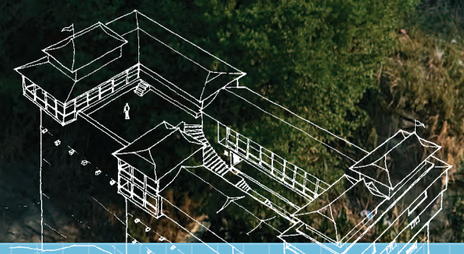
WOOD AND STONE

THE VERNACULAR ARCHITECTURE OF HIMACHAL PRADESH

The architecture of houses and other structures in the Himalayan state of Himachal Pradesh reflects the region's extreme terrain and climate—along with its unique culture and history.

By **Jay Thakkar** and **Skye Morrison** (text) and **Ahtushi Deshpande** (photos)

The early-morning mist lifts over Banjar Valley, revealing the village of Chehni, with its dramatic temple tower, and the thickly forested slopes beyond.



The grand *darbargadh* at Kotkhai village is the tallest and most imposing building for miles around. The upper storeys are balconied, while the lower portion resembles a fortress rather than a palace.

Bijat (Bijleshwar Mahadev) Temple is situated in the small town of Southern Sarahan, 50 km from Khadaran. The twin structures that tower over the open courtyard were built at different points: the one on the right, with its ricketty wooden staircase, is the older of the two.

A small stone shrine (*left*), thought to date back to the eight century, stands in the grounds of the picturesque Maheshwara Temple at Sungra. On either side of the temple's main doors are intricate wood panel carvings of Hindu deities and signs of the zodiac.

WOOD and stone: the state of Himachal Pradesh offers an opportunity to explore a pure combination of two of the fundamental materials of structures in North India. In our journey to discover the vernacular built form in the villages of the Himalayas, we need only look at the mountains themselves to see stone, one of the primary ingredients of a building. The slopes of those mountains are forested with deodar trees, the other ingredient for a potential structure. In these remote mountain houses, palaces and temples, the play of wood and stone becomes both an art form and a characteristic expression of folk culture.

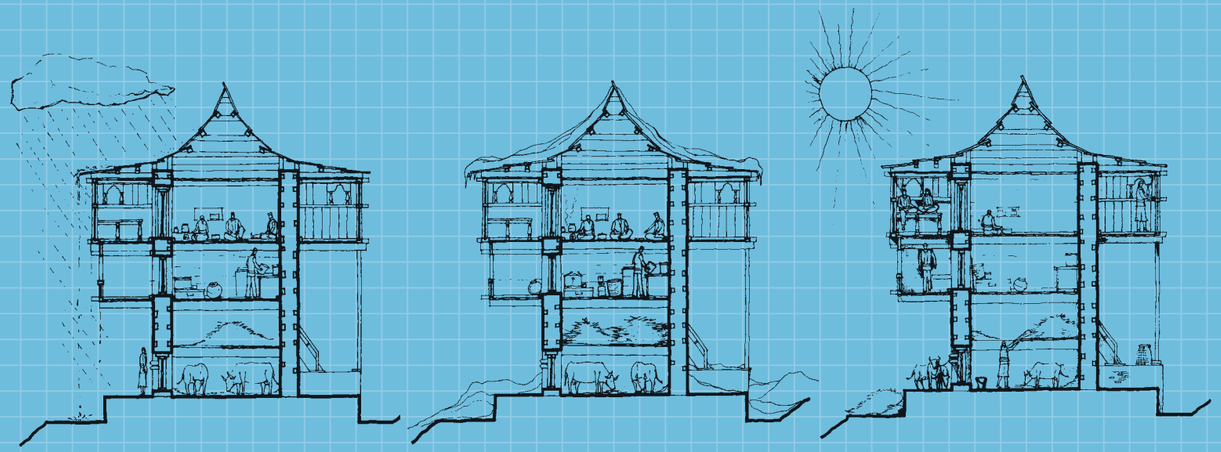
Himachal's extreme climate means that local building has to conserve heat and disperse snow: hence the small doors and windows, extended balconies and steep sloped roofs of vernacular structures. The inherent stability, flexibility, and strength of indigenous *kath-khuni* (wood and stone) buildings make them appropriate for this earthquake-prone terrain. The technique articulates local materials in systematic layers, which make it practical as well as aesthetically gratifying.

