Defining Quality:

From Design through Construction

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Fig. 1.1
A sidewalk abruptly ends.
A mural near Les Compagnons Du Devoir. Rue de l'Hotel de ville.

1: Introduction

How does one read this photo? At the scale of the city, it is a sidewalk ending abruptly. At the scale of the building, the wall is an afterthought, not even worthy of a uniform coat of stucco render. At the scale of decoration, an artist – possibly Levalet – noticed the neglect of city planning as well as lack of maintenance and decided to install the image of a person, mid-gait, walking to the viewer. Finally, at the scale of the microscopic, the water infiltration into the cracked stucco causing biological growth, and the clogged rain leader causing backed-up water to seep into poorly fixed sidewalk joints.

Thesis

Historic Preservation as a discipline is a complicated endeavor – whether it is being practiced in the United States, France, or anywhere in the world – because the theoretical justifications for any physical intervention comes loaded with years, if not centuries, of philosophical discourse. This discourse is a constant undercurrent in the contemporary practice of using the term "Quality" as a short cut for lengthy philosophical debates. This thesis will attempt to lay out how the concepts of "Quality" and "Quality Control" are used, maintained, and justified throughout the practice of Historic Preservation in both the United States and France.

What is quality and how do we define quality as a culture?

The word "quality" is a difficult word to define. It defies subjectivity because it is most often used definitively, without room for discourse. Yet, it is probably the most subjective word in the dictionary. In architecture, who is responsible for setting the standards of quality? Is it the Architect? Owner? Crafts-worker? Magazine Critic? In the field of Historic Preservation, the discourse is even more charged because there is an underlying morality, or an underlying nationalist undercurrent, or an underlying drive to justify one's actions in the face of one's ancestors. It is not an easy task. However, there are aspects of quality that seem to transcend national borders, cultural differences, and even antagonistic religious justifications. Whether it is North America, Europe, or Asia, there are universals that seem to take hold. A stone mason will recognize a block of marble with a tight grain that can be carved, an architect will recognize the proportions of a sacred space, and a tourist will immediately recognize the beauty of a well-designed town square. Now the question is how did these similarities evolve over space and time? Could these be the parameters that define the word "quality"? That question is beyond the scope of this report. However, there were clues that I found during my travels in France. I noticed practices that are similar, assumptions that are familiar, processes that were exactly the same! These were the "ah-ha" moments. Times when the commonalities were so clear that the cultures could be one and the same, even for a brief moment.

Quality lies at the intersection between Theory and Practice

These moments of revelation are where theory and practice intersect. Whether it was to restore a decorative paint scheme on a column capital or restore a timber frame roof, there is always a theory – a philosophical reason – behind what is trying to be accomplished. Ask any Historic Preservation architect the reason for his/her decisions and he/she will respond with a justification based on a theory. These theories might be different for each architect, for each owner, in fact, for each generation. An architectural style worth saving for one generation, might be considered only worthy of the trash heap for the next. What is near and dear to an owner, might not be historically worth saving, but is restored anyway simply because of an emotional attachment. What is considered a proper reconstruction of an architectural element for one architect, might be completely inappropriate in the mind of another.

So, given the wide range of justifications that can exist on any one project, how can we define "quality"? Even if there is no agreement regarding the justification for any single design decision, can there be agreement whether or not it was done *well, in terms of quality?* For example, if a frame for a mirror is water-gilded at the behest of an owner even though there was never any evidence of the frame ever being water-gilded, can there be an agreement that the water-gilding was done properly and to a level of quality that is in line with the best practices of the gilders profession? Or does the historical inaccuracy of gilding something that never was, completely negate any level of craft?

The word, "quality" is elusive because it is used as a shortcut or a nickname, of a larger theoretical argument, and that argument is based on a set of assumptions by the persons who are involved in any restoration project.[1] In an ideal world, these assumptions would be the same for all the persons involved with a project. But it is well accepted, both in France and the United States, that there is never consensus as to what constitutes a well-conceived, well-executed preservation project. So, there are protocols that are set in place to help guide the stakeholders to a successful outcome. This report will describe these protocols and processes in both France and the United States. Some of them are similar; some are different. Ultimately, however, the goal is the same … to preserve the buildings of the past and make them relevant for today and the future.

[1] To make an analogy to the French language, the word "quality" is the equivalent of using the word "le" as a substitute for the direct object of a sentence in all subsequent sentences. Since this grammatical formation does not exist in English, English-speaking persons must reiterate, and therefore reinforce, the direct object of each and every sentence. The French, however, are allowed this shortcut in their phrasing. In both languages, the word "quality" is like the word "le" in that it is a stand-in for something that was said only once … and if one was not present at the beginning of the conversation, it will take some time to decipher what the justification was for any particular restoration approach.

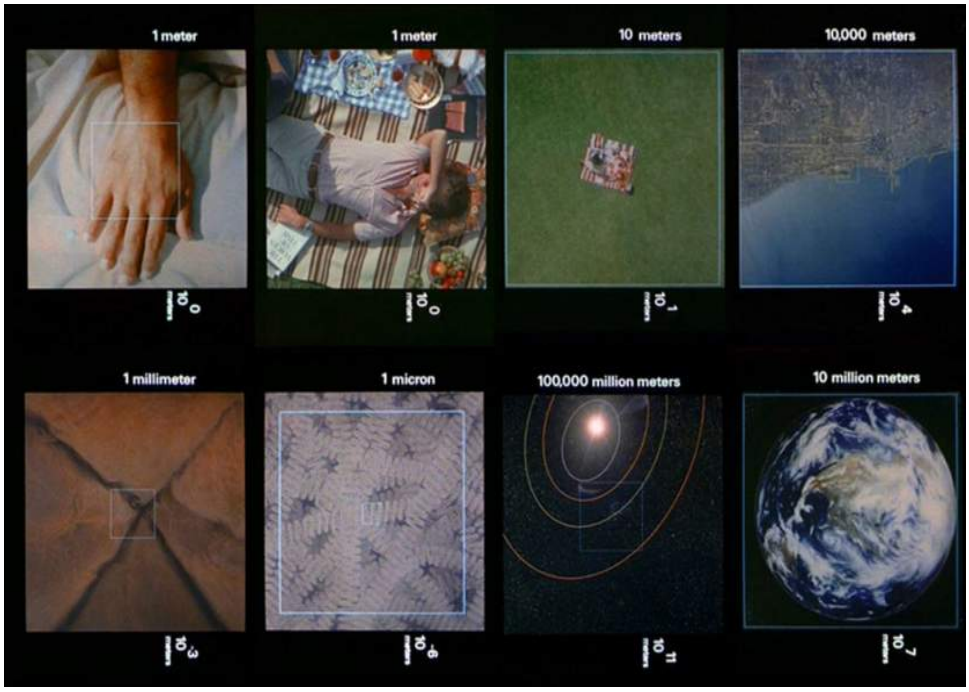

Fig. 1.2
Images from the film, "Powers of Ten"
Charles and Ray Eames. 1977
http://archio.co.uk/blog/2016/11/08/powers-ten/, accessed November 16, 2018.

Quality is a constant dialogue between four different scales of a project

The protocols in the preservation discipline provide a framework in which discourse and interpretation can thrive. Whether it is the federal government Section 106 process in the United States or the state-driven process in France, the protocols create a space and a time where the *qualities* of a project can be reviewed, debated, and agreed upon. From a viewpoint outside the discipline, the presence of such a framework of standards, committees, preservation officers, councils, review boards, advocacy non-profit organizations, grassroot opposition groups, etc., might seem like a dizzying bureaucracy. From inside the discipline, the bureaucracy is accepted as a necessary system, but it is also accepted that debates will occur; different theories will be presented; interpretations will be made; and that an agreement will ultimately prevail.

It is these discussions where the expectations of the project are defined and, what the level of quality the project will ultimately be. But the quality of a project is a compilation of many levels. An analogy would be the Charles and Ray Eames film "Powers of Ten" which depicts a picnic in Chicago from up above and the camera slowly pans out at the rate of one power of ten every ten seconds. When each power of ten is reached, it is clearly demarcated on the screen. (See Fig. 1.2.) Visually, there is a cognitive distinction between each power, with the acknowledgment that the different scales are the realms of different disciplines. The scale of the solar system is the realm of the astronomy, the scale of the atom is the realm of

nuclear physics. But the continuity of the scales and the interdependency of the scales is immediately obvious. They can be dissected as individual scales, but they are interdependent and cannot exist one without the other.

Likewise, the quality of a project depends on factors beyond its walls, at the scale of the city. It depends on the scale of the building, on the spaces and their functions. It depends on the scale of the ornamentation and decoration; and it depends on the scale of the microscopic. At each one of these scales, there is a process that allows the quality of the project to be reviewed, discussed, and approved. Each chapter of this report will lay out these processes and how they are part of one continuum.

In France, at each of these scales, there is a specific profession that is the arbiter of quality. While these processes are implemented through a somewhat rigid French state system, there is constant dialogue between all these professions. At the level of the city, there is a state-designated[2] official known as the *Architecte des bâtiments de France (ABF)* and a regional official known as the *Conservateur régional des monuments historiques (CRMH)* who are responsible for any given project from start to finish. At the level of the building, it is the architect in charge of the restoration, also known as the *architect en chef des monuments historiques (ACMH)* or the *architecte du patriomoine*. At the level of ornamentation and decoration, *conservateur-restaurateurs*[3] and the crafts-workers become the arbiters of quality since they know the limitations of the materials with which they work, and finally, at the scale of the microscopic, the conservation scientists and building scientists are the ultimate specialists. While there is not an exact equivalent structure in the United States, there are similarities and common practices that give us the basis for a continuing and fruitful dialogue.

[2] The differences between the French and United States government systems can be cause for confusion as the direct translations are not a one-for-one comparison. For example, the states in the United States are entities like Pennsylvania and California. In France, the word "état" which directly translates to "state" refers to the centralized government that is based in Paris, but has a hand in the decision-making process at much smaller scales of government, like the "régions," which would be comparable to our states here in the U.S.

[3] The word "restaurateur" has many meanings in French and English. The most common definition, which is the same in both languages, is used to describe a person who owns and/or operates an establishment that serves food and drinks. In France, a "conservateur-restaurateur" is someone who practices the discipline of stabilizing, preserving, and conserving historic materials (or heritage materials). There is a subset profession of "conservateur-restaurateurs" who specialize in replicating historic treatments (like stencil patterns) and they are known as "restaurateurs du patrimoine". Finally, in the United States, the term "conservator" can be used to describe a wide-range of persons, from craftsmen or artists who specialize in accurate replications and non-invasive treatments to university-trained professionals who supplement their treatments with scientific and archival research.

Fig. 2.1
Eiffel Tower
Constance Lai , December 02, 2017.

2: Quality as a Construct of Theory

This image is quite possibly the best axial view of the Eiffel Tower. It is free for the taking at the Trocadero, if one takes the effort to enter the building and weave through its many corridors and staircases to get to this space. Was this planned? To give a choice view, on axis with the Eiffel Tower, to a small café table and two empty chairs of modest design? Does this arrangement make sense in any of the spatial hierarchies that we are taught in school and then try to implement in practice? From an idealistic standpoint, does this arrangement drive you batty? The quality of the space is not bad, it is pleasant, not too hot, not too cold. The light is dim, and not a harsh fluorescent. But at the scale of the city, does it make sense? If one forgets all the reasons why this would not pass muster in an urban design class, can one simply sit down and enjoy the view? From the viewpoint of a tired tourist, the quality of this space is excellent and from the lens of my phone camera, it's perfect.

