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Transforming Trees Into Skyscrapers

In Scandinavia, ecologically minded architects are building towers with pillars of pine and spruce.

By Rebecca Mead

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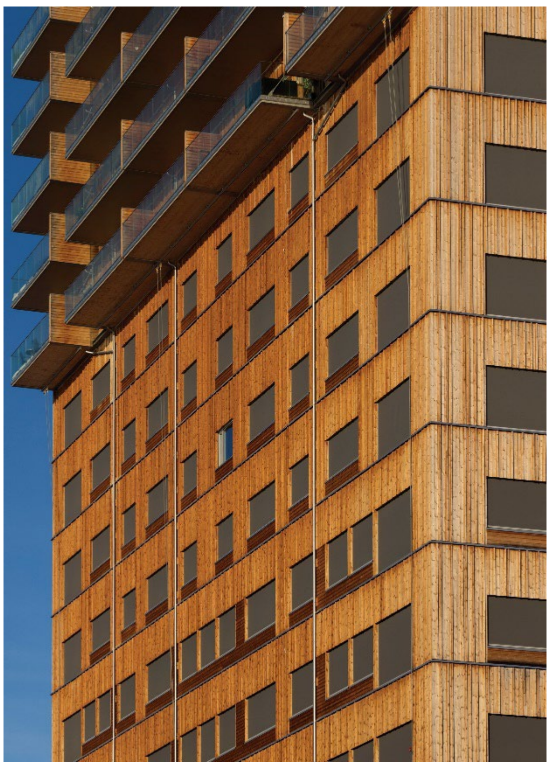


*Mjøstårnet, the world's tallest all-timber tower, rises two hundred and eighty feet—about the height of the Flatiron Building.*Photographs by Paul S. Amundsen for The New Yorker

Brumunddal, a small municipality on the northeastern shore of Lake Mjøsa, in Norway, has for most of its history had little to recommend it to the passing visitor. There are no picturesque streets with cafés and boutiques, as there are in the ski resort of Lillehammer, some thirty miles to the north. Industrial buildings, mostly for the lumber industry, occupy the area closest to the lake, and the waterfront is cut off by a highway. The town, which has a population of eleven thousand, was until recently best known to Norwegians for a series of attacks on immigrant residents three decades ago, which led to street clashes between anti-racism protesters and supporters of the far right. Since 2019, however, Brumunddal has achieved a more welcome identity: as the site of Mjøstårnet, the tallest all-timber building in the world.

Mjøstårnet—the name means "Tower of Mjøsa"—stands at two hundred and eighty feet and consists of eighteen floors, combining office space, residential units, and a seventy-two-room hotel that has become a destination for visitors curious about the future of sustainable architecture and of novel achievements in structural engineering. It's the third-tallest tower in Norway, a country whose buildings rarely extend above ten stories. Although Mjøstårnet dominates the Brumunddal skyline, it is a tenth the height of the world's tallest structure, the Burj Khalifa, in Dubai. Its scale is similar to that of New York's Flatiron Building, which, when completed in 1902, topped out at just over three hundred feet. (Three years later, it was capped with a penthouse.)

Like the Flatiron Building—one of the earliest steel-frame skyscrapers, which defied public skepticism about the sturdiness of a building that tapers to the extreme angle of about twenty-five degrees—Mjøstårnet is an audacious gesture and a proof of concept. It depends for its strength and stability not on steel and concrete but on giant wooden beams of glulam—short for "glued laminated timber"—an engineered product in which pieces of lumber are bound together with water-resistant adhesives. Glulam is manufactured at industrial scale from the spruce and pine forests that cover about a third of Norway's landmass, including the slopes around Brumunddal, from which the timber for Mjøstårnet was harvested.

