2022
Annual Meeting & Symposium
Association for Preservation Technology
NORTHEAST CHAPTER

WALKING THE PRESERVATION TIGHTROPE: TECHNOLOGY VS. TRADITION
February 25, 2022
"Technology, though ceaselessly striving toward the future, has continually revised how we view the past." — Ben Rowen

Preservation of the built environment requires a thorough understanding of historic construction and craftsmanship, but preservation professionals frequently walk the tightrope of integrating old construction with new technologies. Too much focus on either side and a building can lose historic character or risk becoming obsolete. As the world moves towards integrating new modes of technology into all phases of construction, we also risk the loss of knowledge from trades and craftpersons as younger generations are drawn towards the latest and greatest, at the expense of the tried and true.

Preservation is left to wrestle with a number of the following questions. What are the risks, opportunities, and challenges of a greater focus on technological advancements and new construction materials? Are there limits to what new technology can accomplish meaning that there will always be a place for traditional trade skills? How can trades adapt to modern methods and materials to ensure long-term relevance? Can technology and tradition coexist and what practices can preservationists utilize in their project development to ensure that both are integrated into the process? How can vernacular architecture take advantage of modern technology in response to changing culture, code requirements, and development? In what ways, if any, does new technology threaten the historic integrity of built structures?

The 2022 APTNE Annual Meeting & Symposium at Hudson Hall at the historic Hudson Opera House in Hudson, New York features 11 presentations and 1 panel discussion from a variety of industry professionals and a local student. We have included not only case studies, but also larger social discussions, academic research, and review of technology methodology. Presenters will demonstrate how the case study contributes broader knowledge to the field of preservation by providing in-depth analysis of what was learned in the course of the study or project and how that applies elsewhere.

PRESENTATIONS ARE TIED TO ONE THE FOLLOWING TRACKS:

1. Modern technology, i.e. non-destructive evaluation, photogrammetry, laser scanning, materials testing, computer modeling, upgraded and modern materials

2. Traditional building techniques, i.e. tradesperson techniques, preservation of knowledge

3. Adaptation of traditional building techniques and materials using modern technology, i.e. what works and what doesn’t, revisiting historic methods and materials in new construction

4. Infrastructure upgrades, i.e. sustainability of old, mechanical upgrades to existing structures, building monitoring systems

8:30 AM – 9:00 AM
Registration and Breakfast

9:00 AM – 9:10 AM
APTNE WELCOME ADDRESS
APTNE President, Helena Currie

9:10 AM – 9:55 AM
KEYNOTE PRESENTATION
Tradition and Technology- Shared Solutions to 21st Century Challenges
Judy Hayward

9:55 AM – 10:20 AM
Having a Blast in Preservation
Ken Follett

10:20 AM – 10:30 AM
Q&A
Michelle Daihoff

10:30 AM – 10:50 AM
Coffee Break

10:50 AM – 11:15 PM
Influence and Innovation of North American Capitol Domes
Robin Whishurst

11:15 AM – 11:40 AM
Discrete Reinforcement of Loadbearing Unreinforced Masonry at the Franklin School
Gretchen Paschier and Vassil Draganov

11:40 AM – 12:05 PM
Experiments in Hygrothermal and Freeze/Thaw Effects of Insulating Mass Masonry Walls
David Artiga

12:05 PM – 12:20 PM
Q&A
Michelle Daihoff

12:20 PM – 12:30 PM
CHAPTER HIGHLIGHTS
APTNE President, Helena Currie

12:30 PM – 1:30 PM
Lunch, APTNE Annual Board Meeting

1:30 PM – 1:55 PM
Crossing the Pell
Lilian Wong

1:55 PM – 2:10 PM
And There was Light: The Use of Projection Mapping for Historic Preservation
Przem Chayatham

2:10 PM – 2:35 PM
Adapting Traditional Techniques with Modern Technology for Mural and Architectural Ornament
Kim Lovejoy and Katharine George

2:35 PM – 3:00 PM
A Tale of Two Angels: The Restoration of Two Cemetery Memorials
Daniello Pope

3:00 PM – 3:15 PM
Q&A
Jen Kearney

3:15 PM – 3:35 PM
Coffee Break

3:35 PM – 4:20 PM
ROUNDTABLE
Technology vs. Tradition: Perspectives on a Masonry Wall: A Case Study
Moderator: Jeffrey Weatherford
Panelists: Kelly Streeter, Amanahna Quintana-Morales, Chase Finch, Matthew Ridgway

4:20 PM – 4:45 PM
On a Wing and a Prayer: Roof Curtainwall Integration in a Mid-Century Modern Icon
Pamela Clemens

4:45 PM – 5:10 PM
The Quiet Wisdom of Climate-based Design
Cory Roulard

5:10 PM – 5:25 PM
Q&A
Jen Kearney

5:25 PM – 5:35 PM
CLOSING REMARKS
APTNE President, Helena Currie

5:40 PM – 8:00 PM
RECEPTION
WHO WE ARE

Originally founded as the APT New York Chapter in the mid-1980s, the organization was restructured in 2003 as the Association for Preservation Technology Northeast Chapter (APTNE) encompassing New England, New York State, and northern New Jersey. At present, we have over 300 active members.

APTNE is committed to serving this geographic community with regional and local preservation events and outreach. We conduct workshops, co-sponsor events with local and statewide preservation organizations, and sponsor symposia, including our annual meeting in late February. We support students interested in preservation by offering free student membership and discounted young preservation membership and event admission, as well as annual scholarship opportunities.

PLEASE WELCOME OUR NEW BOARD MEMBER!

STACEY THOMAS is from the Albany, NY area. She works at Ryan Biggs Clark Davis Engineering as a Restoration Engineer. Over the last 20+ years, she has focused her career on investigating, diagnosing and designing repairs for various historic buildings. Stacey received her Master of Engineering degree in Structural Engineering from Virginia Tech and a Bachelor of Science degree from SUNY College of Environmental Science and Forestry in Construction Management and Engineering. She continued her education in building conservation with coursework at RPI and Boston University, while working in the preservation field. Stacey enjoys being active in local organizations that support her community, home improvement projects, cooking classes and cheering her kids on during their sporting events.

THANK YOU!

As of February 2022, one of our Directors is stepping off of the Board of Directors. We’d like to take the time to thank her for her time and dedication to making APTNE excellent during her terms.