Thesis

Quality is the word that one uses to set something apart from another when evaluating two things against each other. In addition, the item that is *better* quality, will always be the most desirable, whether it is a piece of chocolate or a house, to the person who is using the word as the qualifier. But, what happens when the persons discussing a particular object cannot agree on which type of chocolate is superior – milk or dark? Is the quality of life better in an apartment in the city or a cottage in the country? When the simple use of the word "quality" does not have the same meaning to different parties, then further discussion ensues. *Why* is dark chocolate better than milk chocolate and vice versa? Why is the country house better than a city apartment? A slew of adjectives, justifications, and examples will then begin to fly between the opposing parties. Where does the discussion end? When one has convinced the other? What if there is a stalemate? What if the points are acknowledged as valid and legitimate, yet there is still no consensus as to which chocolate or which way of living is superior?

In preservation, the theories that are used to justify any urban impact, architectural design move, any craft repair, or conservation-level repair, stem from a few seminal texts. These texts guide the decisions that are made and they are used to justify the moves that we make as preservationists. Eugene Viollet-le-Duc, John Ruskin, William Morris, and Alois Riegl are the texts that are read and interpreted the most. At many levels, these texts give us a theoretical basis for why we do what we do. But, we never seem to question these texts. We will hearken back to the texts of Viollet-le-Duc when we want to justify the reinstating of an architectural space or element to a specific period of time. We will hearken back to the texts of John Ruskin when we want to preserve an element in its deteriorated state. We will hearken back to the texts of William

Morris when we want to create something new that feels old but is completely fabricated from contemporary materials with contemporary tools. Finally, we will hearken back to Alois Riegl when we want to create something completely new directly adjacent to something historic. We pick the theory to justify our very own, very contemporary, desires. The history of how these theories have influenced international charters, national standards, and general public sentiment is worthy of a book unto itself. For the purpose of this report in trying to define how these theories have a modern-day impact on how the word "quality" is defined and how a meaningful conversation might occur about quality between practitioners in America and France, it is important to parse out the various definitions of the most important words in our discipline, many which do not have the same meaning in English and France. From the subtle differences in meaning, we can start to understand how Historic Preservation (or rather, *conservation* in French) is similar as well as different in both countries. It is in the interstitial spaces between the definition of a word in French and its definition in the United States that we can start to understand where the definition of *quality* lies.

As a starting point, I will define the four terms that are most used in Historic Preservation in the United States: Restoration, Reconstruction, Preservation, and Rehabilitation. These four terms correspond to a document issued by the federal Department of Interior called the Secretary of Interior's Standards for the Treatment of Historic Properties, which is the most referenced document in Historic Preservation projects in the United States. In addition, I've slipped in the definition of the word "conservation," which is used as well, but in completely different contexts in the United States and France (as well as Europe).

2.1: The Philosophy of Historic Preservation

In the United States, the ideas of Viollet-le-Duc and John Ruskin are often pitted against each other, their theories representing the two extremes of Historic Preservation. This debate is engrained and accepted by the Historic Preservation community and the differences are even acknowledged in the document that guides all Historic Preservation work in the country, the United States' Secretary of the Interior's Standards for the Treatment of Historic Properties. A simplistic, quick reading of the Standards would see Viollet-le-Duc's influence in the two treatments *restoration* and *reconstruction,* Ruskin's influence in the treatment of *preservation,* and Riegl's influence on the treatment *rehabilitation.*

But for the purposes of this endeavor, to find a way to define "quality" as it is used in contemporary practice both in France and the United States, it is important to clarify the definitions of the words that we use to qualify our interventions since these words have different meanings in both countries. The use of the word "restoration" and "restauration" can mean both the same and different things depending on the context. The use of "preservation" and "préservation" are different. The meaning of the word "rehabilitation" is different in both languages, but the word "reconstruction" is the same. Finally, the most difficult word is "conservation" and its derivative "conservation-restauration" which is the cause for much confusion. Before a discussion about the quality of a work can even begin, a clarification of terms is required.

Fig. 2.2
Mt. Vernon
http://www.mountvernon.org/plan-your-visit/what-to-see/, accessed on April 4, 2018.

Fig. 2.3
Vaux-le-Vicomte
Photo by Constance Lai. December 4, 2017.

2.2: Restoration

The term *restoration* is defined by the United States' Secretary of Interior's Standards[4] for the Treatment of Historic Properties, as "the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period."[5] According to the National Park Service, a department within the Department of Interior, which is responsible for the Standards:

> *When the property's design, architectural, or historical significance during a particular period of time outweighs the potential loss of extant materials, features, spaces, and finishes that characterize other historical periods; when there is substantial physical and documentary evidence for the work; and when contemporary alterations and additions are not planned, Restoration may be considered as a treatment. Prior to undertaking work, a particular period of time, i.e., the restoration period, should be selected and justified, and a documentation plan for Restoration developed.*[6]

However, the standard as a whole is tempered by Standard # 7 which states: "Replacement of missing features from the restoration period will be substantiated by documentary and physical evidence. A false sense of history will not be created by adding conjectural features, features from other properties, or by combining features that never existed together historically."[7]

In the United States, the term *restoration* is used to describe a project at the building scale, the most famous example of a restoration treatment is Mount Vernon in Virginia, the home of George Washington, which to this day is still being restored to accurately portray the time when Washington inhabited the house. In France, the definition of the term "restauration" has evolved over time. Viollet-le-Duc use of the word aligns more with the American term "reconstruction" in that he believed that architectural ruins should be re-constructed to their former state. But he took this thought one step further and would ignore archaeological evidence of a structure if he thought he could do "one better" by creating an even more aesthetically "accurate" version of the architectural element. But now in France – and the United States as well – taking

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[4] The Department of the Interior is the federal department responsible for managing the United States' natural resources and cultural heritage. The "Department of the Interior" is in direct contrast to the "Department of State" which is responsible for the United States' *exterior* efforts, namely foreign policy. The word "interior" can be confusing because it also refers the interior of buildings, in contrast to the exterior of buildings. Likewise, the word "state" can be confusing because in this sense, it is being used to refer to the nation, The United States, and *not* the individual states that make up the United States. In this context, the word "state" is being used more like the French definition of "état" to refer to the entire nation.

[5] "Four Approaches to the Treatment of Historic Properties > Restoration as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-restoration.htm, accessed April 1, 2018.

[6] Ibid., accessed April 3, 2018.

[7] Ibid., accessed April 1, 2018.

liberty to create something for which there is no historical or archaeological evidence – is not considered a proper preservation protocol. So, in France as well, the term *restauration* when used at the scale of the building is in line with the definition used in the United States. For example, Vaux-le-Vicomte, has gone through many restorations starting in the early 20th century, with the primary objective to be as to be as accurate as possible to the original design intent (Figure 2.3).

There is another subtle meaning of the word *restauration* in French that is not used as widely in the English usage in the United States. *Restauration* is also used at the scale of missing significant architectural elements – like pieces of a wall, mural, or sculpture – and describes the act of visually re-instating or filling in a piece(s) or area that has been lost over time. In the United States, these types of interventions are described using different verbs: partial walls (like wood lath and plaster) are "re-constructed", missing parts of murals are "re-instated", and missing pieces of a sculpture are "replicated". In the United States, these are considered "conservation treatments", the equivalent French discipline being "conservation-restauration".[8]

[8] Note that a third interpretation of the term "restoration" is defined as "Returning a place to a known earlier state by removing accretions or by reassembling existing elements without the introduction of new material." This definition was identified in the Australian Burra Charter. – "Burra Charter," https://en.wikipedia.org/wiki/Burra_Charter#Definitions, accessed April 1, 2018.

Fig. 2.4
Postcard of Carcassonne prior to Viollet-le-Duc's restoration
https://auction.catawiki.com/kavels/15765245-france-d-partement-11-l-aude-lot-of-50-old-postcards-la-cit-de-carcassonne, accessed on April 4, 2018.

Fig. 2.5
Fort Ticonderoga. Restored from a ruined state in the early 20th century.
https://www.fortticonderoga.org/, accessed on March 26, 2018.

2.3: Reconstruction

The term *reconstruction* is the easiest term to understand on both sides of the ocean since it is the only word that does not have different meanings in both France and United States. According to the Secretary of Interior's Standards, the term *reconstruction* is defined as "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."[9] Per the National Park Service:

> *When a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction, Reconstruction may be considered as a treatment.*[10]

However, the standard as a whole is tempered like the *Restoration* standard by Standard # 7, which reads exactly the same (as referenced above), ensuring that that conjectural elements will not be tolerated.

In French, reconstruction is the same exact word, with the same meaning, and with the same nationalistic justification overtones. In fact, it is accepted that Viollet-le-Duc is responsible for starting the theory and practice of reconstructing (like medieval structures like Carcassonne and Pierrefonds) to advance a nationalistic agenda. (Viollet-le-Duc used the word "restauration" to describe his interventions, but we will use the word "reconstruction" so as to not create confusion.) In contemporary practice, the overall sentiment in both countries is that reconstruction as a treatment is not preferred at all. There are many reasons for this, including the general acceptance and implementation of the 1964 Venice Charter for the Conservation and Restoration of Monuments and Sites, which stated that "All reconstruction work should however be ruled out 'a priori'".[11]

Interestingly, the revival of *reconstruction* as an accepted treatment was codified in two documents: the 1979 *Burra Charter* and the 1994 *Nara Document on Authenticity*. The *Nara Document on Authenticity* succeeded in redefining the word "authenticity" to take on multiple meanings, but especially the definition as accepted by the culture in which it is being used, and not the definition heretofore used by those prescribing to the Venice Charter, namely members of ICOMOS and the Western tradition. The most famous example being

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[9] "Four Approaches to the Treatment of Historic Properties > Reconstruction as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-reconstruction.htm, accessed April 1, 2018.
[10] Ibid., accessed April 3, 2018.
[11] "Excavations: Article 15." INTERNATIONAL CHARTER FOR THE CONSERVATION AND RESTORATION OF MONUMENTS AND SITES (THE VENICE CHARTER 1964). International Council on Monuments and Sites. www.icomos.org/charters/Engl.%20Venice%20Charter.doc, accessed April 1, 2018.

the Japanese government's periodic dismantling, rebuilding, repairing, and reassembling of wood religious temples.[12] This change marked the beginning of the shift away from the Venice Charter, and opened up the path to the acceptance of *reconstruction* as a treatment with the recent destruction of historical sites due to terrorism.

In the United States, the use of *reconstruction* has also waxed and waned. When the National Historic Preservation Act was passed by Congress in 1966, there were no specific treatments identified. By 1973, there were three treatments: stabilization, restoration, and reconstruction. By 1976, there were seven treatments: acquisition, protection, stabilization, preservation, restoration, rehabilitation and reconstruction. Finally, in 1992, the Secretary of Interior's Standards were issued with only four treatments to choose from: preservation, rehabilitation, restoration and reconstruction.[13] While the most well-known reconstruction project is the Governor's Palace in Colonial Williamsburg in Virginia, the practice continues even today, e.g. the Fort Union Trading Post National Historic Site in North Dakota, an 1828 structure that was reconstructed in 1980s and 1990s.

An early example of an American patriotic-inspired reconstruction effort (in a similar vein to Viollet-le-Duc's Carcassonne) is Fort Ticonderoga (Fig. 2.5) – previously named Fort Carillon – which was an outpost of New France (Canada) and was styled after Marquis de Vauban fortresses. It figured prominently in the Revolutionary War and was therefore considered worthy of preservation by a wealthy New York merchant, William Ferris Pell, who then proceeded to buy the ruined fort and surrounding land in 1820 to protect it from development. The reconstruction of the fortress walls did not occur until 1909 when Pell's grandson, Stephen H.P. Pell and his wife, Sarah G.T. Pell, decided that the best manner to honor the site as a patriotic tourist destination was to attempt to re-create the fort in its original form.[14]

Although the reconstruction of structures (in North America, Europe, and Asia as well) through a contemporary lens can be criticized for being at best nostalgic and at worst nationalistic, the act of reconstructing buildings using original materials and techniques is a way to keep the craft trades alive. If a culture's desire to understand its past from an archaeological and anthropological viewpoint ultimately leads to the desire to reconstruct structures (to test and prove the research conducted on historic building tools, materials, and processes), it is up to that culture to weigh and balance the competing arguments beforehand.