I went to see the building in mid-December, arriving by a train from Oslo that passed through farmland and woodland before reaching the edge of Lake Mjøsa, which is Norway's biggest. The steely waters lapped a shoreline of charcoal-colored rock, on which traces of the previous weekend's snow remained. The forested bank opposite, when it emerged from clouds of fog, was dark green against the pallid sky. The journey north from the capital takes about an hour and a half, but I didn't need a watch to tell me when I had arrived at Brumunddal—the incongruous sight of a tower block rising from the water's edge was a sufficient signpost. Descending from the train, I wheeled my suitcase for fifteen minutes across town—past the parking lot of the local McDonald's and across the highway, which was nearly empty. As I walked, Mjøstårnet loomed in the mist, resembling from a distance a box of matches. On the roof, there was an angled wooden canopy that might have been fashioned from a handful of matches taken from the box's drawer.

The timber for Mjøstårnet was harvested from the forests that blanket about a third of Norway's landmass.

The tower is flanked by two other all-timber structures: on one side, a low building that houses the municipal swimming pool; on the other, an office building. Some low-rise wooden apartment buildings edge the lake. Mjøstårnet's sheer façade is clad in panels of orange-brown knotty timber, whose dark vertical lines of wood grain lure the eye upward. By the entrance, an English-language sign attests that a group called the Council on Tall Buildings and Urban Habitat has certified the tower's record-breaking status. Passing through a revolving door, I smelled the enticing scent of pine—though its source, I realized, to my mild disappointment, was a Christmas tree.

The material from which the tower had been built was evident, though, in the airy ground-floor lobby and restaurant, where wooden dining tables and chairs were arrayed on bare wooden floorboards, wooden pendant lampshades dangled on long cords, and large bamboo palms in pots were clustered at the base of a curved wooden staircase that rose to a mezzanine. Large columns supporting the building, as well as angled braces cutting across the restaurant's walls of windows, were formed from massive glulam blocks, the thickest of which were almost five feet by two feet, like pieces from a monstrous Jenga set. Riding a glass-walled elevator to my room, on the eleventh floor, I noticed that the elevator shaft was built from similar chunky blocks.

I had been assigned a corner room with two huge picture windows. One faced southwest, across the lake, where the view was obscured by fog; the other faced southeast, along the waterfront, offering a painterly sweep of gray skies and water, the shoreline clustered with denuded deciduous birches and evergreen spruces. An enormous glulam pillar between the windows held up the corner of the building. Its surface had been treated with a translucent white-tinted wax, but otherwise it was recognizably derived from the forests through which I'd passed on the journey from Oslo. I rapped my knuckles on the glulam: it was smooth, resonant, and much less cold than a metal pillar would have been.

I put my bag down on a blond-wood coffee table by the window, and settled into a low swivel chair, its comfortable backrest fashioned from bent-wood strips. In December, Brumunddal enjoys less than six hours of daylight; had I sat there long enough, I could have watched the sun rise and set with only the barest swivel to adjust my line of sight. The room was quiet and, despite the lowering skies, it was light. With its minimal, tasteful furnishings—a narrow blond-wood desk; a double bed made up with white linens and a crimson blanket—it had the virtuous feel of a spa. I had no desire to go elsewhere, and, given the town's lack of other attractions, that was just as well. Between the heft of the wooden building and the evanescence of the fog encircling it, the atmosphere was seductively calming—as long as my mind did not linger on the metaphor of the matchbox.

Buildings are among the worst contributors to greenhouse gases. The Global Alliance for Buildings and Construction has reported that twenty-eight per cent of global emissions are generated by building operations—heat, lighting, and so on. An additional eleven per cent comes from the manufacture of materials and from the construction process. A 2018 report by Chatham House, a British think tank, estimated that the four billion tons of cement that are produced annually worldwide account for eight per cent of emissions; carbon is released into the atmosphere by the combustion required for the manufacture of cement, and by the chemical processes involved. (By contrast, the aviation industry contributes just under two per cent of emissions.) Buildings have an environmental cost when they go up and when they come down: concrete waste usually ends up as landfill, especially in countries whose economies are still emerging. Even in places where technologies for recycling the material have been developed, the process is complex, since structural concrete is threaded unpredictably with rebar, which is difficult to remove. Because of the relatively low cost of manufacturing concrete, recycling it—into gravel, say, or fill-in material for landscaping—is hard to justify in purely economic terms.