OLGA HATHAWAY, 6 Years of Service
Tradition and Technology: Shared Solutions to 21st Century Challenges

Presented By Judy Hayward

"But how much time must pass before something becomes a "time-honored tradition" versus a technological advancement?"

HOW MANY OF YOU WERE TOLD not to play with matches as a child by your parents, and those same parents enrolled you in scouts where you learned how to start a fire by rubbing two sticks together? Since fire is critical to the history of building trades and technology, let's break down a mixed message about it.

Starting a fire by rubbing two sticks together seems safer because it is a slower process, a skill developed under careful supervision. The goal of making fire using the resources around you is to ensure your survival in any situation. If you found yourself alone in the wilderness and needed to survive, making, and tending to fire would be essential. By contrast, matches are quick and easy to use; the fire would quickly get underway.

Yet no self-respecting parent would hand a pack of matches to a seven-year-old and say, in case you are lost in the woods, here is an easier way to start a fire that might save your life. You is to ensure your survival in any situation. If you found yourself alone in the wilderness and needed to survive, making a fire by rubbing two sticks together. Who wants to work that hard? Who wants to wait that long? In fact, much of the change from building craft to building technology was driven by the need to build faster to serve a growing population and rapidly expanding cities. Let's fast forward through some historical debates for a quick overview of how we were set up for conflict between tradition and technology.

Is the world flat or round? This debate sets the stage for heated exchange between the Holy Roman Empire and scientists that later reappeared in the 19th century with Darwinism or Creationism. Were you a "man of God" or a "man of science?" And as the preservation of historic sites became popular, did you favor Ruskin, Violette-Le-Duc or Morris?

As education expanded for people in the 19th and 20th centuries, the pursuit of trades careers was diminished in favor of white-collar careers. People were encouraged to "use your mind, not your back." Such admonition belied the reality of what was happening to the trades. Throughout the 20th century, the demand for skilled trades decreased as changes in building materials required only "installers" to execute an architect's plans. And trade unions were disrupted as a result of political debates. A common description heard in the 1980s was "trades were treated as headless hands." The divide between architecture, engineering, and trades seemed to keep growing.

An entire group of people, trained to build with their hands, were minimized by new building materials and increasing professional distinction within the building industry.

Is it any wonder that we are here in 2022 with a conference title of Tradition vs. Technology?

Tradition has many definitions, but the essential qualities of tradition include processes informed over time by experience that are shared and passed on from generation to generation. Technology implies applying experience and information from the sciences. Both tradition and technology are rooted in experience and process. My perception is that technology evolves to solve problems. Traditions have evolved over time to solve problems—slowly or not; whereas technology seems to evolve rapidly and makes its way into practice before we know all the consequences—good or bad.

The good news is that the management of this balancing act already exists within each and every one of those in attendance. The importance of site-specific solutions in historic preservation will serve as our guide to the appropriate applications of tradition and technology. The curiosity in your approach to your work will be the source of working through the right solutions for each project. A deepening understanding of traditions and technology will expand your professional toolbox.

One of the key concepts includes architect Steve Mouzon's reflection. "Most discussions about tradition begin with 'we do this because...' His point is that much of good building practice and design has resulted from an understanding of a building's response to climate. But how much time must pass before something becomes a "time-honored tradition" versus a technological advancement? Our choices are similar to our ancestors; we just have more choices but usually less time to work through the answers. I have learned to ask questions that guide my search for solutions.

- How will a process protect the historic integrity of building fabric?
- Will the treatment allow the structure to tell its full story?
- Do the materials contain ingredients that might harm the structure or people?
- Will the treatment allow the structure to tell its full story?
- What do we gain or lose from each alternative treatment?
- Can the treatment be reversed or permit future treatment?
- What are the financial implications of the decision?
- Are there political or personal concerns in play with a given project?
- What are implications for the carbon footprint of a treatment?

Tradition and technology are not so different. Tradition is the history that we fear (sometimes for good reason) when honing skills for increasingly complex tasks. This example highlights that we fear (sometimes for good reason) when making and tending to fire would be essential. By contrast, matches are quick and easy to use; the fire would quickly get underway. Nevertheless, matches for fire are the matches for fire. When processes are made too easy and the need for understanding and control is cut out (even if those newer/faster processes could save our life one day).

We moved from fire with sticks, to fire with flint, to never letting the fire go out on the hearth, to matches, to coal, to the combustion engine, to electric and butane powered fire starters like the fire go out on the hearth, to matches, to coal, to the combustion engine, to electric and butane powered fire starters like

JUDY HAYWARD is executive director of Historic Windsor, Inc., and the Preservation Education Institute in Windsor, Vermont. She is also the education director for the Traditional Building Conference Series and develops and moderates its distance education programs as well. She is a past president of the Preservation Trust of Vermont and has been a board member of the APT Northeast Chapter and Historic New England’s Advisory Council. She serves on the Windsor Design Review Commission, a Certified Local Government (CLG). For nearly 40 years, she has developed preservation skills training programs for building professionals and written specialized curricula and learning materials on topics including fire safety and historic preservation and accessibility for people with disabilities and historic preservation. Judy writes a column for Traditional Building on Preservation and Traditional Building Techniques and she blogs for the publication’s website. She holds a master's degree in public administration from the University of New Hampshire and a Certificate in Educational Technology from Marlboro College Graduate and Professional School. She is an honorary life member of the Preservation Trades Network.
OVER THE LAST FIFTY YEARS, there have been several parallel arcs of development in aggregate blasting in Historic Preservation. The physical technology was refined through experimentation and adaptation, while the perceptions within the preservation industry evolved. The evolution of this technology will trace the development of equipment, changing attitudes and perceptions towards intentional surface erosion, the understanding of the hands-on trades, and an assortment of pressures from the industrial applications within the construction environment.

The chronology begins in the 1970s with the introduction to sandblasting of steel beams with the application of a primer coat. The 1980s followed with the use of standard blast equipment with plastic media for removal of epoxy paint on granite at the entry of Carnegie Hall, plastic media being a technology adapted from the airline maintenance industry. Within that time an undesirable but common technique used for cleaning brick masonry structures was to sandblast them and thus remove the fire skin, permanently damaging historic facades. A prevailing attitude at the time within the preservation community was to not ever talk about aggregate blasting as a technique to be used on a heritage structure.