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[12] "Nara Document on Authenticity," https://en.wikipedia.org/wiki/Nara_Document_on_Authenticity#Values_and_Authenticity, accessed April 1, 2018.
[13] "A History of The Secretary of the Interior's Standards," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/history-of-standards.htm, accessed on April 1, 2018.
[14] https://www.fortticonderoga.org/, accessed on March 26, 2018.

Fig. 2.6
Drayton Hall
By Goingstuckey - Own work, CC BY-SA 3.0
https://commons.wikimedia.org/w/index.php?curid=5696192, accessed on April 9, 2018.

2.4: Preservation

Per the United States' Secretary of Interior's Standards for the Treatment of Historic Properties, a *preservation treatment* is defined as "the act or process of applying measures necessary to sustain the existing form, integrity, and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction."[15] Per the National Park Service:

> *When the property's distinctive materials, features, and spaces are essentially intact and thus convey the historic significance without extensive repair or replacement; when depiction at a particular period of time is not appropriate; and when a continuing or new use does not require additions or extensive alterations, Preservation may be considered as a treatment.*[16]

In French, this definition might sound more like the definition of the term "conservation-restauration" and this assumption would be true. Here begins the very confusing definition of the word "preservation" in the context of the United States.

In the United States, the word "preservation" has two main definitions. The first one is as just described, and is akin to the discipline of "conservation" as it is practiced in the United States and the discipline of "conservation-restauration" as it is practiced in France. An example of a preservation project in America is Drayton Hall in North Carolina (Fig. 2.6). From the Drayton Hall website:

> *In order to preserve the seven generations of history within its walls, a radical decision was made to stabilize the house rather than restore it to a particular period, and to preserve it as it was acquired from the family in the 1970s. Historic Preservation is a broad discipline, but at its heart is the idea that old buildings enrich our lives and deserve our good stewardship.*[17]

The second definition is the use of the term "preservation" to describe the all-encompassing movement to save historic architecture from the ravages of time, nature, and destructive tendencies of man himself. Preservation in its broadest sense is concerned with identification of properties; creation of policy; implementation of regulations; and advocacy, both from government departments as well as grassroot efforts. It is also associated with the entirety of the cultural and built environment, and now encompasses

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[15] "Four Approaches to the Treatment of Historic Properties > Preservation as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm, accessed April 1, 2018.
[16] Ibid., accessed April 3, 2018.
[17] Drayton Hall, Preservation, http://www.draytonhall.org/the-estate/preservation/, accessed April 9, 2018.

landscapes as well. When used in this context, the term is most often preceded with the adjective "historic", therefore the discipline of "Historic Preservation". In France and the rest of the world, the equivalent discipline is known as "Conservation."

In the United States, the use of the term "preservation" instead of "conservation" is not an arbitrary decision. In the early 20th century, the debate between conservation and preservation within the context of American forests saw the formation of the U.S. Forestry Service in the U.S. Department of Agriculture and the National Park Service in the Department of the Interior. The U.S. Forestry managed the National Forests, that allowed industrial uses like mining and logging, while the National Park Service managed the National Parks, which were set aside as recreational parks for the enjoyment of citizens. The US Forestry approach is called "conservation" or "managed conservation"[18] and the National Park Service approach is called "preservation".[19] Later in the 20th century, Congress gave the National Park Service the responsibility to steward the *architectural* Historic Preservation movement for the federal government. So, it is understandable why the National Park Service did not want to and still does not acknowledge the word "conservation" in The Secretary of the Interior's Standards for the Treatment of Historic Properties. Within the *preservation* standard, the one and only mention of the word "conservation" in its *architectural conservation* connotation (and not its *forest conservation* connotation) is in Standard #3 that states: "Each property will be recognized as a physical record of its time, place and use. Work needed to stabilize, consolidate and *conserve* [emphasis added] existing historic materials and features will be physically and visually compatible, identifiable upon close inspection and properly documented for future research."[20]

However, this de-emphasis of the word "conservation" in the texts of the National Park Service has been the cause for much confusion in the preservation movement in the United States. The next chapter will describe the "conservation" movement in the United States and its impact on the discipline of Historic Preservation.

[18] The term "managed conservation" was coined by Gifford Pinchot, who studied forestry in France. Richard Morris Hunt built Grey Towers, the Pinchot Residence, in Milford, Pennsylvania.
[19] Robert Hudson Westover, U.S. Forest Service in Forestry, "Conservation vs. Preservation," https://www.usda.gov/media/blog/2016/03/22/conservation-versus-preservation, accessed April 2, 2018.
[20] "Four Approaches to the Treatment of Historic Properties > Preservation as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-preservation.htm, accessed April 2, 2018.

Fig. 2.7
Conservation (Conservation-Restauration) work on an interior wall
Petit Château, Château de Chantilly
Constance Lai. November 21, 2017.

2.5: Conservation

While *conservation* is not a recognized treatment by the Secretary of the Interior's Standards, the influence of architectural conservation on the discipline of Historic Preservation cannot be understated. After the first American graduate degree programs in art conservation appeared in the 1960s and 1970s, the architectural conservation programs soon followed. In terms of how architectural conservators approach the prevention, stabilization, and re-instating of architectural materials and features, it is more in line with the French discipline of "conservation-restauration", than with the discipline of architecture or Historic Preservation architecture (also known as preservation architecture and historic architecture).

In the United States, architectural conservators specialize in materials such as decorative paint, coatings, lacquers, wallpaper, wood flooring, wood paneling, light fixtures, architectural sculpture, doors, windows, railings, plaster, brick, stone, and concrete. If an architectural conservator is contracted with the architect, s/he will advise and write the specifications ("Piéce Technique") and sometimes even draw the construction drawings ("Piéce Graphique") for the conservation treatment scope. However, in the United States, only licensed architects may "stamp" drawings. Therefore, all work completed by the architectural conservator needs to be checked and verified by the architect. If an architectural conservator is contracted with the general contractor, s/he is hired to execute the scope described in the construction documents (Piéce Technique, Piéce Graphique, and Piéce Administratif).

The unique specialty of architectural conservators has allowed them to fill voids in the preservation design-construction industry in America. On one hand, American architects are trained in school to be generalists, not specialists, and therefore, are not taught about materials to the level of detail that architectural conservators are taught. On the other hand, the construction trades are not taught conservation theory and techniques that are required to execute a conservation treatment. Therefore, architectural conservators exist on "both sides of the fence." For example, treatments (like laser cleaning) that are performed by masons in France, are performed by conservators (or under the supervision of a conservator) in the United States.[21]

While there over 60 institutions of higher education in the United States that offer some sort of Historic Preservation certificate or degree, less than a third of these institutions offer courses in architectural conservation, and only five that are recognized by the American Institute of Conservation for Historic and Artistic Works and therefore could be considered somewhat comparable to the equivalent education to the French discipline "conservateur-restaurateur".[22] After graduating from these schools, architectural

[21] The use of lasers to clean gypsum crusts is only beginning in the United States and will be discussed later in this report.
[22] Search for "Architectural Conservation" under "Academic Programs," National Council for Preservation Education, http://www.ncpe.us/program-list/, accessed April 2, 2018.

conservators find employment on the client-side (working for an owner or construction manager), on the design-side (working for a conservation or architecture firm), or on the construction-side (working for a general contractor or subcontractor). Due to their common education and training, there is a new phenomenon in the design-construction industry of architectural conservators disrupting the organizational hierarchy on projects, which can cause friction between the design architect, preservation architect, owner, general contractor, and trade subcontractors. This fact is important to keep in mind when discussing *quality*, which once was only the purview of the architect, but now has shifted to the architectural conservators when dealing with conservation matters.

The architectural conservators in the United States are part of a professional organization called "The American Institute for Conservation of Historic and Artistic Works" (AIC) which encompasses conservators from all disciplines, including architecture, books and paper, electronic media, objects, paintings, photographic materials, textiles, and wooden artifacts. The organization also has specialty topics that are cross-disciplinary and include archaeological conservation, collections care, health and safety, and sustainability. Since the predominance of the professionals in the organization are tied to museums and cultural institutions, the architectural conservators are somewhat of an anomaly in the group. But they are over 400 persons strong and will more than likely grow over time.

Unlike Historic Preservation architects, architectural conservators are not beholden to the Secretary of Interior's Standards and would more than likely disagree with some of the treatments, like *reconstruction* and *rehabilitation* (which is the subject of the next section). In fact, architectural conservators are more beholden to the "Code of Ethics and Guidelines for Practice" set forth by the AIC, in which the Preamble states:

> *The primary goal of conservation professionals, individuals with extensive training and special expertise, is the preservation of cultural property. Cultural property consists of individual objects, structures, or aggregate collections. It is material which has significance that may be artistic, historical, scientific, religious, or social, and it is an invaluable and irreplaceable legacy that must be preserved for future generations.*[23]

John Ruskin's ideas hold particular sway over the proponents of architectural conservation. They believe that the materials and the configuration of those materials gives the cultural object or property a life force that needs to be maintained. The quasi-spiritual tones of this rhetoric do not always sit well with clients and

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"Graduate Programs, Careers in Conservation," American Institute for Conservation of Historic and Artistic Works, http://www.conservation-us.org/jobs/become-a-conservator/graduate#.WsLEX4jwbIU, accessed April 2, 2018.

[23] "Code of Ethics and Guidelines for Practice," The American Institute for Conservation of Historic and Artistic Works, http://www.conservation-us.org/our-organizations/association-(aic)/governance/code-of-ethics-and-guidelines-for-practice#.WsLYdojwbIU, accessed April 2, 2018.

can be the source of friction when trying to determine the "quality" of a conservation treatment. Finally, *restoration* in the sense of Viollet-le-Duc is heavily dis-counted as well as the original intent of the architect (whether it can be substantiated through archival documentation or not). Therefore, conservation approaches are sometimes in direct conflict with a client and/or preservation architect who might view the whole point of a project to be to make a building or a space look new again. But then, at the level of decoration, conservators do accept a certain amount of restoration (*restauration*). For example, on a French construction site at the Chateau de Chantilly (Figure 2.7), there was so much historic fabric missing from a decorative wall motif, that many of the ornamental pieces needed to be replicated. This work was being executed by a *conservateur-restaurateur* herself. In sum, when there are philosophical differences between the involved parties, the level of quality will always come into question.

Fig. 2.8
The Old Post Office in Washington, DC. Now the Trump International Hotel
By Photograph by Mike Peel (www.mikepeel.net)., CC BY-SA 4.0,
https://commons.wikimedia.org/w/index.php?curid=35888229, ccessed on April 9, 2018.

2.6: Rehabilitation

Per the United States' Secretary of Interior's Standards for the Treatment of Historic Properties, a *rehabilitation treatment* is defined "as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."[24] In the United States, this treatment is the most used treatment for Historic Preservation projects because it gives the owner the most flexibility, allowing alterations and additions within the structure. Per the National Park Service:

> *When repair and replacement of deteriorated features are necessary; when alterations or additions to the property are planned for a new or continued use; and when its depiction at a particular period of time is not appropriate, Rehabilitation may be considered as a treatment.*[25]

The history of this standard is of particular interest because it was the formation of this standard in 1976 as the guage by which to judge rehabilitation projects for acceptance into the Federal Historic Preservation Tax Incentives program that spurred on revitalization of under-utilized neighborhoods in city centers. The tax incentives allowed up to 20% of the construction costs as a tax credit to developers who were willing to buy and renovate a historic building for modern use(s). The most recent high-profile tax-credit project was the Old Post Office in Washington, DC, which was rehabilitated by the current President Trump prior to entering office.