Engineered wood products such as glulam and cross-laminated timber—a close relative in which flat boards are glued in perpendicular layers—offer an alternative model for the construction industry. Lumber pillars, given their earlier incarnation as trees, retain carbon dioxide captured from the atmosphere. One cubic metre of glulam timber stores about seven hundred kilograms of carbon dioxide. About eighteen thousand trees were required to produce the wood products used in the construction of

Mjøstårnet and the adjoining pool. In aggregate, those trees sequester more than two thousand tons of carbon dioxide. (Norwegian law requires harvested acres to be replanted.)

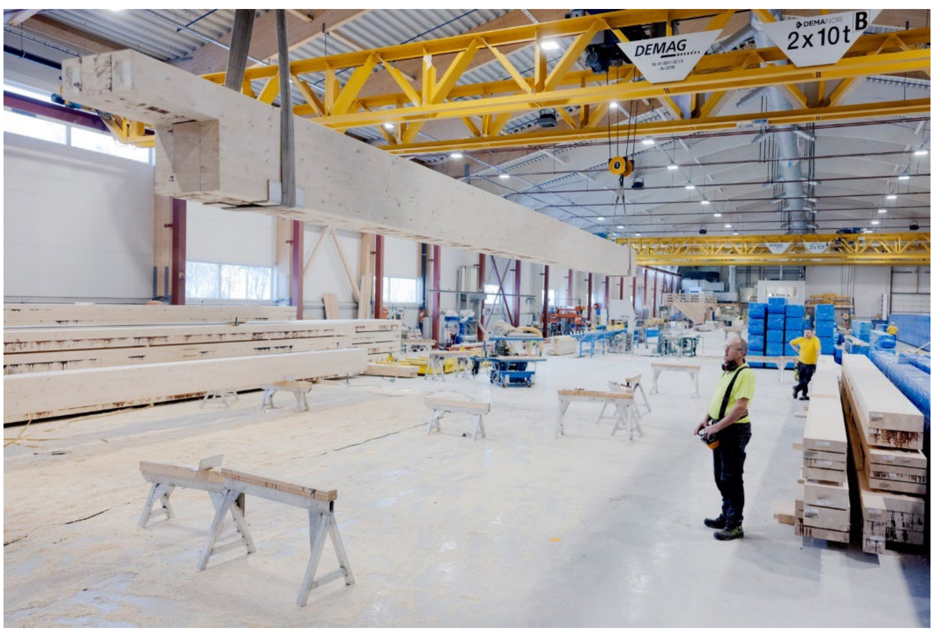
Many municipalities and nations are embracing the environmental advantages of building with timber. In 2020, the housing minister of France stated that new public buildings should incorporate wood or other biological materials such as hempcrete—a composite of hemp, water, and lime. The city government in Amsterdam has decreed that, starting in 2025, a fifth of all new buildings must be constructed mainly with bio-based materials. Other countries have taken a different tack: in the United Kingdom, recent legislation has banned the use of combustible materials, including wood, on the exterior of residential buildings more than sixty feet tall. This ruling was introduced after the Grenfell Tower fire, in 2017, when a twenty-four-story housing block burned like a terrible beacon over West London, killing seventy-two people. The fire was exacerbated by the building's cladding, which was made not from timber but from aluminum and highly flammable polyethylene. Historically, cities have restricted the use of timber in buildings after deadly conflagrations. In 1667, after the Great Fire of London destroyed in excess of thirteen thousand houses—and more than eighty churches—the city passed legislation mandating construction in brick or stone. In the wake of the Great Chicago Fire of 1871, in which more than seventeen thousand buildings were destroyed and nearly a hundred thousand people left homeless, local officials expanded requirements to use fireproof materials in the downtown area. In Norway, timber structures were outlawed in urban contexts in 1904, after the town of Ålesund was ravaged by fire. (That law has since been rescinded.)