The villages are usually located in the middle of the mountains, as if suspended between two worlds—the river valley below and the great stone mass of the mountain above. A palace (*darbargadh*) or temple often forms the focal point of the village, being built on the highest place or the largest plateau of flat ground. Around such focal points are markets, community spaces and schools or government centres. The organisation of houses creates further social spaces between buildings and along pathways.

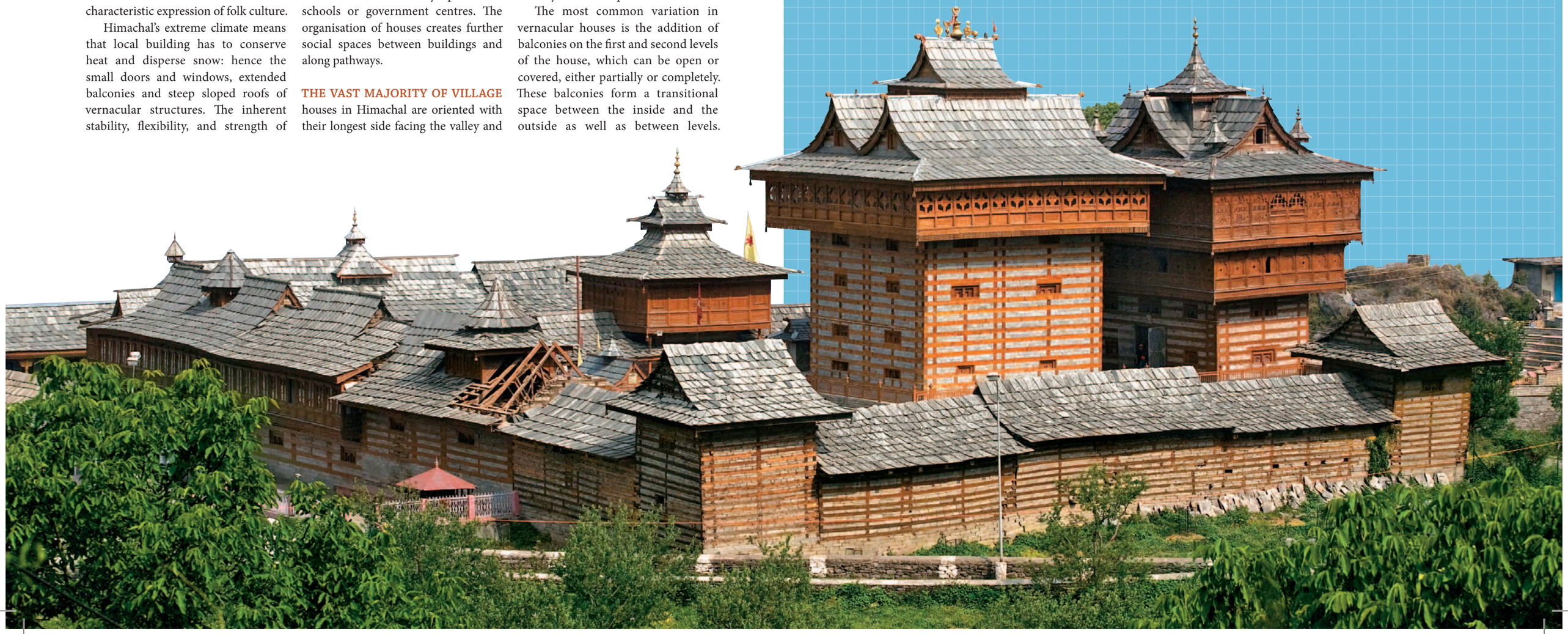
THE VAST MAJORITY OF VILLAGE houses in Himachal are oriented with their longest side facing the valley and their backs against the mountain, which makes them less susceptible to seismic forces. Because of the steep, stepped terrain, houses lie scattered across and up the mountain plateau. Exterior spaces link together, bringing people as directly as possible from one building to another and from one level to the next.

The essence of a Himachal house, its 'story unit,' is a space that is rectangular or cuboid. The smallest houses are single cuboids stacked in two or three layers (ground, first and second floors). The size of the house increases as more cuboids are stacked side-by-side and upwards.