Thus, architectural conservators are required to serve as gatekeepers to advise on projects as to the need for testing and mock-ups. But there also needs to be an understanding of how the capital-based contractor with an investment in a particular technology will approach a project. How can this be balanced? Technology develops where there is a need to be satisfied, but technology can also develop and be introduced where there is no need, and where it is fully inappropriate. As technology develops, increasingly the hands-on trades need to have a more informed understanding of their work. What exactly is happening at the surface of the media, whether it be stone, wood, metal, or otherwise? To what extent and in what manner is the surface changed? What controls are there to assure that heritage fabric is not permanently damaged?

The presentation will review from personal anecdotal experience, the speaker’s participation in the use, experiment, and development of aggregate blast technology up to the current practice of laser cleaning, which is essentially the use of an aggregate of light energy.

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THE MAJORITY OF STATE CAPITOL BUILDINGS as well as several other significant government buildings including city halls, courthouses, and even the U.S. Capitol Building are topped with a style of dome derived by those in Europe and innovated upon here in America. Through an understanding of their commonalities with each other and their European relatives, we identify and appreciate their differences as well as formulate restoration, renovation, and maintenance plans to ensure these spaces can continue to function as government facilities while also showcasing their historic significance.

Dome structures were popularized in America thanks to a close-knit group of Architects including George I. Barnett and Alfred Piquenard who took these European classics and injected them with American ingenuity. Rather than relying on masonry, these domes were constructed with metal, often iron, skeletons. Initially, these skeleton cages were often wrapped in wood and topped with decorative metals. Today, many of these wooden skins have been replaced with more sturdy stone or precast concrete panels which are better suited to protect the domes from the elements.

As iron grew in popularity and availability in North America, so too did innovative takes on stately, European architecture of old. While American Dome design incorporated newer materials, the shapes and techniques echoed Renaissance structures through the inclusion of hollow shaft systems for ventilation in mass masonry walls, inner and outer domes, and wooden rib technology for structural stability. Standing 341 feet from the lantern, the Illinois State Capitol Dome’s maintenance and renovation history was influenced by both European design and contemporary American architects over more than twenty years. The Illinois Dome’s maintenance and renovation history not only influenced the preservation of the dome itself, but also showcased the evolution of preservation techniques over time.

To determine the existing interior conditions and potential causes of deterioration, both destructive and non-destructive evaluations were conducted along with visual observations and material testing. Destructive evaluations included: removal of portions of steel and wrought iron for metallurgical analysis; mortar sample removal for mineralogical analysis; in-situ testing at the wrought iron for metallurgical analysis; removal of roofing sealants, roofing flashing, precast concrete cores, window sealants, window glazing, and paint samples for hazardous material testing; additional tensile testing, chemical analysis, and hardness testing.

Non-destructive evaluations included: pulse echo, radar, and infrared scanning to scope verify floor and wall construction; electronic sensor installation to monitor cracks, temperature, and humidity; monitoring along with temperature and humidity sensors were installed and monitored. A digital laser scan for the interior and exterior of the building was conducted to facilitate an accurate BIM model that could be used to develop a structural model to analyze the structure.

In the dome structure, metallographic analysis of wrought iron supports including additional tensile testing, chemical analysis, and hardness testing.

Participants understand techniques that should and should not be utilized by similar buildings. In sharing the recommended future, we can all have a better understanding of how to ensure we treat these iconic domed buildings in a way that preserves their history while allowing them to continue to serve as functional government buildings.

The condition assessment and structural study of the Dome and supporting tower is a case study of forensic methodology for similar buildings. The integrated team performed extensive research and review of historic documents, photographs, and previous, less comprehensive studies. By conducting a five-day, multi-disciplinary forensic study of the Capitol Dome and tower, the team sought to fully understand the current conditions, structural characteristics, thermal performance, and historic elements, enabling the team to inform restoration and repairs along with sustainable improvements. To determine the existing interior conditions and potential causes of deterioration, both destructive and non-destructive evaluations were conducted along with visual observations and material testing.

Influence and Innovation of North American Capitol Domes

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By using sophisticated technology, this holistic study identified shortcomings in the original design of the dome and tower, shining light on both issues and potential solutions. The forensic methods performed at this site can inform testing at other domes experiencing issues throughout the continent.

ROBIN WHITEHURST is the Technical Principal at Bailey Edward and has led the company’s historic preservation efforts since 1992. Robin has worked throughout the United States and Canada with organizations such as the AIA, APTI, Traditional Building and the University of Illinois, as a lecturer, mentor and educator training students, contractors and allied professionals the proper methods, technologies and techniques needed to preserve historic buildings. He leads by example, pairing his historic expertise with feasible and efficient strategies to restore, preserve and maintain facilities. His energy level is contagious and motivates the entire team to perform at a higher level.

INFLUENCE AND INNOVATION OF NORTH AMERICAN CAPITOL DOMES

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DISCRETE REINFORCEMENT OF LOADBEARING UNREINFORCED MASONRY AT THE FRANKLIN SCHOOL

Presented By Gretchen Pfaehler and Vassil Draganov

PLANET WORD IS A LANGUAGE ARTS MUSEUM that opened in Washington D.C.’s Franklin School in October 2020. Originally designed by Adolf Cluss, a prominent local architect, in a modern Renaissance muntin-arch style, the school is on the National Register and a National Historic Landmark. It was constructed in 1865 as the flagship of eight schools providing universal public education. Cluss featured this design at the Centennial Exposition in Philadelphia for its inventive air circulation systems and classroom layouts. The school also was the site of Alexander Graham Bell’s first wireless communication to his lab on L street—the precursor of modern fiber optic systems. The building subsequently served many uses, including a teacher training school, the Board of Education Administration Building, and a homeless shelter, before being left vacant.

The unreinforced masonry building was built with multiwythe brick walls decorated with stone and cast iron details. The building includes multiple flooring systems. Analysis by the museum’s project team showed that none of the floors met current code, and it was not immediately known if the exterior walls would carry the transfer loads when the flooring was modified. The project team conducted specific research, documentation, and testing to learn more about the brick and mortar foundations and, ultimately, to carefully prepare the walls. To meet current seismic code, they would need to carry the loads to the footings for new steel beams to carefully prepare the walls. To meet current seismic code, they would need to carry the loads to the footings for new steel beams.

