Notre-Dame's recovery is about stewardship, say architects and historians

May 15, 2019 by William Richards

Interior of Notre-Dame Cathedral in Paris.
Image Credit: Bloomberg

In his essay "Paris Not Flooded," Roland Barthes asks us to see the great flood of January 1955 as a creative force that erased roads and sidewalks. It forced Parisians to row to the grocer and priests to enter churches in canoes, "making disaster itself provide evidence that the world is manageable."

If Barthes were to write "Notre-Dame Not Ablaze," he might ask us to see the April 15 fire and its aftermath as evidence of something useful like a lesson or a sacrament. It will be a long while before that evidence is revealed in full, but the dangers of faulty wiring, a smoldering cigarette near highly combustible materials, or failed fire suppression safeguards were all causal frontrunners at press time.

French authorities, represented by the Ministry of Culture, are still assessing the damage at Notre-Dame, which is part of a larger UNESCO World Heritage site that includes the surrounding Île de la Cité and, as such, is subject to special preservation mandates. The Ministry of Culture is also receiving advice from a dedicated UNESCO team, which includes representatives from ICCROM and ICOMOS International, according to Paris-based Mechtild Rössler, director of the UNESCO World Heritage Centre.

"Notre Dame is like a history book illustrating the evolution of the construction and different approaches to restoration over time," says Rössler. "The UNESCO team experts were chosen by their institutions for the specific expertise required, especially in risk assessments and knowledge on conservation and rehabilitation, and they are at the disposal of the French authorities."

President Emmanuel Macron's promise to rebuild within five years (in time for the 2024 Olympics in Paris) elicited strong responses from several observers. Meredith Cohen, associate professor of medieval art and architecture at UCLA, called it "simplistic bravado." Conservative pundit Anne-Elisabeth Moutet called the promise "the arrogance of an unpopular president trying for wokeness." (To Moutet's chagrin, Macron's popularity gained three points between March and April, which pundits attributed to his post-fire commitment to rebuilding.) But, reading between the lines of Macron's vague promise, the real question is how much of Notre-Dame's recovery will be a restoration, renovation, or

something else entirely, which seems to be a philosophical question as well as a technical one.

Thanks to advances in digital imaging and virtual modeling over the last decade, we know nearly everything about the measurable aspects of Notre-Dame. The late Andrew Tallon, associate professor of art at Vassar College, reportedly logged one billion data points on the structure in an extensive survey. French video game developer Ubisoft also owns a substantial cache of digital models created for its 2014 game "Assassin's Creed: Unity." In addition, Paris-based graphic design consultancy Art Graphique et Patrimoine (AGP) and surveyors Géomètres-Experts (GEA) partnered to model Notre-Dame in recent years; like Tallon's scans, their measurements detail the cathedral in millimetric terms—a granular level that's hard for the naked eye to discern, much less remember. These scans, in other words, will be critical to any future effort to rebuild any part of the cathedral.

Will Rourk, a cultural heritage data specialist at the University of Virginia (UVA) Library Scholars' Lab, specializes in 3D documentation of artefacts and buildings using scanners and photogrammetry. He's scanned a range of historic buildings, including Thomas Jefferson's Academical Village at UVA and Monticello, south of Charlottesville, and supplied the data to architects and preservationists to aid in reconstruction or repair. Rourk's work centers on what he calls infomatics, or leveraging technology to record and remember structures slated for demolition or to re-create elements of them for repair work. That level of documentation, notes Rourk, used to be achieved with a ruler, a profile comb composed of metal teeth, mylar sheets, and ink pens. Now, laser scanners can create data points that combine to form point clouds and then export it all to CAD and BIM software to create 3D models. "That means that if the reconstruction of Notre-Dame was to be faithful to the original," says Rourk, "then the data could be used to help with this reconstruction, and the efforts towards authentic reconstruction would be guaranteed by millimeter-accurate data of the original at the time of recordation.

"Stewardship means using the best practice available, including in preservation approaches, frameworks, and effective management," says UNESCO's Rössler. "We sincerely hope that this will be the case for developing an overall restoration and reconstruction framework for Notre-Dame, which is up to international standards."

