indigeneity and Architecture*, ORO Editions, 2018; see also Sheri-Ann Atuahiva, "What is Māori Heritage?", Māori Cultural Heritage Program, talk given in the Auckland Art Gallery Auditorium, July 28, 2021, https://www.aucklandnz.com/business-and-investment/growing-business/networking-events/events/public-talks-tours/what-maori.

* Glossary | Glosario | Glossário

*As guided by the glossary of Maori architecture by Dr. Deidre Brown.

Aotearoa is the name given to the country commonly known as New Zealand, by its native people. It belongs to the *Te reo* language and means "the land of long white clouds". For the purpose of this paper, the authors prefer to use both names in their work because it reminds us of the shared heritage and tradition of this country and its people.

Arai is a subliminal barrier, the façade that the recently departed must navigate to enter the spirit realm. In the case of Ngakau Mahaki, the *Arai* is represented by the primary local *iwi* representatives who elegiacally stand in the path of those who desire to pass beyond.

Hākari are feasting stages.

Harakeke is a type of reed; native to *Aotearoa*.

Kākaho is a woven panel or screen used as an internal surface lining in *whare* construction; traditionally made with *raupo* and *toetoe*.

Katua is a light-framed timber structure used to define and shelter the space allocated to food preparation.

Koru is a traditional spiral pattern featured in carving and tattooing. It refers to the appearance of a new unfurling silver fern frond.

Mana is prestige.

Manaia is an ancient mythical being with a bird's head and a human form. It is said to be the messenger between the earthly world of mortals and the domain of spirits. *Manaia* holds great spiritual energy and is a guardian against evil. It is a popular form in carving.

Pataka is a raised and highly decorated store house.

Paua is a type of shellfish with a shiny blue-green internal shell pattern, similar to mother of pearl; native to Aotearoa.

Pou is a carved structural pillar .

Pounamu is a green semi-precious stone; native to Aotearoa.

Poutokomanawa is a central structural pillar.

Rangatira is a tribal chief.

Raupo is a type of flax; native to Aotearoa

Tahuhu is a ridge pole, symbolic of the spine of the ancestor

Takarangi is an intersecting double spiral pattern that signifies humanity's celestial origin born at the beginning of the Universe. Used widely in Maori carvings and art, the *Takarangi* uses space to separate it's two solid spirals; it is this space that allows us to see the spirals.

Toetoe is a type of swamp grass; native to Aotearoa.

Waka is a canoe carved out of timber .

Whare is a dwelling. Fale is the samoan variation of the word.

Wharenui is a meeting house.

Wharepuni is a rectangular, gabled dwelling designed for communal sleeping.

References | Referencias | Referências

Atuahiva, Sheri-Ann. 2021. What is Māori Heritage?. Talk in Auckland Art Gallery. *Māori Cultural Heritage Programme*.

Auckland Council. A Māori figure in Kaitaka cloak. https://www.aucklandcouncil.govt.nz/arts-culture-heritage/arts/public-art-waterfront/Pages/maori-figure-in-kaitiaki-cloak.aspx (consulted on 02/09/2021).

Auckland Design Manual. Kopupaka Reserve. http://www.aucklanddesignmanual.co.nz/resources/case-studies/kopupakareserve (consulted on 15/03/2021).

Auckland Plan 2050. Auckland's Population. https://www.aucklandcouncil.govt.nz/plans-projects-policies-reports-bylaws/our-plans-strategies/auckland-plan/about-the-auckland-plan/Evidence%20reports%20documents/evidence-reportdemographics.pdf (consulted on 05/05/2019).

Bath, Brooke. 2016. Five of the best artworks in Auckland. *Stuff*. https://www.stuff.co.nz/auckland/83958585/five-of-the-best-public-artworks-in-auckland (consulted on 15/09/2021).

Bell, Leonard. 2017. *Strangers Arrive: Emigrés and the Arts in New Zealand, 1930-1980*. Auckland: Auckland University Press.

Brown, Deidre. 2009. *Māori architecture: from fale to wharenui and beyond*. Auckland: Penguin Group.

Castello, Lineu. 2010. *Rethinking the Meaning of Place: Conceiving Place in Architecture-urbanism*. Farnham: Ethnoscapes.

Deidre Brown. 2014. Māori architecture - Whare Māori. *Te Ara – The Encyclopedia of New Zealand*. http://www.TeAra.govt.nz/en/Māori-architecture-whare-Māori (consulted on 18/03/2019).

Frearson, Amy. 2016. Kopupaka Reserve in Auckland wins World Landscape of the Year 2016. *Dezeen*. https://www.dezeen.com/2016/11/18/kopupaka-reserve-auckland-wins-world-landscape-year-2016/ (consulted on 02/02/2021).

Grant, Lyonel. 2009. *A Vision Beyond Its Time = Moemoeā Kei Tua i Tōnā Wā: Te Noho Kotahitanga*. Auckland: Unitec New Zealand.

Grant, Lyonel. Toi Tu Toi Ora Satellite Exhibition. Auckland. https://www.aucklandartgallery.com/toi-tu-toi-ora-satellite-exhibition (consulted on 15/03/2021).

Hochstein, Gina; and McKay, Bill. 2020. Alien Subversives. *Architecture Now*. Accessed March 21. https://architecturenow.co.nz/articles/alien-subversives/ (consulted on 21/03/2021).

International Organization for Migration. 2015. *World migration report 2015*. Switzerland: International Organization for Migration. https://publications.iom.int/system/files/wmr2015_en.pdf (consulted on 16/03/2021).

Isthmus. 2016. Gather and weave. Kopupaka Reserve. https://isthmus.co.nz/project/kopupaka-park/ (consulted on 08/03/2021).

Jacqueline, Paul. 2016. *Exploring Te Aranga Design Principles in Tāmaki*. Bachelor of Landscape Architecture.

Maude, Simon. 2017. Mesmerising $1.5m Lighthouse sculpture gets walkaround. *Stuff*. https://www.stuff.co.nz/life-style/89312555/mesmerising-15m-lighthouse-sculpture-gets-walkaround (consulted 02/09/2020).

McCay, Bill. 2013. A fresh look at the state house. *Architecture Now*, 4. https://architecturenow.co.nz/articles/a-fresh-look-at-the-state-house/ (consulted on 16/03/2021).

McCay, Bill; and Stevens, Andrea. 2014. *Beyond the state house: New Zealand State houses from Modest to Modern*. Auckland: Penguin Group.

Morgan-Kohu, Hinewirang; and Roberts, Jude. 2003. *Te Whare Whakairo*. Cambridge: Kina Film Productions.

New Zealand History. James Cook - biography. Ministry for Culture and Heritage. https://nzhistory.govt.nz/people/james-cook (consulted on 15/03/2015).

O'Brien, Kevin; Kiddle, Rebecca; and Stewart, Luugigyoo Patrick. 2018. *Our Voices: Indigeneity and Architecture*. New York: ORO Editions.

Orum, Anthony M.; and Neal, Zachary P. (eds.). 2010. *Common Ground: Readings and Reflections on Public Space*. New York: Routledge.

Pollock, Kerryn. 2014. Public and street art. *Te Ara - the Encyclopedia of New Zealand*. https://teara.govt.nz/en/public-and-street-art (consulted on 10/09/2020).

Salmond, Jeremy. 1986. *Old New Zealand Houses 1800-1940*. Dunedin: Reed Methuen Publishers Ltd.

Schrader, Ben. 2016. Towns becoming cities. *The Big Smoke: New Zealand cities 1840-1920*. Wellington: Bridget Williams Books.

Skinner, Damian. 2016. *The Māori Meeting House: Introducing the Whare Whakairo*. Wellington: Te Papa.

Stone, Russell Cyril James. 2002. *From Tāmaki-Makau-Rau to Auckland*. Auckland: Auckland University Press.

Tan, Lincoln. 2016. Auckland more diverse than London and New York. *New Zealand Herald*. https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11575305 (13/06/2019).

Unitec. Marae Design. Unitec Institute of Technology. https://www.unitec.ac.nz/m%C4%81ori/maia-centre-and-marae/te-noho-kotahitanga-marae/marae-design (consulted on 31/03/2021).

Biographies | Biografías | Biografias

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Swathy V Subramanian

The Architectural Tradition of Ponnani, Kerala: A Historic Malabar Port Town

La tradición arquitectónica de Ponnani, Kerala: Una ciudad portuaria histórica de Malabar

A tradição arquitectónica de Panane, Querala: Uma cidade portuária histórica em Malabar

Keywords | Palabras clave | Palavras chave

Vernacular settlement, Traditional knowledge systems, Built heritage typologies, Communities, Cultural traditions

Asentamientos vernáculos, Sistemas de conocimientos tradicionales, Tipologías de patrimonio construido, Comunidades, Tradiciones culturales

Povoação vernacular, Sistemas de conhecimento tradicional, Tipologias de património construído, Comunidades, Tradições culturais

Abstract | Resumen | Resumo

Ponnani, a historic port town located at the mouth of the Bharathappuzha River on the Arabian Sea, was a prominent trading center on the Malabar coast of Kerala, India, in the 15th and 16th centuries. It is one of Malabar's few surviving historic towns, with its heritage sites intact along with its building types, historic streets and alleys, local culture, and traditions. But some of its historic buildings are on the verge of dereliction and need immediate attention. This study attempts to convey an understanding of Ponnani, with an analysis based on field visits and existing literature. The relationship between the region's architecture and landscape and current threats to its heritage is explored. Its vanishing traditional knowledge systems and vernacular architectural types are also discussed, in what may serve as a reference for adaptive use by future generations.

Ponnani, una ciudad portuaria histórica situada en la confluencia del Mar Arábigo y el río Bharatapuzha, era uno de los principales centros comerciales de la costa de Malabar, en Kerala (India), durante los siglos XV y XVI. Es una de las pocas ciudades históricas que quedan en Malabar con sus recintos históricos y tipologías de construcción ancestrales; sus calles y callejones antiguos, su cultura y las tradiciones de las comunidades locales totalmente intactas. Sin embargo, algunos edificios históricos están a punto de ser abandonados y necesitan atención inmediata. Este estudio pretende ampliar el conocimiento sobre Ponnani mediante el análisis sobre el terreno a partir de visitas y la bibliografía actual. En este artículo se exploran la relación entre la arquitectura y el paisaje de la región y las actuales amenazas para el

patrimonio. También se aborda la rápida desaparición del sistema de conocimientos tradicional y de las tipologías arquitectónicas vernáculas. Quizá pueda servir como archivo para que futuras generaciones los adapten.

Panane, uma cidade portuária histórica localizada na confluência do Mar Arábico e do Rio Bharatapuzha, foi um dos centros comerciais proeminentes na Costa do Malabar, em Querala, na Índia, durante os séculos XV e XVI. É uma das poucas cidades históricas sobreviventes de Malabar que mantém completamente intactos os seus recintos históricos, bem como as suas tipologias de património construído, suas ruas e ruelas históricas, sua cultura e as tradições das comunidades locais. No entanto, alguns dos edifícios históricos estão à beira do abandono e necessitam de atenção imediata. Este estudo tenta expandir a compreensão de Ponnani, utilizando análises in loco baseadas em visitas de campo e literatura existente. Neste artigo, explora-se a relação entre a arquitectura e a paisagem da região, e as actuais ameaças ao seu património. É também discutido o rápido desaparecimento do sistema de conhecimento tradicional e das tipologias arquitectónicas vernaculares. Isto pode servir de repositório que promova a sua adaptação pelas gerações futuras.

Introduction

Ponnani is a picturesque coastal port town situated in the Malappuram district of Kerala, India. Its setting by the Bharathappuzha River allowed it to flourish as a trading center in the medieval era. This location was strategically selected, with its interlinked waterways like backwaters facilitating inland trade. Ponnani was a satellite port town serving larger ports such as Muziris on the Malabar coast.

The port drove Ponnani's development as a hub of medieval trade. Ancient texts mention it as of the 1st century. Dr. Irfan Habib, in *An Atlas of the Mughal Empire*, refers to Ponnani as a flourishing port of the 15th and 16th centuries (Habib 1985). It was well known as the second capital and naval headquarters of the *Samoothiris** (rulers) of Kozhikode and as a center of Muslim learning and culture. Trade also promoted connections which in turn influenced the townscape. The coastal area of Ponnani exhibits well-preserved architectural typologies, including industrial, residential, religious, public, commercial, educational, and hydraulic structures. In short, Ponnani represents a typical Malabar town, and its port area is an exemplary vernacular settlement, with its cultural traditions and architectural composition still intact.

As the town is a fishing center to this day, Ponnani's shores remain busy with fine wooden canoe boats and fishing craft. As the European traveler Francis Buchanan said in his insightful account of the land of Panyani (Ponnani) in the 1800s: "the canoes in this part of Malabar are among the best and handsomest that I have ever seen" (Hamilton 1807).

This paper takes a holistic view of the historic town of Ponnani through its ecology, its built fabric, and its sociocultural makeup. It also seeks to show the significance of the vernacular architecture of historic Ponnani in the present day, vulnerable as it is to developmental pressures, insensitive transformations, new construction, etc. Today many of its historic buildings are in poor condition due to neglect and lack of maintenance, and at risk of dilapidation and demolition.

Methodology

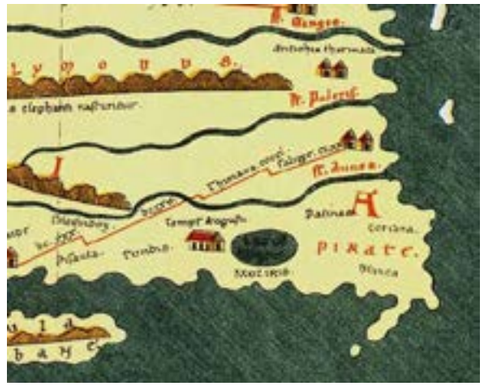
This paper is an extension of my M.Arch. thesis. The methodology involved analyzing primary data gathered in field visits and from secondary sources. On-site observations were enriched by interviews with local stakeholders. A base map, as shown in Fig. 1, was developed by overlaying survey information on an existing Google Earth map, and the mapping of heritage resources was based entirely on field visits and information gathered in situ. Detailed documentation and inventories allowed me to define architectural typologies. This helps show the importance of the town's geographical location, settlement pattern, community structure, sociocultural aspects, architectural influences, local craftspeople, and local building materials and techniques.

Figure 1: A map of Ponnani showing the traditional areas in red

Historic significance of the old port town of Ponnani

The name *Ponnani* allows multiple interpretations. The foremost among these seems to be *Pon nanayam*, meaning "gold coin". Ponnani has also been known as *Arabikasu*, due to its trading relations with Arabia. This name would first have been used by Arab and Persian merchants, as theorized by authors such as William Logan and Nilakanta Sastri (Logan 1887). Malabar's maritime trade relations with the rest of the world are well known from various accounts, including travelogues by foreigners. One such is the Greek *Periplus of the Erythrean Sea* by an unknown author of the 1st century AD, who mentions a flourishing center of maritime trade called Tyndis (see map in Fig. 2). Tyndis is referred to as a coastal town situated 500 stadia (about 60 miles) north of Muziris, which matches Ponnani's location (Sharma 2010).

Figure 2: Tundis, as shown in the 4th century *Tabula Peutingeriana* (Wikipedia)



The remains of a megalith is evidence of a local prehistoric settlement (Fig. 3), and as well as being a center of trade, Ponnani was one of the four earliest Brahmin settlements on the banks of the Bharathappuzha (or Nila) River. Thirumanasseri Raja (king of the independent kingdoms of Malabar region), the *Samoothiris*, the Dutch, the Portuguese and the British also marked the history of Ponnani. Its architecture evolved in every period.

The Thrikkavu area, to the east of Ponnani, became a well-known Brahmin cultural center, of which remnants in the form of houses and temples are still to be seen. In medieval times, Ponnani was controlled by the Brahmins of Thirumanasseri Natu. The Thirumanasseri *kotta* (Fig. 4), their palace, was once an imposing structure, but it was later transformed and now only the *padippura** gateway (Fig. 5) remains.

Figure 3: Umbrella Stone: Megalithic monument; Remnants of prehistoric settlement

Figure 4: Thirumanasseri Kotta residence of Thirumanasseri Raja, located at Kottathara, Ponnani (Archival collection of the Thirumanasseri family)

Figure 5: The only remains of Thirumanasseri Kotta, Padippura

Following the Brahmin settlement, a Muslim one linked to trade emerged near the port around the Thottungal mosque (Figs. 6 and 7), to the south.

The Arab monopoly on the Malabar coast lasted until the advent of the Portuguese in the 15th century. They attacked Ponnani in 1525 AD, overcoming the army of the *Samoothiri* Raja and his navy chief Kunhali Marakkar. In the 17th century, the Dutch took over trade, followed by the English East India Company, which established centers in the ports of Ponnani and Calicut. Malabar was later invaded by Hyder Ali and Tipu Sultan in their war against the British, but Ponnani nonetheless became part of British Malabar (Kunnath 2015).

Ponnani lost its significance as a trading port in the early 18th century as the larger trading ships forsook the smaller ports, and hence the British favored larger harbors such as those of Tellicherry and Calicut.

The building of the Conolly Canal in 1848 further developed Malabar's economy (Fig. 8). The technologies brought by British specialists in the fields of mobility, architecture, etc., and the introduction of foreign products, caused the place to evolve in character from a large village into an urban town.

In the 1800s, the aforesaid Francis Buchanan Hamilton provided many details of the settlements he visited. He said the trading boats called *patemars* carried an average of 50,000 coconuts and 1,000 mudies of rice, equal to 500 Bengal bags. The *Moplay* Muslims were rich and possessed

Figure 6: View of Ponnani with Thottungal Mosque highlighted in yellow (Naseef Gafoor)

Figure 7 View of Thottungal Mosque, the first Mosque in Ponnani (Radhika KM)

Figure 8: Present view of Cannolly Canal (Radhika KM)

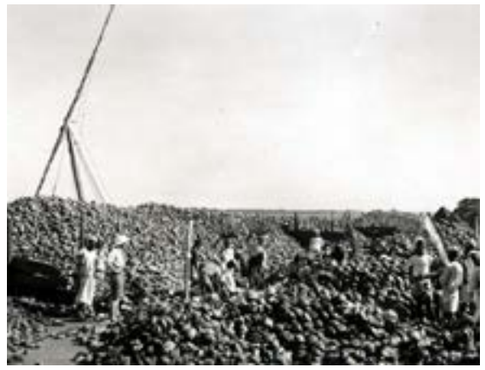


Figure 9: Coconut trade in Ponnani Port (Denkler Gothif)

vessels that sailed to Surat, Mocham, Madras, and Bengal. The more local trade was between Tellicherry and Calicut for supplies of European and Bengali goods. Wheat, *meti* or fenugreek, the pulses called *wulindu*, *pyru*, and *avaray*, sugar cane, jaggery, and salt were brought from Bombay and Rajapuram, while teak wood and coconut were carried the other way (Fig. 9) (Hamilton 1807).

Ecosystem and building materials

The vernacular architecture of Ponnani is an expression of this local coastal environment, its people and its natural resources.

Ponnani is characterized by a special ecosystem, including mangroves that preserve water quality and host many species. This fragile ecology needs to be conserved. The tidal mouth of the Bharathappuzha at Ponnani is a seasonal home to many migratory birds (Fig. 10), with some 25 species identified.

Natural features such as mud banks, which during the south-west monsoon season facilitate the launching of canoes (Fig. 11), established the area as a good fishing ground.

The soil is alluvial in coastal areas and elsewhere predominantly laterite (the reddish clayey topsoil found in tropical regions). As a result, laterite was used rather than mud for building, and its iron-rich variety is widely encountered as a building material.

The area was also rich in coconut groves, providing the prime material for roofing and supporting a coconut trade and coir fiber cottage industries. Coconut beams were used in many historic buildings, and sun-dried thick-layered coconut leaves were employed as roofing material over timber rafters. Seashells were used to make limewash. Coir was used extensively for making thatch roofs. The coir industry extended 10 km along the Conolly Canal and formed the livelihood of most local households. Now just a few families sustain the industry (Figs. 12 and 13).

Wood was shipped from Annaimalai (in the Western Ghats mountains), Mannarcadu, and the Silent Valley of Palakkad along the Bharathappuzha to Ponnani to make boats and houses. Planks of local wood called *aanjili* (*Artocarpus hirsutus*), which is termite-resistant, were used extensively for building houses. The Viswakarma people were involved in making wooden *uru* fat boats. These dhows were the vessels most widely built in Ponnani up to the 19th century (Kutty 2015).

Figure 10: Canoe boats in Ponnani

Figure 11: Water birds along the Ponnani Coast


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Figure 12: Women working on coir

Figure 13: Artisan weaving baskets

The settlement

The older Brahmin settlement of Thrikkavu is about 2.9 km from Ponnani's second historic center. Gujarati and Tamil Brahmins were the main settlers in Thrikkavu and a few of these families still live locally.

Ponnani remains a port town with an economy sustained by fishing. Its commercial heart is still the main marketplace, with a ribbon development of old shops and godown warehouses on either side of the *Valiyangadi** market street (Fig. 15). Public spaces such as mosque precincts thrive as community gathering areas, and residential areas with narrow *kutcha* streets (Fig. 14) add to Ponnani's character.

The town's heritage is concentrated near the port in an area of about 1 km^2, including the traditional vernacular buildings of greater value, age, scale, proportion, and architectural interest. But these heritage resources are under various threats due to developmental pressures. Also, many historic buildings are in poor condition due to neglect, lack of maintenance, dilapidation, and lack of documentation and protection.

The Muslim settlement developed during the colonial phase with the boom in trade. The Kachitheruvu was always its commercial axis, extending from the Thottungal Mosque, where the Gujarati Memon Muslims traded. This commercial center later extended to the *Valiyangadi* (main market) and *Kochangadi** (small market).

Another notable area is the Conolly Canal and its environs, with vernacular houses (Fig. 16) on either side. In 1848, the Malabar District Collector Henry Conolly had the Appithodu, a natural stream, converted into a canal primarily for inland trade, and it is still plied by colorful boats and used by fishing communities and coir cottage industries.

Architecture and material heritage

The architectural elements of Ponnani have evolved with Kerala's peculiar climate, the locally available materials, and input from the various cultures present.

The major architectural types include fishing sheds; residential houses with *padippuras* (gateways) and *nalakams** (courtyards); temples and mosques; residential mosques (*jaram* in local language, Fig. 17); godown warehouses and shops (Fig. 18); madrasas, schools, and other public buildings; communal cisterns; and pillar stones (the old port boundary).

Architectural features include elaborate gable roofs and attics, decorated eaves, timber ceilings, courtyards, elongated verandas, elaborate timber columns, arches, *mathok** architraves, ornamented *padippura* gateways, etc.

Figure 14: Historic shops along *Valiangadi* (main market), Ponnani (Radhika KM)

Figure 15: Streets of Ponani

Figure 16: Cannolly canal with vernacular houses on both sides (Naseef Gafoor)


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Figure 17: Ponnani Valiya Jaram, a Mosque-residential typology

Figure 18: Historic shop with a multifunctional timber window in *Valiangadi* (main market), Ponnani

Figure 19: Coconut beams for roof structure

Figure 20: Raw timber beams for roof structure (Radhika KM)

The town's most distinctive feature is its tiered sloping roofs designed to protect façades and to withstand the heavy monsoon. These are normally tiled or thatched with palm leaves, supported by a timber frame with hardwood beams and rafters. Some heritage buildings have seasoned coconut beams (Figs. 19 and 20). Roofs with flat tiles gradually gained popularity once tile factories were established by missionaries in Kerala, with the tiled-roof system being introduced into Malabar by the Basel Evangelical Mission in the 1850s. They set up a factory near Codacal on the north bank of the Bharathappuzha which supplied Ponnani's roof-builders through the colonial period.

Masonry walls were generally made of laterite stone and the mortar used in them was a combination of mud and lime.

Decorative architraves locally called *mathoks* (Figs. 21 to 23) appear over doors, made of laterite and finished with lime mortar. Some designs have floral motifs. This feature is present mostly in houses and shops, with variants in the mihrabs of mosques across the Malabar region, including in Ponnani.

Initially, common people's houses were built on laterite plinths with mud walls and thatched with dried coconut leaves (Fig. 24). Some houses were roofed with timber planks, with coconut and bamboo used generally. Mud walls were later replaced with laterite. Sloping roofs have continued to be used, as they are climate-responsive (Fig. 25).

Later influences can also be seen in the built forms of Ponnani, evident in such elements as columned and arched openings, circular columns, large glass windows and doors, circular windows, balustrades on verandas, iron railings, decorated cornices, broad stairways, two-story structures, and so on. These influences are generally seen in buildings belonging to the elite of society. While colonial architectural features were present in facades, the design principles remained conservative, as established by the local texts and building knowledge systems.


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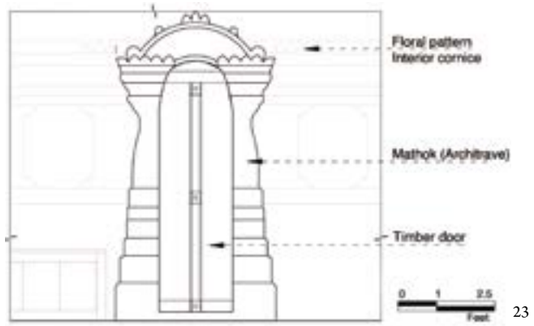

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Figure 21: Architrave (*mathok* in local dialect), a unique architectural element which is present in the old heritage buildings of Ponnani

Figure 22: Courtyard house with *mathok* (architrave)

Figure 23: Detail of *mathok* (architrave)

Figure 24: Series of sloping roofs, facade of a residential building

Figure 25: Thatched houses in Ponnani

Figure 26: Madras terrace roofing in Ponnani Court building

Figure 27: Ponnani Court Building

The Ponnani court building (Fig. 26), for instance, is an amalgam of colonial influences with Kerala vernacular architecture. New technologies were introduced by the British, such as colonial columns, arches, French windows, louvered windows, or Madras terrace roofing (Fig. 27).

As in most ancient port towns, like Calicut or Mangalore, religious structures in Ponnani were planned around a cistern (Fig. 28), or else cisterns were built to cater for the requirements of these buildings.

The oldest Mosque in Ponnani is Thottungal Masjid, with inscriptions recording its renovation by Sheikh Farid some 700 years ago. Juma Masjid (Figs. 29 to 31), built in 1518 AD, is Ponnani's second-oldest mosque, built in the region's traditional style with just a little Islamic influence in its design and ornamentation. It was constructed by native artisans, resulting in a similarity with the region's temple architecture. There are no traces of the Indo-Islamic architecture of the north Indian imperial or provincial schools. Timber was used extensively in its ceiling and roof, including the attic floor. The first two floors are of laterite, and the ground-floor arcades take the structural load. Next to Juma Masjid is an institution called Maunathul Islam Sabha along with boarding facilities for visitors and converts. This place is seen as a second Mecca by Malabar Muslims. William Logan gave a clear description of it: "The Mosque is a spacious four-story building, ninety feet in length and sixty feet in breadth, and stands close to the Jaram or


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Figure 28: Community water tank (Radhika KM)

Mausoleum". According to Logan, in 1887 there were 400 students at the Juma Masjid Madrasa (Logan 1887).

The other prominent mosques include Ponnani Misri *Palli* and Ponnani Akathe *Palli* (*palli* meaning mosque). At present, religious structures such as mosques are owned by the Waqf Islamic property board.

The mihrab of Malabar mosques, such as the one in the Juma Masjid of Ponnani (Fig. 31), has the form of a niche with a semi-circular arch, a semi-circular plan, and a floral motif over the arch in the form of a molding. This feature derives from the mihrabs found in the Persian Gulf and Yemen. Mihrabs in Cochin are framed with lobed arches on stucco pilasters. The earliest example of a frame like this around the mihrab can be found in the 13th century Abu'l Qasim al-Idhajiv mosque in Junagadh, with a frame in the local Hindu and Buddhist style. The frame of the Mithqalpalli mihrab in Calicut is also influenced by traditional Indian motifs, whereas many other mihrabs, such as that of the Muchchandipalli in Calicut, have a plain border decorated with simple moldings (Shokoohy 2013).

Figure 29: Timber *jali* work in the attic floor, Juma Masjid of Ponnani

Figure 30: Juma Masjid of Ponnani, built in 1518 CE

Figure 31: View of the arcuate system in the interior of the Juma Masjid


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Residential architecture

Vastusastra, the "science of architecture", has traditionally been followed in the residential architectural types of Malabar, including Ponnani. Traditional architecture is a matter of craftsmanship, and many master craftsmen known as *muthasaris* still prescribe the dimensions and layout of traditional houses and supervise construction process from the setting out of a building to its completion. Yet these traditional knowledge systems are fading away.

Residential settlements were largely concentrated in the areas closest to the river and religious buildings, forming clusters.

Ponnani dwellings were built especially to cater for extended families, with priority given to women's privacy. This is appreciable in the segregation of private and public spaces in houses. The matrilineal system was adopted by the Mappila communities of Malabar as a cultural throwback to their Hindu origins. House forms generally follow the typical Hindu house typology, but are subdivided or extended to meet changing needs. The front veranda and entrance were mainly for the men of the family while women occupied the more private areas, such as the central interior. The private living quarters were generally around the core or on the upper floor. Each daughter's living space or private area was arranged as a small complete apartment with a bedroom, toilet, bathroom, and a small sitting area.

The most prominent among the residential types are *nalakangal* (courtyard houses) and *ottakangal*, which are forms of *nalukettu* and *ekasala*. *Nallukettu* is a house type with a central courtyard called *tharavad*. Karamkunnath Tharavad, near Thrikkavu Temple, would be an example. There are also many *illams* (ancestral Namboothiri Brahmin houses) that were converted to Muslim *tharavads* when the Nampoothiri converted to Islam. *Ekasala* is a house type usually with rectilinear form and no inner courtyard. *Ekasalas* are occupied by fishermen and other middle-class people and predominate in the historic town of Ponnani, as opposed to houses with *padippura* gateways, occupied by the wealthier classes. *Ekasalas* are mainly single-story structures, owned by the different religious groups of

Figure 32: Historic residential area of Ponnani

Ponnani, i.e. Hindus and Muslims. They all follow the same *thacchusastra* design principles along the main residential corridors (Fig. 32).