In 1977, the Secretary of the Interior's Standards for Rehabilitation were the first standards to be published as a federal regulation in the Code of Federal Regulations (36 CFR 67). It was not until 1995 that The Secretary of the Interior's Standards for the Treatment of Historic Properties (which included the four treatments *preservation, reconstruction, restoration,* and *rehabilitation*) was codified in the Code of Federal Regulations (36 CFR 68) and used as a regulatory measure for the National Park Services' Grants–in–Aid projects, which allowed for the transfer of federal funds to individual states' Historic Preservation activities. It is of note that the guidance that these standards lay out has been widely adopted at the state and local government levels.[26]

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[24] "Four Approaches to the Treatment of Historic Properties > Rehabilitation as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-rehabilitation.htm, accessed April 3, 2018.
[25] Ibid., accessed April 3, 2018.
[26] "A History of The Secretary of the Interior's Standards," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/history-of-standards.htm, accessed on April 3, 2018.

In France, the rehabilitation of existing structures (reconversion) is also common-place. Maybe it is due to the fact that there is so much building density in Europe that *rehabilitation* (reconversion) is just so obvious that it is not differentiated as a treatment unto itself like in the United States.

In the United States, the *rehabilitation* standard is the only one that allows for additions to the original structure. Per Rehabilitation Standard #9:

> *The new work will be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*[27]

From the very beginning of this standard, the majority of architects and preservation officers in the United States have interpreted the word "compatible" to mean that additions should be made of the same materials as the historic structure. In France, where the differentiation of the old from the new is an important concept that has been executed on countless projects, the American obsession with making additions meld into the old is philosophically problematic. In France and in Europe in general, the texts of Alois Riegl have had a much larger influence. Riegl's writings about respecting the old but also allowing for the new to thrive, have given Europeans a theoretical basis in which contemporary architects could design contemporary structures immediately adjacent to historic buildings. In the United States, only recently have American architects been allowed to insert modern designs into historic urban contexts. But there are still many cases even today of local preservation review boards rejecting proposed contemporary designs.

[27] "Four Approaches to the Treatment of Historic Properties > Rehabilitation as Treatment," U.S. Department of the Interior, National Park Service, Technical Preservation Services, https://www.nps.gov/tps/standards/four-treatments/treatment-rehabilitation.htm, accessed April 8, 2018.

2.7: Quality in Theory: Conclusion

Defining quality from a theoretical point of view has always been a moving target from the beginning of the modern Historic Preservation movement. There will be proponents of John Ruskin who will always be in direct opposition to the proponents of Viollet-le-Duc. Conservation (in the *conservateur-restaurateur* sense) will always be in direct opposition to the client who would like to reconstruct a structure. Restoration will always take a back-seat to rehabilitation in a capitalistic society where federal tax law favors adaptive-reuse projects.

Where does that leave us as a profession? To the people outside of the profession (whether they are 'regular' architects, impartial construction managers, or an owner with a set budget), the plethora of contradicting theories to justify any specific design decision can be very confusing. Many persons have cynically noted that the Secretary of Interior's Standards for the Treatment of Historic Properties is written in a manner that any design decision can be justified via theory by just quoting the standard that suits one's needs!

In a design-construction world that is heavily regulated by definable codes, regulations, quantifiable arithmetic formulae, and narrowly-defined testing parameters (like ASTM standards), Historic Preservation standards are not easily interpreted or enforced. But it is completely accepted in the Historic Preservation discipline that the definition of quality starts at the theoretical level … Quality is a *construct* of theory. But, quality is also a *construct* of practice, which is the focus of the next chapter.

Fig. 3.1
Fountaine Bartholdi, Place des Terreaux, Lyon, France
By Phinou [CC BY-SA 3.0 (https://creativecommons.org/licenses/by-sa/3.0)], from Wikimedia Commons, accessed on April 14, 2018.

Fig. 3.2
Fountaine Bartholdi, Place des Terreaux, Lyon, France
By Constance Lai. December 5, 2017.

3: Quality as a Construct of Practice

> *"How far one goes in reconstructing losses, how far one goes in disguising worn or poor condition are topics which to start a war."*[28]

In contemporary practice, the pitting of the view point of Viollet-le-Duc's (pro-reconstruction and pro-disguising) and Ruskin's (anti-reconstruction and anti-disguising) is at the crux and tension of most philosophical debates when they move from theory to practice. Who makes the final decision as to the *quality* of a restoration, the quality of a reconstruction, the quality of a rehabilitation, or the quality of a preservation project? What if the level of quality cannot be physically achieved by the crafts-persons or conservateur-restaurateurs executing the work due to lack of experience, lack of knowledge, lack of time, lack of available materials? What if the level of quality is simply not achievable giving the limitations of the material or the tools with which one is working? The theoretical basis (justification) for any decision can only be useful to our culture/our society/our descendants if there is a physical building/object/structure to show for it. Theory needs Practice to justify itself. Otherwise, it's just a whole bunch of words on a page. Likewise, Practice needs Theory; otherwise, it's just a whole bunch of stacked rocks with a roof on top.

For example, the Fountaine Bartholdi shown here. The *restauration* was recently completed by Sixte Doussau and Didier Repellin of Repellin Larpin & Associés Architectes (RL&A.) From a Historic Preservation point of view, the project consisted of cleaning and repairing the lead statuary, reinstating the original patina, and cleaning and repairing the stone fountain base. The level of corrosion removal, the amount of stone cleaning, the appearance and function of the newly repointed mortar joints, the type and color of patina, and the smoothness of the repair welds were all considerations that required the input of the various team members. The dialogue continued to the very end of the project, where discussions about the *quality* of the work were being flushed out in an on-site meeting with the various sub-contractors (*les enterprises).* Where does the role of the architecte-en-chef des monuments historiques stop and the role of the artisan or craftworker begin? Where does the expectation of quality give way to the limitations of the craft or craftworker?

This chapter will lay out some of the more recent developments in the United States and what I observed in France as to how both countries grapple with the idea of *quality* in the design and construction process. When the project moves into construction, the most important key to the success of the project (and sometimes the most difficult to obtain) is to bridge the gap between what level of *quality* is expected by the client and what is delivered by the construction team.

[28] Nicholas Stanley Price, M. Kirby Talley, Jr., and Alessandra Melucco Vaccaro, *Historical and Philosophical Issues in the Conservation of Cultural Heritage*, (Los Angeles, The Getty Conservation Institute, 1996), 5.

Fig. 3.3
Decorative Paint Exposure by a Conservateur-Restaurateur
Cathedrale Notre-Dame de Nazareth. "Restauration des Decors Peints"
Constance Lai. December 6, 2017.

3.1: Defining Quality on a Project: Architect vs. Conservator

The quote that begins this chapter is from M. Kirby Talley Jr. in his introduction to *Historic and Philosophical Issues in the Conservation of Cultural Heritage*. Interestingly, this book does not cater to Historic Preservation architects, but rather to conservators (*conservateur-restaurateurs)*. While conservators (in the United States) and *conservateur-restaurateurs* (in France) might debate the level of conservation/restauration to be executed on a wall or object amongst themselves, the conflict becomes magnified on an architectural project. In the United States, architects – whether they have any Historic Preservation education or not – will tend towards the reconstruction/re-instating/replication of architectural elements in order to re-create the original architect's *intent*.

This mentality – which is more akin to Viollet-le-Duc's philosophies – is completely engrained in the education of architects at the university level. The architectural studio and end-of-semester jury process favors the uniqueness and ingenuity of the individual student's project as a conceptual, aesthetic, and technical proposal unto itself.[29] In contemporary practice, we refer to the architect's vision – whether it is a Historic Preservation project or not – as the "design intent." Unfortunately, the "design intent" is *always* at odds with the conservator's desire to honor and value the extant material, whether it is in functional state or not. In addition, issues of life-safety and hazardous materials are always at odds with conservation tenets. Should sculptures that might fall and hurt pedestrians walking below be conserved or replaced with a replica? Should flaking lead paint of a decorative paint scheme be completely removed from the wall or stabilized in place with a protective clear coat? In the United States, these are the "battles" that architects and conservators have on a consistent basis.

To add another layer of complexity, in the United States, there is a large hole in the education system where architects – whether being educated as a "regular" architect or as a "preservation architect" – rarely take a course in conservation if it is offered at all. In short, many Historic Preservation departments in the United States emphasize theory, history, policy, and advocacy … not *conservation*. Even if the Historic Preservation school is housed within the university's school of architecture, rarely do architecture students and Historic Preservation students interact.

[29] There is no acknowledgement of the late-night critical input that one's peer may have given, the text that one read the week before in Philosophy 101, the inspiration from a photograph of a building halfway across the world, etc. The concept of the architect's "vision" is so pervasive that we, architects, have a contemporary name for this phenomenon, "star-chitecture" which cynically combines the word "star" (like "Hollywood star") and "architecture". This phenomenon, while derided in contemporary practice, will forever haunt the discipline and the discipline of architectural history because history is always written as if one sole architect made *all* of the decisions. While this is undeniably the case in many situations, there are many alternative histories that have begun to surface, like the contributions of Marion Mahony Griffin to Frank Lloyd Wright's practice and Ann Tyng's influence on Louis Kahn's work.

This schism in the education system has now created a rift between architects, conservators, and the craft trades that is currently being played out in the design and construction of Historic Preservation projects in the United States. Since the 1970s, preservation architects have started to give more and more control to conservators over the material scopes like the maintenance of historic masonry, historic metals, historic decorative paint and wallpaper, historic wood floors and walls, historic sculptures, and historic plaster to name just a few. Not only are the conservators in charge of the decision-making process regarding these scopes, they are also in charge of the *quality control* process. As consultants to the preservation architects, the conservators help to write the specifications (*Piéce Technique*) like how an engineering consultant would be hired to write the plumbing specifications.

As sub-contractors to the general contractor, conservators are hired to execute the procedures (and use the products) defined in the specifications. Sometimes the same conservator on the design side can also become the conservator on the contractor side, which can either result in schedule and cost efficiencies at its best or contractual arguments at its worst.

In addition, conservators are employed as third-party quality control experts to ensure that repairs are being executed properly by traditional crafts-workers. They do not execute the work themselves but check to see that the repairs are being done per the quality parameters set forth in the contract specifications.

In my short stay in France, I noticed a few in particular:

1. "Conservation-level" treatments that are executed by "*conservateur-restorateurs*" are limited to items that are more artistic, like decorative paint and objects. In the United States, conservators execute many more scopes, like laser-cleaning of stone, stone consolidation, masonry repointing, plaster consolidation, bronze restoration, etc. which are still executed by traditional craftsmen in France.
2. Architect-en-chefs and architects du patrimoine make many conservation-level decisions that preservation architects in the United States would not make. Decisions like which decorative scheme is the most important, what paint color would be the most historically accurate, and what material to use to replicate a missing decorative element are increasingly the purview and responsibility of the conservators on an American project.