New concrete columns were installed within the inner wythe of the wall, bearing on the reinforced footings, to carry the loads from the floors down through the building. The ceiling of the Great Hall, the largest historical space, was modified to achieve the required loading capacity for the attic-level event hall above and to effectively support a hanging, 15’ diameter planet of LEDs, a central component of an exhibit below. In installing the new concrete columns, we discovered a lack of connections between the wythes on the primary façade, which required us to develop solutions for stepping injection grouting to bond the wythes. Together, these efforts will protect the National Historic Landmark well into its next 100 years.

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Through testing of the footings, the team learned that the foundations were not brick but instead rubble. An assumed existing bearing pressure and proposed bearing pressure were established. The geotechnical engineer provided ultimate bearing pressure for each foundation wall and Factor of Safety (FoS) measures to determine which locations required foundation reinforcement. Localized changes were included in the design documents for discreet spread footings and grade beams; a notable exception was made for the locations for the new elevator shafts, which required significant underpinning.

GRETCHEN PFAEHLER, AIA is a Partner and Senior Preservation Architect at Beyer Blinder Belle’s Washington DC office. Gretchen offers deep expertise in preservation planning, restoration, and rehabilitation of historic buildings and landscapes. Gretchen’s clients include the Architect of the Capitol, National Gallery of Art, Smithsonian Institution, US Department of State, US General Services Administration, and National Park Service. Her expertise includes management of multi-disciplinary teams, preservation laws, and review processes and regulations. Gretchen is a board member and past President of APTI and a board member and past chair of the DC HPRB.

VASSIL DRAGANOV has been a structural engineer with Silman since 2008 and has over 24 years in the industry working with new and existing structures. Well-versed in designing for both new and existing structures, he has extensive knowledge of all major structural systems and a depth of experience in envelope assessment and adaptive reuse, with special expertise in aluminum and Ultra-High Performance Concrete (UHPC) structures. As Principal at the Washington DC office, he is the manager of the IIM and project planning efforts. As principal in charge, Vassil will be in direct communication with the design team and work closely to assure that the progress of the project runs smoothly. He will provide oversight in the form of quality assurance and quality control throughout the project’s duration.
EXPERIMENTS IN HYGROTHERMAL AND FREEZE/THAW EFFECTS OF INSULATING MASS MASONRY WALLS

Presented By David Artigas

THE RENOVATION AND REUSE OF EXISTING BUILDINGS is a cornerstone of sustainable design and preservation of arts. Masonry buildings, many of which are over a hundred years old, are good candidates for renovation because they have withstood the test of time and proven themselves as durable structures. However, current building codes, environmental concerns, and desires for comfort can require both interior heating and cooling (which require energy) and energy efficiency improvements, often including the addition of interior insulation and air barriers to the existing masonry walls.

Much of the current literature and thinking on the topic of insulating mass masonry walls cautions that adding insulation significantly increases the potential for freeze/thaw damage to the masonry and other moisture-related issues. This literature asserts that insulation should be added with caution and only after testing the existing masonry’s hygric and strength properties and performing hygrothermal modeling of the wall assembly. However, there is no documented case where adding interior insulation to a mass masonry wall causes damage without additional detrimental factors, e.g., bulk water leakage into the wall. Also, previous research on the freeze/thaw durability and the conditions necessary to cause freeze/thaw damage seems to indicate that masonry generally must experience far greater stresses than insulation typically imposes on the masonry for freeze/thaw damage to occur.

Building off of previous research on freeze/thaw damage to masonry, this research specifically aims on exploring how adding different forms of insulation to mass masonry samples effects their capillary suction and reaction to both gradual and rapid temperature cycling. As previous research has shown that both significant water content and rapid decrease in temperature typically are necessary to cause freeze/thaw damage. This research also includes a review of weather records and hygrothermal modeling of mass masonry walls in different cold climates to compare the probable temperature changes that the masonry will experience with different forms of insulation to the conditions that our experiments show generally are necessary to cause freeze/thaw damage.

DAVID ARTIGAS joined Simpson Gumpertz and Hager (SGH) in 2007. He is experienced in managing the investigation, design, and construction contract administration of building enclosures on both historic and contemporary buildings of many types in the United States. He also performs thermal and hygrothermal modeling and assessment of building enclosure assemblies, specializing in existing and historic building enclosure systems.

CROSSING THE PELL

Presented By Liliane Wong

DESPITE THE PARTISAN FRAY ON CAPITOL HILL, an infrastructure bill will pass in the near future. The array of programs covered by such a bill will be the result of “horse trading” amongst legislators. But the program intended for the repair and retrofit of aging infrastructure will be a certainty. Every four years, the American Society of Civil Engineers conducts a survey and issues a report card for the nation’s infrastructure. This year, they issued an overall grade of “C,” citing mediocre roads, deficient water mains and aging levees. Bridges are a particular point of focus. Of the more than 600,000 bridges across the United States, 42% are at least 50 years old, and 15% are considered structurally deficient. The upgrade of these bridges will include repair and maintenance but also projections of their use in a resilient future.

Upgrading our nation’s old and deteriorating bridges will require the introduction of new technology, materials and methods to structures constructed more than 50 years ago. Bridges, as structures of exposed construction, are uniquely defined by their construction materials and methods. In no other type of structure in the built environment will the integration of new methods to old be more visible, nor the short-term of technology vs. tradition more evident. Crossing the Pell is a RISD Adaptive Reuse studio inspired by the 20B Bridge Investment Act and the IMAGINE Act (for the use of innovative construction materials and techniques), co-sponsored by Senator Sheldon Whitehouse of RI. It is a speculation on the future of the Claiborne Pell Bridge of Rhode Island. At a length of 2.2 miles and a main span of 801 feet, it is the longest suspension bridge in New England. The Preservation Society of Newport County calls it “an icon of the state of Rhode Island… [and] an important gateway to one of the most beautiful, historic cities in America.”