The most common variation in vernacular houses is the addition of balconies on the first and second levels of the house, which can be open or covered, either partially or completely. These balconies form a transitional space between the inside and the outside as well as between levels.



A number of different roof styles can be found at the Bhimakali temple complex in Sarahan: pent, pent-and-gable, and composite. The cross-sections above demonstrate how the typical architectural features of this region—small windows, sloping roofs and deep balconies—are ideally suited to the different climatic conditions of Himachal, come rain, snow or shine. The wood-and-stone structures are also able to withstand tremors in this earthquake-prone area.



***Left*: Kothkai *darbargadh* living room. *Above*: the atrium in the central hall of Sainj Palace. *Below*: rendered cut-out of the Shakti-Devi Temple at Chhatrari village.**

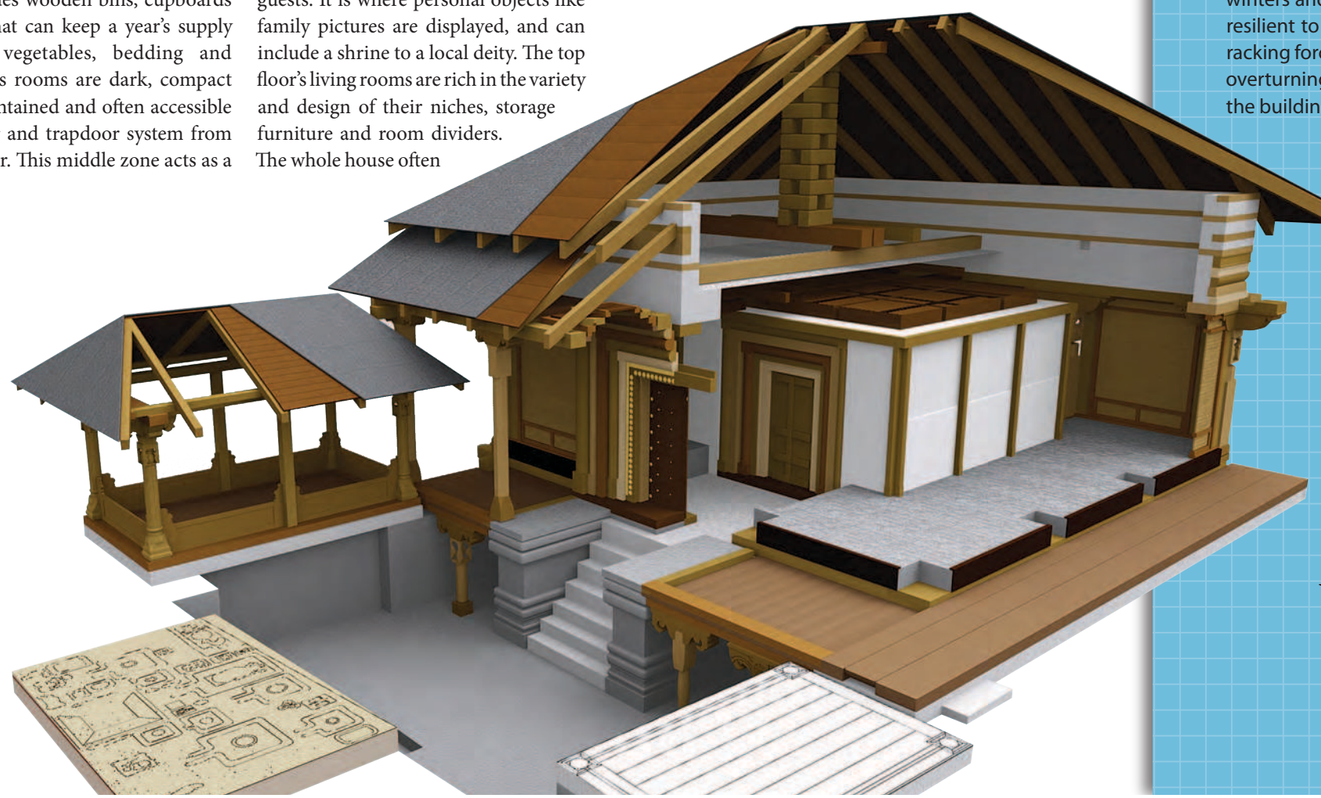
Other additions can be enclosures for outdoor 'rooms,' increased or altered storage space and, sometimes, innovative spaces for new purposes—a shop, a car park or a guest space.