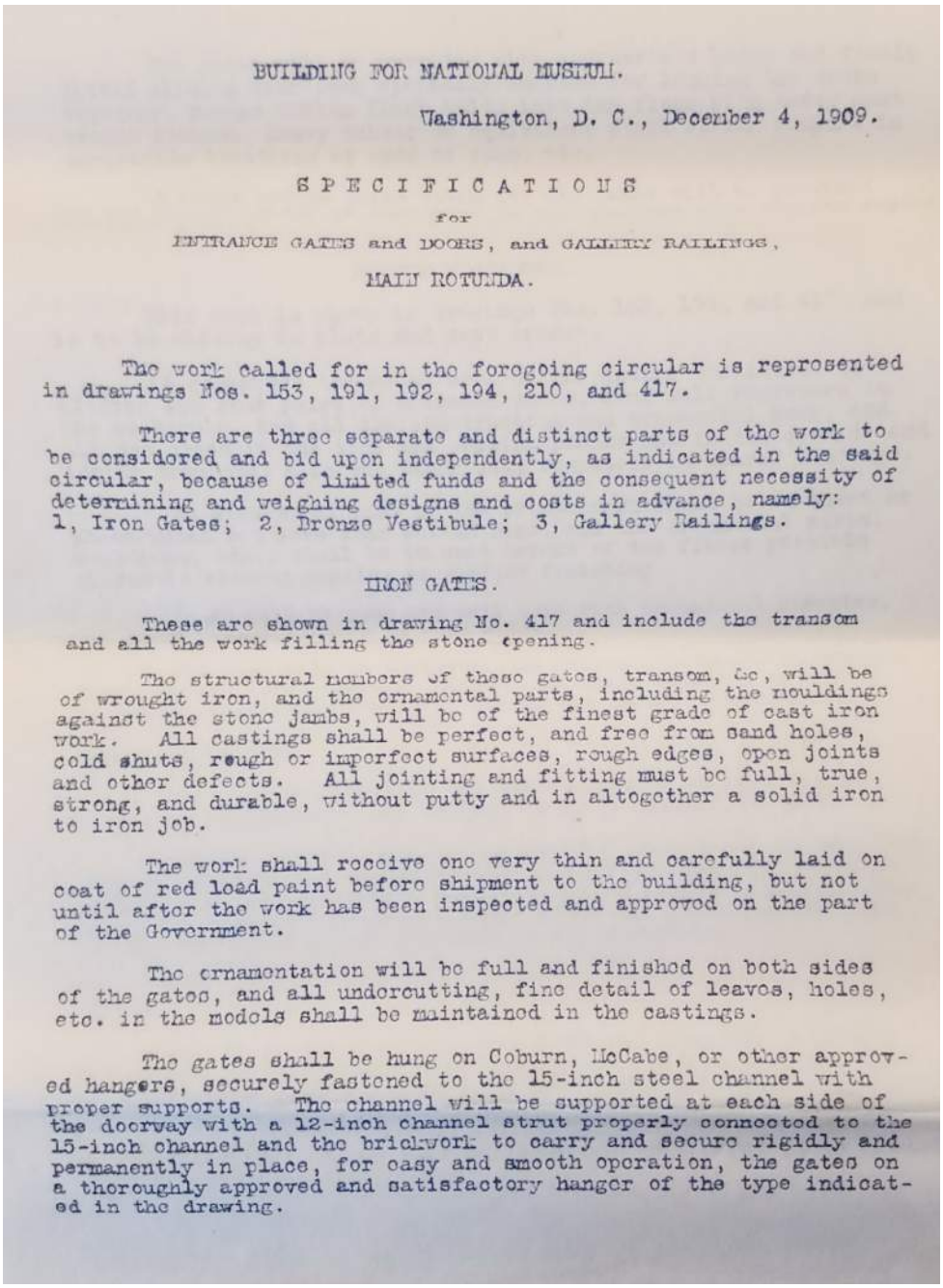
Although the final decision making process is different between the two countries, the philosophical dilemmas are the same … and therefore the "war" alluded to in the quote above is the same. But while the two opposing sides might appear as an "either/or" problem from a theoretical point of view, I would like to propose that when it comes to practice, these two opposing forces actually exist on a spectrum or continuum. There will be times when a conservation approach (*conservateur-restaurateur*) is appropriate and

times when a replication approach (Viollet-le-Duc's *restoration*) is appropriate and sometimes when the solution is a combination of both. And these decisions – to create a *quality* project – are heavily dependent on the current state of craft, the current state of conservation science, and the current state of available products, to name just a few.

For example, craftworkers are now using computer numeric control (CNC) technology to guide robotic arms to re-create decorative stone carvings; conservation science research, like the research that is being executed at the Laboratoire de recherche des monuments historiques (LRMH) is constantly influencing what are appropriate protocols and what are not (e.g. laser cleaning and consolidation); and manufacturers are always tweaking their products to (hopefully) create better ones. The final repair decisions and where they land on the continuum is dependent on these factors.

When does the preservation of a material no longer make sense and replication is the last resort? The decision depends on factors such as whether the conservation consolidation material is being used indoors or outdoors, whether there is active moisture drive, and whether the replication material or replication treatment will do more or less physical harm than a consolidation treatment. When does reversibility not make practical sense due to life-safety issues? The decision depends on factors such as whether or not the treatment will potentially cause premature failure and cause harm to a passerby and whether the original object is made of hazardous materials (like lead paint) that should be stabilized. Finally, from an aesthetic viewpoint, who will make the decision as to whether an architectural element should look brand new, slightly worn, or left completely "as is" even if it is illegible from an artistic standpoint? The decision depends on factors such as how much historic fabric can be removed without the element losing its cultural value, whether or not current cleaning methods will do more harm than good, and whether restoration techniques need to be reversible or durable (non-reversible).

These answers are never black-and-white; they evolve over time; and they are completely dependent on the interaction between what an architect or conservator writes in the specification, what craftworkers are defining as their means and methods (versus what is the dictated by the design team in the specifications), and how this interaction is managed in the field on the construction site.



BUILDING FOR NATIONAL MUSEUM.

Washington, D. C., December 4, 1909.

SPECIFICATIONS

for

ENTRANCE GATES and DOORS, and GALLERY RAILINGS,

MAIN ROTUNDA.

The work called for in the foregoing circular is represented in drawings Nos. 153, 191, 192, 194, 210, and 417.

There are three separate and distinct parts of the work to be considered and bid upon independently, as indicated in the said circular, because of limited funds and the consequent necessity of determining and weighing designs and costs in advance, namely: 1, Iron Gates; 2, Bronze Vestibule; 3, Gallery Railings.

IRON GATES.

These are shown in drawing No. 417 and include the transom and all the work filling the stone opening.

The structural members of these gates, transom, &c, will be of wrought iron, and the ornamental parts, including the mouldings against the stone jambs, will be of the finest grade of cast iron work. All castings shall be perfect, and free from sand holes, cold shuts, rough or imperfect surfaces, rough edges, open joints and other defects. All jointing and fitting must be full, true, strong, and durable, without putty and in altogether a solid iron to iron job.

The work shall receive one very thin and carefully laid on coat of red lead paint before shipment to the building, but not until after the work has been inspected and approved on the part of the Government.

The ornamentation will be full and finished on both sides of the gates, and all undercutting, fine detail of leaves, holes, etc. in the models shall be maintained in the castings.

The gates shall be hung on Coburn, McCabe, or other approved hangers, securely fastened to the 15-inch steel channel with proper supports. The channel will be supported at each side of the doorway with a 12-inch channel strut properly connected to the 15-inch channel and the brickwork to carry and secure rigidly and permanently in place, for easy and smooth operation, the gates on a thoroughly approved and satisfactory hanger of the type indicated in the drawing.

Fig. 3.4
Specification for the Building for National Museum
Smithsonian Archives, Washington DC. Record Group 79, accessed by Constance Lai.

3.2: Defining *Quality* in the Specifications (*Piéce Technique oú CCTP*)

The level of quality that is required on a project is written contractually in the specifications in the United States, which in French is called the *Piéce Technique* or *les cahiers des clauses techniques particulières* (CCTP). The history and evolution of specifications is a very telling tale of how the level of quality and expectations of quality was a constant dialogue between the architect, the subcontractors (craftsmen), and the person who was responsible for the financial aspects of a project. In both the United States and in France, there is a certain level of expectation regarding the knowledge and execution of a specific task which the sub-contractor or craftsman is assumed to have has learned from his or her education and work experience. This knowledge and execution is called "means-and-methods". For example, the "means" (equipment) that is used to create a hole could be an awl and hammer or a hand-held drill, but this information is not explicitly stated in the specifications written by the architect. The "methods" are the manner in which the scope is executed and this information is also not written in the specifications. In this chapter section, the discussion will focus on how architects use specifications to communicate the level of quality desired that is above and beyond the craft's means-and-methods.

An example of a precursor of the modern specification is shown in Figure 3.3, which is from a Request for Proposals for the original construction of the "Building for National Museum" which is now the Smithsonian Institute's National Museum of Natural History. These specifications were written by the architect, Hornblower and Marshall; the Request for Proposals were issued to bidders by the Superintendent of Construction, Bernard Green[30]; the incoming bids were compiled by Green's staff; and the recommendations for final selection sent to the Secretary of the Smithsonian for record. From a quality standpoint, the telling paragraph is as follows:

> *The work shall receive one very thin and carefully laid on coat of red lead paint before shipment to the building, but not until after the work has been inspected and approved on the part of the Government.*[31]

[30] The concept of a "Superintendent" at the turn of the 20th century was not the same as it is today. Currently, the term is used for the person on the general contractor team who directs the construction work and the scheduling of subcontractors on a daily basis. In the early 20th, Bernard Green was trained as a civil engineer and had a hand in the building of the Washington Monument, the State, War, and Navy Building, the Library of Congress, and the Carnegie Library (Washington Public Library). In 1888, when he became the "Superintendent of Construction" for the Library of Congress, the library had already been built. His duties as "Superintendent" consisted of oversight of design and construction – similar to what a construction manager does today – for the Washington Public Library and the National Building. Although these buildings were being commissioned by agencies other than the Library of Congress, he acted on their behalf, communicating with the agency on the client end and the architect and contractors on the construction side.

[31] "Building for the National Museum. Washington, D.C., December 4, 1909. Specifications for Entrance Gates and Doors, and Gallery Railings, Main Rotunda, Iron Gates" Record Unit 79, Box 5,
Smithsonian Institution Archives. "Assistant Secretary in charge of the United States National Museum

In the first phrase, it is telling that the decision to apply a shop-applied primer was not considered "means and methods" in the early 20th century and still is not even today. Contemporary architects still need to write this sentence into every steel specification and cross-reference to the paint specification, even though it could be argued that this step is so common that it probably should be considered "means-and-methods" after over a century of writing specifications. From a historical standpoint, it is obvious that the definition of a quality primer changes over time. In the early 20th century, the requirement to use of red lead primer was a *qualitative* decision, which of course, in contemporary practice, we do not use due to lead being a hazardous material. Finally, it is interesting to note that even over a hundred years ago, the Government, not the architect, was already making shop visits to the fabricator to ensure that the level of quality was acceptable.

In early 20th century America, the specifications were written and issued by architects. By the late 20th century, the architects were using consultants (like engineers), specification writers (either in-house or contracted-out), and computerized specification writing software (like Masterspec). For Historic Preservation expertise, regular architects would hire Historic Preservation specialists, many of them architects themselves. In the early 21st century, the need for more precise specifications for the Historic Preservation discipline became more apparent and architects – both regular and preservation – started to seek the expertise of conservators to advise not only on repair and restoration scopes but also to write the specifications. In addition, Masterspec now has over one hundred standard specifications for conservation of period structures (for site conditions, concrete, masonry, metals, wood, roofing, openings, and finishes) and over sixty Historic Preservation specifications (for masonry, wood and plastics, openings, and finishes).

In the 20th century, once the specifications became contractually binding and the construction process began, the architect or preservation architect would be the final arbiter for quality control, which meant making periodic site visits and issuing a site visit report describing deficiencies in the construction process that were not conforming to the construction documents and specifications. However, beginning in the late 20th century, the control of the preservation scope of work started to shift to the conservators. In today's practice, it is not unusual for conservators to be employed within an architecture firm creating construction documents; for conservators to be issuing construction documents (both drawings and specifications) *without* architects involved at all; and for conservators to be hired by owners to guide an entire Historic Preservation project or even an entire governmental department for preservation.

In France, while the *architecte en chef* or *architecte du patrimoine* are still responsible for the final quality of the project, there is another consultant who writes the specifications and keeps track of the financial aspects of a

National Museum Building Construction Records, 1890, 1901-1916, 1923"

project. This consultant is called the "*Économiste de la construction*", which is a position that does not exist in the United States. In the United States, the word "economist" is not used in the context of architecture and construction at all; rather it is used to describe a person who analyses the local, national, or global economy and how a society's resources and production affect the persons in that society. In addition, the roles that the économiste plays in France is fulfilled by different persons in the United States. In the United States, the quantification of the scope of work and pricing is only preliminarily executed by the architect. On large projects, clients and government entities have started to enlist the services of construction managers, who are responsible for helping steward a project from schematic design to final construction, by estimating the cost of the project throughout the design phase and ensuring that the construction costs are managed to keep the project on budget. The construction management industry includes a wide variety of companies, from architecture firms who have an expert knowledge of financial aspects of a construction to general contracting companies who have expert knowledge in the design process.