A typical Muslim house in Ponnani would have a *padippura* (gateway), a *padamuttam** (front yard), a *padakolaya** (veranda), a *padavathil** (doorway), a *padappuram** (a dais-like plinth on either side of the *padavathil*), a *chadiala** (a multiuse furnished room), and a *nadumuttam* (central courtyard).

There are residential types with and without *padippuras* (Figs. 33 and 34). These gateways, where present, were ornamented and served as a welcoming feature before the houses of the elite, primarily Muslim merchants. The richness of a *padippura* was an indication of the owner's wealth. The roofing on such houses was generally of Malabar *veeti* (rosewood), a naturally termite-resistant high-grade timber.

The usual architectural features include elongated verandas, decorated timber columns, timber ceilings, wooden furniture, gateways, doors, *balakodam* (timber joinery details), arches, broad *kottili* (hallways), *mandakam* (rooms), attics, gables, eave boards, courtyards, *mathok* (architraves), etc. *Nalakangal* houses typically have multiple *kottili* hallways arranged around the courtyard, whereas *ottakangal* houses have a single *kottili* as a common gathering space for family members.

Courtyard houses have been transformed over time. Ownership has changed from single to multiple. Plot sizes have been reduced. Figure 35 illustrates one such transformation of a traditional courtyard house.

Figure 33: *Ekasala* house with a colonnaded veranda

Figure 34: View of *padippuras* (entrance gateways)

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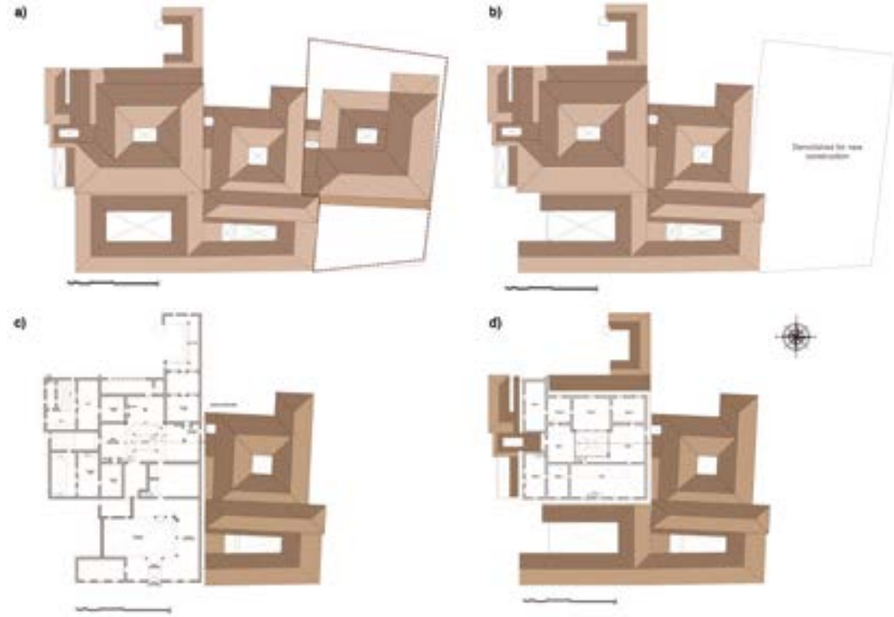

Figure 35: Transformation of a courtyard house a) Original footprint b) One side of the house is demolished c) There is an existing ground floor plan where one side of the house is owned by one family and the other by another d) First floor plan.

Community

The predominant Muslim community included the Makhdums, Thangals, Marakkars, and Memon Muslims.

Gujarati Brahmins settled in the Thrikkavu area of Ponnani, along with Gujarati Memons, for purposes of trade.

Mappila Muslims were largely traders and fishermen, whereas the fisher-people known as Mucua were Hindus later converted to Islam. The Viswakarma community engaged in boat-making.

The Makhdums were Yemeni in origin and settled in Ponnani in the late 15th century. Many Makhdums were renowned scholars, literati and polyglots. They propagated the message of Islam in Madura, Thirichirappally Thanjavoor and Nagoor, then came over to Cochin and, after a short stay there, settled in Ponnani. The early Makhdums' contribution to the compilation of the monumental botanical treatise *Hortus Malabaricus* ("Garden of Kerala") is worth mentioning, and many of their family houses still exist in Ponnani (Kunnath 2015).

Figure 36: Artisan working on pottery

A 500-year-old tribal community called the Koshavans, which migrated from Andhra Pradesh to Kerala, still engages in its ancestral craft of pottery (Fig. 36). They came to Thirumanasseri Kotta to make the pots used for rituals in the temple in medieval times. Their products were usually sold in Ponnani's *Valiyangadi* market. Only seven families in the community's present generation continue this craft in view of its low revenues as compared to white-collar jobs and current changes in farming, as they used to take clay from the bottommost layers of arable soil.

Conclusion

The forces of economic, cultural, and architectural homogenization have become a threat to the survival of vernacular building traditions worldwide. Ponnani is no exception.

Yet although the settlement is being gradually transformed, it still retains its historic fabric. Landscape and architecture are intertwined, making them especially worth preserving.

Geographical location is well known to influence the settlement process, community structure, occupations, sociocultural aspects, architectural forms, and local building techniques and materials. Yet some of Ponnani's heritage is on the verge of dereliction for reasons including lack of heritage awareness, poor planning, lack of involvement of local stakeholders in planning decisions, and an absence of appropriate heritage bylaws and guidelines.

It is therefore important to create awareness among the people of Ponnani about their heritage so that they may help preserve it for future generations, giving them the opportunity to use this resource as a repository for context-based construction.

* Glossary | Glosario | Glossário

Chadiala: In place of a plinth on either side of a *padappuram*, an easily accessible multiuse furnished room used for sleeping.

Godown or *gudaam* in local dialect: A warehouse or area where market goods are stored.

Kochangadi: Small market.

Mathok: Architrave.

Nalakam: Courtyard arrangement flanked by three *kottili* (hallways), letting in natural light and ventilation.

Padakolaya: A veranda or sitting place where a good number of people may be seated, with timber columns and wooden furniture.

Padamuttam: The front yard of a dwelling, usually with a small garden or with fruit trees such as mango or jackfruit.

Padappuram: A dais-like plinth on either side of the *padavathil*, a multiuse space used mainly by the men of the family for prostration and also for dining during festivals, as well as for sleeping. The door is usually highly decorated, with motifs in brass and copper, with a circular calling bell and a feature called *cheep* for closing the door.

Padavathil: A doorway aligned with the padippura gateway.

Padippura: A gateway with decorated wooden doors common in Ponnani. Some have a plinth (*padappuram*) on either side and are roofed with timber rafters and Mangalore tiles.

Samoothiris: Rulers of Malabar in the 15th and 16th centuries whose realm extended from Kollam to the Quilandy region of present-day Kerala.

Valiyangadi: Main market.

References | Referencias | Referências

Chulliparambil Koyamu, Kareem. 1986. *Malappuram Gazetteer*. Thiruvananthapuram: Kerala Gazetteers.

Desai, Miki. 2018. *Wooden Architecture Kerala*. Ahmedabad: Mapin Publishing Ltd.

Gundert, Hermen. 1843. *Keralolpathi*. Mangalore: Basel Mission Book & Tract Depository.

Gupta, Ashin Das. 1967. *Malabar in Asian Trade 1740 – 1800*. Cambridge: Cambridge University Press.

Habib, Irfan. 1985. *An Atlas of the Mughal Empire*. New Delhi: Oxford University Press.

Hamilton, Francis Buchanan. 1807. *A journey from Madras through the countries of Mysore, Canara and Malabar*. 3 volumes. London: Cambridge University Press .

Innes, Charles Alexander. 1908. *Malabar (Gazetteer)*. Thiruvananthapuram: Kerala Gazetteers Department.

Kunnath, Ammad. 2015. *The rise and growth of Ponnani from 1498 A.D. To 1792 A.D*. Calicut: Department of History, University of Calicut.

Kutty, Theruvathveetil Abdurahiman. 2015. *Ponnani Paithrikavum Navodhanavum*. Calicut: Pookavanam Books.

Logan, William. [1887] 1997. *Malabar Manual*. Thiruvananthapuram: Kerala Gazetteers Department.

Menon, Alappat Sreedhara. 1967. *A Survey of Kerala History*. Calcutta: National Book Stall.

Menon, Gangadharan (ed.). 2000. *The Land of Malabar: The book of Duarte Barbosa*. Kottayam: Mahatma Gandhi University.

Miller, Roland E. 1976. *Mappila Muslims of Kerala: A Study in Islamic trends*. Bombay: Orient Longman.

P.A, Zeiphudin, and Krishnakumar K.G. 2012. Ponnanni Ponvahini Ponnanayam. *Journal of Kerala Local Historians*.

Schoff, Wilfred Harvey. 1912. *The Periplus of the Erythraean Sea*. New York: Longmans, Green & Co.

Sharma, Yogesh (ed.). 2010. *Coastal Histories: Society and Ecology in Pre-Modern India*. New Delhi: Primus Books.

Shokoohy, Mehrdad. 2013. *Muslim Architecture of South India: The Sultanate of Ma'bar and the Traditions of Maritime Settlers on the Malabar and Coromandel Coasts (Tamil Nadu, Kerala and Goa)*. London and New York: Routledge.

Thampuran, Ashalatha. 2001. *Traditional Architectural forms of Malabar Coast*. Calicut: Vastuvidyapratisthanam Academic Centre.

Zeiphudin, P.A; and Krishnakumar, K.G. 2012. Ponnanni Ponvahini Ponnanayam. *Journal of Kerala Local Historians*, 1: 1-30.

Biography | Biografía | Biografia

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Lucas Martí Guitera

Armando Brasini's modern classicism

El clasicismo moderno de Armando Brasini

O classicismo moderno de Armando Brasini

Keywords | Palabras clave | Palavras chave

Neo Baroque, Fragment, Complexity, Rome, Overlap

Neobarroco, Fragmento, Complejidad, Roma, Superposición

Neobarroco, Fragmento, Complexidade, Roma, Sobreposição

Abstract | Resumen | Resumo

The work of Armando Brasini is an inescapable part of Rome's cityscape. Despite this, and the great visual interest of his work, this Italian architect has received very little attention from scholars. However, his work displays an extraordinary dynamic and attractive classicism, both traditional and modern, since there is something in it that says that it can only be a 20th century work. The purpose of this article is to try to analyze, albeit superficially, the mechanisms through which Brasini generates an architecture equally classical and convincing and indisputably modern. It also seeks to contribute to give visibility to the work of this not very well known architect, which can also open a debate about whether his quite peculiar method could be considered as a starting point to generate a compelling classical architecture for the present time.

La obra de Armando Brasini es una parte ineludible del paisaje de la ciudad de Roma. A pesar de esto, y del enorme interés plástico de sus obras, este arquitecto italiano ha recibido poca atención por parte de los estudiosos. No obstante, cuando uno se enfrenta a su obra, se encuentra con un clasicismo increíblemente dinámico y atrayente, al mismo tiempo tradicional y moderno, ya que algo en él nos indica que sólo puede tratarse de una obra del siglo XX. El objetivo del presente artículo es tratar de analizar, siquiera superficialmente, los mecanismos a través de los cuales consigue Brasini generar una arquitectura que es, a la vez, convincentemente clásica e irremediablemente moderna. Busca también contribuir a dar a conocer la obra de este arquitecto tan poco estudiado, lo que permitiría además ayudar a abrir el debate sobre si su método, muy particular como veremos, podría ser tomado como punto de partida para generar una arquitectura clásica convincente para el momento actual.

A obra de Armando Brasini é uma parte ineludível da paisagem da cidade de Roma. Apesar disto, e do enorme interesse plástico das suas obras, este arquiteto italiano recebeu pouca atenção por parte dos estudiosos. Não obstante, quando alguém se encontra frente a frente com a sua obra, depara-se com um classicismo incrivelmente dinâmico e atraente, e ao mesmo tempo tradicional e moderno, já que algo nele nos indica que apenas se pode tratar de uma obra do século XX. O objetivo do presente artigo é tratar de analisar, ainda que superficialmente, os mecanismos através dos quais consegue Brasini criar uma arquitetura que é, ao mesmo tempo, convincentemente clássica e irremediavelmente moderna. Procura também contribuir para dar a conhecer a obra deste arquiteto tão pouco estudado, o que permitiria também ajudar a abrir o debate sobre se o seu método, bastante particular como veremos, poderia ser tomado como ponto de partida para criar uma arquitetura clássica convincente para o momento atual.

Antecedentes

El lector de la presente revista será sin duda consciente de que, a lo largo del siglo XX, se ha prestado mucha más atención por parte de los historiadores a los arquitectos y obras que se adscribían a los presupuestos del Movimiento Moderno. Esto ha tenido como consecuencia la errónea imagen de un siglo con un brevísimo comienzo Art Nouveau que heroicamente se tornó Modernista, en el sentido anglosajón de la palabra. Con esto se dejan fuera, de un plumazo, algunas de las experiencias arquitectónicas más interesantes de la primera mitad del siglo XX. Desde grandes maestros como Lutyens, a movimientos regionales como la Escuela de Ámsterdam, la Gracia Sueca o el Cubismo Checo han quedado como meras notas a pie de página (Rivera 2017). Cierto es que muchos de estos movimientos tuvieron un final relativamente abrupto tras la Segunda Guerra Mundial, pero ese no es el caso del arquitecto que nos ocupa, Armando Brasini, que trabajó hasta bien entrados los años 60.

Una de las consecuencias preocupantes de esta laguna historiográfica es que se han dejado sin apenas estudiar las arquitecturas continuistas del clasicismo y los estilos más "tradicionales". Muchas de ellas, como las obras de Reginald Blomfield, son magníficas, pero ciertamente estáticas en cuanto a la adaptación de la arquitectura al pensamiento de su época, y podrían pasar por obras del siglo XIX. Sin embargo, muchas de ellas tienen también un carácter indefectiblemente moderno, y conocer los mecanismos que hicieron esa fusión posible sería de enorme utilidad para poder desarrollar un clasicismo actual convincente y adaptado al momento actual.

El objetivo del presente artículo es, por tanto, aportar un análisis, por somero que sea, sobre tres de las obras principales del romano, que nos permita destilar una serie de mecanismos a partir de los cuales este italiano fue capaz de dotar sutilmente a sus obras de una sensación moderna sin comprometer en absoluto su imagen y su aspecto abiertamente barrocos.

Para ayudarnos en esta tarea, será de utilidad referirnos a un concepto de largo recorrido en la filosofía del siglo XX, que podríamos definir sucintamente como "fragmento". La obra de Bergson, Heidegger, Bachelard o Wittgenstein (recordemos que parte de estos filósofos trabajaron después de la Segunda Guerra Mundial) nos habla, de una manera u otra, de una interpretación fragmentaria de la existencia, ya sea a través de fragmentos temporales, perceptivos o interpretativos respecto al lenguaje. Atrás quedaba la época en que parecía posible aglutinar la realidad en una única teoría que lo explicase todo. Naturalmente, esto tuvo una expresión en el arte, y ha sido muy reconocido en la pintura, por ejemplo, en las grandes obras maestras del cubismo o del deconstructivismo, que en gran parte son la representación artística de esta interpretación del mundo (Argan 1961).

Sólo como ejemplo final, basta mencionar, por ejemplo, la Chiesa dell'Autostrada de Giovanni Michelucci, cuya única interpretación posible es la de un todo conformado por fragmentos espaciales que se compensan los unos a los otros, dando lugar a un edificio complejo en conjunto pero que funciona bien en la escala más cercana. El enfoque fragmentario de la composición es, más que los pilares arboriformes, lo que dota de ese atractivo caos visual a esta obra de los años 60. Se ha considerado que la fragmentación opera de manera similar en el caso de Brasini, añadiendo una capa de información clásica que podría darnos pistas sobre cómo avanzar de manera convincente en el camino del clasicismo sin abandonar la vía de la experimentación espacial y sensorial.

Para llevar a cabo este análisis, se han seleccionado tres obras romanas de este magnífico arquitecto: la iglesia del Sacro Cuore Immacolato di Maria, el convento del Buon Pastore y el complejo proyecto para su casa, la Villa Brasini.

Sacro Cuore Immacolato di Maria

Esta descomunal iglesia en el norte de Roma (de unos 84 metros de largo) cierra una imponente perspectiva en tridente junto a la Villa Glori, en cierto modo similar a la de la Piazza del Popolo. Como encargo de la curia a través de los Padres Claretianos, Brasini tuvo especial interés en convertir este proyecto en una obra maestra que representase su pensamiento en cuanto a la arquitectura religiosa. La obra se desarrolló entre 1923 y 1954.

Podría discurrirse largo y tendido sobre los diseños preliminares de Brasini (Pisani 1996) y cómo fue modificando la planta desde una versión del Panteón hasta la complejísima realidad que podemos apreciar hoy en día, pero en aras de la concisión centraremos el análisis en lo que hemos considerado como el proyecto final, la idea que se hubiera materializado si se hubiera acabado la titánica obra.

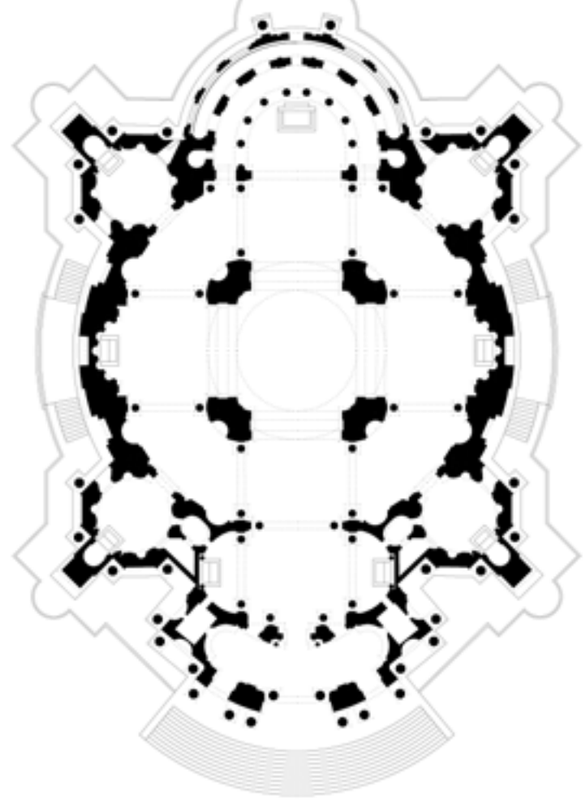
Así, Brasini trata de cumplir con las nuevas exigencias congregacionales en un estilo fiel a la tradición clásica. De hecho, en una de sus cartas podemos leer que considera esta obra como más cercana a Bramante que a Miguel Ángel (Brasini 1979), como una obra total y casi incontestable. Al margen de lo que el propio autor pudiese opinar de su obra, un rápido vistazo a la planta muestra la enorme complejidad del proyecto.

Dado que no está completamente claro cuál era la propuesta definitiva que Brasini pretendía realizar, y lo publicado sobre el tema presenta una serie de planos disímiles, se ha optado por escoger lo que se considera pudieron ser las intenciones generales. Para poder desgranar esto convenientemente, se divide este breve análisis entre la planta (bastante inequívoca), el alzado y la sección.

Comencemos pues por la planta. En un solar donde no había apenas condicionantes de dimensión ni topografía, Brasini decide colocar una iglesia aparentemente de planta central, matizada mediante una serie de mecanismos. En primer lugar, los cuatro grandes machones del centro consiguen combinar la planta circular con una suerte de cruz griega. Además, esta se ve convertida en una planta longitudinal por un nártex y un endonártex que alargan la dirección de la nave principal, pero coloca hábilmente una serie de pantallas de columnas, de nichos y de bóvedas distintas que nos hacen dudar sobre si el edificio llega realmente a ser longitudinal. Se cuida mucho de curvar estas dos estancias para que no interfieran con la sensación general interior y exterior de centralidad.

Además, coloca cuatro enormes capillas en diagonal respecto a los machones, de manera que aporta una cuarta interpretación: la cruz griega girada. Dicha interpretación se ve enfatizada por las grandes entradas que dan a estas capillas, pero negada por los huecos de muro que las conectan con el espacio principal y por los contrafuertes exteriores que parecen negar su importancia. Por último, Brasini utiliza un conocido recurso del Renacimiento (Wittkower 1995): la pantalla de columnas crea una suerte de girola tras el presbiterio, y refuerza así una interpretación

Figura 1: Planta del Sacro Cuore Immacolato. Editado por el autor a partir de un original tomado de Mario Pisani (Pisani 1996: 18)



más procesional, más direccional si se quiere, del templo. Esta pantalla, que es triple, consigue también que la luz entre cenitalmente de una manera doblemente indirecta, generando una gran tensión en el ábside.

El alzado, que podemos apreciar hoy en día inacabado, también podría ser contrastado con la interpretación de las ideas previas de Brasini sobre el tema. No obstante, se ha escogido lo que se cree pudo ser la intención final del romano.

Como se ve, Brasini plantea un podio de escaleras que nos lleva a una serie de frontones partidos sobre descomunales columnas toscanas en mármol. Este frente da paso a un muro más sencillo con alguna imposta interrumpida por nichos y acentos hasta llegar a dos grandes contrafuertes coronados por las estatuas de los Evangelistas. Como detalle, Brasini planteó sendas fuentes a los pies de estos hercúleos machones. Algo más arriba, el arquitecto repite el clásico motivo de la cubierta doble (Wittkower 1995), algo más alta para la nave que para el nártex, que en este caso corresponde al nártex y al endonártex. Por detrás de unos ángeles de mármol aparecen los cuatro brazos idénticos de la cruz griega que nos indicaban los machones, en simple ladrillo decorado con algún acento de mármol.

Finalmente vemos alzarse la cúpula, que tensa enormemente las proporciones del conjunto y nos remite, a pesar de la opinión del propio autor, al proyecto de Miguel Ángel para la cúpula de San Pedro, más que al de Bramante (Wittkower 1995). No en vano esta hubiera sido la segunda cúpula más grande de Roma de haberse terminado. Remata el conjunto una linterna demasiado voluminosa para la cúpula que la sustenta.

De nuevo vemos una composición equívoca, con proporciones forzadas hacia el cielo y en extensión, representando con la curva del pórtico la planta central, la diagonal con los contrafuertes, la cruz griega con los altos frentes de templo y la longitudinal con la posición de la cúpula respecto al frente. No hay una interpretación única. El uso del material nos desconcierta aún más, pues Brasini lo utiliza de una manera tal que podríamos comprender este edificio como si una pequeña iglesia de ladrillo y aplacada por completo en mármol hubiera sido

Figura 2: Alzado del Sacro Cuore Immacolato. Dibujo del autor a partir de un original tomado de Luca Brasini (Brasini 1979: 123)

hinchada hasta dejar ver extensas estrías de ladrillo visto. Las proporciones y los frontones partidos coadyuvan a dar esa sensación de edificio en imparable crecimiento. Y a la vez, da una coherencia casi total a la interrupción abrupta de los motivos de mármol a lo largo del edificio.

Por último, nos asomamos a la sección, que ha sido compuesta a partir de diversos dibujos del propio Brasini, escogiendo aquellas partes que coinciden con lo realmente realizado para generar un todo armónico. En todos estos dibujos existe una profusa decoración de los muros, que se ha omitido porque no se comenzó siquiera en el proyecto real. Parece imposible, de momento, saber si Brasini renunció a la decoración de forma consciente o si fue el presupuesto el que le obligó a hacerlo.

En cualquier caso, la sección nos da una capa más de información sobre esta obra. Y es que, como se ve en la sección transversal, Brasini ha intersecado una gigantesca cúpula similar al Panteón con los cuatro brazos de la cruz griega, corroborando la interpretación inicial a este respecto. Además, la increíble cúpula vuelve a presentar pantallas de columnas que ocultan las entradas de luz desde diversos ángulos, como se ve por otro lado en el ábside. Cabe mencionar también cómo Brasini "representa" la cruz griega con potentes arquitrabes sostenidos por columnas,

Figura 3: Vista exterior de la iglesia, con la cúpula inacabada. Editado por el autor a partir de un original tomado de Mario Pisani (Pisani 1996: 18)

y refuerza, como hemos dicho, la planta central con la curvatura de la bóveda. De nuevo vemos cómo Brasini, dentro de esa complejidad difícil de desentrañar, ha operado sin embargo con reglas muy nítidas sobre cómo y dónde superponer la decoración y las interpretaciones.

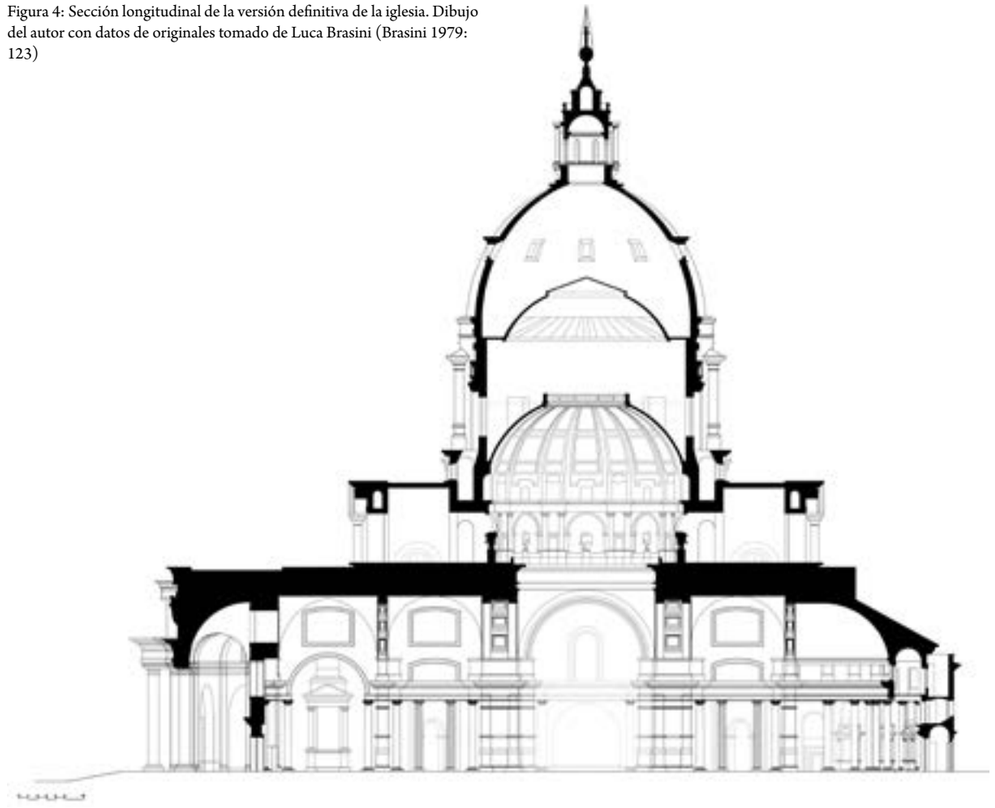


Figura 4: Sección longitudinal de la versión definitiva de la iglesia. Dibujo del autor con datos de originales tomado de Luca Brasini (Brasini 1979: 123)

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Figura 5: Vista de la nave central desde el deambulatorio. Editado por el autor a partir de un original tomado de Luca Brasini (Brasini 1979: 305)

Figura 6: Nave central de la Basílica. Editado por el autor a partir de un original tomado de Luca Brasini (Brasini 1979: 300)

Esta sección deja traslucir, de manera muy notable, cómo Brasini trabaja con las grandes referencias de espacios abovedados de la historia, en este caso, con el Panteón de París (la secuencia de tres cáscaras es casi idéntica) y, de manera más lejana, con la Catedral de San Pablo de Londres.

Se puede decir que esta iglesia, con todo su programa decorativo barroco, ofrece al visitante moderno la experiencia del fragmento, del complejo conjunto de espacios inacabados que han de ser completados por el espectador, atándolo así a la interpretación fenomenológica del espacio tan querida y fecunda en el siglo XX. Todo ello sin comprometer su integración en la ciudad y en la larga historia de la arquitectura clásica.

Complesso del Buon Pastore

El Complesso del Buon Pastore tiene su origen en la voluntad de crear un hospicio para niñas huérfanas de la mano de las Hermanas de la Caridad del Buen Pastor. Construido entre 1929 y 1943, fue utilizado como hospital de campaña durante la estancia de las tropas estadounidenses en Italia y posteriormente ha sido reconvertido a instituto público.

Ahora mismo se enmarca en una pedanía de Roma, cerca de unas zonas baldías. Sin embargo, en su día se trataba de un complejo monástico a la antigua usanza: en una zona apartada, rodeado de campos de cultivo y en la intersección de dos caminos, se encargó a Brasini la creación de una ciudad de Dios.

Lo primero que salta a la vista es la decisión del arquitecto de generar un edificio en forma de V, que parece abrirse hacia la campiña por la presión ejercida por la capilla. Esto produce, de manera rigurosa y geométricamente coherente, una forma extraña para el patio principal, de manera opuesta a la tradición clásica de generar un patio de honor regular, que trata de empujar las irregularidades hacia las estancias de servicio. En el caso de Brasini ocurre lo contrario, se fuerza la planta para crear un espacio complejo e irregular a la vista. Si nos fijamos ahora en el acceso principal, Brasini ha conseguido con este giro que en la vista de la entrada veamos también en escorzo la fachada de las dos alas laterales. Esto tiene una importancia capital en lo que explicaremos más adelante. La vinculación de Brasini con el Neobarroco hace inevitable ligar esta disposición general a la obra de uno de los grandes artistas del Barroco: Filippo Juvarra. En la planta son notables las semejanzas con la Palazzina di Caccia di Stupinigi, si bien el elemento centralizador, que en este caso es la iglesia, y en la Palazzina, el gran salón de acceso, ocupa posiciones diferentes. No obstante, la traslación de ese elemento para generar un patio de geometría compleja es en sí mismo un mecanismo interesantísimo de Brasini para complejizar el espacio dentro de una lógica geométrica clara.

Este primer cuerpo que cierra la entrada contiene las escaleras y dos pantallas murarias que simplemente ocultan la vista del patio principal. Además, las mencionadas escaleras suben desde un sótano, por lo que al entrar nos encontramos en el descansillo de la escalera, con la posibilidad de subir hacia el siguiente piso o atravesar una pantalla de pilares y otra de columnas hasta llegar al patio. Si subiéramos, nos encontraríamos en una terraza abierta con arcadas a ambos lados, que da paso al resto del edificio.