We also find variations within the roofs: pure pent, a four-sided form rising to a single point; pure gable, a two-sided triangle that creates a pitched form, like a tent; and pent-and-gable, the norm in the Sutlej valley, which combines the two. The pent-and-gable form lends the roof many ways of shedding snow and rain in many ways while maintaining the integrity of interior spaces. It also echoes the mountain profiles around it.

The levels of vernacular houses are logically organised. A *gaushala* on the ground level offers both sustenance and insulation. During the summer, cattle stand outside on the deep stone plinth, shaded by the building's overhanging roof. In winter, the whole house uses the warmth created by the animals indoors. Sometimes a secondary mezzanine level in the *gaushala* serves to get the fodder off the ground and closer to the next floor, offering further insulation. In all but the smallest houses, ladders and trapdoors allow people access to the *gaushala* space during cold weather.

The middle level of the house is used to store practical items. If the house is large enough, it includes an indoor granary. Otherwise this first floor includes wooden bins, cupboards or boxes that can keep a year's supply of grain, vegetables, bedding and clothing. Its rooms are dark, compact and self-contained and often accessible by a ladder and trapdoor system from the top floor. This middle zone acts as a buffer between the living areas upstairs and the smells of cattle downstairs.

The top level usually houses cooking and living spaces and, sometimes, formal spaces to entertain and welcome guests. It is where personal objects like family pictures are displayed, and can include a shrine to a local deity. The top floor's living rooms are rich in the variety and design of their niches, storage furniture and room dividers. The whole house often



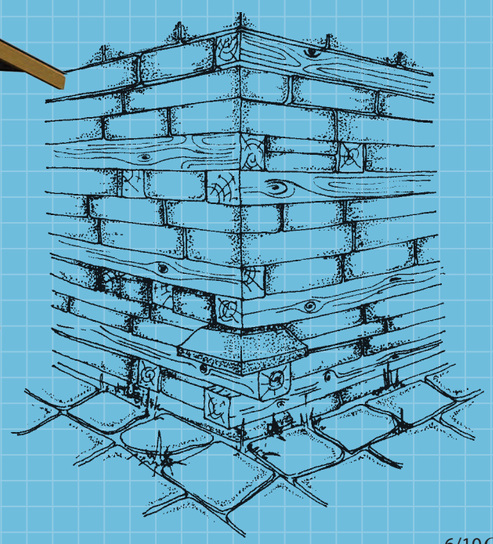
KATH-KHUNI

In its use of local materials and responsiveness to the climate,* kath-khuni *embodies sustainable architecture.

The *kath-khuni* buildings of Himachal Pradesh are made of local materials: deodar wood and slate stone. A plinth of stone gives each building a heavy foundation. Walls alternate layers of wood and stone, with an infill of rubble to close gaps. Often, as the construction proceeds vertically, the stone decreases, until ultimately the structural wall consists of wood frames stacked atop each other. The building is capped by a roof of slate shingles, each nailed to the wooden framework at a single pivot-point. Occasionally, a single carved stone projects out of at least one corner of the house, above the first intersection of timber beams.

In the harsh mountain terrain, *kath-khuni* construction is quick and efficient, using stone and rubble rather than slow-setting mortar, with gravity as its only glue. One benefit of this 'dry masonry' is the flexibility of the stacking, which allows walls to adjust to the foundation. Since the sides of the stone slope slightly inward, any ground movement locks the structure more tightly together: this is important in earthquakes, when the building must move with the shifting ground.

Kath-khuni construction requires neither highly skilled builders nor specialised tools, and can occur in stages as materials, labour and weather allow. The infill rubble traps air within the walls, retaining heat during cold winters and cooling interior spaces during the summer. *Kath-khuni* is also resilient to seismic forces, since wood and stone walls not only resist the racking forces of the earthquake, but are also configured to resist sliding or overturning. The interconnection of the walls, the floors and the roof make the building a single, solid, structural unit.



features half-levels and intermediate spaces that are not obvious from the outside.