From my observations in France, the *économiste* – whether working under the architect[32] or directly for the owner – is very powerful during the construction process because s/he quantifies the repairs, verifies that the scope is being executed per the construction schedule, and holds the power to release payment to the subcontractors. In the United States, the architect provides these services on small-scale projects, but on large-scale projects, these services are increasingly the responsibility of the construction manager.

Another observation I made in France was the lack of general contractors on Historic Preservation projects. On many of the construction sites I visited, I noticed that the *architecte en chef* or *architecte du patrimoine* was performing the same role that a general contractor would play in the United States. This arrangement was very unusual to witness because I saw the French architects dealing with the same coordination issues that I deal with on a daily basis working for a general contractor. For example, I witnessed subcontractors not respecting the work of other trades, like a wood worker removing decorative paint that is very difficult to re-instate or a metal worker allowing patination chemicals to drip onto newly cleaned stone. In the United States, there is verbiage that is written in the specifications that should resolve this issue – namely, the requirement to protect adjacent work from one's own trade activities – but it is not always strictly enforced which then causes problems with the quality of the final product. In the United States, it is the general contractor's responsibility to have the subcontractors rectify these types of deficiencies. In France, it appears that it is the responsibility of the *architecte*.

[32] I am not clear whether the économiste is contractly obligated to the architect or owner or both. In the United States, the financial aspects of the économiste's job are completely the jurisdiction of the general contractor.

Fig. 3.5
Fondation Coubertin. Les Compangons du Devoir. Stair built in the Lunchroom (Cantine).
Photographed by Constance Lai. December 11, 2017.

3.3: Quality of Craft: France vs. United States

The level of quality that is achieved by craftsworkers in France is unparalleled compared to the United States. In the United States, in order to achieve the standards that are required on a Historic Preservation project, it is not unusual to hire subcontractors from the other side of the country or even from other countries like France. The maintenance of quality within a trade is directly tied to their means-and-methods. In France, the means and methods are taught in the trade schools, like Les Compagnons du Devoir, and through on-the-job training. In the United States, similar systems have existed but there are many issues that have limited their success.

In the United States, since the 1970s, there have been multiple revivals of craft schools that teach the traditional trades[33], but the survival of these schools has been marginal at best. Unlike in France where the trades schools are regulated by the French state government, the trade schools in the United States are accredited through state governments, not the federal government. In France, the trade schools are required to implement an ISO 9001 Certified quality management system to prove to the French state government that their curriculum is consistent and relevant to the needs of industry.[34] This type of quality control for the education of tradespersons is non-existent in the United States.

The lack of quality tradespersons in the United States led to the Historic Preservation design community to look elsewhere for the execution of scopes of work … namely, conservators. The rise of conservators starting their own subcontracting companies and executing the work themselves has started to become widely accepted in the construction industry. In fact, architects have gone so far to write in specification that certain scopes of work may only be executed by a qualified conservator. In the general construction industry, this change has caused many misunderstandings (and resentment) on the construction site, especially when a conservator is specified to execute a scope of work that is usually performed by a trade union, like metal work, stone work, and plaster work. In the United States, it is not unusual to specify that a conservator repair a bronze handrail, execute the stone laser-cleaning scope, or stabilize a plaster wall. These scopes, in France, are predominantly executed by tradespersons.

Interestingly, in some cases the level of craft in the United States has improved and conservators have started to pull back from actual execution and have started to become Quality Control specialists. From my experience, if there is a craft tradesperson who can execute the specification to the level of expected quality, it is not unreasonable to propose to the owner and the architect that the specification requirement that a conservator execute the work be changed as long as there is a conservator on the project team that can help

[33] "Training and Degree Programs," Preservation Trade Network, http://ptn.org/training, accessed April 14, 2018.
[34] On November 23, 2017, I met the Director of Quality for the Compagnons du Devoir, Cecile Céret. She explained to me the quality control process for the education training system.

guide the tradesperson to the finished product. It is also not unusual to have the conservator provide the documentation of the entire process, as it is not customary for tradespersons to document their process in a report form, like conservators. It is also more common to see traditional trade subcontractors hiring conservators – both as consultants and as direct hires – to ensure that the level of quality is being met.

From the union perspective, the unions have started to realize that the preservation work is a potential avenue of job creation for their members. This fact was lost on the unions in the late 20th century when they decided to concentrate on teaching their apprentices only new construction techniques. (Note that the unions in the United States have robust training programs to teach apprentices, whereas in France, the *syndicats* do not participate in the education of its members.) The International Masonry Institute – the educational wing of the International Union of Bricklayers and Allied Craftworkers (BAC) – revived their interest and commitment to preservation work by hiring a conservator in 2013 to start a program for apprentices and masons. IMI has continued to expand this program with the hiring of a Historic Preservation engineer as well.[35] Finally, the BAC recently allowed stone carvers to enter the union and IMI held a stone carving workshop, which bodes well for the future of preservation masonry work.

Given the state of flux in the preservation trades and conservation discipline in the United States, it is very difficult to assess the capabilities of any one individual who is being submitted for approval by the architect prior to arriving on the construction site. In addition, the point where the craftworker or conseravtor's means-and-methods ends and the architect's specifications begin is also in constant flux. These factors have given rise to and acceptance of the United States Army Corp of Engineers Quality Control Management System by the Historic Preservation discipline. This system will be the focus of the next chapter section.

[35] The conservator hired by IMI is Roy Ingraffia and the engineer is Amy Woods, both who are friends of mine.

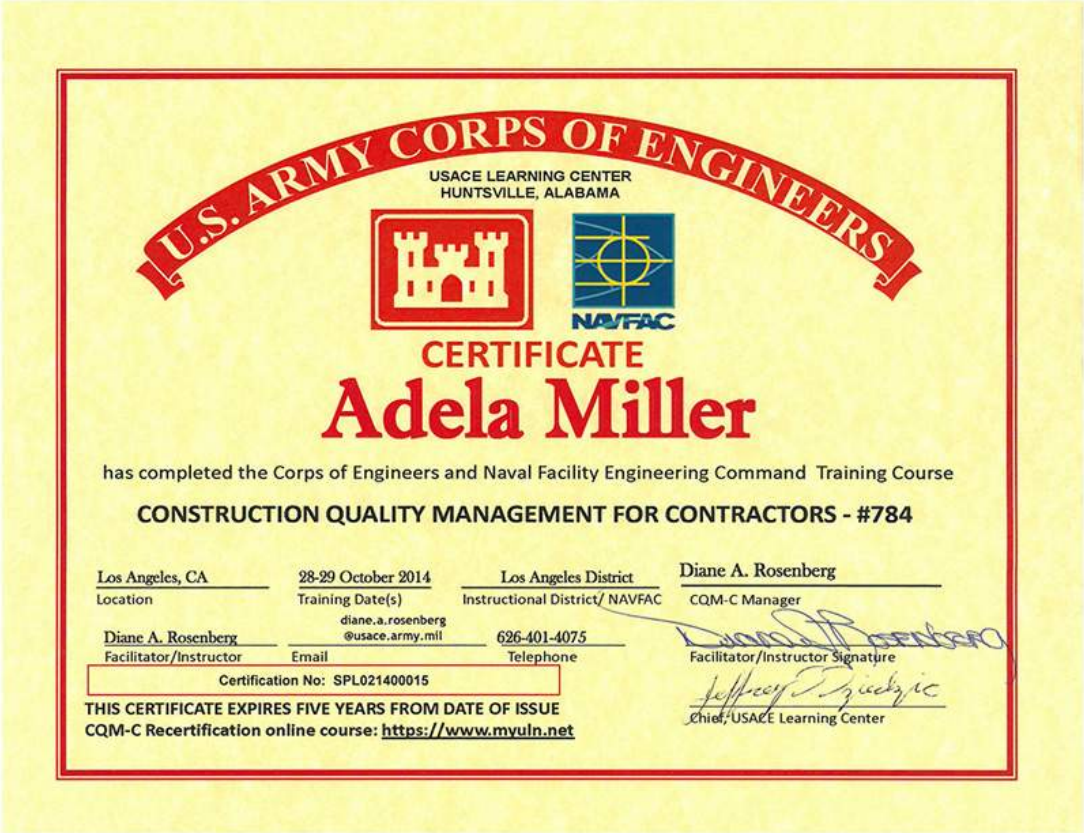


Fig. 3.6
US Army Corp of Engineers – Construction Quality Management for Contractors (Sample CQM-C Certificate)
Sample certificate. https://harborenvirogroup.com/harbor-environmental-group-inc, accessed April 16, 2018.

3.4: Quality Control: USACE CQM

The level of quality that is required on a project is written contractually in the specifications, but as described in the previous chapter section, it is difficult to bridge the gap between means-and-methods and what is required per contract. For decades, the lack of clearly defined and seemingly constantly changing parameters for preservation repairs, led most general contractors to dismiss Historic Preservation as a un-quantifiable and difficult to manage discipline. While this sentiment continues today, it has started to change. For example, some preservation architects are now choosing to clearly quantify repair quantities on the drawings, (similarly in France, the quantification of repairs is now executed by the *économiste*). As for management of Historic Preservation scopes on construction sites, the federal government is leading the way by requiring detailed management of the Historic Preservation repair scopes.

In the 1960s, the United States federal government agency, the U.S. Army Corp of Engineers, made it a requirement that general contractors implement proactive protocols in ensuring quality on the construction site. Per the Student Study Guide for "Construction Quality Management":

> Construction Quality Management: CQM is the performance of tasks, which ensure that construction is performed according to plans and specifications, on time, within a defined budget, and a safe work environment. For purposes of this training, quality is defined as conformance to properly developed requirements. For a construction project, quality begins with requirements carefully developed, reviewed for adherence to existing guidance, and ultimately reflected in criteria and design documents which accurately address these needs. Therefore, the designer establishes the quality standards and the contractor, in building to the quality standards in the plans and specifications, controls the quality of the work.[36]

The use of this USACE program used to be limited to military projects, but it is increasingly used by other federal agencies, like the General Services Administration and the Architect of the Capitol (AOC). While the CQM program encompasses the entire design-construction process, the relevant subset of the CQM program is the Contractor Quality Control (CQC) program, which is the system by which a general contractor "controls the quality of work." In fact, the GSA, the National Park Service (NPS) and the AOC have begun to issue qualification requirements for the Quality Control Manager role that are so restrictive that the position can only be fulfilled by persons with Historic Preservation or conservation professional

[36] "Construction Quality Management for Contractors: Student Study Guide," page I-3. http://www.nau.usace.army.mil/Portals/71/docs/CQMStudentGuide%20rev%2009OCT14.pdf accessed April 16, 2018.

backgrounds.[37] This shift is potentially revolutionary for the Historic Preservation discipline since up until now, the focus of quality control has been exclusively on non-preservation architecture and engineering disciplines.

The requirements to implement a CQC program are long and intensive and are beyond the scope of this report, however, the key elements that are pertinent to Historic Preservation projects are as follows: A Three Phase Control System, Safety Requirements, and Quality Control Documentation. These protocols are important because they force the general contractor and all the subcontractors to be proactive about ensuring that quality is being met from the very beginning of a construction project.

The Three Phase Control System consists of a Preparatory Control Phase, an Initial Control Phase, and a Follow-up Control Phase. All three of these phases are initiated exclusively by the Quality Control Manager (QC Manager). The "prep" meeting is the most pro-active of all the phases since it is where the level of quality specified by the architect is reviewed with the subcontractor, whether it be a trade or craftworker or a conservator. During this meeting, if there is any discrepancy between the means-and-methods of the subcontractor and the specifications, the disputes are resolved and documented. During the "initial" meeting, the subcontractor performs his/her scope of work in the presence of the QC Manager and any disagreement regarding the execution is also resolved and recorded. Finally, the "follow-up" phase is when the QC Manager periodically checks the quality of the work and if necessary, creates a list of deficiencies or punch list (in France, this list is called the "reserve").