Wrestling with Viollet-le-Duc

Restoration campaigns are about choosing one time in a building's history to highlight, but preservation efforts are about addressing all of the choices made on a building's behalf in the everyday work of stewardship over the years. Notre-Dame is widely held to be a high-water mark for Gothic architecture. It is also widely held to be a touchstone of historicism reimagined by Eugène Viollet-le-Duc. "To me, it's a medieval building only sort of," says Lisa Reilly, an architectural historian and associate professor at the University of Virginia. "It's actually more interesting as a record of Viollet-le-Duc's approach and what the cultural icon of France meant to him."

Starting with the iron spire that heated to more than 1,000 degrees Fahrenheit and collapsed into the timbers below, the debate over Notre-Dame's future cannot occur without debating Viollet-le-Duc's contributions. His 1845-64 restoration addressed the cathedral's abuse and neglect that started in the 1770s when Jacques-Germain Soufflot, architect of Le Panthéon less than a mile away, removed parts of the registers on the west portal's tympanum so the king's processional canopy could fit through the front door, according to art historian Daniel Reiff. He also sought to replace elements of the sculptural program lost during the French Revolution by adding 60 statues, sculpted with the faces of his friends and, it seems, himself. These additions have been debated by preservation purists ever since, and for his work, Viollet-le-Duc has garnered derision ("criminal" and "counterfeiter") and praise ("the greatest architectural theorist of modern times").

Soon after Viollet-le-Duc's death in 1879, the scientist Josiah Parsons Cooke remembered him as a man of "singular self-reliance and astonishing labor," or what some might call sheer nerve and unrestrained prolificacy. Nevertheless, he seemed to know exactly what a cathedral ought to look like, and because of him, Notre-Dame de Paris, Amiens, Sens, Laon, and other cathedrals (not to mention the citadel at Carcassonne) look the way they do now, which is to say improved, but in a fabricated sort of way. He also seemed to be everywhere in print, expounding over several decades in his multivolume histories on architecture, military battlements, furniture, the geology and topography of Mont Blanc in the Alps, the evolution of Mesoamerican cities, and the art of drawing. He was an essayist, educational reformer, portraitist, courtier (of sorts) to Napoleon III, capable cook, amateur astronomer, and a lieutenant colonel during the 1870-71 Siege of Paris—working "night and day, walking stick in hand, directing the repair of the works as they were destroyed by the enemy's fire," according to Cooke. This last detail might be embellished, but then again, no one would be surprised if it were true.

All that said, Viollet-le-Duc's conviction is what matters; even for his critics today, he is part of the fabric of not just historic preservation, but all that he sought to preserve. His work at Notre-Dame carries special weight for the cathedral's prominence in Paris near the ancient city center—itself the metropole of the region, from which all distances are measured in L'Hexagone, and the heart of the former French Empire. "For him, Gothic was the national style of France, and Notre-Dame was the national cathedral," says Reilly. If there is a bridge, then, between a 19th century conception of Medieval Gothic

and a 21st century plurality of additions and alterations that command attention, it is this: Finding evidence in the April fire that Macron's promise to rebuild is, indeed, manageable.

Stewardship matters

"Good preservation architects spend a lot of time gathering information to analyze," says Jean Carroon, FAIA, a principal at Goody Clancy and the 2019 president of the Boston Society of Architects. Carroon has spent nearly two decades working on Boston's Trinity Church, completed in 1877 and designed by H.H. Richardson. Its cornerstone was laid 700 years later than its Roman Catholic counterpart 3,400 miles away, but it occupies the same pride of place for Bostonians as Notre-Dame does for Parisians. Trinity commands the head of Copley Square in Boston, "the seat of humanity," according to Ralph Waldo Emerson, a moniker that certainly suited the Brahmins of his day. Trinity is composed of sandstone and granite, not limestone (like Notre-Dame). But, like Notre-Dame, its attic is a timber frame that's "weirdly shaped and hard to get to," says Carroon, who has spent countless hours trying to protect it from what she calls "everyone's worst nightmare."

"Fire detection and protection at Trinity has been an ongoing conversation," says Carroon, "and the biggest concerns of fire are the impact heat and over-dousing the stone with water, which could cause chemical changes or stain it."