Crossing the Pell Bridge to replace ferry access contributed to the development of the city as a center of historic tourism. More than half a century later, consideration is given to a different type of access on the Pell Bridge - bike and pedestrian - in planning for a resilient future in the Narragansett Bay. As an investigation of adaptive reuse of the Pell Bridge for bike and pedestrian access, the studio produced four visions for a future bridge that respond to the existing construction and technology of the 52-year-old bridge. These four interpretations address the integration of advanced composite materials as well as new construction methods within the existing cable suspension system. They also focus on future uses of infrastructure as a means towards a sustainable and equitable community in the Narragansett Bay.

Crossing the Pell is also the name of an immersive exhibition of these four infrastructural visions that utilizes AR/VR technology to provide the visitor the experience of crossing the bridge. The proposed presentation will include a discussion of the projects as well as the exhibition. It will conclude with a visualization component to “cross” the bay.

1 https://trafficstatuoreportcard.org/cat-item/bridges/

LILIANE WONG, AIA received her BA in Mathematics from Vassar College and her MArch from the Harvard University Graduate School of Design. She is Professor in the Department of Interior Architecture at the Rhode Island School of Design. She is co-founder and co-editor of the International Journal on Design Interventions & Adaptive Reuse, author of Adaptive Reuse - Extending the Lives of Buildings, and co-author of Libraries – A Design Manual. Recognized by Design Intelligence for 2018-2020 as one of the top 25 most admired-design educators in the US, her teaching emphasizes the importance of public engagement and social activism in architecture and design.
AND THERE WAS LIGHT: THE USE OF PROJECTION MAPPING FOR HISTORIC PRESERVATION

Presented By Preme Chaiyatham

PROJECTION MAPPING IS A TECHNOLOGY that allows us to change the environment without physically altering it. With no physical contact and complete reversibility, this new technology should be more widely used in the preservation field. Projection mapping has been widely employed in the entertainment sector on both large and small scales, but its use in the field of cultural heritage preservation has been limited to date. While the equipment can vary from the shelf to highly sophisticated, it is all about using light to display an interpreted finish or room.

Historic sites are frequently curated to interpret a designated period of significance. While the one period may establish the history of the site over time can be lost. A new tool, projection mapping has the potential to enable a site to be interpreted for several periods of time. Its non-invasive, non-contact, and reversible character distinguishes it from physical conventional interpretation, which may require the removal of materials. This allows us to temporarily and visually change the space into different time periods without requiring physical intervention. The ephemeral mediation immerses the public in various interpretations while allowing the space to remain in its current condition and deterioration as a living document of the site.

There have been a few initiatives to integrate projected light with historic objects and architecture but they have been limited. Previous projects mostly focused on color reconstruction of deteriorated paintings or places, such as the reconstruction of Mark Rothko’s murals at Harvard University and the color restoration of the Temple of Dendur at the Metropolitan Museum of Art. The Amiens Cathedral light show illuminates its facade in original colors, while the permanent exhibition at Sant Climent de Taüll exhibits the original fresco in its apse. These examples are confined to larger institutions. As an interpretative tool, projection mapping enables these places to show their history, attract visitors, and provide interpretation to the general public.

Projection mapping has enormous potential but it is a little-known technology. To begin promoting projection mapping, variables will need to be considered such as cost, size, and space limitations. Like many technologies, there are drawbacks. The effects of projected light on a darker or non-matte surface may be inaccurate. The challenge of how to incorporate new technology without disrupting the historical environment needs to be considered. The framework for its implementation and maintenance is likewise largely unknown. These are issues that must be acknowledged and resolved before we can fully include this technology into our toolkit.

There is however enormous potential with projection mapping and its use for cultural heritage projects. This presentation attempts to establish a framework to begin the use of this technology that is beneficial to the preservation of cultural assets and can be extensively adopted. I hope that conversations among preservation experts about its potential, problems, and limits will spark ideas for incorporating it into our interpretative toolboxes and advancing the discipline of preservation.

Preme Chaiyatham completed her undergraduate degree in interior architecture. She has been in interior design and built environment industry for four years in Bangkok, Thailand. She is competent in spatial design for residential, commercial, and organizational spaces. With experience working in old structures, she decided to pursue her graduate program in Historic Preservation at Graduate School of Architecture, Planning, and Preservation at Columbia University where she has been working as a preservation lab assistant for the school and served as a student council for the program. Her main goal is to be a conservation architect and an interior designer specialized in adaptive reuse.
FROM HAND TO DIGITAL: DOCUMENTATION AND DESIGN FOR MURAL REPLICATION

As a decorative arts studio with a long history of recreating or replicating lost or irretrievably damaged historic murals and decorative painting, over the years a number of digital technologies have been adopted in our design and art studios. Traditional artwork with the artist’s hands is still fundamental on many levels. Complementary digital tools in routine use include design software for layout, colorization, and archival digital printing of repetitive patterns on canvas. While laser scanning is widely employed by architects to generate baseline architectural drawings, we now use it ourselves to support faster, more accurate pattern documentation in finish investigations and artwork replication. Mississippi County Courthouse in Blytheville, Arkansas, completed in 1833, is a perfect example of the benefits of 3-D scanning and the payoff of learning how to use the technology for mural replication. Listed on the National Register for its local significance as the best example of Colonial Revival architecture in its district, a courthouse had lost its original trompe l’oeil decorative scheme behind acoustic tile alterations. When there is no lift or scaffold access until a restoration project is underway, we have to wait until the last minute to get field measurements and then rush out the final designs and artwork to install. As subcontractor for the decorative paint restoration, ortho-rectified 3-D scanning of the room to get measurements earlier in the process was commissioned. “There is no way we would have been able to meet this project’s deadline with such high quality without a 3-D scan of the room. The accuracy, quantity, and speed with which we get site dimensions from 3-D scans is unparalleled. This technology allows our design studio to prepare layout and design drawings, and our studio artists to produce the murals on canvas, at the right size the first time.” The onsite crew that received the shipments of painted canvases were impressed by the accuracy of dimensions of the artwork, which made their installation easier and avoided costly do-overs.