Joining all these levels together, the primary staircase carries everything from the ground up and is often elaborate, with other smaller staircases joining the levels together. Other transitional spaces in vernacular houses include the plinth at the ground floor and balconies on the upper floors. Together, these transitional spaces help make the house flexible and adaptive to changes in climate, daylight and seasons, forming the most dynamic and commonly used parts of the house.

HISTORICALLY, POWERFUL leaders and royalty in Himachal built grand houses to reflect their status. While a villager might use 40 or 60 trees for a house, a king could afford hundreds. Their palaces or *darbargadhs* use *kath-khuni* construction techniques as well, but over much larger spaces. Heavy stone is used extensively at the lower level, which can at times resemble a fortress. This is one of the seismic features of *kath-khuni* design.

As with the simple village home, the *darbargadh* is composed of groups of stacked cuboids and oriented towards the valley. But it also now features courtyards, narrow street-like spaces open to the sky, which separate parts of the building for various family, community, and religious functions. Like the vernacular house, the *darbargadh* has balconies, but these are fully enclosed and more elaborate.

The interior temple of the palace is always at its highest point; often, the building is a towering structure. Each *darbargadh* possesses a unique layout and a substantially different treatment of the interior temple. While the Kotkhai *darbargadh* has a subdued and sophisticated structure, for example, the Khaneti *darbargadh* has a brightly painted temple perched at the top of the house. Since there are sacred spaces in the building, more attention is given to ornamentation and carving.

Darbargadhs reinforce aesthetic and technical standards by extending the limits of *kath-khuni* construction. The elaborate carvings of local deities, plants and animals demonstrate both the king's power to commission such work and his aesthetic sense. In Kotkhai, for instance, the royal family asserted a connection to the community by commissioning local woodcarvers to embellish ceilings, doors and columns with scenes from the *Mahabharata* and the *Ramayana*, as well as narrative tableaux representing local myths and folktales. This juxtaposition is typical: classical themes alongside folk depictions of local deities, natural forms and secular human activities. In general, residential buildings like *darbargadhs* embody the greatest diversity and freedom in the style, scale and workmanship of wood ornamentation, though there is a clearly defined repertoire of motifs and patterns that express a shared artistic lineage.

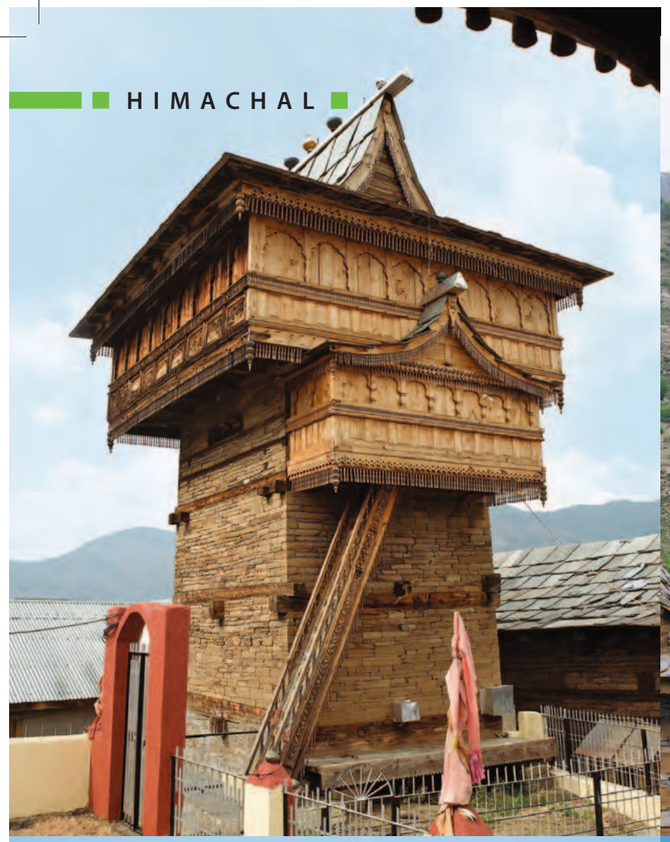
WOODCARVING IS THE PRIMARY visual narrative form in the temples of Himachal Pradesh, both in wooden structures like the Shakti-Devi temple in Chhatrari and wood-and-stone ones such as the Bhimakali temple in Sarahan. For centuries, kings and courts patronised artistic woodcarving in temples. Large temples feature carvings on the doors, structural beams, columns and ceilings. Such ornamentation depicts gods and goddesses, animals and plants, festivals, battles and mythical creatures.