Figura 8: Planta primera del Complesso del Buon Pastore. Editado por el autor a partir de un original tomado de Luca Brasini (Brasini 1979: 73)

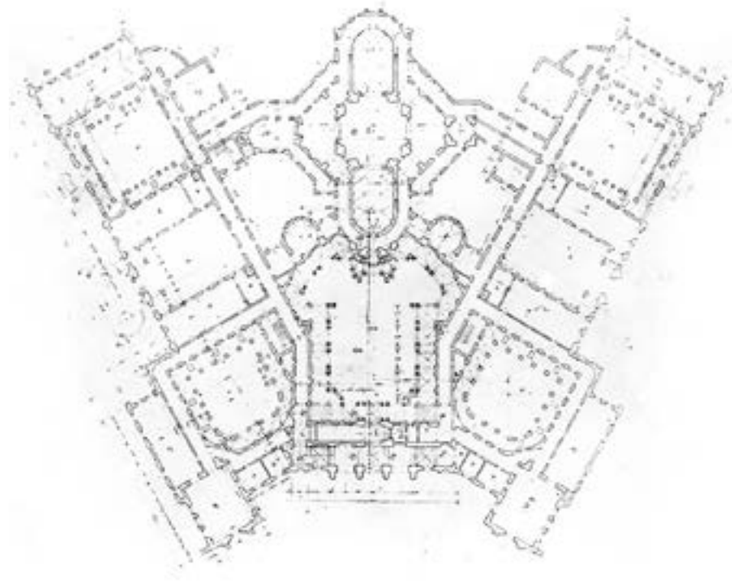

Figura 7: Planta baja del Complesso del Buon Pastore. Editado por el autor a partir de un original tomado de Luca Brasini (Brasini 1979: 72) 1979: 73)

A partir de aquí, el conjunto presenta dos alas con dos patios alrededor de los cuales se distribuyen las habitaciones de los residentes, las aulas, y algunas estancias como el teatro o el comedor. No obstante, los planos de fachada que generan el alzado exterior siempre están ocupados por los cuerpos de escaleras o por simples muros. Esto permite al arquitecto una gran libertad compositiva y enfatizar el ensimismamiento de un tipo como es el del convento.

Por último, una capilla con ciertas similitudes con el Sacro Cuore se encuentra elevada sobre el plano de la planta baja, y se accede a ella a través del patio o de dos corredores en ángulo desde las alas del complejo. La capilla presenta de nuevo la dualidad de planta central o longitudinal, con pantallas permeables que sugieren los espacios adyacentes. Nótese también que desde la campiña no hay accesos al edificio.

En alzado, una vista frontal nos da una cantidad de información casi suficiente para explicar el edificio. Primero, presenta ya la característica más notable de la decoración exterior en Brasini, que consiste en concentrar ésta en la parte central inferior de cada "escena", de manera que el perímetro de nuestro campo visual se desdibuja, pareciendo inacabado. Es en éste perímetro donde aparecen arcos de descarga de ladrillo, impostas interrumpidas o ventanas sin recercado. En cada escena, allí donde pongamos la atención, parecerá que el edificio se desvanece o se construye frente a nosotros.

Si fijamos la atención en una de las dos torres laterales vemos la siguiente característica: la composición deliberadamente fragmentaria. Esta torre presenta tres frentes distintos: el de templo para el alzado principal, otro para el lateral, y un cuerpo más doméstico para la vista desde los patios interiores. Brasini sugiere constantemente la siguiente escena y las yuxtapone sin pudor, asumiendo la complejidad de la realidad que ha creado. Los pináculos ayudan también a identificar la localización de las siguientes escenas y generan un bosque recortado contra el cielo, donde no sabemos con qué criterio aparecen y desaparecen. Pero esto no es más que una ilusión, pues de nuevo Brasini coloca los pináculos con un criterio claro: en las esquinas del perímetro más exterior del edificio. Con estos juegos de confusión y rigidez conceptual es con los que consigue que el edificio no parezca caótico, sino inacabado, pues el orden se percibe, aunque sea difícil identificar cuál es.

Esta composición tiene una similitud notable con otro proyecto de Juvarra: el Concorso Clementino. En primer lugar, la composición de dos pisos con tríadas de arcos que generan un vacío visual profundo es común en ambos proyectos, aunque en el caso de Brasini no esté proyectado hacia delante. En segundo lugar, los torreones de Brasini cumplen una función similar a la de los templetes de acceso en el proyecto de Juvarra, es decir, la de enfatizar en ángulo obtuso los alzados laterales y marcar un acento vertical. Por último, estos templetes cuentan, en el Concorso Clementino, con unas magníficas escaleras de acceso curvas en dos tramos. Si bien nunca llegaron a materializarse, en la planta baja del conjunto podemos ver cómo Brasini planteaba unas escaleras similares, aunque más sencillas, para el segundo patio.

En el alzado lateral, tan del agrado de Venturi (Venturi 1966), se pueden ver composiciones de alzados en dos planos, con homotecias de sus partes y agudos juegos de conexión con las siguientes partes. Brasini utiliza también el desvanecimiento del ornamento como una manera lógica de optimizar la decoración: más profusa y detallada allí donde el espectador verá el elemento de cerca, más difusa en las partes altas y lejanas, donde no podrá acercarse, aunque quiera.

No vamos a tratar en este caso en profundidad los patios secundarios, que presentan inteligentes juegos de equívocos, de desplazamientos decorativos y sutilezas de composición. Solamente sirva de ejemplo esta imagen donde Brasini nos deja ver cómo el pasillo continúa oblicuo, con contraventanas en las habitaciones (dado que el pasillo es, en cierto modo, exterior) o cómo compone un alzado homogéneo del patio, que es coherente y continuo en su proyección, pero que juega con la profundidad en la realidad tridimensional.

El punto fuerte del conjunto es, sin duda, el patio principal. No sólo nos muestra una gama de colores exquisita, con sutiles combinaciones de tonos tierra del Lazio, con mármol y pequeñas impostas de *pietra serena*, sino que juega con la composición de un modo magistral. El patio se compone de secciones no coincidentes de rectángulo, círculos y dos pequeños fragmentos diagonales que hacen referencia a la dirección de las alas del conjunto. Este juego voluptuoso de concavidades y convexidades, amenizado por las impostas que se interrumpen con las ventanas, que invierten la relación de profundidad entre piedra y revoco (destacado sobre el mármol) generan un movimiento acelerado que se culmina con la cúpula de la capilla.

Dicha cúpula se esconde tras una pantalla de columnas que esconde las escaleras de acceso a la capilla, con una terraza que oculta parte del tambor. De ahí nacen unas descomunales volutas que parecen tomar impulso hacia la linterna, que está a todas luces fuera de escala. Y es que tanto los nervios como la linterna son demasiado grandes para las dimensiones de la cúpula y del patio. Lógicamente, la linterna está en relación con la escala del conjunto y las volutas y nervios sirven el propósito de relacionar ambas escalas.

Por último, la vista desde la campiña muestra claramente el proceso compositivo de Brasini, por el cual el conjunto se "abre" literalmente por detrás, y del mismo modo que en el Sacro Cuore se puede casi sentir el movimiento. Aquí la cúpula ya no está fuera de escala y estabiliza un conjunto que se esparce horizontalmente, sobrio y sin apenas decoración por la lejanía desde la que será visto, inexpugnable en su condición de refugio de Dios.

Considerada la obra maestra de Brasini, es quizá la que muestra con mayor profusión todas sus sutiles técnicas de fragmentación del espacio.

Merece la pena comparar esta obra maestra con otra similar de un autor español en muchos sentidos homólogo a Brasini, Luis Moya Blanco. En su obra maestra, la Universidad Laboral de Gijón, desplegó un clasicismo moderno con notables similitudes. Al tratarse de un gran complejo educativo estructurado en torno a patios, es

Figura 9: Vista general del Buon Pastore. Editado por el autor a partir de un original tomado de *Rome Second Time* (https://romethesecondtime.blogspot.com/2019/01/buon-pastore-armando-brasinis-complex.html, consultado el 05/06/2021)

Figura 10: Entrada al primer patio lateral del conjunto. Editado por el autor a partir de un original tomado de Robert Venturi (Venturi 1966: 92)

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Figura 11: Primer patio lateral del convento. Editado por el autor a partir de un original tomado de Luca Brasini (Brasini 1979: 230)

Figura 12: El patio central, desde la caja de escaleras. Editado por el autor a partir de un original tomado de El Poder de la Palabra (https://www.epdlp.com/edificio.php?id=7365, consultado el 05/06/2021)

Figura 13: Encuentro del círculo y el rectángulo del patio central. Editado por el autor a partir de un original tomado de Rome Second Time (https://romethesecondtime.blogspot.com/2019/01/buon-pastore-armando-brasinis-complex.html, consultado el 05/06/2021)

Figura 14: Vista trasera del convento, desde la campiña. Hoy esta vista es imposible, pues el lugar desde el que se tomó la foto está ocupado por edificios. Nótense también los pináculos, eliminados a día de hoy por razones de seguridad. Editado por el autor a partir de un original tomado de Mario Pisani (Pisani 1996: 106)

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fácil compararlo con el Complesso del Buon Pastore. No obstante, hay que hacer notar una serie de diferencias clave.

A pesar de tener, como Brasini, un amplio terreno a su disposición, Moya proyecta un edificio magníficamente clásico a partir de composiciones sutilmente asimétricas. En primer lugar, la entrada al patio principal se encuentra en una de las esquinas, casi a ejes con la torre de la capilla, también descentrada. Los grandes pórticos de mármol se sitúan, desiguales, en las pandas contiguas a la de acceso, ayudando a contrapesar la presencia de la majestuosa capilla. Esta capilla, al estar inserta en el patio, genera dinamismo, pero no tan violento como en el caso de Brasini. La composición es, en planta, un perfecto ejemplo de contrapeso de masas y concatenación de patios en una composición notablemente moderna.

Si bien el edificio de Moya es otro ejemplo magnífico de cómo llevar a cabo un clasicismo moderno, sus mecanismos operan de manera distinta, compensando los acentos entre sí, articulando la planta de manera moderna y depurando el lenguaje clásico hasta casi convertirlo en pura construcción. Brasini, sin embargo, juega con una simetría casi total, que matiza con la fragmentación, el desfase y la interrupción, aparentemente arbitrarias, de un elenco riquísimo de formas barrocas, totalmente bajo su control a través de una ingeniosa geometría. Quizá enfrentar a estos dos grandes maestros nos ayude, de hecho, a entenderlos mejor aún.

Villa Brasini

Como obra final hemos escogido un edificio que es confuso y complejo ya desde el punto de vista de la tipología. Por un lado se puede relacionar con las viviendas estudio presentes en toda Europa, por ejemplo, con el Carmen de los Rodríguez-Acosta (Moneo 2017), y por otro no deja de ser una *palazzina* al más puro estilo italiano, pensada para ser compartida por cuatro o cinco familias.

Construida en dos periodos, se compone de dos partes bien articuladas: Villa Flaminia, hasta 1925, y Villa Augusta, hasta 1933. En el plano, que muestra las plantas principales de ambas secciones del edificio, se vuelve evidente que Brasini pretende obligar a generar un recorrido alrededor del edificio para acceder a cualquiera de las entradas principales. De hecho, incluso el coche ha de pasar por debajo del edificio dos veces para llegar al aparcamiento de la parte más alta. Jugando con el aterrazamiento, Brasini consigue una vez más fragmentar el alzado en segmentos que comparten elementos, pero están pensados para ser vistos por separado.

Fijémonos primero en el alzado de la Via Flaminia. Su perfil naval, similar a las realizaciones de la época, yuxtapone una proa de ocho pisos a un pequeño alzado de dos hacia el patio principal. Presenta una composición más o menos homogénea en proyección, con ventanas a intervalos regulares, que se adereza con cambios en la profundidad del plano, impostas interrumpidas, contrafuertes, y algún que otro accidente, como el gablete curvo hacia el centro del alzado.

Figura 15: Planta principal de Villa Brasini. Dibujo del autor a partir de datos tomados de un original tomado de Mario Pisani (Pisani 1996: 58) y de Google Maps

El alzado interior del patio, magnífico, va concatenando alzados completos, que comparten una crujía, una imposta o la línea de cornisa. Brasini ata así una serie de fragmentos entre sí. No de forma violenta, sino sutil, nos va guiando de una terraza a otra y nos obliga a recorrer todo el edificio.

Figura 16: Alzado principal del patio de honor. Dibujo del autor a partir de datos tomados de un original tomado de Mario Pisani (Pisani 1996), de Luca Brasini (Brasini 1979), de Google Maps y de *ArchiDiAP* (http://archidiap.com/opera/il-castellaccio/, consultado el 05/06/2021)

Figura 17: Alzado en Via Flaminia. Dibujo del autor a partir de datos tomados de un original tomado de Mario Pisani (Pisani 1996), de Luca Brasini (Brasini 1979), de Google Maps y de *ArchiDiAP* (http://archidiap.com/opera/il-castellaccio/, consultado el 05/06/2021)

Figura 18: Alzado opuesto al de la Fig.17. Dibujo del autor a partir de datos tomados de un original tomado de Mario Pisani (Pisani 1996), de Luca Brasini (Brasini 1979), de Google Maps y de *ArchiDiAP* (http://archidiap.com/opera/il-castellaccio/, consultado el 05/06/2021)

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El alzado interior de la adición de Villa Flaminia, la más moderna, incluye varias sutilezas. El uso del ladrillo, el mármol y el revoco se vuelve indicativo de "pantalla", "referencia" y "edificio real", componiendo la inmensa proa a partir de una serie de pantallas con contrafuertes que se van separando del cuerpo principal y dejan entrever fragmentos de muro "real" con ventanas funcionales y utilitarias. Utiliza el ladrillo como motivo referencial, de tal manera que en este alzado pareciera que Brasini ha ocupado las ruinas de un acueducto o arquería con su moderno edificio. Esta sensación de adición, de ocupación similar a la de la Edad Media sobre las ruinas romanas, es evidente también en la vista del edificio desde la Via Flaminia.

El acento más famoso de este conjunto, la fuente que articula las dos partes de la vivienda, lleva al paroxismo las proporciones forzadas, la perspectiva aumentada y el uso de elementos barrocos exagerados. Este lugar mágico no trata ya de engañar de manera convincente a la perspectiva, sino que muestra la baraja, llevándola incluso demasiado lejos. Parábolas en lugar de elipses, juegos de espejos, frontones rotos con volutas, agolpados, demasiado esbeltos. Brasini no se priva de ninguno de los juegos tan apreciados en el Barroco, y los utiliza para llevar nuestra vista inmediatamente hacia arriba, hacia la sección más alta de la villa donde tuvo su estudio y su colección de arte.

Sin duda, esta obra es hija, en su propia composición, de la época en la que se realizó, y sin embargo es capaz de integrarse por completo en la imagen prototípica que tenemos de un pequeño grupo de casas en el Borgo de Roma.

Figura 19: Fuente de conexión entre Villa Flaminia y Villa Augusta. Editado por el autor a partir de una imagen cedida amablemente por Marco D'Antoni, de Vertigine Hairdresser, que ocupa actualmente el local.

Cabría preguntarse en este momento si el "sistema" que hemos destilado de la obra de Brasini sería válido o no hoy en día para llevar a cabo el intento hercúleo de una nueva aproximación a un clasicismo moderno. Si bien es verdad que muchas de las ideas filosóficas de la época de Brasini siguen vigentes en mayor o menor medida, sería tarea de un experto en filosofía (y quien escribe estas líneas no lo es) determinar hasta qué punto se ajustan al pensamiento actual. De cualquier manera, Brasini no dejó constancia escrita de un interés particular en ninguno de los pensadores antes mencionados, y su participación en sus ideas se debe, en principio, meramente a la influencia de estas en la cultura y pensamiento populares del momento. En la medida en que consideremos que compartimos una visión del mundo con quienes vivieron hacia la mitad del siglo XX, podrá tomarse la experiencia de la obra de Brasini de manera más o menos literal.

En cualquier caso, la obra de este arquitecto no deja de ser un ejemplo más de cómo poder trasladar un concepto complejo como el fragmento y el fenómeno de la experiencia moderna al clasicismo, y puede servir como guía para adaptar las ideas que se consideren más actuales al plano de la arquitectura de hoy.

Conclusiones

Tras haber analizado brevemente las tres obras, se podrían resumir los mecanismos de Brasini en tres ideas principales: La interrupción ordenada y cognoscible de los elementos decorativos y de los materiales constructivos más nobles; la concentración de la definición o decoración en el centro inferior de cada escena espacial; y la yuxtaposición articulada de varias escenas, con evidentes escena "principal" y vistas a las que hacen referencia la escena precedente y la posterior.

Como vemos, al contrario que muchos de sus contemporáneos clásicos, Brasini no cifró la modernidad de sus obras en el número de plantas, el uso que tendrían o una cuestionable modificación de las proporciones. De hecho, muestra su mejor cara precisamente cuando está realizando un convento o una iglesia, programas sin apenas diferencia con los del periodo barroco en los que, como buen arquitecto clásico, utiliza el puro ingenio para crear algo que, siendo clásico, pertenece sólo a su época y puede dar cuenta de todos los anhelos filosóficos sobre el mundo de sus contemporáneos.

Es precisamente esta potencialidad, esta posibilidad de expresar significados siempre nuevos, lo que le confiere al clasicismo toda su potencia. Se espera haber demostrado, por medio de las imágenes y los breves comentarios, cómo Brasini participa plenamente del mencionado concepto del fragmento, tan ligado a la idea moderna del espacio.

References | Referencias | Referências

Argan, Giulio Carlo. 1961. *El concepto del espacio arquitectónico desde el Barroco hasta nuestros días* (Transcripción de un curso dictado en el Instituto de Historia de la Arquitectura de Tucumán). Tucumán: Ediciones Nueva Visión.

Brasini, Luca. 1979. *L'opera architettonica e urbanistica di Armando Brasini: dall'Urbe Massimi al ponte sullo stretto di Messina*. Roma: Pagnotta.

Moneo, Rafael. 2017. *La vida de los edificios: La mezquita de Córdoba, la lonja de Sevilla y un carmen en Granada*. Barcelona: Acantilado.

Pisani, Mario. 1996. *Architetture di Armando Brasini*. Roma: Officina Edizioni.

Rivera, David. 2017. *La otra arquitectura moderna: expresionistas, metafísicos y clasicistas, 1910-1950*. Barcelona: Reverté.

Venturi, Robert. 1966. *Complexity and Contradiction in Architecture.* Nueva York: MoMA.

Wittkower, Rudolf. 1995. *Los fundamentos de la arquitectura en la edad del humanismo*. Madrid: Alianza.

Biography | Biografía | Biografia

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Martina Bocci

Raw Earth Construction Perspectives in Italy: An Overview Through the Rehabilitations of Casa Fenu in Villamassargia, Sardinia, and Casa di Teresa in Casalincontrada, Abruzzo

Perspectivas de construcción con tierra cruda en Italia: Aspectos generales a través de de las rehabilitaciones de la Casa Fenu en Villamassargia, Cerdeña, y de la Casa de Teresa en Casalincontrada, Abruzos

Perspectivas de construção em terra crua em Itália: Uma perspectiva geral através da reabilitação da Casa Fenu em Villamassargia, Sardenha, e da Casa di Teresa em Casalincontrada, Abruzo

Keywords | Palabras clave | Palavras chave

Italian vernacular architecture, Contemporary earth building, Participatory approach, Field-training, Sustainable local development

Arquitectura vernácula italiana, Edificios de tierra contemporáneos, Enfoque participativo, Formación sobre el terreno, Desarrollo local sostenible

Arquitectura vernacular italiana, Construção contemporânea com terra, Abordagem participativa, Formação de campo, Desenvolvimento local sustentável

Abstract | Resumen | Resumo

A detailed analysis of the rehabilitation processes of two publicly owned buildings in Sardinia and Abruzzo is taken as a basis for describing the background, difficulties and possible future developments of raw earth as a building material in Italy. Earthen construction techniques, despite a rich tradition and extensive documentation, are still considered outdated, and their use today requires a fortunate confluence of contextual factors. Archival research, literature review and a study of manuals were coupled with an examination of urban plans and public policies, as well as interviews with experts and stakeholders. This multi-approach research shows that there is a strong need to appropriate traditional knowledge so as to translate local skills into viable solutions able to meet today's needs. The key issue may be investment in training and dissemination. The mindset of the artisan, that of the *homo faber* (Sennet 2008), needs to be more widely associated with action toward sustainable local development.

Un análisis detallado de los procesos de rehabilitación de dos edificios públicos en Cerdeña y los Abruzos se utiliza para describir los antecedentes, las dificultades y la posible evolución futura de la tierra cruda como material de construcción en Italia. Las técnicas de construcción con tierra, a pesar de existir una rica tradición y una exhaustiva documentación, se siguen considerando obsoletas y requieren una feliz confluencia de factores contextuales para ser utilizadas hoy en día. La investigación en archivos, el análisis bibliográfico y el estudio de manuales se combinó con el examen de los planes urbanísticos y las políticas públicas, así como con entrevistas a expertos y partes implicadas. El enfoque múltiple de esta investigación demuestra que existe una gran necesidad de adoptar los conocimientos tradicionales para convertir las

habilidades locales en soluciones viables que puedan dar respuesta a los requisitos actuales. El problema principal puede ser la inversión en formación y divulgación. Debería haber más gente que asocie la mente de artesano, del "homo faber" (Sennet 2008), con la acción a favor del desarrollo local sostenible.

Uma análise detalhada dos processos de reabilitação de dois edifícios públicos na Sardenha e Abruzo é utilizada para descrever o contexto, dificuldades e possíveis desenvolvimentos futuros da terra crua como material de construção em Itália. As técnicas de construção com terra, apesar de serem uma tradição rica e extensamente documentada, ainda são consideradas ultrapassadas e requerem uma confluência privilegiada de factores contextuais para serem utilizadas hoje em dia. A investigação de arquivos, a revisão bibliográfica e o estudo de manuais foram associados ao exame de planos urbanos e políticas públicas, assim como entrevistas com peritos e investidores. Esta investigação multi-abordagem mostra que existe uma forte necessidade de apropriação dos conhecimentos tradicionais, de forma a traduzir as competências locais em soluções viáveis que possam satisfazer as necessidades actuais. A questão chave pode ser o investimento em formação e divulgação. São necessárias mais pessoas que associem a mente de artesão, do "homo faber" (Sennet 2008), à acção para o desenvolvimento local sustentável.

Introduction

The use of raw earth has received strong support in recent years, gaining relevance on the international scene. But regulatory difficulties, limited trust, a lack of specialized skills among designers and builders, and limited availability of approved materials still generate reticence to the pursuit of projects for the recovery of earthen structures or for new construction, with sociocultural consequences for the communities that inhabit and own them. This situation can lead to opposite albeit complementary phenomena of abandonment and gentrification.

This article sets out from an analysis of successful recovery stories concerning two earthen buildings in Italy: Casa Fenu (2005-2008), a large complex (1,110 m^2 of covered project area) in the historic center of Villamassargia, Sardinia, and Casa di Teresa (2008-2015), a small house (58 m^2) in Casalincontrada, Abruzzo. The former was restored by a contractor and the latter by an extensive worksite/workshop. The two case studies were chosen as representative of the resurgence of the use of earth in Italy, enriched over the years by numerous initiatives from regions, municipalities, and individuals. They reflect a determination to set good examples and to promote knowledge and awareness, along with the commitment of communities to preserving their earthen heritage and the associated traditional building techniques.

Primary and secondary data were combined with an integral approach, considering the restorations as interconnected, not just in their technical and material aspects but also in their social and intangible value.

Our paper starts with a review of raw-earth construction in Sardinia and Abruzzo. An analysis of the recovery of the two buildings follows. Our discussion critically examines the social, historical, spatial and legislative contexts for the stakeholders and their interactions, the role of the local communities, and also the subsequent impacts on those communities, focusing on the positive local effects of these restorations. Our conclusion reflects on the current situation in the rehabilitation of earthen architecture in Italy.

Raw earth, a perspective from Sardinia and Abruzzo

The use of raw earth in Sardinia dates back to the Nuragic period, i.e. 800-500 B.C., and persisted through the ages, with particular growth during the Spanish period and the rise of a "raw brick culture" in the early 20th century (Bertagnin 1999: 251). Earthen construction techniques are found in both urban and rural areas in the island's southern plains. They concern almost all building types, most of which revolve around a courtyard (Garau 2004: 187). In response to economic needs, the prevalent technique was that of unfired brick, locally called *ladiri* (derived from the Latin *later, -is*, meaning "brick"). With a widely available raw material, the *maist'e muru* (master masons) would make bricks by hand during fallow periods in the agricultural cycle, when a workforce was available and the fields could be used to let the bricks dry in the sun. Traditionally they used *arrabbiaticcio*, soil compacted through agricultural overuse but which was optimal for construction. It was not until the early 20th century that proper workshops producing unfired bricks began to spread, standardizing the process and materials. Their products mainly targeted urban markets.

In Abruzzo, the spread of earthen houses, known as *case a terra* or a *massùne* or *pinciaie*, coincided with the re-appropriation of the countryside by farmers on the abolition of feudalism in the 19th century (Conti 2004: 24). But the growth of housing demand was not matched by an increase in production, which made the use of earth for self-building the only available option, "a parsimonious way of understanding living, (…) a building logic reduced to the essential" in the words of Gianfranco Conti (Albanesi 2012).

Constructing buildings was a cooperative act for peasant families: a kind of "time bank" was set up, with mutual exchange of labor. Mud and water were mixed using animal power while women were responsible for making the *massoni,* loaf-like blocks of earth and straw. After a night of curing, these blocks were laid side by side and at a 45° angle (appearing as a herringbone pattern in façades) in rings so as to form a monolithic structure that works by compression, and then cut with a shovel.

The geographer Osvaldo Baldacci described this as "a spontaneous product of nature and intelligence, expressing a relationship that was elementary but not primitive" (Baldacci 1958). Earthen houses were built mainly in isolated rural areas, on ridges and hilltops.

After the Second World War, with the abandonment of the countryside, urbanization and suburbanization, and the economic boom, the earthen construction sector went into crisis in both regions. New buildings were inserted into the traditional fabric of towns without planning, disregarding both traditional designs and materials. Earth as a material was increasingly associated with poverty, difficult living conditions and backwardness, and was deemed incapable of denoting affluence (Conti 2004: 36). The abandonment of local construction techniques and traditional buildings led to the abandonment of traditional crafts, with the loss of about 50% of the earthen heritage in Sardinia and 88% in Abruzzo[1] within a few decades (Garau 2004: 190-191).

In the late 20th century, an increasing need arose for a systematic and urgent recovery of earthen heritage to help strengthen the identity of rural areas, linked to the knowledge handed down by older inhabitants and builders. Among the public initiatives that have marked the resurgence of raw earth in Sardinia and Abruzzo are respectively the rehabilitation of the Casa Fenu complex in Villamassargia (Fig. 1) by Ignazio Garau[2] (1949-2018), and that of Casa di Teresa in Casalincontrada (Fig. 2) by Gianfranco Conti.[3]

The two buildings have been turned into an eco-museum and an information and exhibition space respectively. The interventions were carried out with the aim of providing tangible examples of good practice to start bottom-up regeneration processes.

Figure1: Historic centre of the medieval town of Villamassargia, in which 79% of the buildings are in *ladiri*. The Casa Fenu complex is marked in red.

Figure 2: Earth houses tour in and around Casalincontrada. The Casa di Teresa is marked in red (CEDTerra)

Research methodology

Our research was carried out between 2017 and 2021, as part of a broader investigation of case studies on European earthen buildings. In order to cover both new building and renovation, as well as different construction techniques and countries, 30 professionals were chosen according to their social and technical approach. On the basis of their availability and an analysis of the documentation they submitted, seven were selected: professionals with sound building know-how who use earth not only occasionally but place it at the center of their work, and who help to enhance its value and propagate its proper use. Among them were the architects Ignazio Garau and Gianfranco Conti.

The choice of buildings to be analyzed was the result of a joint appraisal. Consideration was given to architectural qualities and the ways in which techniques were used, and also to the buildings' functions and clients, with preference given to public or communal uses.

Our research methodology centered on face-to-face encounters, personal knowledge, experimentation and hands-on experience. Primary data were obtained from unstructured interviews, informal conversations with inhabitants, on-site observation and interviews with the main stakeholders in the projects, including public servants and advocates of raw-earth construction.

Further data were drawn from architects' archives (including site photographs, project drawings, technical reports and bills of quantities) (Conti 2008; Garau 2003), and from reviewing the literature, such as traditional construction manuals.

The projects were described in detail, with a previously unavailable in-depth analysis of earthen techniques (Bocci 2018). Project drawings were updated to describe the as-built situation.

Casa Fenu

Originally at the heart of a large farm of about 250 hectares, the family-owned Casa Fenu complex combines a dwelling with the functional needs of rural husbandry, with a sequence of three mixed-use courtyards connected by arched portals of fired brick (Fig. 3).

The entrance courtyard (I) is accessible through a covered hallway and represents the old residential core of the complex, with a "cellular house on the road with a courtyard behind and a plot of extended depth" (Sanna and Atzeni 2009: 27) – and its later extensions.

The ox yard (II) was the center of the complex, with a portico for sheltering animals and storing materials (Fig. 4).

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Figure 3: Outer walls of the oxen courtyard (II) in 2005 (Ignazio Garau)
Figure 4: The arch between courts I and II in 2005 (Ignazio Garau)

The smaller courtyard (III) was used for storage and originally gave access to animals and foodstuffs through a portal opening onto the road beyond the buildings that now surround it.

The stone and unfired-brick dwelling (A), dating from 1850, originally had one story. The main entrance leads directly into the rooms of the house, mediating between the courtyard and the street according to a recurring sequence of "street/house/courtyard/annexes" (Sanna and Atzeni 2009: 39) Toward the courtyard was a loggia as a filter space – an essential component for bioclimatic regulation (Garau 2004: 188). As usual in Sardinia, openings are small, partly to keep out heat.

In the early 20th century the complex underwent a major renovation. The main building was modified on urban models. The result was a hybridization with the *palattu* type: a stately house with symmetrical, regular-sized openings in the façade in a classical style, and a central accessway (Garau 2004: 188). The use of plaster and the incorporation of iron, fired-brick, and reinforced concrete elements also date from this period (Bertagnin 1999: 253). A bomb shelter was added in 1942. The latest changes were made after the war, with a further extension of courtyard I and the replacement of some of the wooden flooring.