Notre-Dame's stonework appears to be intact, according to the damage assessment teams that have probed its faces and joints for heat or water damage after a dozen hours of exposure. Although its attic has been incinerated, how it burned—which was captured by drones and from nearby rooftops during the blaze—will help Carroon and other architects, specialists, and preservation officials understand the burn patterns and points of inflection during the blaze where wind or material changes might have hastened the outcome.

Trinity, Carroon reports, has looked into installing a fire suppression system in its attic that wouldn't douse a blaze with sprinklers (possibly further damaging the church, particularly John La Farge's murals below) so much as it would spray a high-pressure mist to battle its spread. "A mist chokes a fire instead of soaking a space," says Carroon. "What's interesting is that the sprinklers that are most common in buildings even today, and the kind we replaced in Trinity, were patented a hundred years ago."

She notes that disasters like Notre-Dame (and the kind Trinity is hoping avoid) often spur aggressive code changes, new technology, and innovation. For historic structures with brittle timbers, the future of fire suppression is still in water—just not a lot of water.

Less water means better results

One of the most innovative fire suppression systems on the market today was installed in 2015 at St. Patrick's Cathedral in New York, designed by James Renwick Jr. and completed in 1878, a year after Trinity. The high-pressure misting system engineered by ABCO Peerless Sprinkler is part of a $177 million renovation helmed by New York's Murphy Burnham & Buttrick (MBB), which received several awards, including a 2019 AIA COTE Top 10 Award and a 2016 AIA Design Award for Architecture. MBB also replaced or cleaned more than 3,600 stained-glass panels, repaired and cleaned the exterior stonework, and stabilized the structure (adding a subterranean geothermal system in the process).

According to MBB founding partner Jeffrey Murphy, FAIA, in specifying the misting suppression system in the attic (originally designed for use aboard cruise ships), which discharges one-tenth the amount of water of a normal sprinkler, they could save the plaster nave ceiling below. The system is also powered by nitrogen gas, rather than electricity, eliminating another potential cause of fire.

"Our mandate at St. Patrick's was to put the building on a responsible path for the next 30 years," says Murphy. "And our client knew that if we could get out in front of the maintenance issues, being good stewards of the cathedral moving forward would be easier and less costly."

Good stewardship at St. Patrick's, says Elizabeth Hallas, AIA, one of the jurors who awarded it the 2016 AIA Award for Architecture, also meant making fire suppression an upstream consideration rather than an afterthought.

"It's important to bring in a fire suppression engineer in the beginning of a restoration to advise on how we can incorporate it into the design," she says. "Seeing the misting system firsthand, it was really clear that the pipes were light in weight, which worked well for the timbers of the attic and to achieve a minimal visual impact. For that reason and others, it was also clear that MBB's work represented a high level of craft and coordination."

While it seems possible that a misting fire suppression system would be appropriate for Notre-Dame, conversations about the cathedral's future are stalled in the vacuum created by the fire and a reliable post-mortem report.

Macron's promise to rebuild Notre-Dame on an aggressive five-year schedule in time for the 2024 Olympics was tempered on April 29 by 1,170 architects, preservationists, and curators. They issued an impassioned plea to cautiously move forward and employ far more contemplation than a five-year horizon suggests. On April

17, French Prime Minister Édouard Philippe announced what many consider to be an ill-conceived architectural competition for the new spire. The initial resolve to do something for the cathedral has not diminished, but prudence seems to be the greater virtue held by many in architecture and preservation circles. While it's the most symbolic loss at Notre-Dame, Viollet-le-Duc's spire is only one element added at a moment in time to a nearly thousand-year-old cathedral whose construction is accretive, whose infrastructure is taxed by 13 million visitors each year, and whose administrators are awash in unrestricted cash pledged to the restoration. It's complicated, to say the least, and there are larger questions that need to be addressed before Philippe's spire competition can be something more than a frivolity.

"Being a good steward of a significant historic structure is using the resources, technology, and sustainable practices available to ensure its utility for future generations," says MBB's Murphy. "In light of the recent disaster at Notre-Dame, this challenge requires an approach informed by context, history, current technology, and aspiration. I view this comprehensive project approach as the definition of preservation in the broadest sense."