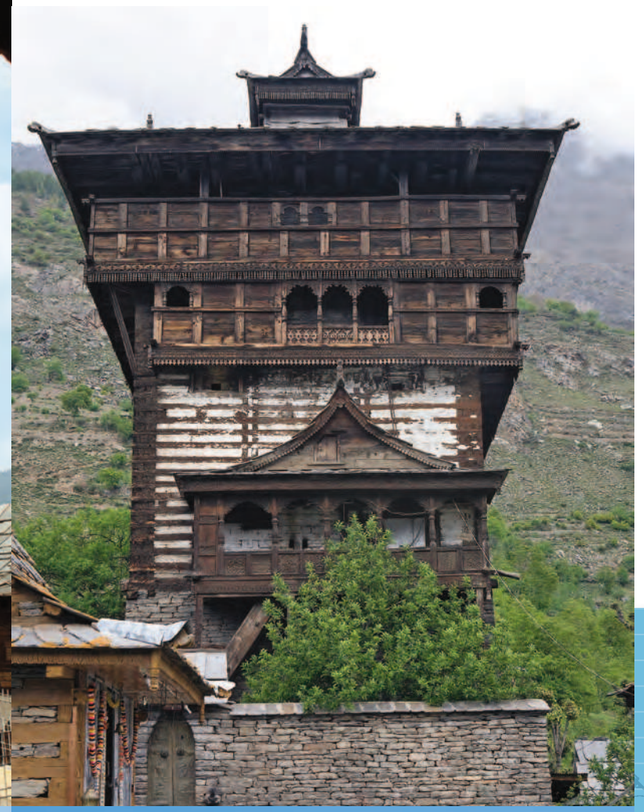
Clearly, some of the woodcarvers who worked on historic temples were brought in from outside the local area, as is evident from the dexterity of the work and its mastery of religious iconography. Interspersed with classical depictions are examples of folk carving, where the woodcarver has drawn upon local deities and ideas.

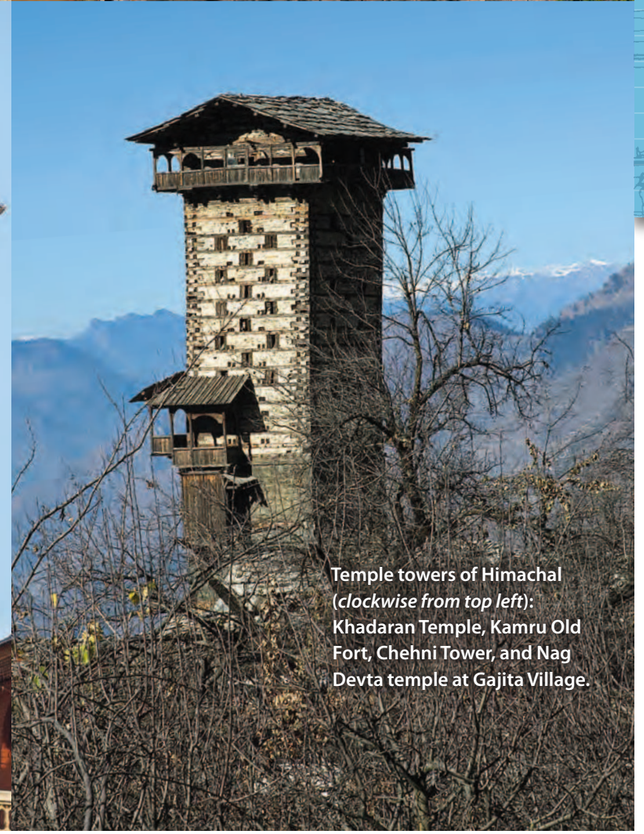
In wooden temples, the use of stone is restricted to temple foundations and roofs as slabs and stone shingles. Only a few very early temples made primarily in wood have lasted, since the material is vulnerable to temperature, moisture and

***Right*: rendering of part section of Aukta House, Old Jubbal. *Above*: this 3D view shows the primary, load-bearing structure of the *kath-khuni* house and the attached secondary structure of the balcony.**