The expropriation of the farm's land in 1952 led to the decline of the complex, which was abandoned in the late 1960s. After forty years without maintenance, the roofs were falling apart, with a generalized spread of damp. Leaks and runoff had eroded the bricks and mortar and caused swelling, cracks, and detachment of the plaster layer.

After detailed surveys, in 1999 the complex was acquired by the municipality of Villamassargia for rehabilitation. The project envisaged the creation of a venue for "sustainable tourism" as well as for local people, with exhibitions of handicrafts from the Cixerri area, cultural workshops, and training facilities.

Faithful to the Sardinian tradition of hybridization with new technologies (Garau 2004: 194), the architect Ignazio Garau resisted the preconceived idea of "authenticity" in historic centers (which usually means copying traditional forms and techniques) in favor of evolution. As recommended by Vitruvius, Garau attempted to show that there can be a fruitful continuity between old craftsmen and modern builders, and that traditional materials can help reconnect with the "materiality of doing" (Achenza 2009; Garau 2005; Sennett 2008).

In his design Garau emphasized both the disorientation caused by the intricate sequence of courtyards and their multiple prospects, with no one perspective prevailing – aspects inherent to Sardinian tradition. He also took the liberty to introduce variations and even to somewhat modify the layout of the complex, enhancing the usability of its spaces. Restoration work was made legible through the use of modern techniques and materials (Achenza 2009).

The restoration was based on different approaches in each part of the complex (Figs. 5 and 6); raw earth was used even in partially or completely rebuilt parts.

An integral, philological restoration of the house was made in courtyard I, based on traditional materials and construction techniques. Diagnostic investigations were carried out after removing plaster and renders. To re-establish structural integrity, steel ties were installed

Figure 5: Demolition and reconstruction plan. The demolition is marked in yellow and the new construction in red

Figure 6: Project plan, ground floor.
Courtyard I: A) exhibition rooms and tourist agency; B) storerooms; C) tasting rooms; D) Villa Fenu; 1) portal and entrance hall to the courtyard; 2) main entrance; 3) connection to Villa Fenu.
Courtyard II: E1) cafeteria and E2) kitchens; F) exhibition area.
Courtyard III: G) workshop and laboratories; H) conference room.
Red: *ladiri* masonry; black: concrete; dark grey: stone masonry; grey: fired bricks and hollow bricks

between opposite walls. Damaged wall portions were demolished and rebuilt with new *ladiri* (Fig. 7) measuring 10x20x40 cm, made by hand with a mix of earth and fibers and laid on an earth, lime, and sand mortar bed. Minimum requirements for *ladiri* were established, such as dimensional stability and compressive strength. Deteriorated masonry surfaces were restored by removing loose parts, reinforcing with wooden sticks or filling with brick flakes and a mixed mortar of natural hydraulic lime, slaked lime, and sand, as well as by applying a mixture of earth and natural fibers in thin layers. The most delicate parts, such as plinths, cornerstones, doorposts, jambs, lintels, and roof-beam bearings, were strengthened with fired bricks (Fig. 8).

The portico and the buildings around courtyard II were reconstructed, with the addition of further buildings for equipment rooms and toilets.

Given their advanced state of decay, the remaining structures around courtyard III were demolished and reconstructed using *ladiri*. Fourteen arches (spanning about 2.5 m) in four parallel walls were built with unfired bricks (Fig. 9). Fired bricks were also used at certain points to counteract the thrust and to support the roof trusses (Fig. 10)

A plaster made of earth, sand, and lime, plus natural fibers such as hay and straw, was applied on all walls. This was rendered with slaked lime and sand and finished with a smooth coat of long-aged slaked lime. The interior walls were limewashed, with color from natural earth pigments. The exterior walls were finished with two coats of a breathable, weather-resistant mixture of slaked lime, mineral additives, natural earths and oxides (Fig. 11).

The restored and new buildings were given reinforced concrete foundations and borders, external drainage, and crawl spaces, along with reinforced concrete screeds under the *cocciopesto* (made with crushed brick and aerial lime mortar), ceramic stoneware, and fired-brick floor tiles. Most of the intermediate floors of the buildings by courtyard I, built in 1947 with iron girders and hollow clay blocks or reinforced slabs, were rebuilt using solid fir beams.

The roof structure was rebuilt with solid fir beams in the original configuration, while in the buildings by courtyard III the trusses were formed with laminated glulam beams. The roofing combines industrial and natural materials (Fig. 12). In the outdoor areas, the cobblestones were taken up and reused (Fig. 13). Irregular slabs of Serrenti trachyte were laid dry on the main paths.

The timeframe for the works increased due to the contractor being replaced and a further survey being drawn up. The new contractor also took charge of *ladiri* production. The restoration work was completed in 2008 and Casa Fenu was inaugurated in 2009 (Figs. 14-16). The


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Figure 7: In the reconstruction work of building B, the reuse of original *ladiri* in good condition was frequent. The earth derived from the demolition, heterogeneous and with spurious materials, was not reused within the construction site, but was instead reused to fill the land where the earth used for the new bricks was extracted from. (Ignazio Garau)

Figure 8: The openings were consolidated: reveals and lintels were installed, sometimes with a new element on the inner side, or fired brick platbands, replacing the eroded or fractured bricks (Ignazio Garau)

Figure 9: Laying of *ladiri* in the construction of the portion of the wall between two arches (Ignazio Garau)

Figure 10: View through the arches of courtyard III (Ignazio Garau)


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Figure 11: The colour of the main façade was chosen to match the shades found in other buildings in Via Santa Maria (Ignazio Garau)

Figure 12: Various stages in the construction of roofs: reed mats above the battens, non-woven fabric and EPS foam panels with a bituminous sheathing, curved tiles laid on lime mortar (Ignazio Garau)

Figure 13: The laying surface of the pavement was adjusted to ensure adequate slopes for water drainage, and a subflooring of stones, gravel, sand and cement was laid before the replacement of the cobblestones (Ignazio Garau)

Figure 14: Courtyard I as seen from the entrance hall (1): on the left the staircase leading to building B, on the right building C made of fired bricks on the second floor, while glass curtain walls enclose the rooms on the ground floor (Ignazio Garau)

Figure 15: The oxen courtyard (II) seen from under the loggia (F) towards the cafeteria (E1) and kitchens (E2) (A. Guarino)

Figure 16: Conference room in courtyard III (H) (A. Guarino)

total cost of the intervention was €915,870 (€545.50/m^2), i.e. very low.[4]

Despite the training of three young people to manage the eco-museum and the undertaking that the municipality would support the start-up of the complex, the building has never been fully used for its intended purpose. After some roof improvements in 2019 and a restoration of the façade in 2020, part of it has been made over to a nursing association.

Casa di Teresa

Named after its last owner, this building has two parts: the original west block from before 1950, and a block to the east added in 1955-1956 as the resident family increased (Fig. 17). In contrast to the tradition of building structurally independent modules, the C-shaped extension had just three walls not actually connected to the pre-existing outer walls. This was probably to speed up construction and to reduce the amount of earth needed, and also due to a lack of structural knowledge.

The house is attributable to the "Italic" type (Conti 2004: 30), with the dwelling over the rooms linked to farm work: the bedrooms on the first floor were connected to each other and reached via a brick staircase and a ladder; the kitchen and the stable on the ground floor had independent accesses and imparted warmth to the rest of building. Toilets and fittings were absent. In recent times a concrete-block store with asbestos roofing had been added.

The *massoni* walls, built in direct contact with the ground and lacking proper foundations, are 80-85 cm thick at the base and 60-65 cm at the top. They were left exposed, except for the west bedroom, which was plastered and painted. The openings are small, to limit heat loss, surrounded by a margin of white plaster to reflect light into the interior.

In the intermediate floors, timber beams supported rough brick tiles. Downstairs the floors were of beaten earth, with brick flooring only in the kitchen. The double-pitched roof was insulated with a layer of earth and straw, covered with ceramic tiles.

Before the restoration, the building retained most of its original elements, but due to its abandonment and lack of maintenance since 1967, the incorrect dimensioning and anchoring of the walls, the absence of protective render, and the partial collapse of the roof, it was progressively deteriorating. The chimney had been seriously damaged by a fire and heavy-vehicle traffic. Unsound materials had been used to restore part of the walls, and weeds were growing at their base.

Casa di Teresa was purchased in 2008 by the municipality of Casalincontrada so as to save it from dereliction. Its location made it a perfect spot for a continuous, participatory raw-earth workshop, set up on a self-build basis and open to experimentation: "In order to conceive the recovery of an earthen house, we must enter into the perspective of experimentation, of operating freely" (Conti 2016). From 2008 to 2015, workshops and events were organized in conjunction with the annual "Festa della Terra" (Earth Festival)[5], involving the local population together with experts, associations, artists, companies, universities, and building schools. More than 200 people took part (Fig. 18). The aim of the activities was to translate theory into experimental practice, interpreting knowledge derived from tradition and applying it to a restoration project.

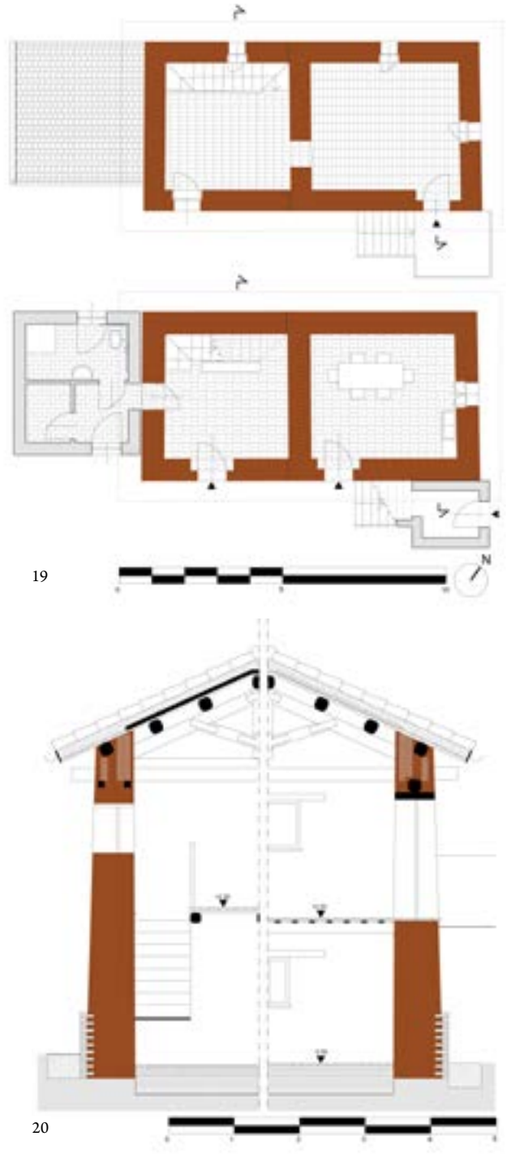
Casa di Teresa has been given new functions, respecting the original character of the building and with "intelligent additions" (Conti 2008).

In order to ensure public use, an independent structure of perforated brick was built to accommodate toilets, the external staircase was rebuilt and an internal one was added, and electrical and heating systems, powered by photovoltaic cells, were installed. The outer area was reorganized and partly paved with bricks (Fig. 19).

The rehabilitation involved the use of earth, straw, wood, and fired brick, in accordance with traditional local techniques (Fig. 20).

Figure 17: La Casa di Teresa before the intervention, view of the south-east elevation. (CEDTerra)

Figure 18: "La finestrella", group photo from the September 2013 workshop. Architect Gianfranco Conti and Stefania Giardinelli in the centre (M. S. Bianco)



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The inner surfaces of the walls were in good condition but loose parts had to be removed from the outer walls (Fig. 21). Cracks and gaps were consolidated and new *massoni* were laid, made from a mixture of earth, sand, water, straw, and pure gypsum. For every 5 kg of mud mixed with straw, one 20x12 cm loaf-like brick was obtained. The bricks were left to cure overnight wrapped in straw and then laid (Figs. 22 and 23). A structural framework of twigs facilitated bonding with the existing masonry. The connection between the west and east blocks and the repair of the damaged chimney were executed using wooden frames filled with the *massoni* mixture, with wooden formwork. A wood bar was used to level the surface. Two tie-rods were fitted along the long side of the house.

The walls were entirely plastered, except in the west room, with a mixture of earth, sand, and straw; in the kitchen a lime plaster was applied. The window margins were repainted white using the lime in plaster residue from a self-built lime kiln, subsequently covered with *cocciopesto* and converted into a baking oven.

A drain was dug around the perimeter and crawl spaces were made by digging 30 cm under the floors. A baked-brick wall was erected along the façade bottom and the space in between was filled with the *massoni* mixture. The north and east corners were reinforced with buttresses.

The intermediate floors were rebuilt, maintaining the original position of the beams in the east room and rotating them in the west room so as to tie the walls together and to

Figure 19: Project plan of the ground floor (below) and first floor (above) of Teresa's House. In red are indicated the walls in *massone*

Figure 20: West section (left) and east section (right): following an approach open to experimentation, different solutions were adopted in the construction of the ring beams and the covering of the roof. In red the *massoni* walls, in light red the raw earth bricks

Figure 21: Removal of plaster in the west first floor room (CEDTerra)

Figure 22: *Massoni* production cycle: reuse of earth, recycled from demolished parts and other collapsed buildings, making loaves and curing (CEDTerra)

Figure 23: Laying of *massoni* by workshop participants: they can be thrown with force, to allow the release of excess water, or laid on beds of dry straw and pressed to adhere and penetrate each pore (CEDTerra)

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Figure 24: Laying the new beams in the west room (CEDTerra)

Figure 25: Laying of the laths made during the 2015 workshop (CEDTerra)

better distribute the loads (Fig. 24). Joists placed above the beams support the brick flooring.

Ring beams at the top of the walls distribute the loads of three trusses supporting the main beams and rafters. On the east half of the roof, laths covered with 10 cm of straw and earth were laid, and on the west half, wooden boards waterproofed with a membrane (Fig. 26). A layer of pressed straw helps reduce heat loss. An OSB panel over the pressed straw supports the roof tiles.

The total cost of the intervention was €116,220 (€1,555/m^2), financed by regional funds. The waiting time for funding and the workshop construction method increased the duration of the work, which took place intermittently from 2008 to 2015 (Figs. 26-28).

Figure 26: Casa di Teresa from the exterior

Figure 27: New internal staircase in the west portion. The tie-rod added during the renovation runs along the wall

Figure 28: *Massoni* walls left without plaster on first floor to the west

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Discussion

Stimulated by the exhibitions *Des architectures de terre* (Centre Pompidou, Paris, 1982) and *Case di terra. Memoria e realtà*,[6] since the 1990s there have been numerous local, regional and national initiatives involving earthen practitioners, academics, craftspeople and local authorities. In 1990 the Arch.Terra association was founded in Cagliari; in 1992 CEDTerra was established in Casalincontrada, coordinated by the Terrae-Onlus Association since 2000; in 1997 LabTerra was set up at the Cagliari University School of Architecture; in 2001 the Associazione Nazionale Città della Terra Cruda was founded, and it now encompasses forty municipalities in Sardinia, Abruzzo, Marche, Basilicata and Piedmont.

The Sardinia regional authorities have incorporated the experiences accumulated in recent years into manuals for the recovery and restoration of vernacular architecture, forming a body of rules and good practice liable to support local authorities (Sanna and Atzeni 2009; and Achenza 2009).

Numerous initiatives have also been launched in the Abruzzo academic community to disseminate good practices for work on earthen buildings (Forlani 2005).

The rehabilitations of Casa Fenu and Casa di Teresa were therefore part of a much wider picture, in a very active period in political and legislative terms. This section aims to portray these examples in context in order to understand the various factors that led to these restorations, and to evaluate their effects.

Villamassargia was the first Sardinian town to experiment with citizen consultation and participation in the drafting of its municipal urban plan[7] of 2004 (updated in 2014), thanks to collaboration between the municipality, technicians and a multidisciplinary team of researchers, architects, and planners. One aim of the participatory approach was to generate awareness about the town's heritage value. With the mapping of abandoned buildings, it also showed that renovation could help meet housing needs without the provision of new buildings.

The Detailed Plan for the Historic Center (2003, updated in 2008) put further emphasis on the importance of Villamassargia as one of the few towns surviving the 14th- and 15th-century destructions during the Aragonese domination of Sardinia (Medda 2008). Awareness of this could stimulate the preservation and recovery of traditional heritage, which represents about 79% of buildings, and enhance the identity of the historic center. Specific regulations were adopted to guide interventions.

Concurrently, grants were allocated by the regional authorities for rehabilitation work in historic city centers.8 Through an Integrated Historic Center Program (based on Regional Law no. 29/98), public and private "diffuse maintenance" interventions were made (Pusceddu 2021).

The project to restore Casa di Teresa was also part of a process that has been going on for a number of years in Casalincontrada and the Abruzzo region.

In 1997 the province of Chieti catalogued 322 earthen houses in 15 municipalities. In the same year the regional law entitled "Provisions for the recovery and enhancement of tholos huts and earthen houses" (L.R. no. 17/97) was passed, implementing protective actions. Four municipalities, among them Casalincontrada, started a program of *Albergo Diffuso* hotels in 1999.[9] In 2001, a regional law extended these incentives to earthen houses throughout the region, defining them as "historical testimony of the culture of Abruzzo" (Forlani 2011: 227).

As part of their top-down urban regeneration processes, the municipalities of Villamassargia and Casalincontrada saw a need to undertake the rehabilitation of traditional publicly owned buildings. Casa Fenu and Casa di Teresa were restored with the aim of providing good practice, a sort of real-life guideline to stimulate other bottom-up urban regeneration actions.

These tangible examples, as well as the efforts by the multidisciplinary team and the municipality to boost public awareness, did indeed contribute to the rehabilitation of 31 earthen buildings in Villamassargia in 2003-2015, and five in Casalincontrada in 2008-2019.

Such progress in a cultural context is slow but nevertheless significant, if we consider that raw-brick building heritage is almost exclusively in private hands in both regions.[10]

Conclusion

The rehabilitation of traditional heritage is now a global trend. The European Union is calling for a "renovation wave" in public and private buildings (European Commission 2019), with large investment in the energy refurbishment of existing buildings. The need to focus more on renovation than on new construction is even greater in areas of demographic decline such as Abruzzo and Sardinia with a surplus of housing stock.

While regions and municipalities seem to encourage a mindful recovery of traditional heritage through preservation laws and supporting actions, this is not always accompanied by a positive response from communities. The design of an earthen building, in restoration and even more so in new construction, is exceptional and remains confined to local experiences, a niche technology linked mainly to the revival of tradition or informal uses.

The reasons for this are partly cultural: the fragmentation of the Italian cultural landscape results in inadequate cultural representation. A widespread awareness of the identity, historical, and architectural value of earthen buildings is still lacking. In this regard, Walter Secci reports a lack of appreciation of the value of *ladiri* buildings in Sardinia (Secci, interview). Gianfranco Conti notes that Abruzzo's earthen heritage still has a strong association with rural poverty (Conti, interview).

Changes in production traditions are another factor: Casa Fenu, for example, was built with exhausted agricultural soil used by farmers as building material; but the few remaining farms are now mechanized, soil is regenerated with chemical additives instead of lying fallow according to seasonal rhythms, and earth is no longer used for building houses because building materials are supplied industrially. The social set-up that used to be expressed through earthen architecture has disappeared or is on the way out (Germanà 2011: 37-38).

Meanwhile, there are technical and regulatory impediments: raw-earth materials are not acknowledged as load-bearing in the national building code (as opposed to in other countries[11]), and obtaining a construction permit for an earthen building involves a long and expensive ad-hoc process in a branch of the national ministry. Another factor is the high seismic risk in most of the country.[12]

The lack of standardized criteria for assessing the performance of finished materials and controlling the quality of design and construction is a problem for owners and clients, and discourages potential investors (Bollini 2005; Mecca 2015: 21). This also affects small manufacturers: there are scarcely any professional *ladiri* producers in Sardinia, despite a great effort made to encourage certified production (Achenza 2010; Achenza et al. 2013). Even more complicated is the situation in Abruzzo, where it is almost impossible to envisage a process that might standardize the construction of *massone* buildings. The lack of a market in certified materials, in turn, leads to difficulties in carrying out interventions, especially in public tenders.

Alongside this, there is a lack of local-tradition-specific skills and know-how: a generational shift led to the abandonment of these techniques, no longer part of mainstream Italian cultural and architectural discourse, and the consequent non-transfer of building know-how. The renovation of an earthen building requires both meticulous planning and careful site management (Achenza, interview). The lack of demand is therefore matched by a lack of supply.

So there is a need for cultural and regulatory tools to propagate the qualities of exemplary "exceptional" interventions such as Casa Fenu and Casa di Teresa to common practice, especially in Sardinia where *ladiri* buildings are widespread.

To overcome mistrust, cultural investments are needed (Forlani 2011: 228). Such strategies may be enriched by local actions with identity value, well placed to take advantage of local production networks and technical know-how (Magnaghi 2010: 95,193; Watson 2019: 399). In this regard, the involvement of representatives of local communities was fundamental in Casalincontrada: interviews were carried out (Conti 2016), local master builders were invited to meetings, and young masons and the community were involved in numerous workshops.

Retrieving earthen building techniques would also involve identifying strategies for using this material efficiently, so that its contemporary value is recognized (Houben and Van Damme 2019: 38-39; Heringer 2020: 16, 18; Jenkins 2000; Laureano 2013: 298). Taking the positive evolution of timber construction as a reference, a comprehensive strategy to encourage the use of earth would be beneficial, including a renewed interest from the research community and skills development in research institutes; training for designers, craftspeople, and builders; and dissemination of good practice through communication platforms, awards, and international exhibitions (Gauzin-Müller 2021).

Alongside this, it would be good to restore the figure of the "*homo faber*" (Sennett 2008), a status that the architects Ignazio Garau and Gianfranco Conti aspired to and perhaps attained. They are examples of militating intellectuals, to quote Walter Secci's interview, capable of translating their knowledge into both written documents and built objects with social and spatial benefits.

Dedication

This article is dedicated to Ignazio, "A man of the earth, with the refined mind and curiosity of the intellectual, the firm hand of the artist – but also of the craftsman, who knows to touch and make things" (Pubusa 2018), who passed away a few months after our pleasant and stimulating meeting in his beloved Sardinia. Happy journey, Homo Faber. Thank you for your "act of courage", *maestro*.

Interviews

Ignazio Garau (30/5/2017-7/6/2017)

Gianfranco Conti (11-14/11/2017; 4/2/2021; 22/2/2021)

Walter Secci, vice-president of the Association City of Raw Earth and mayor of Villamassargia at the time Casa Fenu was restored (2/6/2017; 11/2/2021)

Maddalena Achenza, representative of ICOMOS-ISCEAH and director of LABterra (5/7/2017; 26/2/2021)

[1] A Survey of Rural Houses in Italy, carried out in 1934 by the Central Statistical Office (Shepis 1935), recorded 7,074 houses built in *massone* in Abruzzo, 3,343 of them in the province of Chieti. The current census records 806 buildings, 322 of them in the province of Chieti (Perotti 1999, Conti 1999).

[2] Garau was trained in earthen techniques from childhood on self-build sites and at seasonal workshops and on-site tile and brick kilns (Pubusa 2018). He engaged in urban, spatial and landscape planning, especially for the restoration of historic centers and villages in southern Sardinia. He was a member of the team that drew up the Villamassargia Municipality Urban Plan (2014) and the municipal building regulation (2015). Garau contributed to the creation of the Sardinian section of INU (the National Institute of Urban Planning). In Villamassargia he also supervised the restoration of the Church of Santa Maria della Neve.

[3] Because of his dedication to earthen building, he is considered the guardian of the *massone*'s art: as president of the Terrae Association, he has coordinated the activities of the Permanent Documentation Center on Earthen Houses (CEDTerra) since 2000 and he promoted the 1997 census of earthen houses in the province of Chieti, subsequently extended to the entire Abruzzo region. The architects Stefania Giardinelli and Lucia Secondo also contributed to the rehabilitation of Casa Fenu.

[4] The renovation of Casa Fenu could be included in the category "Major renovations and restorations in historic centers": according to a 2006 report, the construction cost threshold for this category is €1,530/m^2 (Consiglio dell'Ordine degli Ingegneri della Provincia di Grosseto 2006).

[5] Cultural event promoted by the Municipality of Casalincontrada, organized every September since 1997.

[6] A 1985 exhibition held by the University of Chieti in collaboration with the Abruzzo region, linking the memory of earthen buildings in Abruzzo with those of Algeria, where earthen construction was still common. Currently viewable at the CEDTerra headquarters.

[7] 10% of the population was consulted in 2002 through a questionnaire. Besides a high level of appreciation for the town (88%) and a willingness to go on living there (64%), 71% of interviewees were also in favor of restoring the buildings in the historic center and preserving its heritage (*La nuova Sardegna* 2002).

[8] Four grants were provided between 2003 and 2015. In early 2021, the Città della Terra Association appealed to the regional authorities for a new allocation of resources to restart the rehabilitation process; this would also reactivate the supply chain of bricks, tiles, lime, timber, and stone, with opportunities for economic development among entrepreneurs and specialist craftspeople as well as helping revitalize the historic centers of southern Sardinia (Pusceddu 2021).

[9] Of the 27 planned restorations (including 13 abandoned earthen buildings), six have been carried out, of which two are not yet accessible.

[10] In Sardinia more than 90% of the 25,000 earthen buildings are privately owned (Pusceddu 2021).

[11] The first attempts to call for the establishment of technical standards for earthen buildings in Italy were in 2002, later included in the proposed bill of 2009 (Lion 2005), which also calls for a census and monitoring of earthen heritage, definition of the geographical areas where such building is possible, and the release of funds and incentives (http://casediterra.com/proposta-legge-schirru). Currently it is proposed that Italy may make use of an existing regulation, such as the German *Lehmbau Regeln* (for regulations in other countries, see Achenza 2017).

[12] Following the 2003 Seismic Standards, criteria for a new nationwide seismic classification were established. The process of restoring Casa Fenu was facilitated by the fact that at the time the project was approved, Sardinia was in the lowest-risk seismic zone. The situation is quite different in Abruzzo, 33% of which is classified in the highest-risk seismic area, while Casalincontrada is classified as medium-risk.

References | Referencias | Referências

Achenza, Maddalena. 2009. La casa Fenu a Villamassargia. In Achenza, Maddalena; and Sanna, Ulrico (eds.), *Il manuale tematico della terra cruda, Caratteri, Tecnologie e Buone pratiche*, 86-91. Rome: DEI.

Achenza, Maddalena. 2010. Trasmissione delle conoscenze e insegnamento del know how. In Galdieri, Eugenio (ed.), *Scritti sulla terra*, 128-134. Saonara: Il Prato.

Achenza, Maddalena; and Meloni, Alessia (eds.). 2013. *Standard di riferimento per la preparazione e la messa in opera dei mattoni in terra cruda*. Rome: Progetto Cluster P.RE.MURA.

Achenza, Maddalena; and Chiri, Gianmarco. 2017. Imparare dal passato: costruzioni in terra in zona sismica. In: Bernardini, Gabriele; and Di Giuseppe, Elisa (eds.), *Colloqui.AT.e 2017. Demolition or Reconstruction?*, 228-240. Monfalcone: EdicomEdizioni.

Albanesi, Dante. 2012. Gianfranco Conti, architetto. Talenti e Territori. *ScannoNaturaDoc*, documentary television series. https://www.youtube.com/watch?v=tlbbhynd7d0 (consulted on 13/5/2021)

Baldacci, Osvaldo. 1958. L'ambiente geografico delle case in terra in Italia. *Rivista geografica italiana*, 65. Firenze: La Nuova Italia.

Bertagnin, Mauro. 1999. *Architetture in terra cruda in Italia. Tipologie, tecnologie e culture costruttive.* Monfalcone: Edicom Edizioni.

Bocci, Martina. 2018. *A view of earth architecture between Europe and Brazil*. Master thesis of Architecture for Sustainability Design. Torino: Politecnico di Torino. https://didattica.polito.it/laurea_magistrale/architettura_progetto_sostenibile/en/presentation (consulted on 15/2/2021).

Bollini, Gaia. 2005. Dalla tutela alla nuova costruzione: la realtà normativa nazionale. In Bollini, Gaia (ed.), *Atti del convegno Costruire in terra cruda oggi*, 119-120. Monfalcone: Edicom Edizioni.

Conti, Gianfranco; Di Chiacchio, Antonio; Cicchetti, Maria; Fiadone, Franco; Gentile, Pierluigi; Morandi, Maurizio; and Forlani, Maria Cristina. 1999. *Terra cruda. Insediamenti in provincia di Chieti.* Penne: Cogestre Edizioni.

Conti, Gianfranco. 2004. Le case di terra: orgoglio e pregiudizio. In Conti, Gianfranco (ed.), *Antologia della Terra Cruda. 1997-2004. Viaggio nella Terra Cruda in Italia*, 23-37. Villamagna: Tinari.

Conti, Gianfranco. 2008. Laboratorio Terra. Sistema espositivo e informativo sulla tecnica tradizionale del massone in terra cruda. Relazione del progetto esecutivo. Casalincontrada.

Conti, Gianfranco. 2016. Il racconto della casa di Teresa. *CEDTerra*. https://www.facebook.com/58109899746/videos/10155818524414747/ (consulted on 13/5/2021)

European Commission. 2019. *The European Green Deal.* Brussels. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_it (consulted on 15/2/2021).

Forlani, Maria Cristina. 2005. *Report sulle attività di ricerca di Fase I: Vulnerabilità dell'involucro delle costruzioni in crudo, criteri di valutazione del rischio nel progetto di conservazione: caso-studio sul patrimonio abruzzese*. Pescara. http://www.taed.unifi.it/eah-management/main/seminario16_05_06/I%20report%20Prin%202005.pdf (consulted on 10/5/2021).

Forlani, Maria Cristina. 2011. Conservation strategies of Abruzzo's historical and cultural heritage. In Mecca, Saverio (ed.), *Earth/Lands. Earthen Architecture of Southern Italy*, 227-245. Pisa: ETS.

Garau, Ignazio. 2003. Comune di Villamassargia progetto di recupero e di ristrutturazione di un edificio "tradizionale" da destinare alla biblioteca, uffici comunali, spazi informagiovani e attività culturali. Relazione tecnica illustrativa. Villamassargia.