Architects and engineers who specialize in mass-timber buildings say that fears of fire are misplaced. I met with Martin Lunke, a project manager for Hent, the contractor responsible for the wooden complex in Brumunddal, and he told me that some locals initially referred to Mjøstårnet as "the world's biggest torch." Lunke explained that the kind of laminated wooden blocks used in Mjøstårnet exceed modern fire standards. Unlike wood planks or beams cut from individual trees, the massive blocks of engineered timber used in large-scale construction projects do not burn through: they char only on the surface, to a depth of one or two centimetres, much the way a large log placed in a fireplace will the next morning be blackened but not incinerated. At least, that's what has been demonstrated in tests: Lunke, like others in the industry with whom I spoke, could not cite any fires in the real world which involved mass-timber buildings. A recent architectural competition in Oslo provided an oblique endorsement of the material's safety: the city's fire department elicited proposals for a new station and elected a firm that had designed a two-story structure built from wood and clad in panels of scorched timber.

Engineering wood to make it stronger and more adaptable is not a recent innovation: plywood, in which thin strips of lumber are glued together, with the grain running in alternating directions, has been used as a building material since the early twentieth century. Glulam and cross-laminated timber, which are more recent innovations, are manufactured according to similar principles. Large planks of sawn timber are dried in a kiln—a process that can take weeks—then glued together and compressed. Computer imaging allows pieces of engineered wood to be cut precisely to size before they're transported to a building site, producing less waste than conventional construction methods. (Unlike steel, timber elements don't clang, so less noise is generated by the raising of a timber building.)

Because building with glulam and cross-laminated timber is still in its infancy, it can be more expensive than conventional construction: the Mjøstårnet development cost approximately a hundred and thirteen million dollars, about eleven per cent more than an equivalent development would have cost in concrete and steel. Although some regions of the world have plentiful forests of harvestable, renewable trees—Germany, Austria, Canada—others lack a ready supply of wood to turn into engineered timber. Despite Dubai's appetite for architectural innovation, it wouldn't be a sensible location for a timber tower: the ecological cost of shipping the wood would cancel out its green credentials.

Building towers with wood poses certain design challenges: the supporting columns in a timber office tower must be thicker than those in steel-and-concrete towers, causing precious metres of rentable floor space to be lost. The inherent lightness of wood can also prove tricky for architects. The engineers of Mjøstårnet determined that the upper levels needed to be equipped with concrete floors to weigh the tower down. Rune Abrahamsen, the C.E.O. of Moelven Limtre AS, the Norwegian company that provided the timber elements for Mjøstårnet, explained to me that, otherwise, although the tower would have been structurally sound, the wind that blows off the lake would have caused it to sway so much that some occupants would have become nauseated, "as when you're on a boat."



At a warehouse in Moelv, Norway, glulam—short for "glued laminated timber"—an engineered product in which pieces of lumber are bound together with water-resistant adhesives, is manufactured at industrial scale.

Other developers are now making plans to build hybrid timber buildings that are even taller than Mjøstårnet—and their designs break from the geometric simplicity of the Brumunddal tower. The architectural firm Penda has designed a jagged eighteen-story apartment building whose modular structure will have large jutting balconies that can accommodate fully grown trees. Vancouver will soon become home to several innovative timber buildings, including the Earth Tower, a forty-story apartment block that incorporates shared winter gardens for residents and a rooftop greenhouse. A new home for the Vancouver Art Gallery, designed by Herzog & de Meuron, combines structural-timber elements with a woven-copper façade. The New York architectural firm SHoP, which recently completed the skinniest skyscraper in the world—Steinway Tower, in midtown Manhattan—has designed a forty-story wooden tower, in Sydney, for the tech company Atlassian. An internal-timber structure is to be wrapped with a curvy exoskeleton of steel and glass; solar panels will adorn the façade, and indoor terraces will have naturally ventilated gardens.

Mass-timber materials encourage architects to try something different from the cool, shimmery blue-glass towers omnipresent in large cities. Structural-timber designs have an inherent warmth: for the headquarters of SR Bank, in Stavanger, Norway, the architecture firms SAAHA and Helen & Hard created a stunning wood building whose soaring atrium features interlacing staircases and walkways that resemble a giant marble run. Øystein Elgsaas, an architect based in Trondheim, Norway, whose firm, Voll, was responsible for Mjøstårnet, told me that he saw no reason that wooden buildings should look markedly different from those made of steel and concrete: rather, a design should be suited to its particular setting. "Mjøstårnet has wooden cladding, but I believe that should not be the rule—we need *more* colors in our environment, and not only brown or gray façades," he told me. "But, if we look at some concepts for new wooden designs, they do feel a bit more organic. If you use glass on the façade, you can show the wooden construction inside and make passersby understand that it is a wooden building." Many wooden buildings, he noted, evoke "something growing up from the ground—rooted in the earth and reaching for the skies, like a tree."