***Top left*: a brightly painted clan deity temple at Khaneti *darbargadh*. *Middle*: an animal-mouth door knocker at Sainj Royal Palace. *Bottom left*: the wooden slates and box-like structure of a traditional house in the remote and inaccessible village of Khadaran.**







Temple towers of Himachal (*clockwise from top left*): Khadaran Temple, Kamru Old Fort, Chehni Tower, and Nag Devta temple at Gajita Village.

the destructiveness of natural and artificial forces. Many of those that have survived were repaired and restored on a regular basis. Wood-and-stone temples tend to be the norm, and have much in common with other *kath-khuni* built forms.

The simplest kind of temple in Himachal Pradesh is the gable roof temple, usually a single-storey structure built on a solid stone plinth. These temples are often situated in high-altitude areas, where their high-pitched gable roofs protect them during heavy snowfall. There are also some pure pent roofed temples in the western Himalayas, though they are rare: in these, the four equal sides of the roof rise to a single point, like a mountain peak.

Much more common are pent-and-gable roofs, in which the rising four-point form of a pent roof caps the gable sloping over temple walls. This form is popular both because it is easier to construct and because it offers protection against heavy rainfall and snow. Sometimes, the pent and gable roof is combined with further forms, perhaps as the result of modifications over time: one example of such a composite roof temple is the Shakti-Devi temple at Chhatrari.

Some of the tallest structures in a village are tower temples, multi-storey *kath-khuni* buildings with either pent-and-gable or composite roofs. These can be between three and seven floors high. As their height suggests, tower temples historically also functioned as watchtowers and are often strategically located, to be used as surveillance points. The top floor traditionally holds the clan deity (*kul devata*) or community deity (*gram devata*), while the tower's lower floors are used as storage spaces, or to house a kitchen and assembly hall. Tower temples have solid stone plinths at their base, sometimes almost a storey high. Thick sections of wood and stone along the walls help distribute weight more evenly, and the highest floors and balconies are made primarily of wood. The balcony has a series of openings, usually framed by cusped arches, and can be elaborately carved with scenes from local culture or natural motifs.

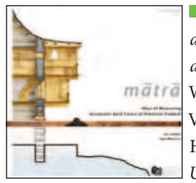
Though it requires more energy and money in Himachal's climate than local wood and stone, cement has increasingly become the building material of choice. Newer materials require ongoing expenses through the seasons, even if the raw materials of the vernacular building are more scarce and expensive to procure. There remains some continuity, since more recent buildings often combine cement with wood and stone, or apply the fundamental principles of traditional construction to industrial materials.

The vernacular architecture of Himachal's villages might be understood as a continuous performance over generations. The rhythmic, repeating patterns found in wood and stone structures, or the delicate carving of a niche frame in a kitchen or a balcony, could be thought of as the spatial songs of its communities. The material reality of these solid built forms embodies something that is both more mutable and intangible: the life and culture of Himachal's people. ■

GONDHLA TOWER, LAHAUL

The miniature canvases of artist Bireswar Sen (1897–1974) manage to perfectly capture the grandeur of the Himalayan landscape and its buildings. In this haunting watercolour of Gondhla Tower at dusk (from the National Gallery of Modern Art, New Delhi), Sen highlighted the wood-and-stone structure by placing tiny points of light in its windows. Gondhla is situated on the banks of the Chandra river, just over the Rohtang Pass. Like most *kath-khuni* tower forms, it consists of alternating layers of timber and stone held together with dry masonry, and the upper levels are enclosed by a balcony. Painted by Sen in the 1950s, this magnificent eight-storey fort now lies in a state of disrepair.

IN THEIR HOUSES, PALACES AND temples, the communities of Himachal Pradesh have traditionally built used naturally available resources, avoiding wastage and taking the topography and climate into account. The vernacular architectural idiom that emerged is an organic expression of local culture. As the social fabric of life here stretches and changes shape with new economic activities and new kinds of agriculture, so does its architecture.



■ ■ ■ Jay Thakkar *and* Skye Morrison *are the authors of* Matra: Ways of Measuring Vernacular Built Forms of Himachal Pradesh *(CEPT University, Ahmedabad).*