Garau, Ignazio. 2004. Stato dell'arte dell'architettura in terra cruda in Sardegna. In Conti, Gianfranco (ed.), *Antologia della Terra Cruda.*

1997-2004. Viaggio nella Terra Cruda in Italia, 187-220. Villamagna: Tinari.

Garau, Ignazio. 2005. Esperienze di recupero in Sardegna: una chiave di lettura. In Bollini, Gaia (ed.), *Atti del convegno Costruire in terra cruda oggi*, 77-78. Monfalcone: Edicom Edizioni.

Gauzin-Müller, Dominique. 2021. Inspiring Regenerative Materials Architecture. *CAS Regenerative Materials* (online lecture)

Germanà, Maria Luisa. 2011. Earth as a building material between past and future. In Mecca, Saverio (ed.), *Earth/Lands. Earthen Architecture of Southern Italy*, 37-39. Pisa: ETS.

Heringer, Anna; Blair Howe, Lindsay; and Rauch, Martin. 2020. *Upscaling Earth: Material, Process, Catalyst*. Zürich: Gta Verlag.

Houben, Hugo; and Van Damme, Henri. 2019. Améliorer les performance de la construction en terre sans réduire ses atouts écologiques. In: Dethier, Jean (ed.), *Habiter la terre. L'art de bâtir en terre crue: traditions, modernité et avenir*, 38-39. Paris: Flammarion.

Jenkins. Tim N. 2000. Putting postmodernity into practice: endogenous development and the role of traditional cultures in the rural development of marginal regions. *Ecological Economics*, vol. 34, 3: 301-313.

La nuova sardegna. 2002. Quando il Puc è partecipato Villamassargia, per la prima volta nell'isola un piano regolatore sottoposto al vaglio preventivo da parte dei cittadini. Sassari, December 14 https://ricerca.gelocal.it/lanuovasardegna/archivio/lanuovasardegna/2002/12/14/SU103.html (consulted on 12/2/2021)

Laureano, Pietro. 2013. *La piramide rovesciata. Il modello dell'oasi per il pianeta terra*. Torino: Bollati Boringheri.

Lion, Marco. 2005. Proposta per una normativa nazionale per la costruzione in terra cruda. In Bollini, Gaia (ed.), *Atti del convegno Costruire in terra cruda oggi*, 121-126. Monfalcone: Edicom Edizioni.

Magnaghi, Alberto. 2010. *Il progetto locale. Verso la coscienza di luogo.* Torino: Bollati Boringheri.

Mecca, Saverio. 2011 Earth/Lands. In Mecca, Saverio (ed.), *Earth/Lands. Earthen Architecture of Southern Italy*, 13-21. Pisa: ETS.

Medda, Antonello. 2008. *Comune di Villamassargia*. Piano Particolareggiato del Centro Storico.

Perotti, Antonio. 1999. *Case in terra cruda. Diffusione degli insediamenti in Abruzzo*. Regione Abruzzo: L'Aquila.

Pubusa Andrea. 2018. Ignazio Garau, mite costruttore di uguaglianza e bellezza. *Democrazia oggi*. http://www.democraziaoggi.it/?p=5349 (consulted on 1/3/2018)

Pusceddu, Enrico. 2021. Situazione edifici abbandonati in terra cruda in Sardegna. *Città della terra cruda*. Samassi. https://www.terracruda.org/it/news/situazione-edifici-abbandonati?fbclid=IwAR3Bsziylch_3PZ7lw5Z2hAJJE8TgRXpLrZqHijsoXRtcsyPVtiJomEop7I (consulted on 12/2/21)

Sanna, Antonello; and Atzeni, Carlo (eds.). 2009. *Architetture in terra cruda dei Campidani, del Cixerri e del Sarrabus*. Roma: DEI.

Schepis Giovanni. 1935. Le case rurali nel mezzogiorno. *Questioni Meridionali*, 290-374. Napoli: EPSA.

Sennett, Richard. 2008. *The Craftsman*. London: Anne Lane.

Watson, Julia. 2009. *LO-TEK. Design by radical indigenism*. Cologne: Taschen.

Biography | Biografía | Biografia

Martina Bocci

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Sohini Pyne

Engagement of Contemporary Communities with the Shared Heritage Resources of the Dwindling Minorities of Central Calcutta

Compromiso de las comunidades actuales con los recursos patrimoniales compartidos de las minorías decrecientes del Centro de Calcuta

Envolvimento das comunidades contemporâneas com os recursos do património partilhado das minorias em declínio de Calcutá Central

Keywords | Palabras clave | Palavras chave

Urban heritage, Cultural pluralism, Shared built heritage, Community engagement, Participatory methods

Patrimonio urbano, Pluralismo cultural, Patrimonio construido compartido, Compromiso comunitario, Métodos participativos

Património urbano, Pluralismo cultural, Património construído partilhado, Envolvimento da comunidade, Métodos participativos

Abstract | Resumen | Resumo

The accelerated growth of Calcutta as a trading center under the British between the mid-18th and early 20th centuries brought an influx of diverse trading communities, including Armenians, Baghdadi Jews, Parsis, and Chinese, who settled in the historic bazaar nucleus of the city known today as Central Calcutta. These ethnoreligious communities erected significant heritage buildings reflecting their cultures. But with large-scale emigration and a rapidly dwindling local population, this shared built heritage is in neglect and has little or no relevance for Central Calcutta's contemporary communities. This paper discusses the issues faced by these heritage resources and offers recommendations for enhancing community engagement, initiating co-management and developing common goals amongst contemporary communities so as to effectively safeguard this built heritage of dwindling minorities.

El crecimiento acelerado de Calcuta como centro del comercio bajo el dominio británico entre mediados del siglo XVIII y principios del XX fue testigo de la llegada de diversas comunidades de comerciantes, como armenios, judíos de Bagdad, parsis y chinos, que se asentaron en la zona del Bazar histórico de la ciudad, lo que hoy se denomina Calcuta central. Estas comunidades establecieron recursos patrimoniales importantes que conmemoraban la vida sociocultural de la ciudad. Sin embargo, con la migración masiva y el rápido despoblamiento de la zona, el patrimonio edificado común de estas comunidades etno-religiosas ha quedado abandonado. Este patrimonio apenas tiene relevancia o carece completamente de ella para las actuales comunidades de Calcuta central. Este artículo trata de los problemas que aquejan a estos recursos patrimoniales y ofrece recomendaciones para mejorar el compromiso comunitario, iniciar

la gestión conjunta y desarrollar objetivos compartidos por las comunidades actuales para salvaguardar eficazmente el patrimonio construido de las minorías hoy en retroceso.

O crescimento acelerado de Calcutá como centro comercial sob o domínio britânico entre meados do século XVIII e o início do século XX viu o influxo de diversas comunidades mercantis, incluindo os Arménios, Judeus Bagdadi, Parses e Chineses, que se estabeleceram no núcleo histórico do Bazar da cidade, conhecido hoje como Calcutá Central. Estas comunidades estabeleceram recursos patrimoniais significativos em comemoração da sua vida sociocultural na cidade. No entanto, com a emigração em grande escala e uma população local em rápido declínio, o património construído comum destas comunidades etno-religiosas foi negligenciado. Este património tem pouca ou nenhuma relevância para as comunidades contemporâneas de Calcutá Central. Este artigo discute as dificuldades enfrentadas por estes recursos patrimoniais e fornece recomendações para reforçar o envolvimento da comunidade, iniciar a co-gestão e desenvolver objectivos comuns entre as comunidades contemporâneas, para salvaguardar eficazmente os recursos patrimoniais construídos que são partilhados pelas minorias em declínio nos dias de hoje.

Introduction

Calcutta has seen an influx of immigrants from various parts of the world from its earliest days – mainly Armenians, Baghdadi Jews, Parsis, and Chinese, who made their way to Calcutta for commercial reasons together with European traders. Some new communities, such as the Anglo-Indians, were also formed from this synthesis. Thanks to the flourishing trade established by the British East India Company, Calcutta, which in 1690 was just a group of hamlets, rapidly turned into a truly cosmopolitan city with diverse ethnoreligious communities that each contributed a piece of their own identity to its built heritage. Being chiefly engaged in trade, these communities settled in the historic bazaars, and this area, along with parts of Burrabazar, Tiretta Bazaar and Bowbazar, also known as Central Calcutta, soon developed a culturally plural character. Some of these communities made Calcutta their home, and some returned to their places of origin after three or four generations. All, however, left a stock of architectural resources reflecting their life in the city. These structures are architecturally diverse in terms of their functional and spatial typology, scale and proportion, construction techniques, building materials, and ornamentation, with both local and colonial influences lending a unique character to the urban fabric.

But the scenario is different today. With the large-scale emigration of Calcutta's Armenian, Jewish, Parsi, Chinese and Anglo-Indian communities, their population has dwindled. As they were located in the historically dense core of the city, the gap left has been filled by "communities of today", described below, that are either unaware of these heritage resources or attach little or no value to them. The preservation of the shared built heritage of dwindling minority communities has low priority in these dense commercial neighborhoods, due to which the structures are threatened with encroachment, abandonment, and dereliction. This paper asks the question: what happens to the built heritage of communities that have moved on? Who will now take ownership to ensure the conservation of these resources – especially living heritage, the less famous but equally significant structures, not under official protection? How do these seemingly distant factors affect heritage conservation today? (ICOMOS 2005: 5). This paper also aims to show that these resources are not only of sociocultural and historical significance for bygone communities but are also significant today by virtue of their artistic and architectural qualities, exhibiting universal values that also serve the communities of today, irrespective of ethnoreligious background.

Figure 1: "Of the Nations Most Known in Hindoostan" (Solvyns 1811)

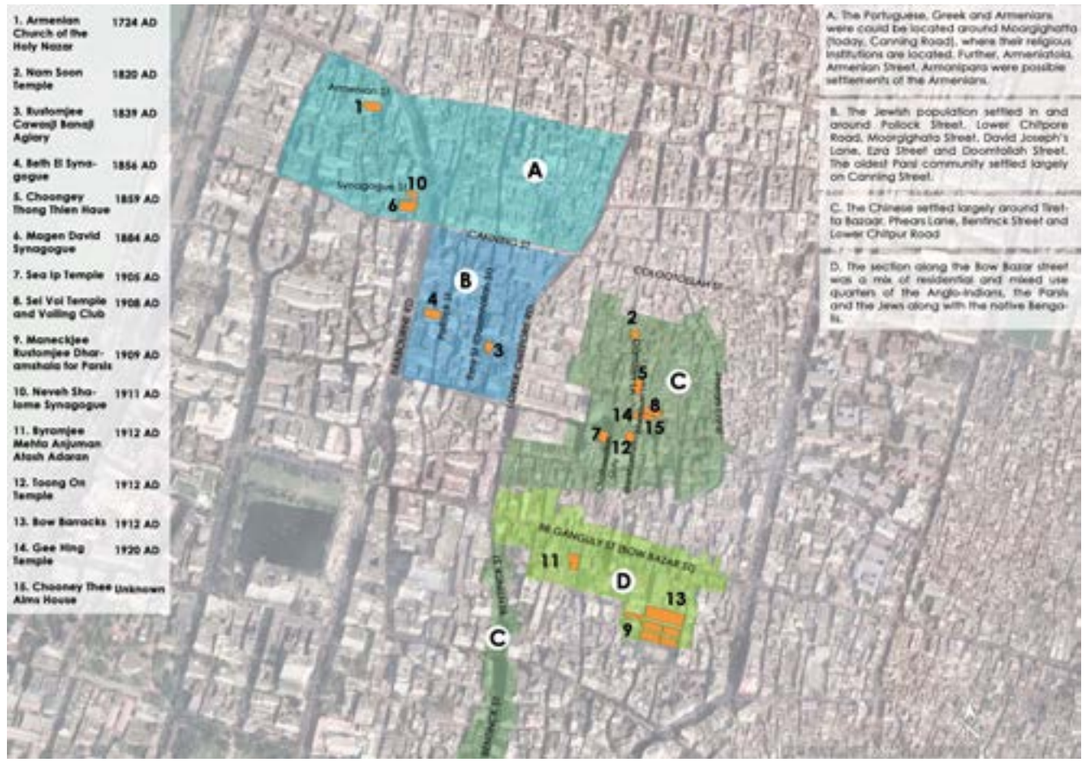
Methodology

To apprehend the historical evolution of dwindling minority communities in Calcutta, a review of the existing literature was undertaken. This identified the neighborhoods where these trading communities lived, along with their architectural heritage. To examine local community engagement, activities at heritage sites and their surrounding areas were studied and two distinct communities were identified: ethnoreligious and occupational. Informal discussions gauged these communities' perceptions of heritage. In-depth interviews were conducted with representative members of ethnoreligious communities and semi-structured interviews with occupational ones, including wholesale electrical traders around the Rustomjee Cawasji Banaji Agiary, shopkeepers and informal vendors along Brabourne Road, by the Armenian Church, the Neveh Shalom Synagogue and the Magen David Synagogue, and office-goers in Old Chinatown. The key findings were then analyzed and summarized .

Migration of trading communities to Central Calcutta and their architectural heritage

The migration of diverse ethnoreligious communities to Calcutta had a direct impact on the city's morphology, and distinct neighborhoods soon took shape. Native *comprador* (colonial agent) families were concentrated in the north of the city, while European traders and company officials gravitated toward Fort William in the south. Between them an "Intermediate Town" emerged, a cosmopolitan district with residential and commercial establishments of diverse trading communities, along with their houses of worship. The Intermediate Town was at the heart of the city, in Central Calcutta, with the popular Burrabazar, Tiretta Bazaar and Bowbazar districts. Though these communities migrated to the bazaar areas chiefly for trade, each one was quick to build houses of worship and gathering places close to their residential and trading quarters. The architecture that developed as a result was a fusion of these communities' traditional styles, popular European Colonial styles and local Bengali materials and techniques. The historical backgrounds of these migrant communities are outlined below along with their contributions to architectural heritage, enhancing the city's diversity with their spatial arrangements, their scale and proportions, and their ornamentation and iconography.

Figure 2: Possible neighborhoods of the migrant communities along with the identified heritage structures



Armenians

The Armenians, "pioneers of foreign trade in India", formed trade relationships with Bengal prior to the advent of the European trading powers. The community migrated from Shiraz and New Julfa in Persia (Bhattacharya 2009: 71), and traded in Sutanati, a cotton-bale market in north Calcutta (Seth 1897: 40). The Armenian genocide in Turkey brought a second influx of Armenians to Calcutta in the early 1900s and the community settled largely in the Burrabazar area, around the Armenian Holy Church of Nazareth (Bhattacharya 2009: 76).

This church was built in 1724 by Mr. Gavond, a Persian architect, and is one of the city's oldest churches (Seth 1937: 429-430), with notable Middle Eastern influences. It is rectangular in plan, with a wide, two-story nave flanked by two aisles. The columns dividing the nave and aisles are Doric in form but with stout proportions, supporting pointed cinquefoil arches of unique geometry. A staircase leads to a gallery above the aisles and the interior is richly decorated with frescoes and paintings. At the altar are twelve candles symbolizing the twelve apostles. The façade of the longer side is divided into seven bays, each with a rose window at its center letting in abundant light. On the shorter façade, a belfry with prominent corner moldings, a clock turret, and a short steeple were added in 1734, probably to give the church verticality, and now serve as a porch. The conical steeple with a cross above the octagonal drum of the clock turret is a characteristic feature of Armenian churches globally, including the Cathedral of Holy Etchmiadzin in Armenia (17th century), the Akdamar Cathedral in Lake Van in Turkey (10th century), and, closer to Calcutta, the Armenian Church of the Holy Resurrection in Dhaka (18th century). With its distinct Armenian features, this is an example of global interconnectedness of diaspora communities through architecture.

Jews

Jewish immigration to Calcutta started in the late 18th century via Surat, as Surat's prosperity as a trading port declined and that of Calcutta grew. The mid-19th-century religious persecutions in Baghdad (Mukherjee 2009: 86) brought another wave from Baghdad, Aleppo, and Basra, and the community became known as the "Baghdadi Jews". From their arrival in Calcutta they established "large commercial houses" dealing in tobacco, jute, and real estate (Ray 1996: 570) and settled in Kalutola, Burrabazar and Bowbazar (Omalley 1911). Large religious structures soon emerged in the Jewish quarter, such as the Neveh Shalom Synagogue (1831, rebuilt in 1911), the Beth El Synagogue (1856), and the Magen David Synagogue (1884).

The synagogues in Burrabazar follow the typical floor plan of a Jewish synagogue, having a large rectangular prayer hall with a wide nave and two aisles. The three-level nave is separated from the two-level aisles by rows of columns. Located centrally in the nave is the *Bimah*, a dais on which the Rabbi conducts services. At the apsidal end of the nave is the *Hekkal*, the sanctuary, covered by a hemispherical dome, where the Torah scrolls are kept and with a plaque of the Ten Commandments. The vaulting above the *Hekkal* represents the heavens, with stars painted on a blue background. The side aisles have benches for men and women and children are seated in a gallery. The nave and aisles have flat roofs supported by large cast-iron beams and wooden joists. As well as Judaic iconography, Colonial elements, popular in construction at the time, are also present in the interiors.

In the Beth El Synagogue, cast-iron columns with unusual capitals support an entablature with a decorative frieze and cornice. Cast-iron brackets support the overhanging galleries. The synagogue has a large stained-glass window with lancet arches over its entrance, letting light flood in, and a traditional façade adorned with Jewish symbols. On the twin pilasters dividing the three bays of the front façade are scroll-like designs framing a Star of David. The central bay features a *Menorah*, a seven-branched candelabrum, flanked by two Stars of David. Above this is a decorative pediment also serving as a clock tower. At both levels of the two side bays there are tall bifora windows of unusual proportions.


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Figure 3: The Armenian Church of the Holy Nazareth in Burrabazar

Figure 4: Stout columns with unusual arches at the Armenian Church of the Holy Nazareth in Burrabazar (Kolkata Trips, https://kolkatatrips.com/armenian-church/)

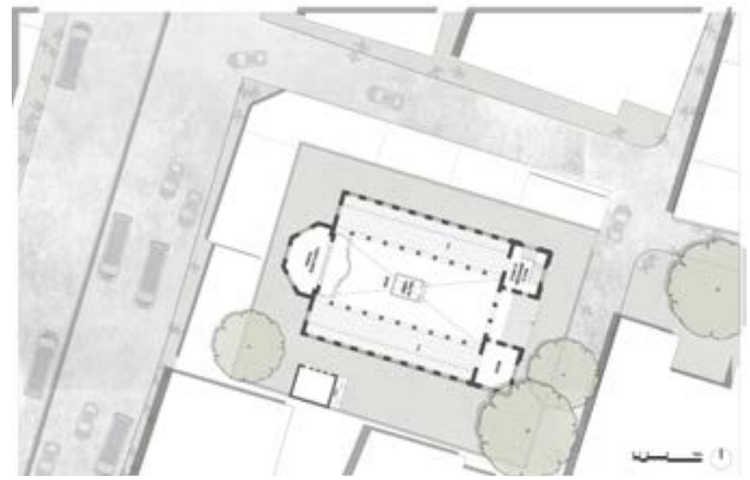

Figure 5: Plan of the Beth El Synagogue

Figure 6: Interior of the Beth El Synagogue

Figure 7: Stained glass over the women's gallery at the Beth El Synagogue

Figure 8: External façade of the Beth El Synagogue

Figure 9: Interior of the Magen David Synagogue

Figure 10: The *Hekkal* of the Magen David Synagogue

Figure 11: External façade of the Magen David Synagogue


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The Magen David Synagogue, built when Jewish trade in Calcutta was at its height, is much grander. Its stone columns have Corinthian capitals supporting semicircular arches. The delicate incised plasterwork on the arches, with floral patterns and Hebrew excerpts from the Psalms on the archivolts, forms a striking textural contrast with the stone. A stained-glass rose window and fanlights let in a diffuse light. Many of the materials used to build this synagogue were imported from Europe (Silliman 2018). Its façade blends European-style Classicism with a traditional spatial layout, indicating a shift from a traditionally Judeo-Arabic style to a Judeo-European one. Inspired by the multiple churches in the vicinity, it adopts the popular feature of a steeple. It is designed in Renaissance Revival style, as shown by the series of mullioned Roman windows on the façade, the moldings on the arches, the dentiled cornices, and the chamfered, rusticated quoins.

These synagogues generally show a fine blend of the traditional architecture of a diaspora community with the Colonial architecture of the time.

Parsis

The Parsis migrated to India, largely to the west coasts of Bombay and Gujarat, between the 8th and 10th centuries with the persecution of Zoroastrians in Persia. In the late 18th century the Parsi community arrived at Calcutta from

Figure 12: View of the external façade of the Banaji Agiary, showing the Tuscan columns and the wooden louvered screens
Figure 13: The front porch of the Banaji Agiary with rectangular pilasters and alternating triangular and segmental pediments above the openings
Figure 14: Plan and section of the Banaji Agiary, at Ezra Street
Figure 15: Front façade of the Anjuman Atash Adaran
Figure 16: External façade of the Anjuman Atash Adaran showing the Neo-Classical influences
Figure 17: Zoroastrian iconography of the *Faravahar* on the (a) stained-glass paintings and (b) frosted glass etchings, at the Anjuman Atash Adaran
Figure 18: Zoroastrian iconography of the *Atash* (Holy Fire) on the tympanum of the arch


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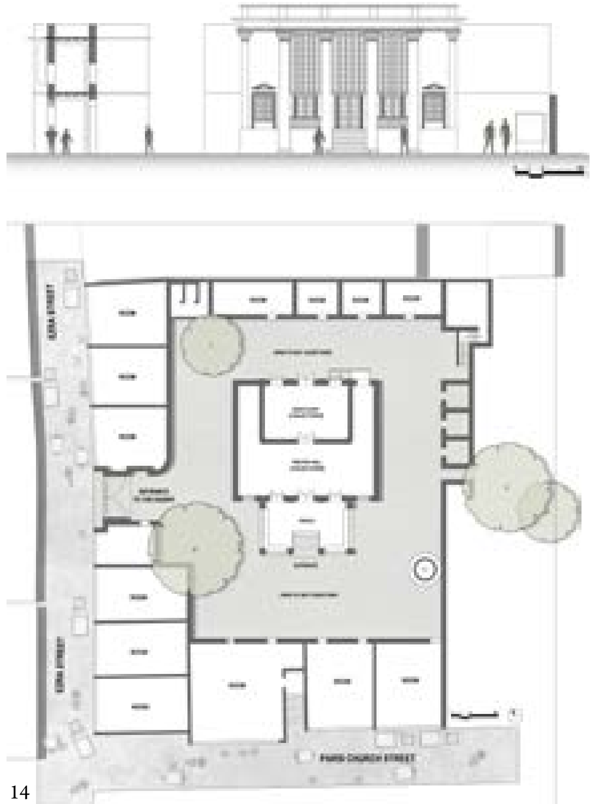

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Surat and soon took over the shipping industry and made significant philanthropic contributions to the city (Madan 1990: 62).

Calcutta has two Parsi fire temples: the Rustomji Cawasji Banaji Agiary (1839) and the Anjuman Atash Adaran (1912). Their spatial layout is fairly simple, typical of fire temples in western India and even the Middle East.

The Banaji Agiary, built on a high plinth, is entered via a flight of steps and a porch leading into a rectangular temple with an antechamber and a sanctum, the *Atashgah* containing the *Atash* or Holy Flame. The sanctum has an opening in the roof to let out smoke. Borrowing from European forms, the Banaji Agiary is designed in the Classical style. Four Tuscan columns supporting an entablature adorn the front façade symmetrically. The ornamentation on the entablature is unidentifiable due to its ruinous condition. Large wooden louvered screens, a shading device suited to these climes, and decorative cast-iron grilles with floral patterns surround the porch. Another borrowed Renaissance feature is the alternating triangular and segmental pediments capping the five openings of the façade. Unlike other fire temples in the country, especially in west India, the façades of the Banaji Agiary are not heavily embellished with Zoroastrian iconography.

By contrast with the Banaji Agiary, the Anjuman Atash Adaran is much adorned with Colonial as well as Zoroastrian features, although its plan is similar. The street-side façade is divided into five bays, with the central and end ones projecting slightly. The ground-floor façade is plain with vermiculations. On the upper floor, the central bay has two columns with Ionic capitals supporting a semicircular pediment, while the end bays have pilasters with a triangular pediment above. The end bays also have rose windows while the three middle ones have large semicircular arched openings with projecting keystones. All the openings contain stained glass with Zoroastrian iconography. Deep heavily molded cornices run along the façade at terrace and parapet levels. In the interior, Zoroastrian icons in the form of the *Lamassu* (an Assyrian protective deity with human head and the body of a winged bull or lion), the *Faravahar* (a winged sun disk with a male figure in the center), and the Holy Fire are repeatedly expressed in stained-glass paintings, etchings on frosted glass, wall panels, and cast-iron grilles in the arch tympanums.

Anglo-Indians

By the late 1700s, a new community with a complex social structure had been formed – the Eurasians. Amongst these, the Anglo-Indians settled in the densely commercial and cosmopolitan environs of Bowbazar. The wealthier part of this community eventually moved to the newer southern districts, closer to the European quarters, but the less affluent part remained in this neighborhood. Bow Barracks was designed as a garrison's mess for the army during World War I, but it was eventually leased to the Anglo-Indian community by the Calcutta Improvement Trust. As in most barracks, the architecture is minimalistic, functional, and symmetrical; somber without ornamentation. The precinct comprises 132 apartments of three types arranged in seven rectangular structures, each three stories high. Their façades have minimal decoration, with plain rectangular cornices and segmental arches devoid of trim or moldings. Their aesthetic quality derives from functional elements such as the louvered screens on the verandahs, letting in the breeze but keeping out the harsh sun, or their materials: exposed

Figure 19: Plan of Bow Barracks showing the ground floor plans of the seven blocks
Figure 20: View of the Barracks showing the exposed red brick façade with minimal ornamentation, segmental arched openings with louvered window shutters and narrow verandah with wooden louvered screens


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Figure 21: Elevation of block F of Bow Barracks

brick and cast-iron structural supports, cheap and widely available at the time of building. The wide private street between the blocks is used for gatherings during festivals like Christmas and Easter and also in everyday life.

Chinese

The Chinese began to settle in Calcutta much later than other nationalities. In 1780 Yong Atchew was the first Chinese to set up a plantation, 15 miles south of the city. The Calcutta Chinese were noticed in the early 1800s and from then there was an influx from various parts of China, settling around Bentinck Street, Phears Lane, Tiretta Bazaar, and stretches of Chitpur Road, forming a distinctive Chinatown with "traditional Chinese temples, dragon-architecture, gaily-painted signboards and festoons in their bold and picturesque language with the rustle of red silks and the aroma of Chinese food so temptingly around" (Sircar 1990: 64).

Unlike the places of worship of Armenians, Jews or Parsis, which are grand in scale, the Chinese temples are much humbler. This may be due to the different types of trade that these communities engaged in. While the Armenians, Parsis, and Jews were involved in larger businesses, such as shipping, coal mining or real estate, the Chinese engaged mainly in carpentry, shoe-making, and opium-dealing. As the Chinese migrated to Calcutta, to the Tiretta Bazaar trading area, migrant groups from particular villages would each set up their own temple, which also became their meeting places. This gave rise to six diverse temples, each belonging to a particular clan, with their own various deities and no typical layout being followed. Like all Chinese diaspora settlements, Calcutta's Chinatown incorporated many local features and also adopted Colonial elements. The temples are on a human scale, no more than two stories high and often rectangular in plan, with a courtyard and an open front or verandah. The temple façades have a distinctive rectangular entrance with Chinese calligraphy on brightly colored plaques and hanging Chinese lanterns, making these temples stand out despite their humble scale. The interiors are richly decorated, with an intricately carved wooden screen at the threshold of the shrine room and a structure hanging from the roof with imagery of flowers, fruits, birds, and mythical figures. In most temples, Chinese war weapons are displayed. The interiors are in bright vermillion, yellow, and green, the auspicious colors of traditional Chinese architecture.

Figure 22: View of the Nam Soon Temple from its front yard

Figure 23: Intricate woodwork in the Nam Soon Temple

Figure 24: a) Ground floor plan b) First floor plan c) Section AA' d) Front façade of the Toong On Temple (Base drawings by The Cha Project, https://issuu.com/buzzzmedia/docs/thechaprojectreport_red)

Figure 25: Neo-Classical facade of the Toong On Temple at Tiretta Bazaar

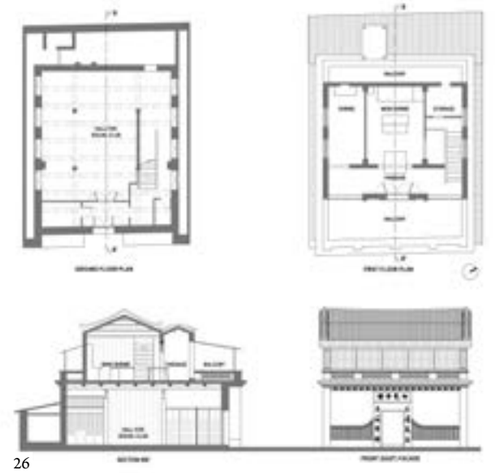

Figure 26: a) Ground floor plan b) First floor plan c) Section BB' d) Front façade of the Sea Ip Temple (Base drawings by The Cha Project, https://issuu.com/buzzzmedia/docs/thechaprojectreport_red)

Figure 27: Intricate woodwork in front of the altar at the Sea Ip Temple

Figure 28: View of the Sei Vui Temple showing the brightly painted ground floor and the long and narrow veranda on the upper floor, with cast iron railings and timber screens

Figure 29: Brightly painted interiors of the Chooney Thong Thien, plaques with Chinese calligraphy, and column capitals with the Meander pattern common in Chinese ornamentation

The Nam Soon temple is the oldest one, and has a charming simplicity. It is a single-story structure with a front yard leading to a verandah, supported by slender rectangular pillars and clad with glazed ceramic tiles. The verandah leads to three rooms, with an altar in the central one. The Sei Vui temple is a long narrow structure with its altar on the ground floor. The main doorways have brightly colored plaques with Chinese calligraphy on three sides. The upper floor is a continuous verandah with cast-iron railings and a timber screen running the length of the facade to keep out the fierce local sun. The Chooney Thong Thien and Gee Hing temples are two-story structures with the altar on an upper floor, opening onto a long verandah overlooking the street. Chooney Thong Thien has many interesting features, including column capitals with the meander or Greek key[1] pattern, widely used in traditional Chinese

architecture, and decorative wooden guardrails on the door and shutters. The Sea Ip Temple is a two-story structure, rectangular in plan, with a community hall on the lower floor and the altar upstairs. With its curlicue sloping roof, clay tiles, and upturned corners, the temple draws strongly on Chinese tradition. The Toong On Temple is rectangular in plan, with a community hall on the ground floor and an altar upstairs. The façade of this later temple borrows from the Classical style, with elements such as fluted columns with Ionic capitals, ornamental cornices above windows, dentiled cornices, semicircular pediments with stucco, festoons, and a parapet with decorative balusters.