On the outskirts of Copenhagen, ground will soon be broken on an all-wood housing development, Fælledby, by the design studio Henning Larsen, with eighty-odd buildings that include wooden balconies, expansive glass windows, and nooks for bird's nests integrated into the façades; the structures will be connected by plank paths that lead pedestrians through wetlands. Signe Kongebro, the firm's global design director for urbanism, believes that the growing use of timber is likely to encourage lower-rise, denser districts, with more room for nature. "In a way, we are returning to our roots," she told me, in an e-mail. "Timber is one of the oldest building materials we have—it has been used for thousands of years." She noted that various cultures have developed distinct timber idioms: in Japan, traditional wooden buildings are often detailed and highly tactile; the American tradition of the frontier log cabin is far more functional. Scandinavia's mass-timber movement highlights wood's unique qualities while also using it in much the same way that steel and concrete are used. Kongebro thinks that architects will eventually embrace "the aesthetic experimentation with wood that happens at the level of products—for example, innovation in laminated wood led by the Eameses in the mid-twentieth century." Such boldness, she said, "could generate an architectural language for timber that we have never seen before."

In Oslo, I visited the practice of Oslotre, an architecture firm that works exclusively in timber. Its offices are on the ground floor of a nineteenth-century stone building. In most architectural offices, tabletops showcase scale models of prospective buildings—with flawless concrete contours rendered in paper, and tiny figurines walking across a paper plaza. But the office of Oslotre's founding partner, Jørgen Tycho, displays an enormous chunk of wood: two precisely cut pieces of cross-laminated timber that were slotted together at a right angle, then secured with wooden dowels. The dowels, Tycho explained, were made from beech wood, rather than the spruce from which the cross-laminated timber was fashioned. The wood for the joined blocks had been dried down to a moisture content of twelve per cent, to match the humidity of the air in the office: if the levels are not calibrated, the wood will absorb ambient moisture, causing swelling, or it will dry out, causing shrinking and cracking. The beech for the dowel had been dried down to six per cent. After it was introduced into a hole bored through the cross-laminated timber, Tycho explained, the dowel absorbed atmospheric moisture and expanded, creating a tight fit that obviated the need for metal screws. The technique was both old and new. Oslotre had been experimenting with it while designing an office building, for Save the Children, that should be completed by the end of the year. “We can see this technology in Japanese and Chinese architecture that goes back hundreds of years, but we are also relying on more modern calculations,” he told me. “This is *super*-strong. This won’t go anywhere.”

Tycho took me to see Valle Wood, a seven-story timber office building in Oslo that Oslotre had worked on; it opened in 2019, in a development adjacent to a soccer stadium. It was a damp, misty day, and when viewed from a remove the building’s cladding—warm reddish-brown wood—looked like rusted steel, though up close I could see that thin horizontal strips of pine had been arranged in angled modernist patterns. The exterior was naturally water-resistant, thanks to resins in the wood. The cladding will turn gray with time; the south side, which is exposed to more direct sunlight, will transform more quickly than the north.

The tower’s base was occupied by a cafeteria. In its concrete floor, blond-wood furnishings, and floor-to-ceiling windows partly obscured by massive trusses made with blocks of glulam, I could see a wooden-architecture vernacular emerging: airy spaces formed by pale wood beams and columns that had visibly been slotted and joined together. The wooden surfaces had been treated only minimally, to prevent the kind of yellowing that Norwegians associate with old-timey country cabins—the “Norwegian wood” of the Beatles song. Instead, the palette was a globally fashionable greige and cream.

An architect whose firm, Voll, was responsible for Mjøstårnet says that many wooden buildings evoke “something growing up from the ground—rooted in the earth and reaching for the skies, like a tree.”