2 D TO 3 D: DOCUMENTATION AND CRAFT TECHNIQUES AT TRINITY CHURCH REREDOS

In the massive restoration at Trinity Church Wall Street, tasks included cleaning, repairs, gilding and sculpture reinstallation at the Gothic Revival reredos designed by Frederick Clarke Withers and completed in 1877. The contract scope included allowances and unit prices for quantities of several types of repairs tagged on standard 2-D architectural drawings. A key part of our responsibility as conservator/contractor was to re-survey and document conditions on all sides of three-dimensional ornament that could not have been seen in a limited inspection pre-construction. A pictorial workaround of hi-tech professional photo-documentation using slider photos proved valuable, along with hands-on inspection when scaffolding was in place. The conservation team documented findings in a numerical labeling system, photos, and preparation of supplemental drawings and an inventory spreadsheet of conditions and recommendations for repair types and quantities. This provided a point of reference for collaborative field meetings with the design team to decide upon the revised treatment scope for over 150 repairs, and a format for as-built documentation.

Traditional techniques for French Caen stone and Lisbon marble included cleaning, repointing, re-pinining, Dutchman repairs, and reinstallation of four angels and the central crose. Materials chosen where matching stone wasn’t available included molding plaster and modern substitute formulations of natural hydraulic lime and aggregates.

The survey and documentation methodology employed for the Trinity reredos is the latest iteration of field documentation procedures we employ at large-scale stone and plaster projects. It is expected that evolving uses of digital technologies and traditional crafts continue, involving conservators, designers, artists, and craftsmen to serve the unique needs of each project. 
DESTRUCTION BROUGHT ON BY HURRICANE SANDY led to a set of conservation decisions on how to restore two large stone monuments at Woodlawn Cemetery, located in the Bronx, New York. The two monuments, the Deeves Memorial and Hall Memorial, were both knocked from their pedestals and severely damaged by fallen trees. Each monument brought its own set of challenges. The Deeves Memorial, consisting of a marble angel figure, lost its delicate marble wings and arms as it fell from on top of a 30-foot granite column. The Hall Memorial, consisting of a seated marble female figure resting her hands on a ship’s anchor, was fractured in multiple places and lost significant portions of stone, including most of her head and a corner of the base.

Restoration of these two monuments was complicated by the fragile nature of the remaining marble, the availability of replacement stone, a short timeline for completing the work, and a limited budget. A conservation treatment plan was developed using substitute materials to recreate some missing elements, while other elements were either not replaced or replaced using traditional conservation materials.

A modern material was used to recreate the missing wings of the Deeves Monument. Due to the fragility of the marble wing tabs, traditional carved marble or cast stone recreations were not feasible because of the weight. A novel treatment was devised to meet project conditions involving the use of a light-weight composite material known as Microcotta to recreate the missing angel wings. Clay models were sculpted of the missing wings based on historic photographs of the memorial from which molds were created for the casting process.

The Microcotta cast wings were then blind pinned to the existing marble wing tabs. Though they appeared to be highly friable, the marble arm fragments proved sound enough to be able to blind pin at the elbows; allowing the ability to reattach original fragments.

The Hall Memorial was treated in a more traditional way. The remaining fragments of the head of the seated female figure was sent to a stone mason to be recarved based on historic photographs and remaining features in marble. The missing corner of the base was cast-in-place using a composite patching material that was matched to the color and texture of the adjacent marble.

DANIELLE PAPE has worked for Jablonski Building Conservation, Inc. (JBC) since 2017. She graduated from the University of Pennsylvania’s Weitzman School of Design (’17) with an MS in Architectural Conservation. Danielle’s interests include field and laboratory testing of materials, cemetery conservation, and hands-on conservation treatments. She performs conditions surveys and construction supervision for a wide range of restoration projects at JBC.

"Due to the fragility of the marble wing tabs, traditional carved marble or cast stone recreations were not feasible because of the weight."

A Tale of Two Angels: The Restoration of Two Cemetery Memorials
Presented By Danielle Pape
CHARLES (CHAS) FINCH is the Director of Restoration Services at Pullman. He joined the Pullman Team in 2019. He started in the commercial masonry façade restoration field in 1980. He has 42 years of hands-on experience in nearly every facet of the restoration, rehabilitation, and re-construction after working nationwide on hundreds of major Historic and Landmark masonry restoration projects. Chas brings a well-rounded, practical, and realistic approach to every project from years of experience and expertise in building façade restoration. He assists countless design teams and building owners with practical, field-driven solutions to complex restoration procedures as well as logistic, and access challenges. He assigns and directs required trades, labor, equipment, and materials for each specific task, with detailed method of Procedures. He has designed, fabricated and realized countless safety and labor-saving mechanical and procedural solutions. His specialties include major restoration and replacement of terra-cotta, brick, and stone façade, concrete & steel structure repair and rehabilitation, complex rigging and housing solutions, and overall restoration forensics. He holds a current NYC DOB Special Riggers License.

AMARANTHA QUINTANA-MORALES works on projects involving building enclosure investigation, remedial design and renovation, and design consultation of new building enclosure systems. She has experience investigating and designing both contemporary and historic façade claddings, fenestration, roofing, masonry, and waterproofing systems. Her notable projects include a “Best In New City” award-winning project with the American Institute of Architects New York Chapter. She has been involved in the investigation, remedial design and renovation, and design consultation of numerous historic buildings in New York City. She is well-versed in the contemporary analysis and issues of building enclosure systems on historic and modern buildings, managing projects for both public and private clients.

MATTHEW RIDGWAY is a licensed Architectural Engineer specializing in the assessment, design, analysis and remediation of building enclosure systems on historic and modern buildings, managing projects for both public and private clients. Matt is well-versed in the contemporary analysis and issues of building enclosure design, serviability, materials selection and enclosure commissioning and often moderates discussions between stakeholders, consultants and local code/historic authorities. Mr. Ridgway is the Regional Manager of InterTek’s Building Science Consulting group and oversees the Northeast Region’s diverse team of experts who help clients understand building performance issues, diagnostics, risk mitigation, and capital/maintenance planning. Mr. Ridgway has been a guest speaker and guest lecturer at local Universities, the National AIA Convention, ASTM symposia, and local RCI (IBRCE), NCC and BEC chapters.

KELLY STREETER, PE is a partner and structural engineer with Vertical Access. She developed a testing and research program to evaluate the acoustic properties of Guastavino tiles and the use of non-destructive evaluation of Guastavino tile as an assessment tool. In addition, Kelly serves as chairperson for the American National Standards Institute (ANSI) Z359.9 Personal Equipment for Protection Against Falls — Descent Controllers and leads all Maintenance and Access Fall Protection, assessment, design, and installation projects. Kelly also leads the in-house development of inspection technologies including direct to digital annotation software (TINS®), and 3D imaging techniques using unmanned aerial vehicles, or drones.