The above discussion of some of the built heritage of the migrant communities of Central Calcutta shows that the architectural characteristics of these structures are not necessarily alien to the communities of today. The structures are a unique mix of the styles of traditional communities amalgamated with prevalent Colonial features and elements native to the city, expressed through differences in layout, scale and proportion, street interfaces, materials, construction techniques, ornamentation, and iconography. The main heritage resources of the communities located in the neighborhoods of Burrabazar, Tiretta Bazaar and Bowbazar are listed in Figure 30.

IDENTIFIED SHARED HERITAGE RESOURCES OF THE DWINDLING MINORITY COMMUNITIES OF CENTRAL CALCUTTA

Sl. No.	Past Name/ Present Name	Year of construction	Associated Community	Protection Status	Use / Functional Typology
1	Armenian Church of the Holy Nazareth	1688/ 1724	Calcutta Armenian community	Protected by Kolkata Municipal Corporation (KMC) - Grade I	Religious
2	Nam Soon Temple	1820	Calcutta Chinese community	Protected by KMC - Grade I	Religious & Educational (Primary and Middle School)
3	Rustomjee Cawasjee Banaji Agiary	1839	Calcutta Parsi community	Protected by KMC - Grade I	Religious
4	Beth El Synagogue	1856	Calcutta Jewish Community	Protected by Archaeological Survey of India (Kolkata Circle)	Religious
5	Chooney Thong Thien Haue Temple	1859	Calcutta Chinese community	Protected by KMC - Grade I	Religious
6	Magen David Synagogue	1884	Calcutta Jewish Community	Protected by Archaeological Survey of India (Kolkata Circle)	Religious
7	Elias Meyer School and Talmund Torah	Mid 19th Century	Calcutta Jewish Community	Unprotected	Educational Institute
8	Sea Ip Temple	1905	Calcutta Chinese community	Protected by KMC - Grade I	Religious
9	Sei Vui Temple and Voiling Club	1908	Calcutta Chinese community	Protected by KMC - Grade I	Religious and Community gathering place
10	Manackjee Rustomjee Dharamshala for Parsi Travellers	1909	Calcutta Parsi community	Unprotected	Hospitality and Community Gathering place
11	Neveh Shalome Synagogue	1911 (originally built in 1831)	Calcutta Jewish Community	Protected by KMC - Grade I	Religious
12	Byramjee Mehta Zoroastrian Atash Adran	1912	Calcutta Parsi community	Protected by KMC - Grade I	Religious and Community gathering place
13	Toong On Temple	1912	Calcutta Chinese community	Protected by KMC - Grade I	Religious and Community gathering place
14	Bow Barracks	1912	Anglo Indian	Unprotected	Residential
15	Gee Hing Temple and Club	1920	Calcutta Chinese community	Protected by KMC - Grade I	Religious and Community gathering place

Figure 30: Identified shared heritage resources of the dwindling minority communities of Central Calcutta

Communities of today and their engagement with the shared heritage of Central Calcutta

After Indian independence the scenario began to change. The Anglo-Indians, largely dependent on the British for social security, started emigrating, unsure of their position in society in an independent India (Bhattacharya 2009: 143). With the creation of the state of Israel in 1948, many Jews emigrated there (Mukherjee 2009: 87). The Sino-Indian war of 1962 led to large-scale emigration of Calcutta Chinese (Sircar 1990: 64). With the political changes, most of these communities lost their prosperity and migrated to the West in search of better opportunities. Their population began to dwindle and today only a few people of these minorities remain, struggling to protect their tangible and intangible cultural heritage in the city.

The neighborhoods of Burrabazar, Tiretta Bazaar and Bowbazar remain part of Calcutta's Central Business District, full of trading establishments. After the mass emigration of the original custodians of this heritage, the contemporary communities or "communities of today" inhabiting the area attach little or no value to it. To this day, the responsibility to protect these historic buildings rests with the remaining members of the ethnoreligious communities, who are largely unable to keep up with the task, given the departure of younger generations. In this scenario it is essential to seek participatory approaches for mobilizing contemporary communities to safeguard this heritage and prevent it from falling into dereliction. Two broad communities can be identified as stakeholders: the few remaining members of the ethnoreligious communities, and the occupational communities who work and live in these areas today. The next section of our paper seeks to apprehend their relationship with this shared heritage.

Ethnoreligious communities

This category includes not only the members of the ethnoreligious communities that continue to live or work here but also their worldwide diaspora.

The Armenian community of Calcutta, including a floating population of students, staff, and priests at the Armenian College and Philanthropic Academy, from various parts of the world, is actively involved in adequately maintaining its built heritage. This is funded by a trust headed by the Holy Church of Nazareth in Burrabazar.

The Jewish community of Calcutta takes pride in its shared built heritage and actively engages with it, though only a few Jews remain in the city. In the past decade its synagogues have been restored with funds from both the community itself and the diaspora. Seventy members of Jewish communities in Israel, the United States, Singapore, and Australia visited Calcutta for the reopening of the restored synagogues (Das 2008).

Calcutta still has a few hundred Parsis. While regular maintenance of the Byramjee Mehta Anjuman Atash Adaran is undertaken, the Banaji Agairy, the city's oldest agiary, has been encroached upon by a wholesale electrical market despite the temple having been declared a Grade I Heritage Building by the Kolkata Municipal Corporation, and community initiatives to protect it have been unsuccessful.

The Calcutta Chinese community is seeking to ensure the continuity of its intangible and tangible cultural heritage with aid from local and international organizations. For example, the Sei Vui Temple and Voiling Club, a Buddhist temple with an attached club and dormitory built in 1896, was recently transformed into a Cantonese restaurant. The community decided to reuse the dormitory as a restaurant to ensure continued funding for the maintenance of the temple and club by future generations. The diaspora community also come here, especially during the Chinese New Year, to visit family and friends.

In the past decade the Anglo-Indian community of Bow Barracks has been struggling to protect the Barracks and get it listed by the Kolkata Municipal Corporation as a heritage site to prevent it from falling prey to land sharks. The

Figure 31: The Toong On Temple engulfed by the Telephone Bhavan

Figure 32: Street Elevation of Old China Town showing large office buildings surrounding the Toong On and the Sea Ip Temple

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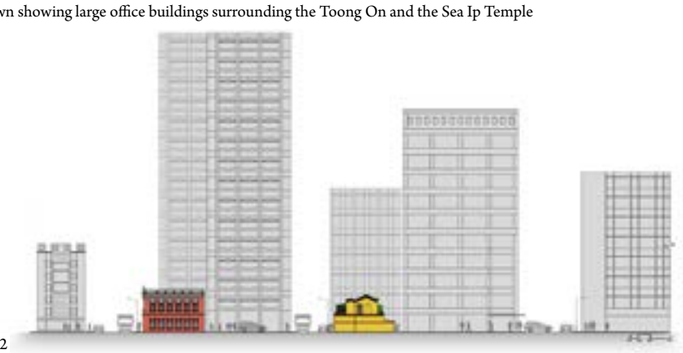

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community also safeguards Anglo-Indian heritage through annual celebrations and frequent cultural gatherings.

Occupational communities

As well as the ethnoreligious communities, those that encounter this shared heritage on a daily basis are also important. This community attaches little value to these resources, but lives and works close to them. It includes the office-workers of Old Chinatown, shopkeepers and informal vendors along Brabourne Road outside the Armenian Church, Neveh Shalom Synagogue, and Magen David Synagogue, and wholesale electrical traders around the Rustomjee Cawasji Banaji Agiary.

The temples of Old Chinatown, in Tiretta Bazar, are in an area densely built up with public and private office buildings, overwhelming the temples and degrading the neighborhood. They not only disrupt the area's visual harmony and human scale but also overpower these heritage resources, with no regard for the historical, social, and architectural values that these structures offer. Disregard for built heritage can also be seen in the planning by local authorities, allowing the building of monstrous modern structures so close by the temples. This disconnect from heritage was glaringly reflected in the survey conducted with office-goers in Tiretta Bazaar, who were largely unaware of the area's historical and sociocultural significance. Most office-workers could not identify the six Chinese temples within 300 m of their workplaces. But once informed, the respondents agreed to Old Chinatown being a significant heritage resource. Some of the reasons accounting for this significance were: "different communities live here", "diversity gives Calcutta its identity", their importance as "an identity-maker", "places of worship", "historical value", or as a "lineage of a section of society", and their relevance for "cultural fusion". However, some respondents said these structures had very little relevance to them personally, since they had no associational value for them, and the temples belonged to a community with whom they had little in common.

The shopkeepers and vendors on Brabourne Road have been engaged in business in this area for more than two generations now. While they were aware of the presence of the Armenian Church, the Neveh Shalom Synagogue, and the Magen David Synagogue, they were largely unaware of their historical and sociocultural significance. A majority recognized the structures as significant heritage resources of Calcutta, as "historical places", "tourist places" and "places of worship". Only a few, however, felt this heritage was relevant to them personally.

Similarly, the electrical wholesale traders at 26, Ezra Street, overpowering the Rustomjee Cawasjee Banaji Agiary, have been associated with this address for half a century. Yet even though most shopkeepers were aware of the building's historical and sociocultural value, they felt it was unnecessary to protect the Agiary, since it has "been closed for many years" and "does not have any worshippers", or because the "significance of the commercial activity on the premises far exceeded its heritage value", and they view these premises "only as a place for their business, with no personal association". They also felt that a restoration of the Banaji Agiary would have a negative impact on their businesses and that it was more important to retain the shopkeepers' livelihood than to conserve the temple. In both cases, the informal trade in the vicinity has left the buildings very much in the background, making them inconspicuous and undermining their heritage value due to the lack of any positively reinforced relationship with this built inheritance.

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Figure 33: Encroachment by informal commercial establishments at the Banaji Agiary premises

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Figure 34: Shopkeepers and informal hawkers on Brabourne Road, at the entrance of the a) Neveh Shalom Synagogue and b) Armenian Church

Developing common goals

Through our study some key questions emerged: how can Calcuttans of today be persuaded to protect heritage that they do not see as their own? How can this built heritage, whose original custodians are too few in number, be made relevant to a community that does not inherently identify with it? The neighborhood has great historical, associational, and sociocultural value as well as its distinct architectural character. It is a true representation of shared built heritage in Calcutta with far-reaching cross-cultural connections. The involvement of local contemporary communities in heritage preservation is essential, and so this section will look at possible methods for addressing the shortfalls in the engagement of these communities with heritage resources, increasing participation, and developing common goals for heritage protection.

The first step should be to generate awareness and recognition of the historicity of these neighborhoods which the communities of today identify as workplaces only. Heritage professionals, collaborating with members of the ethnoreligious communities, may help by organizing awareness-generating workshops at the heritage sites with traders, shopkeepers and office-workers in and around Burrabazar, Old Chinatown (Tiretta Bazaar) and Bowbazar, sensitizing them as to the area's historical and sociocultural significance, creating a first level of interaction between occupational and ethnoreligious communities. Heritage walks may be organized through historic neighborhoods, guided by heritage professionals and ethnoreligious figures, to build knowledge and inculcate a sense of pride in these business districts. Architectural heritage here may play a role in demonstrating the universal values of art, architecture, and beauty displayed through these structures that benefit not only the communities that built them but also those who now live and work in the vicinity. These structures transcend cultural boundaries and political divides by virtue of their artistic and architectural qualities, amalgamating the traditional architecture of diasporas with local and colonial attributes.

Engaging occupational communities with the intangible cultural heritage of ethnoreligious communities through craft workshops, food festivals, culinary workshops, etc., may result in increased associational value with this historic neighborhood. Collaboration with the city's educational institutes may be established so as to instill a discourse of cultural exchange at young ages. In this digital era, web-based engagement through digital tools may also be generated with help from the ethnoreligious communities. A compilation of the online archives of community members (photographs, letters, oral histories, narrations, memories, traditional recipes) may serve as a cultural repository. Such websites may be promoted to a wider audience through social media.

Central Calcutta's occupational communities must be helped to recognize the current state of these heritage resources and the need to safeguard them. Cognitive mapping exercises may be carried out with the communities to identify the threats and issues affecting the heritage and its vicinity. To ensure a balance between the needs of multiple communities and those of heritage resources, it is essential to facilitate dialogue between members of the ethnoreligious and occupational communities and also local government through public forums, focus groups or roundtable discussions. This will encourage mutual understanding between ethnoreligious and occupational groups, allowing them to meet on common ground, as well as directly expressing their concerns to political, civic, and professional representatives. Better coordination amongst the multiple communities will lead to better solutions and effective management of our cultural heritage resources.

Conclusion

The Armenian, Jewish, Parsi, Chinese and Anglo-Indian communities gave Central Calcutta a uniquely plural culture. The diverse architectural heritage generated as a result is a rich blend of the architecture of these traditions, mixed with European stylistic elements and local techniques and forms responsive to the city's climate.

As an indispensable part of Calcutta's history, this rich stock of built heritage is relevant not only to the stakeholder community that built it but also to the people of Calcutta today, as it testifies to the shared histories of multiple cultures in the city.

These structures should be seen not merely as houses of worship of bygone communities but also as exhibits of universal values of beauty in art and architecture which are relevant today and still able to serve all communities.

Our study showed that the needs and aspirations of the communities of today are not aligned with the conservation of built heritage. Various efforts should be made by heritage professionals to ensure that today's Calcuttans view these structures as valuable resources, understand the underlying values of sociocultural harmony that they represent, and have an increased sense of belonging and pride in these historic neighborhoods. A shift of attitude in the communities working here should be brought about, from identifying the areas of Burrabazar, Tiretta Bazaar and Bowbazar solely as workplaces to valuing the cultural amalgamation that this historic district represents.

These neighborhoods are reminiscent of Calcutta's cosmopolitan identity. With the diminishing population of migrant communities, their architectural heritage is vital to retaining this identity. We must ensure a sustained preservation of these shared built heritage resources

of Central Calcutta, and this will occur only if the communities of today take ownership, safeguarding this irreplaceable heritage and becoming active participants in its conservation.

[1] The meander is a repetitive ornamental motif resembling a labyrinth or the meanders of a river, appearing in bronzes of the Shang Dynasty in China and later in Chinese architecture. This pattern, which also resembles a primitive key, was also extensively used in Greek and Roman architecture, from which the name "Greek key" derives. It is unclear whether the pattern may have had an ancient common source, but the motif was common in traditional art and architecture in both civilizations.

Biography | Biografía | Biografia

Sohini Pyne

Sohini graduated from the Faculty of Architecture at Manipal University in 2017. She was initiated into the field of heritage conservation at Vikas Dilawari Architects, Mumbai, and was given the opportunity to work on a range of conservation projects under the guidance of leading conservation architect Vikas Dilawari. She has completed her post-graduate studies (M.Arch) in Architectural Conservation at the School of Planning & Architecture, New Delhi, with a scholarship from the Ministry of Human Resource Development. Sohini hopes to advocate for increased community engagement with the urban heritage of Calcutta and for the integration of heritage conservation in urban planning policies in our historic cities.

References | Referencias | Referências

Bhattacharya, Nandini. 2009. The Anglo-Indians of Calcutta: An Interview with Rudolph L. Rodriguez. In Bannerjee, Himadri; Gupta, Nilanjana; and Mukherjee, Sipra (eds.), *Calcutta Mosaic*, 142-150. New Delhi: Anthem Press.

Bhattacharya, Susmita. 2009. The Armenians of Calcutta. In Bannerjee, Himadri; Gupta, Nilanjana; and Mukherjee, Sipra (eds.), *Calcutta Mosaic*, 70-85. New Delhi: Anthem Press.

Bose, Nirmal Kumar. 1964. *Calcutta 1964: A Social Survey*. Calcutta: Lalwani Publishing House.

Edulji, Phiroze. 2015. Banajee Agiary in Calcutta is now an Electrical Market. *News World India*. https://parsikhabar.net/heritage/banajee-agiary-in-calcutta-is-now-an-electrical-market/11914/ (consulted on 05/11/2015).

ICOMOS. 2010. Changing World, Changing Views of Heritage: Heritage and Social change. *Proceedings of the ICOMOS Scientific Symposium*, 5-6. Dublin: ICOMOS International Secretariat.

Loth, Calder. 2016. The Complex Greek Meander. *Institute of Classical Architecture & Art*. https://www.classicist.org/articles/classical-comments-the-complex-greek-meander/#_edn1 (consulted on 02/09/2021).

Madan, C. J. 1990. The Parsis of Calcutta. In Chaudhuri, Sukanta (ed.), *Calcutta The Living City*, vol. 2, 62-63. New Delhi: Oxford University Press.

Mukherjee, Sipra. 2009. The Jews of Calcutta. In Bannerjee, Himadri; Gupta, Nilanjana; and Mukherjee, Sipra (eds.), *Calcutta Mosaic*, 86-95. New Delhi: Anthem Press.

Omalley, Lewis Sydney Steward. 1911. *Census of India*. Calcutta: Bengal Secretariat Book Depot.

Ray, Dalia. 1996. Jews in Indian History After Independence. *Proceedings of the Indian History Congress*, vol. 57, 568-574. http://www.jstor.org/stable/44133361 (consulted on 20/10/2020).

Seth, Mesrovb Jacob. 1897. *History of the Armenians in India: From the Earliest times to the Present Day*. London: Luzac & Co.

Sircar, Jawahar. 1990. The Chinese of Calcutta. In Chaudhuri, Sukanta (ed.), *Calcutta: The Living City*, vol. 2. New Delhi: Oxford University Press.

Solvyns, François Balthazard. 1811. *Les Hindous*, vol.3. Paris: Chezl' Antuer.

The cha project. 2014. *A heritage-led revival of Kolkata Chinatown*. https://issuu.com/buzzzmedia/docs/thechaprojectreport_red (consulted on 10/07/2020).

Nathaniel Robert Walker

Classicisms of Color: Transatlantic Exchanges in African and American Traditional Architecture

Clasicismos de color: Intercambios transatlánticos en la arquitectura tradicional africana y americana

Classicismos de cor: Intercâmbios transatlânticos na arquitectura tradicional africana e americana

Keywords | Palabras clave | Palavras chave

Charleston, Ethiopia, West Africa, Colonnades, Metalwork

Charleston, Etiopía, África Occidental, Columnatas, Metalistería

Charleston, Etiópia, África Ocidental, Colunatas, Trabalho em metal

Abstract | Resumen | Resumo

The beautiful city of Charleston, South Carolina, was built by enslaved Africans, and the painful historical connections between classical architecture and slavery have encouraged some critics to see classicism as racist. Contemporary black artist Jonathan Green, however, proposed a new way of viewing Charleston's buildings: as a testament to black creativity and resilience that fused African architectural traditions, such as colonnaded porches and metalwork, with European ones. Following Green, this essay traces a number of trans-Atlantic architectural connections forged during the age of empires. Many different African nations, from Ethiopia to Ghana, developed great classical architectures that traveled to Europe and America through the migration of people or the publication of books. African-American designs also returned to Africa, sometimes with European accents, and found compatibility with indigenous traditions. As Green asserted, a beautiful truth emerges from this study: traditional architecture is bigger than racism. It is African, American, and human.

La hermosa ciudad de Charleston, en Carolina del Sur, fue construida por esclavos africanos y las dolorosas relaciones históricas entre arquitectura clásica y esclavitud han llevado a algunos críticos a considerar el clasicismo como racista. Sin embargo, el artista negro contemporáneo Jonathan Green propuso una nueva forma de ver los edificios de Charleston: como testimonio de la creatividad y la adaptabilidad de quienes fusionaron las tradiciones arquitectónicas africanas, como los porches con columnatas y los trabajos en metal, con las europeas. Siguiendo a Green, este artículo recorre una serie de vínculos arquitectónicos transatlánticos forjados durante la época de los imperios. Muchos países africanos, desde Etiopía a Ghana, desarrollaron grandes arquitecturas clásicas que pasaron a Europa y América a través

de las migraciones o la publicación de libros. Los diseños afroamericanos también volvieron a África, a veces con acentos europeos, y encontraron una compatibilidad con las tradiciones autóctonas. Como decía Green, una hermosa verdad surge de este estudio: la arquitectura tradicional es más grande que el racismo. Es africana, americana y humana.

A bela cidade de Charleston, Carolina do Sul, foi construída por escravos africanos, e as dolorosas ligações históricas entre a arquitectura clássica e a escravatura têm encorajado alguns críticos a ver o classicismo como racista. O artista negro contemporâneo Jonathan Green, contudo, propôs uma nova forma de ver os edifícios de Charleston: como um testemunho da criatividade e resiliência negras que uniram as tradições arquitectónicas africanas – tais como os alpendres com colunatas e os trabalhos em metal – com as europeias. De acordo com Green, este estudo identifica uma série de ligações arquitectónicas transatlânticas forjadas durante a era dos impérios. Muitas nações africanas diferentes, da Etiópia ao Gana, desenvolveram grandes arquitecturas clássicas que viajaram até à Europa e América através da migração de pessoas ou da publicação de livros. Os designs afro-americanos também regressaram à África, por vezes com sotaques europeus, e descobriram ser compatíveis com as tradições indígenas. Como afirmou Green, uma bela verdade emerge deste estudo: a arquitectura tradicional é maior do que o racismo. Ela é africana, americana, e humana.

Introduction

In May of 2016, the curtain rose on an opera at the Gaillard performing arts center in Charleston, South Carolina, revealing the true nature of that city to the world for the first time. Admittedly, neither the city nor the opera were new; Charleston was founded in 1670 and quickly rose to wealth as an imperial fusion of America, Europe, and Africa, as West African rice was grown in vast quantities by enslaved people to feed a hungry British Empire (Smith 2020). The opera, George Gershwin's *Porgy and Bess*, had since 1935 explored the lives of impoverished black Charlestonians, with set designs depicting slummy iterations of the famously beautiful and historic city's courtyards and alleyways (Fig. 1). For the new 2016 production, however, Spoleto Festival USA asked Jonathan Green (1955-), a popular, black, Charleston-based painter and advocate of African-American history and culture, to transform *Porgy and Bess*. Green agreed to the job on the condition that he also be empowered to transform Charleston: "I wanted to do it from the perspective of Africans coming here just like everyone. What would we be looking at today if Africans had come here…like Europeans?"[1]

Using costume and set design, Green worked to reveal a hidden Charleston by visually amplifying the African creativity fundamental to the city's development. Africans had not only powered the agricultural sector of the colony; they had also filled skilled architectural roles as carpenters, bricklayers, and blacksmiths. Because slavery compelled them to conform to European tastes, however, African contributions to the architecture of Charleston are too easily overlooked. Importantly, Green did not believe that foregrounding African contributions would totally alter Charleston's classical architecture, because he knew that many of the features that make the city beautiful, such as its porches and metalwork, have deep African connections. Green's sets for *Porgy and Bess* therefore "drew on Charleston's traditional architecture",[2] featuring colonnaded galleries, elegant wrought iron, exuberant arches, symmetry, and proud spires; human-scaled windows and balconies were everywhere to be seen. There was one crucial innovation, however: the buildings confidently displayed colorful patterns and ornaments that Jonathan Green summoned from his studies of African-American and West African aesthetics (Figs. 2 and 3).

When the curtain – actually, the wrought-iron like scrim – rose to reveal his designs, Charleston's architecture was finally seen for what it truly is: a hybrid of multiple traditions of equal value, many of them African and all of them beautifully compatible with one another. Critics were enthusiastic about the results, describing the sets as "beautiful," an "artistic paradise", a "triumph", and a "utopian vision."[3] The world that Green revealed, however, was no fantasy. Africa is home to its own classical design traditions that are compatible with European and American ones because they all ultimately sprang from the same human source. Indeed, the traditions of these three continents have been shared for centuries, if not always on equally beneficial terms, and frequently along lines that have been obscured by distance and time. Green's set designs asserted that studying African and American classical kinships offers new tools for two crucial endeavors: first, supporting the continued flowering of our living traditional architecture, and second, empowering that architecture to serve as a progressive agent of American cultural, social, and political wellbeing.

Figure 1: Theater Guild production of *Porgy and Bess*, Boston, 1935–36 (Library of Congress)

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Figure 2 and 3: Spoleto Festival USA production of *Porgy and Bess*, Charleston, 2016 (Julia Lynn Photography, Spoleto Festival USA)

One of the Most Ancient of All Arts

Some critics insist that classicism is inherently antithetical to black people. The reasons for this argument are as deep and far-reaching as the ocean that unites the continents of the Atlantic World. In 2021, Amber Wiley published an essay entitled, "Firmitas, Utilitas, Profectus: The Architecture of Exploitation in Ghana," calling attention to, among other things, classical ornamentation on European slave-trade fortresses (2021). Rome scholar Dan-el Padilla Peralta recently argued that classical studies were hopelessly contaminated by white supremacy, recounting how Rafael Truijllo, former dictator of the Dominican Republic, described his capital city of Santo Domingo as the "Athens of the Americas" and claimed to inherit the "impeccable whiteness" of the beautiful Greco-Roman artistic tradition while fomenting hatred against the "darker and inferior" people of Haiti (2020).[4] Similar abuses of classical history also took place in the United States. The pro-slavery politician John C. Calhoun (1782-1850) said in the early 1830s, as Greek Revival buildings rose all over America, that "if he could find a Negro who knew the Greek syntax, he would then believe that the Negro was a human being and should be treated as a man". Some years later, the African-American intellectual Alexander Crummell answered this "crude asininity" by pointing out that Calhoun had studied Greek at Yale, and that black people were not then allowed to enroll at Yale, and that it was unreasonable to expect Greek syntax to blossom in black Americans' brains by "spontaneous generation" (Crummell 1898: 206-207).

Recent books including *The Ebony Column* and *Classicisms in the Black Atlantic* recount other episodes in which American white supremacists leavened their racist arguments with appeals to classical history; these books also, however, show how many black intellectuals, ranging from Mary Church Terrell to W.E.B. Du Bois, reappropriated classical philosophy, art, history, and literature throughout the nineteenth and twentieth centuries, deploying it against bigotry by repeatedly pointing out the "intrinsic conflict between American racist, capitalist, materialistic culture and the cultural virtues found in the classics" (Hairston 2013: 14). These black voices argued many times, on many levels, that prejudice and oppression were beneath classicism. Many allies joined the conversation; for example, one white abolitionist reversed the stream of historical association by arguing that it was none other than the corrupting evil of slavery that had, "at last, converted the whole republic [of Athens] into a mass of ruins", and hastened the decline of Rome (Brown 1844: 453).

Among the leaders of African-American intellectual and cultural life at the beginning of the twentieth century were the earliest black licensed architects in the United States. Their beaux-arts training guaranteed an immersion in classicism. The Macon, Georgia-born architect Wallace A. Rayfield (1873-1941) earned a bachelor's degree in the classics from Howard University followed by a certificate in architecture at the Pratt Institute and a degree in the same from Columbia University. He returned to the South determined to support the cultural aspirations of black Americans, teaching for a time under Robert R. Taylor at Tuskegee before settling in Birmingham, Alabama, in 1908 for a prolific career (Durough 2010: 2-3). He was heralded in the African-American press as one of the "Beacon Lights of the Race" for his commitment to "one of the most ancient of all arts", and for his record as a careful teacher and prudent businessman (Hamilton 1911: 451-457).[5]

Figure 4: 16th Street Baptist Church by Wallace A. Rayfield, Birmingham, Alabama, 1911 (Library of Congress)

Figure 5: The Obelisk of Axum in Axum, Ethiopia, ca. 400 AD (Ondřej Žváček)

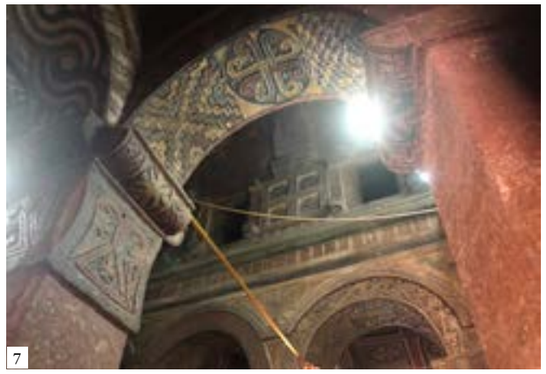
had been sustained since antiquity. By Rayfield's day, such ties were discussed using, among other bodies of evidence, architecture. As early as 1814, the English traveler Henry Salt (1780-1827) published praise of a 400 AD monolithic obelisk in Axum, Ethiopia (Fig. 5), as a "highly wrought and very magnificent work of art." His admiration only grew when he "compared the design… with many of Egyptian, Grecian and Roman structure," as he declared it "as the most admirable and perfect monument of its time," assuming, with a hint of prejudice, that Greek architects had designed it (Salt 1816: 313). In his epic work *The Illustrated Handbook of Architecture*, James Fergusson (1808–1886) dedicated a short chapter to Ethiopia, asserting its ancient ties to Egypt as evidenced by the pyramid tombs of Meroë, and citing G.A. Hoskins' 1835 book *Travels in Ethiopia* to argue that some of the earliest true arches were built in that African nation, long before they rose in Rome (Fergusson 1859: 249-254; Hoskins 1835: 157).

In the 1860s, William Simpson (1823-1899) presented a widely publicized report on the ancient Orthodox cathedral in the Nubian city of Dongola, which had been hewn out of solid rock. Simpson observed how its enormous columns stood "upon a square base" and were crowned with capitals in the form of "massive blocks" supporting vaults of solid stone. Unifying the building was a frieze that was "most unlike what belongs to the Doric order, and yet I know of nothing else to which it could be compared." He noted other unique features, including an Islamic arch and "beautiful decoration" in the form of inscribed lines that, to his eyes, resembled ancient Anglo-Saxon metalwork. He returned repeatedly to the structure's overall likeness to other Orthodox churches: "It is curious to note that the Greek church has penetrated such a distance south into Africa, and so far north into Russia, carrying in each direction a similar style of architecture" (Simpson 1869: 239-240).