Tycho also showed me around some co-working spaces at Valle Wood, and cited an Austrian study indicating that schoolchildren who attend class in a room with wooden walls and furniture have lower heart rates than those who occupy conventional classrooms. (Such studies tend to be underwritten by the forestry or the lumber industry, although that does not invalidate their claims.) The stairwells had been equipped with durable flooring made from wood blocks cut against the grain, so that tree rings formed beautiful patterns underfoot, like elegant Italian tiles. Tycho flinched with annoyance at a wall that had been painted black; along the seams, the pallor of the original timber had become exposed. “We tried to tell the interior architects that if it is going to be painted black it needs to be done in the wintertime!” he said. “This was done in the summertime. When you heat up the building, it takes away a lot of the moisture, and the wood is always adapting to the climate it's in. It shrinks." Cracks in the beams had similarly been caused by seasonal changes, he said; in summer, the beams would expand, rendering the surfaces smooth again. In this building, and in others that Oslotre has worked on, the use of wood walls helps regulate the level of moisture indoors, reducing the need for mechanically balanced ventilation.

Next, we drove to one of Oslotre's current projects: two private homes that were nearing completion in what had once been the yard of a larger property. The houses, both modernist in style, were perched on a hillside with near-flat roofs and walls of windows opening onto outdoor living areas; Tycho assured me that on fog-free days the houses had views overlooking both forests and a fjord. The exteriors were clad in wood, with curved corners. The interiors had wood ceilings, floors, and walls, and attractive laminate kitchen cabinets. In a bedroom, Tycho showed me a wall panel that came with a hole for electrical cables already cut in its predetermined spot: very little drilling had to be done on site, which meant less dust and noise.

Our final visit was to a timber music school that had opened only weeks earlier, in the town of Rakkestad, an hour's drive south of Oslo. Much of the formative work of Oslotre's practice was in designing and building wooden public schools. Tycho not only believed that timber interiors improved the well-being of students and staff; his designs also provided a way of using up an excess of available timber in Norway. Despite the country's reputation for being blanketed with forests, Norway has not always been as densely tree-covered as it is now. From the nineteenth century until the middle of the twentieth century, the country's forests were severely degraded, its trees having been chopped down and used in the boatbuilding and mining industries or exported as construction material—often to the U.K., which lacked sufficient timber of its own.

Today's extensive forestation is the result of a program, instituted by the Norwegian government after the Second World War, in which schoolchildren planted trees as part of their curriculum. The resulting forests, it was thought, would spur economic growth through the expansion of wood-based industries, including paper manufacturing. But, starting at the end of the nineteen-sixties, a more lucrative natural resource presented itself when giant oil deposits were identified beneath the North Sea. That discovery meant that Norway's forests grew to an unplanned maturity. Spruce and pine planted in the immediate postwar years are now ripe for industrial use—all the more reason to harvest them as timber, in which carbon dioxide remains trapped, rather than allowing them to die and decay, releasing the gas back into the atmosphere.

Norway's nineteenth-century experience demonstrated the dangers of deforestation, and a related objection is sometimes mounted against using timber in large-scale construction projects: why cut down a healthy tree to sequester carbon in a building when the tree is doing a perfectly good job of sequestering carbon in the forest? Advocates of timber-based architecture stress that the industry's viability depends on sustainable forestry methods, and argue that, given the environmental damage caused by conventional construction methods, we have no choice but to explore alternative materials, including wood and other bio-based products. (Mycelium—networks of fungi—and straw, for example, can be used as insulation.) As Tycho drove us through the Norwegian countryside, he said, "In the short term, the building industry has to do things differently. And then, maybe in the long term, we will have other technologies for carbon sequestration, and green energy, and other ways of solving it. But at the moment we don't do enough fast enough."

We arrived at the music school as daylight was fading. Set in a plaza, the two-story building was warmly lit from inside. Rain and snow had left damp patches on the exterior cladding, which still had the scent of the sawmill. The school's principal gave us a tour, taking evident pleasure in his new professional home. In one large room, a terrazzo floor and heavy burnt-umber curtains fit harmoniously with the wood walls and ceiling; in a small practice studio, the bars of a wooden xylophone were visually echoed by the strips of wood covering the walls and the ceiling.