ADVANCES IN NEW TECHNOLOGIES CAN BE VERY POWERFUL TOOLS TO INCREASE EFFICIENCY of the building and information gathering) and provide more data. Balancing new technologies with traditional tried-and-true techniques requires a critical evaluation by the Professional. Preservationists can rehabilitate deteriorated buildings integrating new technology from the initial design phase through construction. These technologies are employed to assess conditions, increase building performance, and improve sustainability. What information can new technologies provide and how can we evaluate that information to ensure we aren’t altering construction techniques without an understanding of long-term performance?

Technology vs. Tradition: Perspectives on a Masonry Wall: A Case Study

Case Study to be Explored: A client owns a five-story mass masonry brick building on the National Register of Historic Places in the Northeast. This building has a circa 1910’s addition that consists of a brick veneer exterior cladding attached to a steel frame structure. At the addition’s connection, there are systematic cracks and brick degradation throughout. Mortar loss, open joints with loose bricks, and buckling walls have been found at both the old and new construction. The client is concerned that there might be extensive hidden degradation issues and wants to effectively repair this damage and realign the adjoining walls while also introducing the appropriate water abatement infrastructure. It is critical that the restoration retains the original character of the building while improving stability and the long-term performance. Consultants and the Contractor are asked to inform the client what type of assessment should be conducted and what modern code compliance will be required. The client expects all preservation requirements to be followed and is interested in a solution that improves sustainability performance.

MODERATOR

JEFFREY WEATHERFORD is a furniture maker, architectural and furniture conservator, and historic preservation consultant. He also teaches materials conservation and adaptive use of historic structures at Eastern Michigan University’s Graduate Program in Historic Preservation. Over the past thirty years he has been extensively involved in the restoration of historic buildings as well as the creation and restoration of furniture.
ON A WING AND A PRAYER: ROOF CURTAINWALL INTEGRATION IN A MID-CENTURY MODERN ICON

Presented By Pamela Clemens

UPGRADING BUILDINGS TO INCORPORATE MODERN MATERIALS DOES NOT COME WITHOUT ITS HURDLES. Taking the time to study all options is imperative to creating a design that balances the historic beauty with current needs. While the new curtainwall system at the Westport Unitarian Church does not directly mimic the initial construction, it provides an appropriate balance of aesthetic intent, occupant needs, and budget constraints. Distinguished by its soaring roofline, the gracefulness of its soaring curved wood beams, and the simplicity of its material palette, the Unitarian Church of Westport inspires both new and returning visitors. Designed by Victor Lundy, this 1961 building has been occupied by the same congregation that commissioned its design and this next generation of parishioners are beginning to plan for its future. It has remained largely unrenovated allowing the original construction to shine through but also left it in need of modern advancements. The design team was tasked with creating a master plan to restore and upgrade this majestic mid-century modern building. After the creation of the master plan, the parish decided an important first step was to increase occupant comfort and highlight the congregation’s commitment to sustainability by upgrading their exterior curtain wall, starting with the sanctuary.

"Due to the fragility of the marble wing tabs, traditional carved marble or cast stone recreations were not feasible because of the weight"

This construction campaign focused on using the sanctuary as a showcase to the congregation how investing in modern technology and materials can impact the building in a positive way. While maintaining the soaring wood roof aesthetic the single pane, non-thermally broken exterior wall needed to be upgraded to meet modern code, enhance occupant comfort and raise the building efficiency. In order to achieve this goal, we studied different ways to imitate the curving mullion patterns, overcome the minimal transom structure and balance the glazing pane sizes with available glass technology. It was understood the curtain wall structure would change in depth to meet current lateral and gravity load requirements, but it was of the utmost importance that this mid-century modern sweeping structure continued to uplift the spirits of all occupants. Working directly with a curtain wall manufacturer, we were able to study challenging details and evaluate several viable solutions.

The north wall of the sanctuary is a soaring 20-foot-tall decorative glass focal point. With the vertical and arched mullions directly connected to the adjacent curtain walls and a vent window stuck in a partially open position, it was important to include this wall in the replacement. The challenge to the curtain wall designer was to mimic the decorative wall with a modern system. The system would need to be able to accommodate the more regular design of the east and west wall. By modifying an EFCO system with internal structural steel combined with applied mullions, the curtainwall contractor was able to get a similar look with minimal aesthetic concessions.

The biggest structural hurdle was to recreate the full-glass transom aesthetic for it to meet modern codes but maintain the aesthetic of a floating roof. The existing transom was a full glass system following the curved roof line with an aluminum mullion on the bottom of the glass only. The sides were connected to adjacent glass with a sealant joint. The top of the glazing was captured by a shallow channel carved into the roof deck. The congregation widely acknowledged the transom’s transparency was important to disconnecting the roof from the structure. While the curtain wall now requires vertical structure to meet code-prescribed loading, the design strategically placed mullions to minimize site lines and created a custom top rail detail that reduced the visual impact of the connections to the roof.

The size of the original glazing panes was a challenge for both constructability and energy of client technology. The original curtainwall relied on an 8’ wide by 6’-8” tall mullion pattern throughout the sanctuary. A double-pained glazing unit of this size weighs approximately 350 lb and could not be easily transported into position due to site constraints. Of bigger concern was a low-E coating. The original glazing technology research and coordination meetings with the contractor, all but one pane of glass will be able to receive a Low-E coating. The final design reflects the required energy upgrades balanced with a maintained building aesthetic.

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IN THE CONTINUED RACE AGAINST CLIMATE CHANGE, where buildings are responsible for approximately 40% of global carbon emissions; it is vital that the preservation community apply its expertise in providing creative solutions to curb drastic environmental effects. Typically, the role of existing buildings is discussed in terms of operational carbon improvements, such as through deep energy retrofits. However, the role of embodied carbon is also being broadly considered as a vital player in the care of our existing buildings.

Preservation brings a critical resource to the table: the wisdom and ingenuity of traditional building forms and techniques developed over the millennia to make the built environment work with local climates and conditions. Long before the recent era of cheap fuel, people have been inhabiting buildings and devising strategies for improving human comfort (thermal, humidity, daylighting) and building longevity (durability and repairability) through the design and detailing of their built environment. These strategies, as built forms, may be considered “inherently sustainable features”, or ISF. They often are found in the form of passive design, sometimes in the form of well-considered active features. While they are by definition climate-specific, the underlying concepts may be found globally. They often become character-defining features, helping to shape local styles, and yet they may also transcend styles through place and time.