Simpson had no inkling of the true depth of that observation. Centuries before and much further to the south, at the mountainous site of Lalibela, the great Ethiopian king Gebre Mesqel Lalibela (reigned ca. 1181-1221) had marshalled a veritable army to excavate a representation of the Heavenly Jerusalem out of the stony fabric of his realm. Its many churches exhibit the Greek cross plans, inscribed ornamental lines, Byzantine or Islamic-inspired arches, and beautiful columns and vaults like those that amazed Simpson at Dongola, but on an urban scale (Figs. 6-8). The peerless classical complex of Lalibela is a unique synthesis of many influences, enlivened by locally created forms and construction methods. Old first-hand accounts by flabbergasted Portuguese explorers were available to Victorian Americans, and new descriptions of Lalibela were slowly being published in the 1800s, describing its architecture as "simple and majestic," with "coloured ornamentation" of "a geometrical pattern," and "ogive and horse-shoe curves… seen in combination with the plain round arch."[6]

In the 1800s, African-American intellectuals had at their fingertips many histories connecting the ancient Mediterranean world to sub-Saharan Africa. Egypt flowered before any European civilization, and just as that kingdom reached east to Mesopotamia and north to the Aegean, it also reached south into its own continent of Africa. Victorian historians struggled to parse historic Upper Nile domains like Nubia, Kush, and Ethiopia, but they knew that connections between them and the Mediterranean

Rayfield's most prominent designs were monumental brick churches serving African-American congregations in his adopted hometown. Among them is the famous Sixteenth Street Baptist Church of 1911 (Fig. 4), which is still standing despite its horrendous 1963 bombing by the Ku Klux Klan. With twin, domed towers flanking a triple-arched portico, a plethora of open and blind arches, and large central cupola floating on a tiered drum, this church, together with others by Rayfield, reveals a unique classical aesthetic deserving of more study. His proliferation of round arches seems to draw upon Romanesque, Renaissance, and perhaps Rundbogenstil sources, but Rayfield's "cross-in-square" plan and central, domed cupola are similar to Orthodox churches of Byzantine descent (Spinks 2006: 5). The motivations for this eastern turn are unclear; it could have just been an erudite aesthetic choice. On the other hand, there was at least one reason why a black American designer with a knowledge of the classics and great hopes for his community might reach into Orthodox traditions: their connection with African architectural achievement.



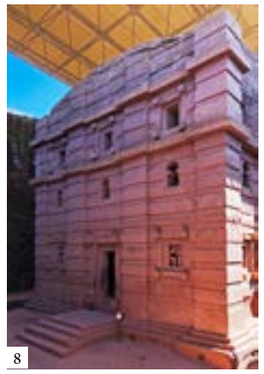


Figure 6: The roof of the rock-hewn Biete Ghiorgis (Church of St. George), which takes the form of a Greek cross, in Lalibela, Ethiopia, late 1100s or early 1200s

Figure 7: Column capitals and arches with inscribed and painted geometric and botanic ornament in Biete Maryam (Church of St. Mary), all cut out of solid rock, in Lalibela, Ethiopia, late 1100s or early 1200s

Figure 8: The symmetrical main façade of the rock-hewn Biete Amanuel (Church of Emmanuel), with banded pilasters and human-scaled apertures, some with Islamic or Byzantine-inspired arches, in Lalibela, Ethiopia, late 1100s or early 1200s

If Wallace A. Rayfield came across any of these various descriptions of Ethiopian architecture in the course of his studies or practice, it is possible that he might have chosen to emphasize arches and draw upon Orthodox traditions in his church designs as an affirmation of African significance in classical architecture. Only a few years after the Sixteenth Street Baptist Church went up in Birmingham, W.E.B. Du Bois (1868-1963) published an influential book asserting constant architectural congress between ancient Egypt, Ethiopia, and Greece, and citing Hoskins to point to the African source for the classical arch (Du Bois 2001: 22). The eager reception of the argument that black Americans could claim classical architecture as a part of their heritage is indicated by a much-discussed 1944 artwork entitled *Building More Stately Mansions* (Fig. 9), by the famous African-American painter and muralist Aaron Douglas (1899–1979), a friend of Du Bois. Insisting upon representing black Americans as "a proud and majestic people," Douglas consistently worked to celebrate the legacy of African art in new ways (Driskell 1976: 62, 153). *Building More Stately Mansions* took its name from the 1858 poem "The Chambered Nautilus", by Oliver Wendell Holmes – itself a reference to natural beauty of perennial significance to classical architects. It foregrounds black builders and intellectuals, as well as a teacher who gathers two children before a globe and inspires them to contemplate the glorious architectural forms of the black past and future, including a pyramid, classical columns, and a great triumphal arch (Moyer, Lecznar, and Morse 2020: 1-2). Wallace Rayfield's unique architecture seems more legible when considered alongside such proud assertions of Egypto-African origins for classicism and especially the arch. In any case, nobody then or now could accuse Rayfield's classicism of being an inherently "white" derivation without insulting the architect and betraying an ignorance of millennia-old Ethiopian design traditions that even a nineteenth-century Bostonian or Chicagoan could have overcome with a small amount of reading, and black writers and artists assertively claimed in the years following the construction of the Sixteenth Street Baptist Church.

Figure 9: *Building More Stately Mansions*, painting by Aaron Douglas, 1944 (Nashville, Tennessee: Fisk University Galleries)

Figure 10: Taeke Negest Beata Lemariam by several architects working under Empress Zewditu, Addis Ababa, Ethiopia, 1918–1928 (Kyle Dontoh)

A great church with a similar configuration of triple round-arched entryway, twin domed towers, and central dome over a Greek cross plan even went up in Addis Ababa, Ethiopia, in 1918-1928 (Fig. 10), under the direction of the Empress Zewditu (1876-1930). She hired several architects from multiple countries, including Germany, Greece, and Japan, to bring her monument into being.[7] While Rayfield's prominence was probably not such that Ethiopian royalty was aware of his achievements, the similarities between his churches and that of Empress Zewitu at least speak to a common inheritance of architectural forms and ideas that were being claimed by great black builders at nearly the same time. Rayfield's work may have actually reached a different part of Africa after he became the official architect of the nationwide Zion African Methodist Episcopal Church; they commissioned him to design buildings for South Africa and Liberia, including churches and a great hotel or office tower in Monrovia (Durough 2010: 111, 113).[8] More research must determine whether any of these endeavors were built.

West African Classicism: "As a Gift from God"

Rayfield was not the first African-American architect to project his profession across the sea. There was, by this time, already a longstanding tradition of black craftspeople and builders returning, in a reverse diaspora, from the Americas to different parts of West Africa. As recounted by scholar Adédoyin Tẹ̀riba, African traditional architecture was profoundly affected by the migration of nearly eight thousand Afro-Brazilians to the Bight of Benin during the 1800s (Tèriba 2017, 2019, 2020). Working alongside other emancipated migrants such as the Afro-Cubans and the Sàró of Sierra Leone, Afro-Brazilians formed social and economic networks in cities such as Ouidah, Porto Novo, and Lagos, building monumental cathedrals and mosques with great columns and arches, soaring spires with delicately carved floral scrolls, and undulating pediment gables (Fig. 11). Working in a confident Baroque mode, they built colorful monuments for the dead (Fig. 12). They also built magnificent houses for the living, including the

Figure 11: Shitta Bey Mosque by Martin and Porphyrio, Lagos, Nigeria, 1894 (The Trustees of the British Museum)

Figure 12: A mausoleum by Afro-Brazilian architects, Lagos, Nigeria, ca. 1894 (Adédoyin Tẹ̀riba)

Figure 13: Ẹbùn House by Sàró architect Herbert Macaulay and Afro-Brazilian craftsman Balthazar dos Reis, Lagos, Nigeria, 1913 (Salvador, Brazil: Fundação Pierre Verger)

Figure 14: Detail of Ẹbùn House by Sàró architect Herbert Macaulay and Afro-Brazilian craftsman Balthazar dos Reis, Lagos, Nigeria, 1913 (Salvador, Brazil: Fundação Pierre Verger)

1913 Ẹbùn House by Sàró architect Herbert Macaulay and Afro-Brazilian craftsman Balthazar dos Reis (Figs. 13 and 14). This house took its name from the inscription over its arched entryway announcing in Yoruba and English that it was "a gift from God." The botanical plaster ornaments that enfolded every human-scaled window and doorway brought it nearly to Edenic life – even its Corinthian columns seemed to burst from seed pods or emerge from baskets brought to the place as votive gifts. These vital forms push the boundaries of the classical orders, even as they also, in the words of Tẹ̀ríba, reveal "the continuous usefulness of classicism" for these immigrant builders (Tèriba 2017: 77). Sadly, the Ẹbùn House was destroyed by fire in the 1980s, and many surviving Afro-Brazilian masterpieces are today at risk of destruction from decay or redevelopment. Where they remain, however, they testify to the talent and skills of American-African migrants who, aspiring to achieve a transcontinental homecoming, expressed their hopes in traditional architecture.

Over time, indigenous West African builders in the hinterlands of Nigeria began to draw lessons from the immigrant work in the coastal metropolis, creating "their own interpretation of what the Afro-Brazilians did in Lagos," and producing "a regional architectural aesthetic in the process" (Tèriba 2017: 165). This is not surprising, as there were many different design precedents across West Africa, centuries in the making, that were inherently sympathetic with the core features of Afro-Brazilian classical architecture. The Hausa people, the Edo Empire, and the Asante Empire were among the many groups that had long supported great cities and towns with world-class achievements in design and craft. It is impossible to provide a meaningful introduction to all of these traditions here, but a few examples can be gently touched upon for their commonalities with and links to the broader architectural traditions, including in America.

Adobe is one of the most important building materials in West Africa. It is well-insulating, sustainable, and affordable – if also high-maintenance – and lends a ceramic or "fluid" aesthetic quality to buildings (Morris 2004: 7). In the Sahel, the vast semi-arid sub-Saharan belt across Africa that bridges the desert and the tropics, much African adobe classicism had strong historic links to the Mediterranean world. Here, for many centuries, the Islamic faith has intersected, sometimes beautifully and sometimes violently, with pre-existing indigenous traditions (Blier 2004, Bourdier and Minh-ha 2011, House 2018). In the ancient nation of Mali, the Great Mosque of Djenné was built and rebuilt many times since the Middle Ages until it was consolidated by French colonizers in the early 1900s. This building is well known, but there are many other less studied structures, some of them newly built, that speak the tectonic language of classicism in similar vernacular terms. The ca. 1995 mosque of Nangoyo, for example, contains an orderly grid of great square columns with sculpted capitals supporting arcades (Fig. 15). Thick beads of plaster emphasize round arches, with narrow apertures punctuating their spandrels, adding an upper register to this rhythmic, human-scaled space, which is crowned by a simple but well-proportioned cornice. Half-circle windows, like those of Roman baths, shower light along every row; these windows are framed on the exterior by spired, pilaster-like buttresses lining up with the columns within, rationally dividing the building's facades into regular bays (Fig. 16).

Mali's *sakho* houses provide a communal residence for single men awaiting marriage. Many of them fuse local and French aesthetics, participating as assertive works of public architecture in the complex power struggles between indigenous traditions, Islamic authorities, and European colonizers (Blier 2004: 199). One of the *sakho* houses in Kolenze presents a veritably Palladian arrangement (Fig. 17). Five human-scaled bays, centered upon an arched doorway, are divided by subtle pilasters that seem to melt into or ripple across the building. The arched windows feature railings that match the earthen balustrade crowning and unifying the house. The wooden ceiling joists jutting out in clusters beneath this balustrade are akin to the posts that famously protrude from mosques such as that in Nangoyo and in Djenné. As the ends of structural members that subtly convey the strength of the roof while providing rhythmic decoration, they are also akin to the rafter tails of Craftsman bungalows or triglyphs of the Doric order.

Another performance of classical rhythm is found in a mosque in Sanam, Niger (Fig. 18). Here, square columns rise in segments that evoke the divisions of the human body. Many of them feature shallow, blind niches, scaled to human heads, that seem to commit their little arched spirits to the great structural endeavor above. The topmost segments of each column are articulated in a capital-like manner, with delicately flaring corbels that gracefully spring into the soaring adobe arches that carry the wooden ceiling; the columns themselves seem to unfurl branches like great trees, or even spread their wings and fly, lifting the prayers of those below. This mosque was built in 1998 by El Hadj Abou Moussa, a student of the Aga Khan Award-winning Nigerien architect Falké Barmou (1926-). The latter explained, when asked where he found his skills and inspiration, that they came to him "in a dream from God" (Morris 2004: 7).

In Hausa buildings of Niger and Nigeria, geometric ornamentation is often covered with vivid color. Dating back to the 1700s, the Palace of the Emir in Daura, Nigeria,

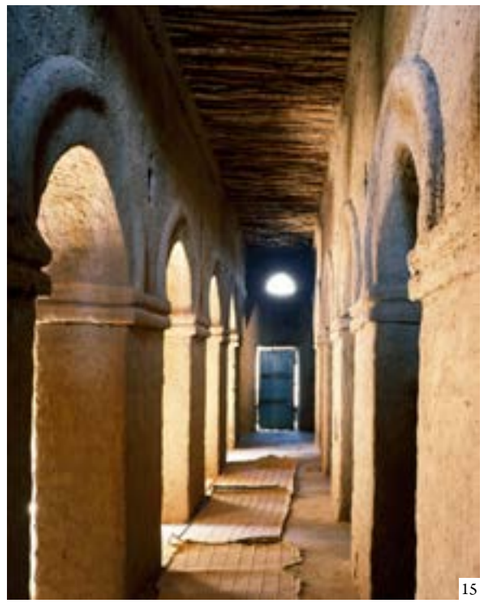


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Figure 15: The prayer hall of a mosque in Nangoyo, Mali, ca. 1995

Figure 16: Exterior of a mosque in Nangoyo, Mali, ca. 1995

Figure 17: Sakho house in Kolenze, Mali, twentieth century

Figure 18: The prayer hall of a mosque by El Hadj Abou Moussa in Sanam, Niger, 1998

(15-18: James Morris, from the series *Butabu*)

features a forecourt with a great arch decorated with flowers and visual assurances from the ruler that he will decapitate all serpents (Fig. 19). This is centered symmetrically upon the entrance pavilion to the palace, or *zaure*, which features two decorated pilasters supporting a prominent lintel, from the center of which scrolls and a diamond rise to crown the heads of all who enter. The *zaure* is flanked by colorful lozenges that read like quoins, tying it into the façade. The entire composition is comparable in many ways to other classical civic structures relying on symmetry and centrality to provide clarity, dignity, and delight. This palace is also, unlike the other adobe buildings discussed in this essay thus far, made of concrete, having been rebuilt in the mid-twentieth century (Blier 2004: 211). Hausa architecture is currently undergoing a Renaissance, but adobe is giving way to cement wherever money and materials are ready at hand. The palace in Daura thus offers valuable lessons to most other modern societies: concrete can be beautiful and ennobling if builders draw upon the traditional forms and principles that Africans have shared and developed for centuries, sculpting fluid materials into elegant forms that poeticize structure, celebrate human bodies, and delight human eyes. Here, great architecture is wrapped in sinuous skin, and sprouts boughs and flowers as gifts from God.

Figure 19: Entrance to the Palace of the Emir in Daura, Nigeria, built in the 1700s, rebuilt in the mid-1900s (James Morris, from the series *Butabu*)

Roots of Iron and Faces of Gold

Just as Du Bois asserted an African role in the early development of classical architecture, he also praised the early development of African metalwork, which had a direct impact on American architecture (Du Bois 2001: 68). A "cautious position" places the origins of ironworking in sub-Saharan Africa between 800-400 BC; some historians believe it was invented indigenously while others argue that it was imported, but all agree that the "story of iron production and use in Africa is punctuated with a great diversity of brilliant inventions and innovations, attesting to local experimentation and adaptation" (Chirikure, Dewey, and MacEachern 2019: 243). To the Yoruba people of modern Nigeria, iron was sacred, linked in name and in characteristics to the deity Ògún, who descended to the world "at the dawn of creation" with an iron chain in his hand (Abiodun 2019: 37).

The great capital of the Edo Empire, Benin City, had straight streets, seemingly infinite expanses of earthen walls, and a vast royal palace. Benin art and architecture exhibited, in the words of historian Kathryn Wysocki Gunsch, an "aesthetic preference for symmetry," and their craftspeople and architects used metal elements to emphasize the symmetry of facades and colonnaded courtyards as well as invest them with a visual vitality (Gunsch 2018: 143). Eyewitness reports indicate that the palace, first built by Oba Ewedo (1255-1280), possessed "beautiful and long square galleries… resting on wooden pillars, from top to bottom covered with cast copper on which are engraved the pictures of… war exploits and battles… every roof is decorated with a small turret ending in a point, on which birds are standing… cast in copper with outspread wings… cleverly made after living models" (Gunsch 2018: 48). A 1668 Dutch engraving depicts the spires and their naturalistic bird sculptures (Fig. 20). The palace was sacked by the British in 1897, but many of the leaded brass plaques that adorned its great colonnades survive. One example in the British Museum depicts four figures standing in front of a symmetrical façade that probably represented part of the palace (Fig. 21). Four columns, all covered by sculptures, rise to support a shingled roof with a central turret adorned by a great cast-metal serpent and crowned by a metal bird, now damaged. The building's entryway features an inscribed botanical scroll, perhaps representing an ornamented metal door, and floral quatrefoils sprout everywhere else. The royal palace of Benin City was clearly imbued with many symmetries and deployed high-quality metalwork to accentuate its great towers and human-scaled colonnades.

Further west in the Asante Empire, in what is now Ghana, one could find more metalwork and colonnades. The latter often took the form of domestic porches as well as royal galleries and were built of sculpted wattle-and-daub. Since the capital of Kusami was also wrecked by the British in the late 1800s, early eyewitness reports remain key. Thomas

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Figure 20: *Benin City*, engraving by Olfert Dapper, 1668 (National Library of Portugal)

Figure 21: Leaden brass plaque depicting the decorated columns and adorned roof of the Royal Palace of Benin City, 1500s. This plaque probably decorated a column in the manner depicted (The Trustees of the British Museum)

Edward Bowdich visited the Asante Empire in 1817 and used many classical terms to describe its architecture:

> *(…) the palace is an immense building of a variety of oblong courts and regular squares, the former with arcades along the one side, some of round arches symmetrically turned… the entablatures exuberantly adorned with bold fan and trellis work of Egyptian character. They have… small windows of wooden lattice, of intricate but regular carved work, and some have frames encased with thin gold. The squares have a large apartment on each side, open in front, with two supporting pillars, which… give it all the appearance of the proscenium… of the older Italian theatres. They are lofty and regular, and the cornices of a very bold cane work in alto relievo* (Bowdich 1819: 57-58).

Bowdich's engravings reveal that this arcaded, golden-windowed, intricately carved palace of open porches and geometrically intricate friezes also featured columns with paneled shafts and little medallions serving as understanded capitals where they met their entablatures (Fig. 22). Bowdich also recorded a less elite street in Adoom, where a number of captains dwelled (Fig. 23). The architecture consisted of a continuous earthen base tinted by red ochre and sculpted in geometric decorations (Bowdich 1819: 305). Symmetrical columned porches alternated with elaborately carved, pilastered, solid masses; these served, respectively, as the public and private portions of each house. The porches were used for long, idle conversations among friends and family, as well as for "receiving strangers, observing or superintending customs, and evening recreation" (Bowdich 1819: 308). The patterns that were carved on the earthen

Figure 22: Engraving depicting part of the royal Asante palace, modern Ghana, by Thomas Edward Bowdich, 1819 (University of Pittsburgh Library)

Figure 23: Engraving depicting a porch-lined street occupied by Asante captains, modern Ghana, by Thomas Edward Bowdich, 1819 (University of Pittsburgh Library)

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Figure 24: A single temple structure in Kumasi, modern Ghana; usually, these came in groups of four, tightly arranged around a central court. Photograph ca. 1899, from Mary Alice Young Hodgson, The Siege of Kumassi, 1901 (University of Toronto Library)

facades of Asante houses had many different sources and purposes. Some of them were *adinkra* symbols with specific meanings, others may have drawn upon the Islamic designs that the Asante encountered to the north, while others were local exemplifications of geometrical and floral beauty, carved to delight the eye. Many Asante dwellings and temples (Fig. 24) survived into the twentieth century, and photographs confirm written descriptions from the century before. Only a handful stand today.[9]

The gold that glittered on portions of the royal Asante palace was, together with their commerce in slaves and textiles, the source of their wealth. Their craftsmanship with that glistening material offers another example of African traditional design with classical features: the *akrafokonmu*, or "soul washer's badge," which embodied the light and warmth of the life-giving sun. There is a great deal of variety in these objects, but they always exhibit radial symmetry and usually offer botanical forms, with cast or hammered foliage, petals, and rosettes (Fig. 25). One *akrafokonmu* presents a special case: in 1874, it was set into a larger golden disc designed by the London jeweler R & S Garrad & Co. This amalgam of African and British craft testifies to the innate compatibility of different human aesthetic traditions, as the English jewelers interpreted and replicated the African forms without straying too far from their own habitual patterns (Fig. 26). In so doing, it visually captures the ancient kinship of the human family, connected by threads that ripple along stone obelisks and arches through Egypt and into Ethiopia and back again, wind through prayer halls from the Mediterranean through the Sahel, weave their ways through the brass colonnades of Benin City and the proscenium porches of the Asante, connect the Alabama work of Wallace Rayfield to Africa, and ascend along the undulating Afro-Brazilian pediments of Lagos. These lines of human connection also, however, made their way to Britain as imperial siphons of loot and tribute, and traveled to Charleston along the hellish routes of slave ships. The London-embellished *akrafokonmu* was, in fact, a trophy of war. What if we summoned these beautiful traditions together to build for peace and equality, as Jonathan Green did in Charleston?

Figure 25: A gold *akrafokonmu* or "soul washer's badge," Asante, modern Ghana, before 1874 (The Trustees of the British Museum)

Figure 26: A compound object; at the center is a gold *akrafokonmu* or "soul washer's badge," Asante, modern Ghana, before 1874; this is imbedded in a gilt silver plate designed by R & S Garrard & Co., London, 1874 (The Trustees of the British Museum)

Conclusion: New Beginnings for Old Things

Green's sets in *Porgy and Bess* used architecture to celebrate classical Charleston as African as well as European and American. W.E.B. Du Bois and probably Wallace Rayfield would have recognized Green's colorful arch as a feature with deep African ties. The wrought iron that Green summoned also has direct African connections, and while the nature of slavery makes them hard to trace with specificity, evidence has been available for years. Gerald K. Geerlings, for example, noted in his landmark study, *Wrought Iron in Architecture*, that "Boston, New York, and Philadelphia have a certain amount of early iron work, but scarcely any in comparison to the quantity produced… in New Orleans, Mobile, Savannah, and Charleston" (Geerlings 1983: 123, 143, 190), the four most important North American port cities for enslaved Africans. While Geerlings apparently knew nothing about African metalwork and therefore attributed what he saw in these Southern port cities to French and German immigrants, he noted that the craftmanship of white blacksmiths seemed strangely transformed when it was practiced in the American South, becoming "far more influenced by local work" than that of Europe (Geerlings 1983: 144). He also noted that the ironwork attributed to a white blacksmith, such as the German-born Christopher Werner, was in fact often made by the black craftsmen they enslaved, such as Toby Richardson, who is remembered to this day as a "top rank artist in iron" who did much of the "actual work" in Werner's shop (Geerlings 1983: 144, Shuey 1935: 5, and Vlach 1991: 25-29). Looking at specific examples, such as the ca. 1840 wrought-iron gates of St. Michael's Church in Charleston (Fig. 27), also traditionally attributed to a German, Geerlings observed that different portions seem to have been made by different hands (Geerlings 1983: 144). Some of those hands were certainly black, and if they had arrived in chains from Africa, their veins may have been coursing with the same ancient metalworking traditions that produced the decorated columns of Benin City and the solar flowers of the *akrafokonmu*. Surely many enslaved African metalworkers also noticed that the s-curves and other forms of European-style ironwork had direct parallels in African aesthetics, such as the plaster ornament on Asante dwellings. The ethnic convolutions of the slave trade meant that most of the enslaved would have had complicated relationships with polities on all sides of the Atlantic Ocean, but no matter which particular empires had torn their lives to pieces, they held the power to hammer songs of home into sacred iron, formed into familiar shapes on foreign shores. Those songs echo in the streets of Charleston, and every other place that Africans built, as a painful and powerful testament to the humanity that slavers tried to deny.

Figure 27: The wrought- and cast-iron gates of St. Michael's Church, Charleston, by J.A.W. Iusti and, inevitably, the enslaved craftspeople in his workshop, ca. 1840

Jonathan Green also pulled colonnaded porches and galleries into his vision. There have long been many debates about the origins of the American porch, given their paucity in British domestic architecture and proliferation in places like Charleston. Some scholars have pointed to European models, but Jay D. Edwards has traced direct links between American porches and Caribbean precedents, such as those in Barbados, and a web of connecting lines tying all of the above to West Africa (Manca 2005, Edwards 2005, Edwards 2011). There is no question that many porch-lined American streets resemble Adoom at least as much as do the lanes of Bath or Bristol. Green's exemplification of a Charleston porch does not require us to disbelieve in the potential for multiple historic sources, but it does ask us to acknowledge and honor African ones. For centuries, in Africa as across much of the world, great architects and craftspeople have drawn upon sources near and far, combining different ideas and techniques and summoning many materials to fashion brilliant buildings with proud columns, soaring arches and domes, vivacious lines of floral and geometric pattern, and symmetries and spaces that frame and ennoble human bodies. We can build upon our shared architectural heritage by drawing close, in great halls and on intimate porches, as the sisters and brothers we have always been.

[1] Felder, Lynn. May 22, 2016. S.C. artist bringing fresh, authentic look to 'Porgy and Bess', *Winston-Salem Journal*, Section D, 1.

[2] Parker, Adam. October 4, 2015. Spoleo announces production of 'Porgy and Bess' – Gershwin opera to feature sets and costumes by Jonathan Green. *The Post and Courier*, Section: Arts & Travel, 1.

[3] Oestreich, James R. May 26, 2016. 'Porgy and Bess,' a Spoleto Festival USA Homecoming. *The New York Times*, Section C, 2; Felder, Lynn. May 29, 2016. Latest vision of 'Porgy and Bess' brings artistic paradise to Spoleto, *Winston-Salem Journal*, Section A, 10; Toppman, Lawrence. June 1, 2016. Charleston goes wild over everything about 'Porgy and Bess,' *The Charlotte Observer*, 5A; Parker, Adam. May 26, 2016. Spoleto Festival's

'Porgy and Bess' reimagines Catfish Row, *The Post and Courier*, Section Arts and Travel.

[4] In addition to Peralta's essay, see: Poser, Rachel. February 2, 2021. He Wants to Save Classics From Whiteness. Can the Field Survive?, *The New York Times*: https://www.nytimes.com/2021/02/02/magazine/classics-greece-rome-whiteness.html?searchResultPosition=1 (accessed February 25, 2021).

[5] Business Efficiency: How W.A. Rayfield Is Proving His Genius in Special Field. May 3, 1913. *The Denver Star*, 7.

[6] Clerke, E.M. July 1884. Abyssinia and Its People. *The Dublin Review*, vol. 3, no. 23, 332.

[7] Gebrewold, Frehiwot (Ed). June 2016. Taeke Negest Beata Lemariam: Hidden Gem in Bustling Addis, *The Eminence*, vol. 20, 58–59.

[8] Boyd, Ashley. January 31, 2010. Work of Tuscaloosa's First Black Architect Shines in Churches. *Tuscaloosa News*: https://www.tuscaloosanews.com/article/DA/20100131/News/606109647/TL (accessed March 3, 2021).

[9] Asante Traditional Buildings, official website of UNESCO: https://whc.unesco.org/en/list/35/ (accessed March 22, 2021).

References | Referencias | Referências

Abiodun, Rowland. 2019. Ògún, the Òrìṣà Whose Fame is Worldwide. In Roberts, Allen F.; Joyce, Tom; and Berns, Marla C. (eds), *Striking Iron: The Art of African Blacksmiths*, 36-41. Los Angeles: Fowler Museum at UCLA.

Blier, Suzanne Preston. 2004. Butabu: *Adobe Architecture of West Africa*. In Morris, James, Butabu: Adobe Architecture of West Africa, 185-216. Princeton: Princeton Architectural Press.

Bourdier, Jean-Paul; and Minh-ha, Tinh T. 2011. *Vernacular Architecture of West Africa: A World in Dwelling*. London: Routledge.

Bowdich, T. Edward. 1819. *Mission from Cape Coast Castle to Ashantee*. London: John Murray.

Brown, Henry. 1844. *The History of Illinois, from Its First Discovery and Settlement to the Present Time*. New York: J. Winchester.

Chirikure, Shadreck; Dewey, William J.; and MacEachern, Scott. 2019. Ages of Iron: Origins of the Blacksmith's Art in Africa South of the Sahara. In Roberts, Allen F.; Joyce, Tom; and Berns, Marla C. (eds.), *Striking Iron: The Art of African Blacksmiths*, 240-243. Los Angeles: Fowler Museum at UCLA.

Crummell, Alexander. 1995. The Attitude of the American Mind toward the Negro Intellect, a speech originally delivered in 1898. In Oldfield, John R. (ed.), *Civilization and Black Progress: Selected Writings of Alexander Crummell on the South*. Charlottesville: University Press of Virginia for the Southern Texts Society.

Driskell, David C. 1976. *Two Centuries of Black American Art*. Los Angeles: Los Angeles County Museum of Art.

Du Bois, William Edward Burghardt. 2001. *The Negro*. New York: Dover Publications.

Durough, Allen R. 2010. *The Architectural Legacy of Wallace A. Rayfield, Pioneer Black Architect of Birmingham, Alabama*. Tuscaloosa: The University of Alabama Press.

Edwards, Jay D. 2005. Open Issues in the Study of the Historic Influences of Caribbean Architecture on that of North America. *Material Culture*, vol. 37, 1: 44-84.