At a timber music school that had just opened in the town of Rakkestad, Norway, the exterior cladding still had the scent of the sawmill.

As luthiers and piano-makers can attest, wood is a resonant material. When we walked into a loftlike practice-and-performance studio, it felt almost as if we were inside a musical instrument ourselves. Here, the director admitted, there had been a slight problem with the acoustics. He clapped his hands, and the sound bounced off the walls with an ugly, unintended reverberation. Tycho looked closely at the wall: it appeared that someone had forgotten to place a layer of sound-absorbing material behind the wood panelling. It wouldn't be too hard to remedy, he said. In this respect, an all-timber building is just like a conventional one: the construction process is likely to include a few missteps.

Islept well in my corner hotel room at Mjøstårnet, though I cannot report any measurable lowering of my heart rate from one night's exposure to its wooden components. I can, however, attest to the resonance of its wood walls; when a chiming iPhone alarm went off in a neighboring room at 7 A.M., it was so loud that I groggily reached for my own phone.

Later that morning, I had coffee in the hotel restaurant with Arthur Buchardt, the developer behind the building of Mjøstårnet. He said that timber architects will have to learn how to better quell the sound-transmitting qualities of wood. "The material is very porous, especially when you walk on it," he said, rapping on the tabletop to demonstrate. In many rooms of the tower, he noted, interior walls had been covered with painted plasterboard for sound insulation—resulting in an unfortunate reduction of the promised health-giving benefits of exposed wood.

Buchardt, who is seventy-three, grew up in a small town near Oslo, but he spent his later teens in Brumunddal, where his father worked for a timber company. Buchardt's professional breakthrough came when he built a hotel in Lillehammer in time for the 1994 Winter Olympics; since then, he has built twenty-three hotels in Nordic countries. Mjøstårnet was a labor of love, he told me: an idea conceived on a restaurant napkin, to demonstrate the possibilities that wood could deliver. “This is not a smart place to build this building,” he noted. “If I had built it in Oslo, the cost would have been almost the same, and the value would have been double.” But the tower had been good for Brumunddal’s economy, and for improving the town’s reputation: “Some things you do for economic reasons, and some you do for enthusiasm.” Originally, the tower was designed to be two hundred and sixty-five feet tall, but when word spread of a rival project under construction in Austria—the two-hundred-and-seventy-five-foot HoHo Hotel, in Vienna—the architect stretched the top of Mjøstårnet by a further four or five metres, securing its world-record status. The building showed what the future of sustainable architecture might look like, Buchardt told me. “Norway is an oil nation, but the oil will end,” he said. “All the politicians talk about ‘green change’—we must do something else that must be environmentally friendly, and we must use local resources. I thought I could build something like this, as an answer.”

At the moment, assessments of the construction cost of a building do not generally take carbon emissions into account. Buchardt feels that such a penalty is inevitable, at least in Scandinavia. If developers have to weigh the environmental costs of building as a matter of hard cash, engineered timber will start to look particularly appealing.

After our coffee, Buchardt and I rode the elevator to the top of Mjøstårnet, where there is a viewing platform beneath the wood frame that tops the building. Buchardt called the structure a pergola, though it would be a foolish gardener who tried to trail ivy along its massive, windswept struts. Before visiting Brumunddal, I had read about the rooftop space, and had entertained visions of rustic Scandi outdoor seating—accessorized, perhaps, with sheepskins, and equipped with a cabin serving *gløgg* in turned-wood mugs. Such notions swiftly evaporated as I climbed an icy metal staircase to the upper terrace, which was blasted by a chill wind and covered with crunchy remnants of the most recent snowfall. Above our heads, the pillars and struts of the pergola looked like the masts of a gigantic ship—their edges rounded, like huge pencils, to diminish the force of winds that can pummel the tower.

The base of Valle Wood, a timber office tower that opened in Oslo in 2019, is occupied by a cafeteria. Its design—airy spaces formed by pale wood beams; columns that have been visibly slotted and joined together—suggests an emerging wooden-architecture vernacular.