The Safety Requirements for Historic Preservation projects are always contentious. Whether it is the use of an angle grinder without a guard in order to not over cut a mortar joint during the mortar removal process or the use of a solvent with a high volatile organic compound count in order to apply gold leaf, the preservation trades always seem to be the last industry to comply with current laws and standards. For many years, the preservation industry has been able to dodge these regulations. But recently, with the expansion of knowledge regarding safety precautions, insurance premium rates, and federal government laws, it is almost impossible for the preservation industry to ignore the changes that are occurring on construction sites. In France, this awareness is most apparent in the new regulations to control the level of air-borne lead particles on construction sites.

Finally, the third most important feature of the CQC program is the documentation. While the list below is not comprehensive, the most important items are the following:

[37] I have been the Quality Control Manager on two projects, the Washington Monument Earthquake Repairs project for the National Park Service and the U.S. Capitol North Extension Stone and Metal Preservation Project for the Architect of the Capitol.

- Contractor Quality Control Daily Report
- Preparatory and Initial Phase Checklists
- Deficiency/Rework Items List
- Submittal Register & Submittals
- Activity Hazard Analysis (AHA)
- List of Definable Features of Work (DFOW)
- Offsite Fabrication, Testing and Inspection
- Material Receipt and Check-Out
- Deficiency/Rework Items Tracking and Correcting
- Non-compliance Notice or Report (NCN or NCR)
- Request for Information (RFI)
- Control Testing and Recording/Reporting
- Punch-out Inspection, Pre-Final Inspection, & Final Acceptance Inspection
- As-Built Drawings
- Operation and Maintenance Manuals and Warranties

Each of these items are protocols that have become so consistent in the general contracting industry that even if the project is not a government project, most general contractors will implement some if not all these protocols because they are effective management tools. Not only are the client, subcontractors, and manufacturers familiar with these protocols, the broader construction community (lawyers, regulatory agencies, insurance companies) are as well. The embracing of these protocols by the federal government on large-scale Historic Preservation projects has brought a legitimacy to the discipline in the eyes of the general construction industry. The proof that Historic Preservation trades can be managed from a quality control standpoint has translated into a better acceptance of the trades on large-scale projects. While this acceptance is not across the board, it is at least moving in a positive direction.

In addition to the CQC program, the counterpart of the USACE program is the Quality Assurance (QA) program on the client or owner side. On federal government projects, the persons who fulfill the QA roles are called "inspectors". Their primary role is to ensure that the general contractor is implementing a CQC program and act on behalf of the client. For example, if there is a deficiency in the quality of repointed mortar joint, the inspector will take note of the location and bring it to the attention of the general contractor's quality control manager. It is customary that the work day cannot commence unless there is an inspector on the job site. Likewise, it is also customary that work cannot commence unless the general contractor's quality control manager is present.

On a weekly basis, a formal process of reviewing the documentation and quality control protocols listed above is required. Sometimes these items are discussed during a broader "Progress" meeting, and sometimes it is a separate "Quality Control" meeting unto itself. During these meetings, the quality control manager,

the government's inspectors, and if necessary, subcontractors, project managers, and design team members, will review the status of RFI's and submittals, discuss means and methods that might be inhibiting the level of quality, coordinate visits to subcontractor's facilities to review items for quality prior to their delivery to the job site, and discuss deficient repairs, just to name a few.

While I was in France, there was not enough time for me to see if similar protocols exist on construction sites, but I did notice some similarities while visiting projects with *architects* and *Architecte des bâtiments de France (ABF)*. In particular, I was able to witness a few construction meetings held by *architects*. During these meetings, the *architects* would hold a meeting with either all or a few of the sub-contractors and discuss schedule, budget, change orders, scope discrepancies, unforeseen conditions, repair scope that was incorrectly executed, etc. On small projects, I noticed that these meetings were completely run by the *architecte*. There was no general contractor team with a superintendent, project manager, and quality control manager. In fact, the architect-en-chef played all of these roles, with support from the *économiste*.

Unfortunately, I was not able to witness a large-scale construction meeting or process, but I would be very interested in pursuing further research on this topic. In addition, I would like to start a dialogue with *Vérificateurs des Monuments historique (VMH)* and *Vérficateur des travaux des Bâtiments de France* who I believe might be the equivalent of Quality Assurance Inspectors.

Fig. 3.7
Laboratoire de recherche des monuments historiques
Constance Lai. December 18, 2017.

3.5: Quality in Practice: Conclusion

Attempting to define quality as a construct of practice is as difficult as the defining quality as a construct of theory. But even though the process of pinning down a level of quality can be difficult on a project-to-project basis, it is accepted that through education (trade schools), contractual vehicles (specifications), and protocols (documentation) or a combination thereof, that communication can occur … and misunderstandings addressed.

From a global perspective, it is interesting to note that there is a difference in how the United States and France think about quality in practice overall. In America, the level of quality is something that is controlled on the construction site, while in France, the level of quality is controlled as much as possible before construction begins. For preservation architects in France (*Architecte du Patrimoine*, *Architect en chef*), not only is a preservation (*conservation)* degree from *L'École de Chaillot* required, there is an internship requirement of ten years to work on the more prestigious *Classé* monuments.[38] In the United States, there is no formal education requirement to practice preservation and a minimum practice requirement of one year. For the trades, there are French schools dedicated to teaching the craft and means-and-methods. In the United States, all the training is on the job, with the employers, except for a few preservation-focused schools and some basic training from the unions.

In addition, France has a national conservation laboratory, the *Laboratoire de recherche des monuments historiques*, that is on-call to aid important Historic Preservation projects all over France. In the United States, there are some governmental services, like the National Park Service's Technical Preservation Services (TPS), which is responsible for maintaining the Standards (as described previously in this report) and the corresponding guidelines, the main publication being "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitation, Restoring, & Reconstructing Historic Buildings."[39] This publication is a "how-to" manual that attempts to bridge the gap between theory (the standards) and practice (the guidelines). While the guidelines are an excellent starting point in making the transition from theory to practice, the information is not kept current with the practices that are being implemented on projects across America. The federal department that conducts material research is the National Park Service's National Center for Preservation Technology and Training (NCPTT),[40] but the level

[38] These monuments are the equivalent of National Historic Landmarks in the United States.
[39] "The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitation, Restoring, & Reconstructing Historic Buildings." https://www.nps.gov/tps/standards/treatment-guidelines-2017.pdf, accessed April 19, 2018
[40] "National Park Service's National Center for Preservation Technology and Training," https://www.ncptt.nps.gov/programs/materials-conservation/, accessed April 19, 2018

of research and ability of this department to help projects is extremely limited. A more detailed comparison of LRMH and NCPTT can be found in Chapter 7 of this report.

Finally, both countries are extremely conscious of the constant flux of the practice. The vehicle that both countries employ to help keep the discipline abreast of current developments is the publication of peer-reviewed journals. These journals are a communication vehicle to promote a constant self-reflection of the practices and protocols that drive the profession forward. A similar system of checks-and-balances exists in the peer-reviewed journals of the science research discipline. Although I was not able to conduct a thorough investigation of the journals and books that are currently used by the conservation community in France, I was graciously given copies of *[monumental]* and *"La Pierre d'Angle".* In the United States, there is the Association for Preservation Technology International's (APTI) journal, *Bulletin,* and the *Journal of the American Institute for the Conservation* (JAIC).

In summary, it is apparent that *quality* as defined in practice, like in theory, is not something that can be quickly explained or pinned down. It is a moving, living concept that changes not only through the course of a project and through years of experiences, but through the culture in which it is being implemented as well. What French architects believed as a perfect solution to a problem twenty years ago (like laser cleaning), is now considered inappropriate without proper testing. While France has almost completely stopped laser cleaning, the United States is just now ramping up the use of lasers on construction sites, but under the control of the conservators. (See Chapter 7 for more discussion regarding the state of laser cleaning in both countries.) It is instances like this one where the dialogue between the two countries would be an obvious benefit to the discipline as a whole. Quality suffers when there is no communication, whether it is on a small construction site or across an ocean.

Fig. 4.1
City Center, Montpellier, France
Constance Lai. December 18, 2017.

4: Quality at the Scale of the City

The scale of the city is the most public aspect of the Historic Preservation discipline. It is the most regulated by multiple government agencies, most visible to tourists, most passionately contended by grassroots activists, influenced by non-government agencies, social services, private capital and interests, and the battleground of urban designers and urban planners. Therefore, it is the place where a sense of community is either fostered or broken. How a city is conceived, experienced, modified, interpreted, and regulated can spark a "war" just as much as a dispute over using a conservation-approach to stabilize a statue's hand at the risk of a deteriorating piece falling off and hurting a tourist below.

This chapter and the subsequent ones as well will provide a comparative study of examples of French and American projects that show how the two nations are similar and different in implementing and bridging the gap between theory and practice, all in an effort to provide the best *quality* project possible for future generations. Unlike the previous chapters, these chapters will be more of my own observations, a commentary of what I learned and witnessed, and how these ideas can potentially bring us closer as a world community, where we learn from each other's similarities as well as differences.

Fig. 4.2
McDonald's, Taipei, Taiwan
Constance Lai. November, 2016.

4.1: Montpellier | Easton | Taipei

The image of Montpellier that starts this chapter (Fig. 4.1) is testament to a feat of urban planning and design. In the 1970s, the city planners decided to close the middle of the city to traffic. I can only imagine how difficult this decision must have been, with businesses frightened that their customers would not bother to come because there was no convenient parking and fretting over whether the new Antigone district by Ricardo Bofill – with both low-income housing and an American-style mall – would literally suck all customers away. But in the end, the decision was a good one, creating a pedestrian-friendly city with a strong public transportation system, allowing the city center to thrive in a way that could not have been possible if cars were still allowed to drive in. In the United States, the same urban strategy of creating pedestrian-only city centers was also implemented and ended up with mixed results. The key to a successful pedestrian-dominant city center is beyond the scope of this report, but it is something worthy of exploration because it affects and impacts the preservation community of both countries.

While exploring the city, I passed by the old market hall, Les Halles Castellane, which is still an active produce market. However, half of the market's real estate was removed to accommodate a different type of retail, the Japanese clothing store Uniqlo. (Fig. 4.3) For someone who frequently shops at Uniqlo, but who is avid seeker and believer of local, sustainable food production and markets – this sight was a struggle for me. As a preservationist and foodie (gourmand), I would have been in heaven to see the entire building

being actively used as a food market, like Paris's Marché d'Aligre, which I had the pleasure to live near for a week. But, the city could not maintain the market for economic reasons and allowed an international clothing company to rehabilitate the space.

I was immediately reminded of the struggling downtown of my home town, Easton, Pennsylvania, that has transformed itself into a foodie destination. There is a farmer's market every Saturday; a thin-crust Italian pizza restaurant; a yearly festival celebrating bacon; and the most recent addition, an indoors food market, The Easton Public Market, located in a rehabilitated store front on the main street of town (Fig. 4.3). Easton's revival did not come easy. When my family moved to Easton in 1980, it had already started to decline quite drastically. Multiple starts of a revitalization were never quite successful. Businesses would open to great fanfare and then go bankrupt. There just wasn't enough interest or pedestrian traffic. There was too much crime and it was too dangerous to walk on the streets at night. Now, there has been a complete reversal. An active restaurant scene, a theater, and a couple of museums have created enough critical mass to keep the downtown alive from morning to night. It is questionable if Easton would ever be able to sustain a store like Uniqlo or dare I say, be sought after by the city to act as a catalyst for further development. But, it is a question that we – as preservationists – need to pose. Who are we serving when the price of fruit is less expensive at a big box store in the suburbs than in the city center's market? This phenomenon exists both in Montpellier and Easton. For answers, should we be looking to the markets of Taipei, where the freshness of the produce and meats are unparalleled, and the prices are cheap?! (Fig. 4.7)

Another phenomenon that I've witnessed on three continents is the seemingly ubiquitous Christmas tree. In Montpellier's city center, the tree is a sign of welcome to visitors and inhabitants alike of an engaged community (Fig. 4.4). In the United States, the tradition of the Christmas tree is similarly used by both public and private entities (Fig. 4.6). Finally, in Taiwan, the tradition is in full force, with possibly the most enthusiasm that I've witnessed (Fig. 4.8). Is it possible because the weight of the religious connotations (and wars and disputes) are so dis-associated from the symbol that Christmas trees can exist in government buildings and be infused with a celebratory zeal that no longer exists (out of cynicism or political correctness) in Western cultures (Fig. 4.8)?