There is a growing database of ISF. Hundreds of examples have been catalogued thus far, as these climate concepts are explored in their built form around the world. This database is in the process of being uploaded to APT’s OSCAR platform, and will continue to grow and evolve in the coming years.  

CORY ROUILLARD brings to Jan Hird Pokorny Associates (JHPA) her decades of historic preservation experience, as a licensed architect, architectural conservator, and active advocate for climate leadership through preservation. Her award-winning work has included the restoration of significant historical buildings, new construction in a historic context, and work in many unusual circumstances, including relocating entire buildings and reassembling buildings from previously disassembled components. In her role at JHPA and in her professional outreach, she promotes technical guidance for the appropriate care of existing buildings to both protect our cultural heritage and meet our carbon mitigation targets. Ms. Rouillard oversees all of JHPA’s architectural services agreements and construction contracts.

### Examples

**Hot Humid**
- **Maximize Heat Gain**
  - China: Latticework and shutters
  - Dubai: Badger

**Minimize Heat Loss**
- New Orleans: Porches
- Sumatra House: on Stilts

**Cold**
- **Maximize Heat Gain**
  - Strasbourg: Kachelofen
  - Plymouth, MA: Small Windows

- **Minimize Heat Loss**
  - Ancient Rome: Hypocaust
  - Sumatra House: on Stilts

**Optimizing Climate Intent**

**Temperature Regulation**

**Heat Gain**
**Heat Loss**
CONGRATULATIONS TO APTNE’S 2022 STUDENT SCHOLARSHIP RECIPIENTS!

SHANNON TRONO  
Columbia University, New York  
APTNE is proud to announce that Shannon Trono is the 2021 Melissa Morrissey Scholarship Fund Recipient.

Shannon’s keen interest in the interdisciplinary studies of preservation, conservation, material science and architecture is evident both in the classroom and in her past work experiences as a museum educator, a conservator of the decorative arts and an archeological laboratory technician. Shannon’s passion for preservation in the form of architectural conservation prompted her to relocate from Texas to New York, where she is currently pursuing her masters in historic preservation at Columbia University. As part of her thesis research, Shannon is exploring how 3D printing technologies can provide a potential cost-saving alternative to mold-made reproductions for historic terracotta elements. Shannon is also passionate about expanding the number and diversity of voices heard within the preservation industry.

PREME CHAIYATHAM  
Columbia University, New York  
APTNE is proud to announce that Preme Chaiyatham is the 2021 APTNE Scholarship Recipient.

Preme’s passion for preservation stems from examining the critical intersection of technology, creativity and preservation to progress the industry and practice. Her thesis investigates the use of projection mapping as a non-invasive and reversible tool in historic preservation. As projection mapping technology becomes more available and costs become more affordable, small and underfunded house museums can use this technology to educate the public about their history and engage the next generation. The remainder of Preme’s thesis will focus on evaluating various types of projection mapping software to develop a guideline for small institutes to follow when incorporating this technology. In addition to her master’s thesis research, Preme recently earned first place in APTI’s design-build student competition where students examined the arch of the Brooklyn Bridge and were asked to design/build two masonry arches. Preme is a student speaker at APTNE’s 2022 Annual Symposium on Technology vs. Tradition.

STUDENT MEMBERSHIP WITH APTNE

The Northeast Chapter of the Association for Preservation Technology International is committed to serving the arts, science, architecture, conservation, construction and engineering community with regional and local preservation knowledge and events.

WHY JOIN?

• Scholarships  
• Professional networking opportunities  
• Internships and mentorships at partner and member firms  
• Free events and tours—virtual and in-person  
• Practical insight into the preservation industry from professionals working in the field  
• Recognition and participation at symposiums

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One $1500 Scholarship to attend the APTI Annual Conference  
Two $2500 Scholarships to provide financial support

APTN 2023 Annual Meeting & Symposium

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One $1500 Scholarship to attend the APTI Annual Conference  
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2021 YEAR-END REVIEW

VIRTUAL JANUARY 14, 2021 5-6PM
How the Future of Preservation will Change as a Result of COVID-19

VIRTUAL MARCH 18, 2021 5PM–6PM
Exploring the Legacy of the Monsanto House of the Future: A Creative Collaboration in Structural Plastics that was Ahead of its Time

VIRTUAL APRIL 15, 2021 5PM–6PM
Building Stone “Virtual” Walking Tour - Staten Island, NY

VIRTUAL APRIL 29, 2021 5:30PM–7PM
Restoring a Boston Treasure: Comprehensive Restoration of the Robert Gould Shaw & Massachusetts 54th Regiment Memorial

VIRTUAL MAY 20, 2021 12PM–1PM
A Tale of Two Domes: The Restoration of Domes at the Cathedral of St. John the Divine and Gould Memorial Library in New York City

VIRTUAL JUNE 17, 2021 5PM–6PM
Going Deep: Geothermal System Integration at St. Patrick’s Cathedral in NYC

VIRTUAL AUGUST 27, 2021 6:30PM–10PM
Brooklyn Cyclones Baseball LIVE!

VIRTUAL JUNE 17, 2021 12PM–6PM
Traditional Tradesperson Spotlight: Ben Brandt: Wood Windows and Odd Doors

VIRTUAL SEPTEMBER 23, 2021 12PM–1PM
Artfully Restored: Waldorf Astoria Behind the Scenes Tour

VIRTUAL OCTOBER 1-2, 2021
Vermont Quarry Tour- Slate, Marble, & Granite

VIRTUAL OCTOBER 28, 2020 5PM–6PM
Artfully Restored: Waldorf Astoria Behind the Scenes Tour

VIRTUAL DECEMBER 7, 2021 6PM—9PM
APTNE Winter Holiday Party LIVE!

VIRTUAL DECEMBER 13, 2021 5PM—7PM
APTNE Holiday Virtual Networking Event

VIRTUAL FEBRUARY 26, 2021 9AM—7:30PM
2021 Annual Meeting & Symposium

VIRTUAL MARCH 18, 2021 5PM–6PM
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