Edwards, Jay D. 2011. Creolization Theory and the Odyssey of the Atlantic Linear Cottage. *Etnofoor*, vol. 23, 1: 50-83.

Fergusson, James. 1859. *The Illustrated Handbook of Architecture*. London: John Murray Albemarle Street.

Geerlings, Gerald K. 1983. *Wrought Iron in Architecture*. New York: Dover Publications.

Gunsch, Kathryn Wysocki. 2018. *The Benin Plaques: A 16th Century Imperial Monument*. London: Routledge.

Hairston, Eric Ashley. 2013. *The Ebony Column: Classics, Civilization, and the African American Reclamation of the West*. Knoxville: The University of Tennessee Press.

Hamilton, Green Polonius 1911. *Beacon Lights of the Race*. Memphis: F.H. Clarke & Brother.

Hoskins, George Alexander. 1835. *Travels in Ethiopia*. London: Longman, Rees, Orme, Brown, Green, and Longman.

House, Steven; and House, Cathi. 2018. *Villages of West Africa: An Intimate Journey Across Time*. Atglen: Schiffer Books.

Manca, Joseph. 2005. On the Origins of the American Porch: Architectural Persistence in Hudson Valley Dutch Settlement. *Winterthur Portfolio*, vol. 40, 2-3: 91-132.

Morris, James. 2004. *Butabu: Adobe Architecture of West Africa*. Princeton: Princeton Architectural Press.

Moyer, Ian; Lecznar, Adam; and Morse, Heidi (eds.). 2020. *Classicisms in the Black Atlantic*. Oxford: Oxford University Press.

Peralta, Dan-el Padilla. 2020. Athens and Sparta of the New World: The Classical Passions of Santo Domingo. In Moyer, Ian; Lecznar, Adam; and Morse, Heidi (eds.), *Classicisms in the Black Atlantic*. Oxford: Oxford University Press.

Salt, Henry. 1816. *A Voyage to Abyssinia*. Philadelphia: M. Carey.

Shuey, Mary Willis. 1935. Charleston's Signed Ironwork. *The Reading Puddle Ball*, vol. 4, 1: 1-5.

Simpson, William. 1869. Abyssinian Church Architecture. *Papers Read at the Royal Institute of British Architects, Session 1868–1869*, 234-246. London: The Rooms of the Institute.

Smith, Hayden R. 2020. *Carolina's Golden Fields: Inland Rice Cultivation in the South Carolina Lowcountry, 1670–1860*. Cambridge University Press.

Spinks, Amie A. 2006. Sixteenth Street Baptist Church, National Historic Landmark nomination form. Washington DC: National Historic Landmarks Survey. https://npgallery.nps.gov/NRHP/GetAsset/NHLS/80000696_text (consulted on 01/03/2021).

Tẹ̀riba, Adédoyin. 2017. *Afro-Brazilian Architecture in Southwest Colonial Nigeria*. Princeton: Princeton University PhD Dissertation.

Tẹ̀riba, Adédoyin. 2019. A Return to the Motherland: Afro-Brazilians' Architecture and Societal Aims in Colonial West Africa. In Dogramaci, Burcu; and Pinther, Kerstin (eds.), *Design Dispersed: Forms of Migration and Flight*, 232-247. Bielefeld: Transcript Verlag.

Tẹ̀riba, Adédoyin. 2020. The Burden of Freedom: Therapeutic Architecture as Self Fashioning in the British Protectorate of Lagos (1830s–1900). *EuropeNow: The Online Monthly Journal of the Council for European Studies*. https://www.europenowjournal.org/2020/10/11/the-burden-of-freedom-therapeutic-architecture-as-self-fashioning-in-the-british-protectorate-of-lagos-1830s-1900/ (consulted on 04/03/2021).

Vlach, John Michael. 1991. *By the Work of their Hands: Studies in Afro-American Folklife*. Charlottesville: The University Press of Virginia.

Wiley, Amber. 2021. Firmitas, Utilitas, Profectus: The Architecture of Exploitation in Ghana. In Meuser, Philipp; and Dalbai, Adil (eds.), *Architectural Guide: Sub-Saharan Africa*, 276-283. Berlin: DOM publishers.

Biography | Biografía | Biografia

Nathaniel Robert Walker

He is Associate Professor of Architectural History at the College of Charleston. He earned his PhD at Brown University and studies the relationships between architecture, urbanism and human dreams of reform and utopia. Walker recently published *Victorian Visions of Suburban Utopia: Abandoning Babylon* (Oxford University Press: 2020), and *Suffragette City: Women, Politics, and the Built Environment* (co-edited, Routledge: 2019). His research has been featured in numerous journals, edited volumes, and exhibitions, including *The City Luminous: Architectures of Hope in an Age of Fear* (co-curated, 2019). He has given research presentations in many places, from the American University of Beirut to the Kanazawa Institute of Technology, from the Harvard GSD to the United Nations Conference Center in Addis Ababa.

Book Reviews
Reseñas de libros
Revisão de livros

Regarding Geography, Building and Tradition in Catalonia

Sobre geografía, construcción y tradición en Cataluña

Sobre geografia, construção e tradição na Catalunha

Josep Maria Fortià

Esta publicación es el catálogo de una exposición organizada por el Departament de Cultura de la Generalitat de Catalunya, que recorrió múltiples ciudades catalanas entre 2015 y 2019.

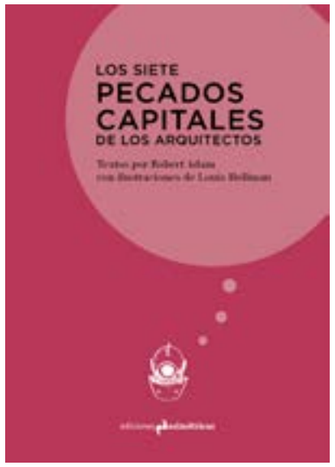
La publicación, además de referirse al contenido de la propia exposición, aborda las relaciones cruzadas entre la arquitectura tradicional, los materiales y las técnicas constructivas y la configuración del paisaje a partir de la perspectiva de disciplinas tan diversas como la antropología, la geografía y la arquitectura.

Las reflexiones que se van hilvanando a lo largo del libro, acompañadas de abundante material de archivo procedente de toda la variada geografía catalana, plantean cómo el territorio, las formas de vida y las relaciones sociales en la sociedad tradicional se combinan para dar forma y sentido a las arquitecturas vernáculas, que a su vez permiten crear un paisaje humanizado provisto de una fuerte identidad.

Los autores de esta obra son los antropólogos Ferran Estada y Fabien Van Geert –comisarios también de la exposición–, la arquitecta Mónica Alcindor y Roger Costa, responsable del Departament de Cultura. Todos ellos plantean interesantes cuestiones relativas a la arquitectura tradicional, a sus valores etnológicos y a la necesidad de su protección y salvaguarda. También abordan su difícil adaptación a las formas de vida, a las tecnologías y a las necesidades de la sociedad del siglo XXI.

Por ser evidente que las condiciones en las que estas arquitecturas surgieron han cambiado de forma radical a lo largo del siglo XX, el debate sobre qué hacer con estas construcciones y este paisaje que está mutando a ritmo vertiginoso es necesario y urgente. En este sentido, los ejemplos, las aportaciones y los elementos para la discusión que se plantean en esta publicación son de un gran interés para profesionales y para los ciudadanos preocupados por el territorio, el paisaje y la identidad de nuestro país.

Fabien Van Geert y Ferran Estrada
Construint el territori. Arquitectura tradicional i paisatge a Catalunya
Departament de Cultura. Generalitat de Catalunya, 2018



The way we are

Tal como somos

Tal como somos

Carlos J. Irisarri

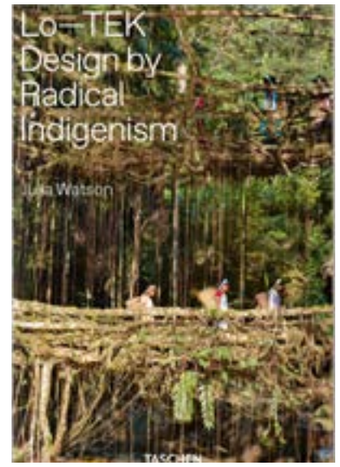
Hace tiempo el teórico de la arquitectura Colin Rowe decía que, ante el deprimente espectáculo de la arquitectura moderna, su refugio era la Italia del siglo XVI. Pues bien, he aquí unos autores que no sólo no se resignan al consuelo, sino que con sorprendente valentía señalan a los culpables y dirigen su agudo sarcasmo a los artífices de tanto horror contemporáneo.

Robert Adam, conocido arquitecto y activista del buen gusto, reúne en esta breve obra una serie de artículos publicados originalmente en *Architects' Journal*, que acompaña con los dibujos del gran arquitecto y viñetista Louis Hellman. Capítulo a capítulo, los autores atacan los vicios profesionales –y también algunos personales– del considerado "arquitecto medio", de forma sistemática, inmisericorde y... muy divertida.

Del vestuario extravagante al lenguaje rebuscado, de la soberbia al dogmatismo, del derroche a la incompetencia, no hay exceso que no quede ridiculizado desde la agudeza –muy británica– de quien conoce a fondo la profesión. Aún más inquietante resulta el convencimiento de los autores de que esos extravíos son los que están detrás de los pobres resultados de tanta arquitectura prescindible. No cabe duda de que los que dicen que la crítica ha muerto aquí tienen quien les contradiga.

Advertencia al lector: si alguien se reconoce, se ofende o se siente maltratado, es que quizá tiene algo sobre lo que meditar seriamente. Eso sí, siempre puede regalarle el libro a su cónyuge, a quien seguro que sí divertirá.

Robert Adam, Louis Hellman
Traducción: Isabel Suárez-Llanos
Los siete pecados capitales de los arquitectos
Ediciones Asimétricas, 2020



Our Need for Traditional Ecological Knowledge

Los conocimientos ecológicos tradicionales que necesitamos

A nossa necessidade de conhecimento ecológico tradicional

Harriet Wennberg

Lo-TEK's 419 pages are held together by an innovative binding that allows them to fall open at any point with equal ease. This edition has been designed to illustrate the fact that a traditional object (in this case, a book) can be state-of-the-art, echoing the content between the covers which demonstrates that indigenous cultures deserve not romanticised idealisation, but recognition for the highly advanced and adapted benefits they offer. Author Julia Watson's central argument is that the traditional ecological knowledge (TEK) of cultures and communities across the globe has answers to the climate crisis we face in the 21st century: the ancient and time-tested is the radical and current. It is an argument made not by arguing, but by amassing a compelling compendium of detailed examples of indigenous philosophy and vernacular architecture.

The book is divided geographically and ecologically into sections on mountains, forests, deserts, and wetlands. Each entry is dedicated to a particular practice, system, or technology and has a summarising introduction and conclusion along with more in-depth information, diagrams, photographs, and illustrations. Content ranges from the *waru waru* agricultural terraces of the Inca in Peru and the *kihamba* forest gardens of the Chagga in Tanzania, to the *qanat* underground aqueducts of Iran and the *sawah tambak* rice-fish aquaculture of the Javanese in Indonesia.

We have entered the decade of action towards the UN's 2030 Sustainable Development Goals. 2021 is being called "an environment super-year", and we need a global shift towards symbiosis with nature. In designing cities, and in facing the challenges of the climate crisis, Lo-TEK argues that we must acknowledge indigenous innovation and age-old ecological knowledge.

Watson's thorough research, meticulous compilation, and veneration for the subject matter will help her readers to develop more of a sense of awe for what humans are capable of, and to reflect on what actions they can take to live more in balance with nature. This book is needed. So too is all the knowledge referenced and contained between its covers. The critical thing is, of course, what happens next. Let us hope that the ways of the past are allowed to inform the ways of the future.

Julia Watson
Lo-TEK: Design by Radical Indigenism
Taschen, 2019

Architecture, a Question of Dignity

La arquitectura, cuestión de dignidad

A arquitectura, uma questão de dignidade

Carlos J. Irisarri

Que este libro estuviera desaparecido dentro del panorama editorial en español (la edición mexicana precedente, publicada en los años setenta, está más que extinguida) es asombroso, pero a su vez ha ayudado mucho a que se haya convertido en un libro de culto, uno de esos imprescindibles en las bibliografías a pesar de su carácter de ausente. Por esto, es quizá uno de los libros más anhelados por el lector despierto, aquel que busca referencias de una arquitectura que esquive el deprimente panorama del *star system*.

No es raro que sea el intrépido equipo de la editorial Asimétricas el que por fin repare esta carencia, tras traernos no hace mucho una excelente monografía de Hassan Fathy. Se culmina así una azarosa historia editorial que ha merecido ser contada en la propia introducción del libro. La traducción, de tono muy cercano al original, es excelente, y la obra se ha envuelto, además, en un diseño exquisito.

El pensamiento de Fathy se puede resumir en una idea contundente: la arquitectura del pobre merece ser tan digna como la del rico. No dispondrá este primero del mismo presupuesto, y distarán mucho los tamaños, instalaciones y acabados. Pero la calidad espacial, las proporciones y disposición de las piezas, la luz, el confort o la belleza, deben ser igual de buenos, algo que el arquitecto está obligado a conseguir. Si la dignidad, además de un derecho universal, es la cualidad suprema del ser humano, uno de sus mayores garantes es precisamente el marco en que este desarrolla su existencia.

Toda esta teoría es la que este libro convierte en práctica, narrando con detalle el experimento de la creación de Nuevo Gourna, núcleo de realojo en el que Hassan Fathy trabajó incansablemente. Aquí reinterpreta el urbanismo y la arquitectura vernácula, sus formas, sus materiales y modos de construir, con toda su sabiduría. Viviendas frescas en pleno desierto sin coste energético, iluminadas naturalmente a través de prudentes celosías, distribuciones a la medida del ser humano, viviendas hermosas en su sencillez. Todo ello es una modernidad que nada tiene que ver con la que ha ocupado –demasiado tiempo ya– el papel cuché de las revistas.

Mejorar la sociedad desde la arquitectura, ese es el elevado ideal al que aspira Fathy. En esta obra encontramos los elementos necesarios para, al menos, intentarlo.

Hassan Fathy
Traducción: Cristina Ramos
Arquitectura para los pobres
Ediciones Asimétricas, 2021

Revisiting the ill-understood principles of the master builder Hassan Fathy

Al rescate de los principios del maestro Fathy para revertir su incomprensión

Revertendo a incompreensão: Ao resgate dos princípios do mestre Fathy

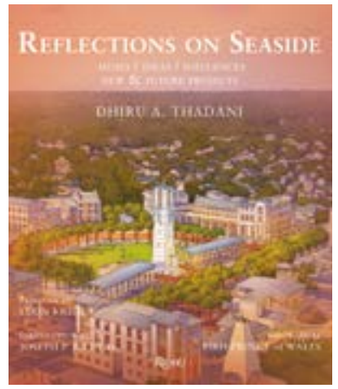
José Luis Baró Zarzo

Creador poliédrico de profundo calado humanístico, Hassan Fathy (Alejandría 1900 - El Cairo 1989) destacó por su personalidad firme y valiente, que no le impidió nadar a contracorriente en un momento en el que los nuevos aires que corrían en la arquitectura comenzaban a imponerse como referente exclusivo y excluyente de una modernidad que sobrevaloraba el progreso y denostaba la tradición constructiva. El incomprendido arquitecto egipcio experimentó entonces el camino opuesto: rechazó la utilización importada del acero y hormigón armado, y se acercó a la sabiduría popular, recuperando una filosofía *low-cost* al alcance de las gentes, basada en el empleo del adobe y diversas técnicas constructivas ancestrales, como las bóvedas nubias erigidas sin cimbra, las cúpulas, los patios o los captadores de viento.

Estos principios fueron desarrollados en el que sería el encargo más relevante de su trayectoria: la construcción de Nuevo Gourna (1946-1952), la ciudad que habría de realojar a los habitantes del antiguo asentamiento, lejos del área arqueológica donde se implantaba. El trazado inacabado de este pequeño núcleo urbano de Luxor responde a la reinterpretación de la tradición urbanística y arquitectónica desde el apego a la cultura autóctona, traducida en el uso racional de materiales y técnicas locales de acuerdo con una extraordinaria sensibilidad hacia los problemas climáticos.

En pleno siglo XXI, ante los retos suscitados por el cambio climático y la pérdida de identidad a causa de la globalización, la arquitectura de Fathy está más vigente que nunca. De ahí que la publicación del catálogo *Hassan Fathy, a contracorriente* resulte especialmente oportuna. El libro recoge diversos ensayos suscritos por especialistas, alternados con una selección de la obra construida del arquitecto egipcio y sus peculiares dibujos. José Tono Martínez, coordinador del catálogo y comisario de la exposición, ofrece al inicio una visión global con la puesta en valor del protagonista; Serge Santelli, Leïla el-Wakil, Nadia Radwan y María Pura Moreno aportan sus propias interpretaciones críticas; mientras que Fernando Vegas, Camilla Mileto y Valentina Cristini complementan la publicación con un texto sobre la arquitectura de tierra en España.

José Tono Martínez (coord.)
Hassan Fathy: a contracorriente
Ediciones Asimétricas, 2021



The Central Square: Lyceum Set-Piece

La Central Square unida al Lyceum de Seaside

A Praça Central do Lyceum de Seaside

Michael Dennis

Dhiru Thadani has just produced his second massive book on the tiny beach town, Seaside, Florida. *Reflections on Seaside* joins his earlier *Visions of Seaside* as well as *Views of Seaside*, a still earlier volume produced by the Seaside Institute. In terms of number and area of pages, these three volumes are almost equal (95%) to Edward Gibbon's *The History of the Rise and Fall of the Roman Empire*. Can this small, designed, community support this degree of attention? Possibly. Although Seaside has been reviled by many modernist architects who resent its style and success, it is important for its urbanism well beyond its size and neo-traditional style. *Reflections* contains 132 essays by ninety contributors. These essays are organized in four chapters: "Muses," "Ideas," "Influences," and "New & Future Projects." Within these mostly short, mostly interesting, *Reflections*, however, there is a very important improvement to the urban form of the town: Thadani's own design connecting the Town Center to the Lyceum. This is beautifully illustrated in Steven Hurtt's essay, "Of Modest Grandeur and the Affordance of Intimacy."

Despite its sophistication and importance, the Seaside plan had two major flaws. One is that the Central Square was too big. The other, more important one, was that the buildings defining the Central Square had a public "front" to the square and a service "back" to the spatially incomplete Lyceum and residential fabric behind, thus disconnecting the square from the fabric.

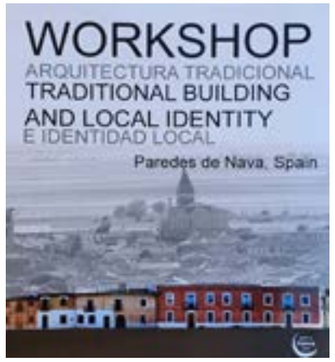
Dhiru Thadani's design to connect the Central Square through Dan Solomon's arched opening to the Lyceum is a miraculously beautiful and effective solution to the problem. It is, in fact, so effective that it is hard to see that there ever was a problem to be solved –but there were many. They are now invisible due to the ingenious design. These many problems, and their solutions, are described and illustrated by Thadani in his essay, "The Lyceum Colonnade."

The concept of the project is simple: a continuous colonnade unites the detached buildings and defines the central space of the Lyceum, similar to Jefferson's Lawn at the University of Virginia. The far end is closed by a semi-circle of the colonnade framing a stage; the entrance from the Central Square side is framed by symmetrical stairs leading to the second level. The connection of the Lyceum to the Central Square is accomplished by a slightly raised "neck" crossing Quincy Circle. This neck, Quincy Plaza, is defined by paving and palm trees. The resulting sequence of Central Square, Portal, Quincy Plaza, and Lyceum is so beautifully clear and compelling that one hardly notices passing through the service backs of buildings.

This unifying urban ensemble is designed at the intersection of urban design, architecture, landscape, and the *minutia* of construction. It is what

practice should be –architecture and landscape in the service of urbanism. It also illustrates the value of incremental development and correction, like the evolution of Seaside itself. For this reviewer this intervention is worth the massiveness of the tome. The connection of the Lyceum to the Central Square is one of many recent improvements to Seaside's public spaces that are illustrated in *Reflections on Seaside*.

Dhiru Thadani
Reflections on Seaside
Rizzoli, 2021



Experimental Earthen Building in Paredes de Nava

Paredes de Nava: Un espacio rural experimental

Paredes de Nava: Um espaço rural experimental

José Mª García de Acilu

Paredes de Nava (Palencia, España) cuenta con una importante arquitectura de tierra, un auténtico catálogo vivo de soluciones y técnicas constructivas, que uno puede encontrar tanto en grandes iglesias como en casas, casonas, casetas, naves, corrales, o, incluso, palomares. Muy variado es, además, el muestrario de técnicas con las que la tierra es aplicada: adobe, tapia, tapia encadenada, entramados, revocos de tierra, en combinación con ladrillo, piedra, madera… Se trata de una arquitectura hecha de materiales naturales, cercanos, casi sin procesar, que se ha adaptado al lugar y responde a sus necesidades: una lección de sostenibilidad.

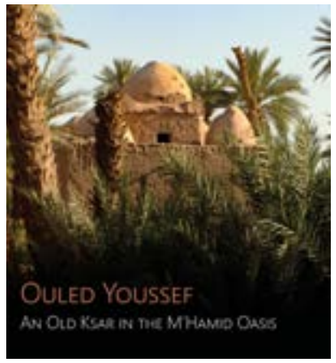
Durante una semana al año, el pueblo se convierte en un campo experimental internacional, en el que el diseño colaborativo del espacio público involucra a los asistentes en un intenso debate estético y funcional, que crea un espacio abierto donde compartir experiencias. La suma de todas las propuestas permite obtener unas directrices de actuación, con la intención de, mediante la mejora del espacio público, poner en valor el municipio. En definitiva, se busca innovar a partir de la tradición, encontrar soluciones sencillas y saludables, y, finalmente, ser capaces de autogestionar los recursos.

El libro *Workshop arquitectura tradicional e identidad local* recoge las experiencias del primero de los dos Talleres que "Made in Tierra Spain" desarrolló bajo este título en Paredes de Nava en los años 2018 y 2019.

En ellos se planteó una reflexión sobre la entidad del espacio público del pueblo en relación directa con la arquitectura que lo contextualiza, con la intención de encontrar soluciones que dialoguen con la estética y la compatibilidad técnica y de materiales de la arquitectura del entorno, que sea capaz de regenerar el espacio público respetando lo existente, dotándolo de carácter, y evitando así transferir al lugar soluciones urbanas típicas "de ciudad" o simplemente "de catálogo".

Esta actividad tiene como objetivo investigar, experimentar, recuperar el conocimiento técnico, y trasmitirlo de forma que se forme a los participantes en la regeneración urbana integral del medio rural. Al mismo tiempo, se busca iniciarlos en el uso de la tierra como material de construcción. Todo ello queda bien plasmado en este volumen.

Àngels Castellarnau Visús, Pilar Diez Rodríguez, Miguel Macho Villameriel, Ignacio Represa Bermejo, Sebastiano D`Urso
Workshop arquitectura tradicional e identidad local
Assur - Laboratorio Cultural, 2020



A richly illustrated book about a worthwhile project

Un libro ampliamente ilustrado sobre un proyecto valioso

Um livro ricamente ilustrado sobre um projecto valioso

Rand Eppich

This publication could easily have been a less-than-interesting project report. But this small book about a conservation training programme conducted in 2019 in the small oasis settlement of Ouled Youssef in central Morocco is richly rewarding. It not only describes educational activities but goes deeper into the lives of the community who inhabit this small historic settlement. The publication could have stayed within its parameters of earthen architectural conservation but exceeded expectations by touching upon music, dance, gastronomy, basket weaving, and building crafts. The book could easily have lost focus with such wide-ranging topics, but the authors manage to keep it interconnected.

It is delightfully illustrated with watercolours mixed with digital 3D documentation and exquisite photography. The photographs entice the reader and include romantic images of the architecture and the workers needed to conserve this special place. These illustrations complement the text, which is straightforward in describing the project, location, and people involved. Of particular interest is the emphasis on the importance of women in the community and their crafts, which "economically empowers and emancipates women, who can contribute to support their families…". The objectives described within are worthwhile, and the authors, project participants, and funders must be complimented.

Marta Colmenares Fernández, Oriol Domínguez Martínez, Alejandro García Hermida, Rebeca Gómez-Gordo, Carmen Moreno Adán, Susana Osés, Raquel Peña López and Giamila Quattrone
Ouled Youssef, an old ksar in the M'Hamid Oasis
INTBAU España, 2020

Enjoying Strapwork Carpentry with Enrique Nuere

Disfrutar la carpintería de lazo de la mano de Enrique Nuere

Desfrutar da carpintaria de lazo pela mão de Enrique Nuere

Llanos Gómez González

Enrique Nuere, Doctor Arquitecto y Académico de la Real Academia de Bellas Artes de San Fernando, recoge bajo el descriptivo título *La carpintería que me atrapó entre sus lazos* una narración en tono personal, didáctica y convenientemente ilustrada, fruto de su investigación y dedicación profesional a lo largo de más de cuatro décadas a la carpintería de armar.

Especialista y autor de numerosos textos sobre este oficio, nos propone en esta ocasión acompañarle en un recorrido que muestra cronológicamente su encuentro con la carpintería de lazo. Como acompañamiento a las explicaciones escritas, Nuere incluye un amplio compendio de fotografías, tomadas en su mayoría por él, e

ilustraciones que completan aquello que el objetivo no ve, la parte oculta del elemento fotografiado.

Comenzando por la exposición inicial de su tesis, que responde a la pregunta ¿es realmente mudéjar la carpintería de lazo? y siguiendo por el interés por explicar su origen y evolución, el autor comparte su experiencia en torno a esta tradición constructiva. Tomando como punto de partida su primer encuentro con esta disciplina, a través del manuscrito sobre carpintería de armar de López de Arenas y gracias también a un encargo relacionado –que le motivó a la interpretación y comprensión del texto para entender cómo se realiza su trazado– hasta la formalización de ese encargo y la comprobación experimental de lo aprehendido, nos da la posibilidad de introducirnos en la pesquisas, averiguaciones, obra y comprobaciones que le han llevado a ser un respetado experto en la materia.

En este primer volumen recorreremos la mayor parte de las regiones de la Península Ibérica y se sientan las bases para continuar el viaje por el territorio luso, las Islas Canarias y el Nuevo Mundo, en un segundo título que será publicado este año 2021 dentro de la misma colección sobre Patrimonio Iberoamericano que publica KALAM.

Enrique Nuere Matauco
La carpintería que me atrapó entre sus lazos
KALAM / Fundación EKABA, 2020

In Memory and Gratitude

En recuerdo y agradecimiento

Em memória e agradecimento

Julia Villa García

El Catálogo *Nueva Arquitectura tradicional MMXXI* muestra entre sus páginas el más reciente legado del mecenas Richard H. Driehaus, recientemente fallecido y fundador, entre otras muchas iniciativas en España y Portugal, de los Premios de las Artes de la Construcción que llevan su nombre. A este filántropo norteamericano debemos el reconocimiento del patrimonio cultural inmaterial y de la conservación que de él hacen tantos maestros artesanos de los diferentes oficios de la construcción. Su pasión y su admiración por la arquitectura tradicional afloran en los varios prólogos y en el capítulo inicial "La arquitectura y la construcción sostenibles".

Los Premios de las Artes de la Construcción, en su quinta edición, constituyen un motivo de esperanza para todos aquellos artesanos que trabajan en oficios tradicionales –en ocasiones casi extintos– y se esfuerzan cada día por mantener vivo el legado de nuestros antepasados y por darle continuidad en nuestro tiempo. De entre los cuatro maestros premiados en esta edición, encontramos que dos de ellos aprendieron el oficio de sus padres y abuelos y que continúan por tanto la tradición familiar. Del maestro albañil Jordi Doménech Brunet (El Masnou, Barcelona) podemos señalar su contribución a la conservación de la construcción de bóvedas tabicadas y el perfeccionamiento de esta técnica mediante el empleo de nuevas soluciones. Miquel Ramis Bordoy (taller Es Moliner, Mallorca) es un maestro carpintero que se ha especializado en la construcción y la reparación de molinos. Gracias a su trabajo se está recuperando una de las señas de identidad de la isla de Mallorca.

Tanto Cristina Thió Lluch, maestra estucadora y restauradora de Barcelona, como Santiago Martínez Otero, maestro herrero de Santiago, aprendieron el oficio gracias a la pasión de todos aquellos profesores o artesanos que encontraron en su camino. Los dos son hoy en día un ejemplo del trabajo bien hecho, que aúna pasión, técnica y belleza.

El trabajo de estos cuatro maestros premiados, un año más, permite mantener vivo el deseo de Richard H. Driehaus, quien, al instituir estos premios, quiso demostrar que la belleza de las obras bien hechas trasciende cualquier tiempo y lugar, y que estas merecen perpetuarse generación tras generación. Su labor nos ha permitido apreciar la arquitectura tradicional y los oficios tradicionales de la construcción no sólo como arte sino como un "legado de valores"[1], del que tantas lecciones podemos seguir aprendiendo cada día.

[1] Entrevista a Richard H. Driehaus, en: https://elpais.com/elpais/2019/07/23/eps/1563889674_391108.html (consultada el 11/10/2021).

Alejandro García Hermida
Nueva Arquitectura Tradicional MMXXI
INTBAU España, 2021

Translations | *Traducciones* | *Traduções*

Works | Obras | Obras

Selas House on Lamu Island, Kenya - Roderick George
A Casa Selas na ilha de Lamu, Quénia - Ana Sofia Alves Lourenço

Una casa japonesa tradicional con armazón de madera ensamblada y muros tsuchikabe: la Casa Kamogawa en Chiba - María Hernández
Uma casa tradicional Japonesa com uma armação de madeira articulada e paredes tsuchikabe: a Casa Kamogawa em Chiba - Vítor Vasconcelos

The Restoration and Construction of Can Ferrereta, Mallorca - Roderick George
A restauração e a construção de Can Ferrereta, Maiorca - Ana Sofia Alves Lourenço

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Networks of the sacred in the Atlas: Igudars and zawyas, intermediary receptacles of pre-Saharan Morocco - Translation by Alfred LeMaitre, relecture by Carolyn F. Strauss and copy edition by Roderick George

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Copy editing | *Edición de textos* | *Edição de textos*

Español

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English

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Português

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