Another late revision to the building's blueprints was a penthouse apartment for Buchardt, like the one atop the Flatiron Building. Some packing boxes remained by the front door, but the place was well on its way to being a spectacular cabin in the sky, with an elegant dove-gray couch positioned with a view across the lake, handsome Flos lighting, and a gas fireplace in a pillar of gray stone. Buchardt sat in an armchair and explained that he travels a hundred days out of the year. In a decade or so, though, he hoped to slow down, and this seemed a congenial place in which to do so.

The clouds had lifted, and low sunlight bounced off the lake and filled the room with replenishing warmth. Feeling that it would be hard not to have one's spirits lifted by these surroundings, I asked Buchardt if he believed that being in a wood environment was conducive to better mental health.

"Yes, because it's warm, and the surfaces are not so hard," he replied. He went on, "Most of us already live in wooden buildings—only not so tall." Pulling out his phone, he showed me photographs of one of his other homes: a log cottage in Hafjell, where the Olympic competition for slalom skiing was held in 1994. It, too, looked like a very pleasant place in which to spend one's retirement, or just to spend the weekend. "The building is twenty years old," he said. "But the timber is two hundred years old."

When I returned to Oslo, I went to see a group of buildings made from even older timber. At the open-air Norsk Folkemuseum, a hundred and sixty historical buildings from around Norway have been gathered in hilly, wooded parkland. It was a bright, cold morning, and there were few other visitors—it was too late in the season for school groups.

There were eleven zones, each dedicated to a different geographical part of the country. There was a schoolhouse with a turf roof from western Norway. Built in the eighteen-sixties, it had a wood ceiling and floor, and wooden benches and desks that had been installed with no thought of their effect on the students' well-being. A farmhouse from Telemark had survived from the first half of the eighteenth century. The largest room was illuminated by leaded windows and furnished with a long dining table that could easily have seated twenty. About fifty yards away, I came across a storehouse that consisted of a turf-roofed cabin raised up on a log base. It looked almost animate, like Howl's moving castle, and appeared alarmingly off balance, though it had presumably stood without collapsing since it was first constructed, in about 1300. The museum offered a reminder that, not so long ago, the skills required to build enduring buildings with wood—taking into account how the substance was affected by moisture and temperature, and how it can be bent and torqued to meet different needs—were common.

The most prized building in the museum is a church that originated in the village of Gol, in the interior of Norway. It was acquired in the late eighteen-hundreds, by the Society for the Preservation of Ancient Norwegian Monuments, and presented to King Oscar II, whose collection of antique Norwegian buildings forms the basis of the museum's holdings. The church dates to approximately 1200, and, although it has repeatedly been restored since then, it preserves the characteristics of what is known as stave construction: an all-wood method of building in which load-bearing posts allowed for the raising of towering structures whose walls were made of vertical boards. Stave churches usually had steep, tiered wooden roofs, and were often decorated with fantastically shaped carvings. They used to be widespread in northern Europe, but only a few remain, almost all of them in Norway.

The church was on a hill, approached along wooded pathways. Silhouetted against the sky, the pine-tar-treated timbers of the façade looked stark and black—almost threatening. Close up, the building was less fearsome. Walking along a raised, covered gallery that surrounded the church's core, I could hear my footfall ringing on the plank flooring with a familiar, reassuring resonance. The main doorway was richly carved with interlocking floral patterns. The gate to the interior was locked, but when I peered inside I could see—warmly illuminated by concealed electric lighting—religious paintings that dated from the mid-seventeenth century.

Daylight fell on the polished floorboards from concealed peepholes in the highest parts of the roof. Despite the chill of the day, the interior of the church seemed cozy and welcoming, the kind of space that promises to hold you safe, like an ark. After a few minutes, I descended the path, turning around to look at the building again from a distance. It was an extraordinary architectural gesture: rising on the hilltop like a ship lifted by waves, towering above the clusters of pine trees surrounding it. Once, I thought, this must have been the tallest building that anyone who laid eyes on it had ever seen. ◆

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