Finally, McDonald's – an American invention – fills a gap in the French urban planning, where the use of bathrooms is free (no purchase required) and the wi-fi connection is free (also, no purchase required). It felt kind of ironic that as an American, I had to depend on an American establishment to provide me these necessities in not just Montpellier but all over France. Taipei also has a four-story McDonald's (Fig. 4.2) and multi-story Uniqlo's. How does a city find a balance between old and new? Between local and foreign businesses? Between affordable housing and exclusive areas? Is there a formula or not? How do cities all over the world deal with what are essentially very similar issues?

These may seem like questions for an urban planner or designer, but their decisions then impact our profession. It would be futile to restore a building if there is no commitment by the city or town to create and manage a thriving urban environment. Or might it be the reverse? If there is a commitment by preservationists to restore a dilapidated building, could that be the catalyst for a re-generation and growth of a neighborhood? Essentially, both parties need to work together in a symbiotic relationship.

Fig. 4.3
Old Market, Montpellier, France
Constance Lai. December 18, 2017.

Fig. 4.4
Christmas Tree, Montpellier, France
Constance Lai. December 18, 2017.

Fig. 4.5
Easton Public Market, Easton, Pennsylvania
http://www.artefactarchitecture.com/2016/03/28/easton-public-market/, accessed April 21, 2018

Fig. 4.6
Easton Public Market, Easton, Pennsylvania
https://www.facebook.com/eastonpublicmarket/, accessed April 21, 2018

Fig. 4.7
Minxiang Street Evening Market, Taiwan
Constance Lai. November 12, 2016.

Fig. 4.8
Christmas Tree in a Government Building, Yonghe, Taiwan
Constance Lai. December 18, 2015.

4.2: The Role of Government in Historic Preservation

In general, the role of government in stewarding the Historic Preservation movement in the United States and the conservation movement in France might seem in direct contrast with each other, with the French model being top-down and the American model being bottom-up (grassroots). However, from my experience in America, and the limited time I had in France, I noticed that this generality is not a universal. There are many situations where government takes a very active role in the United States, and there are situations in France, where the top-down approach is in fact a more egalitarian process than it seems at first glance.

In the past few years France's government has gone through quite a few changes, of which I was only able to grasp a small fraction during my visit. However, I noticed that there were multiple levels of authority and overlapping jurisdictions that would cause friction among the various entities. The *Ministère de la Culture*, the top-most level of the conservation bureaucracy, had the responsibility of guiding projects at a very high level. Among the various responsibilities of the *Ministère* is the overseeing of the development of two types of urban design/planning documents: *Le plan de sauvegarde et de mise en valeur (PSMV)* et *le plan de valorisation de l'architecture et du patrimoine (PVAP)* which will be described in further detail in the next section.

The *Ministère* also houses the *Inspecteur Générals*, who review projects in all *régions* and *départments* for appropriateness. The *Inspecteur Générals*, play two roles on any given project. They serve in an advisory capacity as well as function as a final decision maker as well. In these two roles, they have the ability to influence the quality of a project, from its very conception to its final completion. For example, if it is necessary to bring in the *Laboratoire de recherche des monuments historiques (LRMH)* to provide conservation science support to a project, the *Inspecteur Générals* have the power to facilitate their inclusion. They also have the ability to make decisions that influence projects directly. But there is recognition that there might be a conflict of interest when the project in question is in in the same region in which an *Inspecteur Général* has a private practice. In these cases, the *Inspecteur Général* must recuse him/herself from the role of *Inspecteur Général*.

In the United States, the closest role that we have to the *Inspecteur Générals* are the staff members of the Advisory Council for Historic Preservation (ACHP) and the Historic Tax Credit Reviewers. The ACHP is a separate executive branch entity that administers the Section 106 process for the Federal government. This process ensures that federal agency projects and federally-funded projects take into consideration Historic Preservation principles during the design and construction of projects. The Historic Tax Credit (HTC) reviewers are part of the National Park Service's Technical Preservation Services branch and they have the power to grant private real estate developers a percentage of a project's construction costs as a tax credit from the Internal Revenue Service (IRS) if the project follows the Secretary of the Interior's Standard for

Rehabilitation. Unlike in France, both ACHP staff and HTC reviewers are exclusively government employees and would therefore rarely need to recuse themselves from reviewing a project. Also, unfortunately, unlike France, the United States does not have a national conservation-science research laboratory, but the hiring of private architectural conservators or the use of conservation science on a project is encouraged when necessary.

Since 1977, the *ministère de la culture* has had a presence in the separate regions in France, with the formation of the *Directions régionales des affaires culturelles (DRAC).* Each DRAC has a *conservateur régional des Monuments historiques (CRMH),* who is essentially the steward of all the historical monuments in the region and is responsible for "studying, classifying, preserving, maintaining, enhancing and promoting the buildings and objects that are classified or inscribed as historical monuments in the territory for which he is responsible."[41]

In the United States, the equivalent of the CRMH would be the State Historic Preservation Officer (SHPO … pronounced "ship-oh"). On projects, where there is state-funding involved, the SHPO will act in an advisory capacity as well as final arbiter. The SHPO is also the liaison between any project in that state that is receiving federal funds and the ACHP or HTC if it is a tax credit project. If a project is receiving both state and federal funding, the role of the SHPO can be an efficient facilitator at its best and at its worst, cause for confusion, especially when the SHPO and the federal agency (ACHP or HTC) do not agree on the preservation methods on a specific project. This conflict exists in France as well, where the *Inspecteur Générals* and the DRAC might not be in agreement on a given project.

Finally, at the local level, the French and American systems are similar as well. The thirteen regions in France are divided into *departements*, each with its own architecture and heritage section called the "*Unité départementale de l'architecture et du patrimoine*" *(UDAP).* Within the *UDAP* there are the *Architectes des Batiments de France (ABF)*, who have day-to-day control over preservation matters in their *departement*. For example, the ABF have the power to dictate the viability of projects within 500 meters of a historic monument. In the United States, these decisions are made by the Historic Preservation office or department of the city or county (if the parcel of land has not been incorporated into a city). In some states, there are smaller divisions within a county called townships, but they do not have separate Historic Preservation offices. The preservation offices at the local level can reside in many different places in a city or county's organizational structure, which can be the cause for confusion for foreigners. In some local governments, the preservation department is housed within the city planning department; in others, the department of consumer and regulatory affairs (Washington, DC); and sometimes there is a stand-alone landmarks commission.

[41] "Conservateur des monuments historiques," Wikipedia, https://fr.wikipedia.org/wiki/Conservateur_des_monuments_historiques, accessed April 24, 2018.

The most complicated local version might be Washington, DC, which has a Historic Preservation Office (where the SHPO resides), a Historic Preservation Review Board (HPRB) which rules on cases that cannot be resolved by the HPO staff, the National Capitol Planning Commission which is the federal government's planning agency, and the Commission of Fine Arts (CFA) whose role is to rule on all projects regarding the "arts and national symbols, and to guide the architectural development of Washington, DC."[42] On any federal project, all of these entities must be satisfied, and it is not an uncommon occurrence for these agencies to have differing opinions on any given project.

In both France and the United States, the Historic Preservation world is a system of checks-and-balances, with the same end goal … to create a project of quality. Although the word "quality" does not enter into the debates very often, it is an undercurrent that is the basis for all decisions, no matter how subjective they may be. These government processes – on both sides of the ocean – are slow and laborious. But it is a commitment to these forces, whether they are in alignment or not with each other, that provide a forum for debate to create the best project possible.

[42] "History of the Commission of Fine Arts," US Commission of Fine Arts. https://www.cfa.gov/about-cfa/history, accessed April 24, 2018.

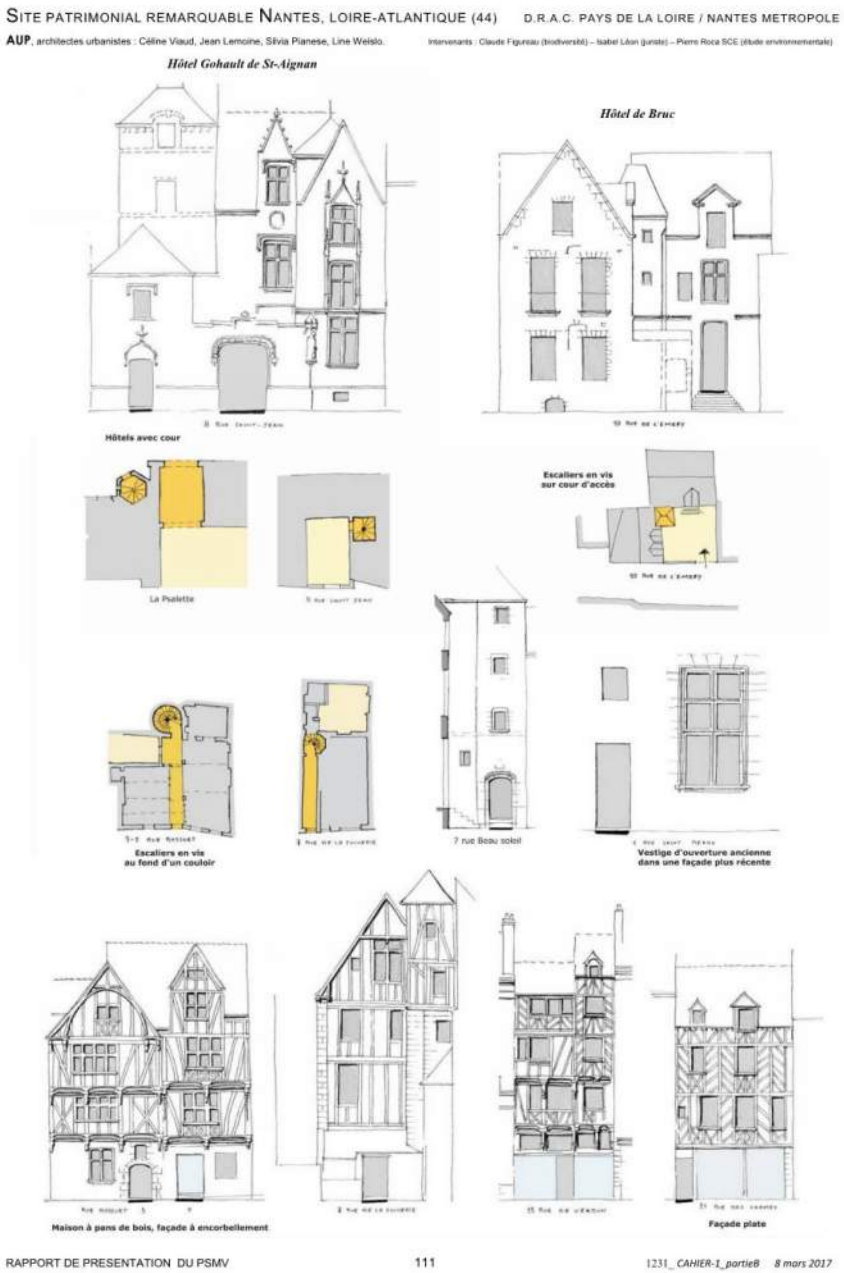


Fig. 4.9
SITE PATRIMONIAL REMARQUABLE DE NANTES
Révision du PLAN DE SAUVEGARDE ET DE MISE EN VALEUR
SITE PATRIMONIAL REMARQUABLE NANTES, LOIRE-ATLANTIQUE
D.R.A.C. PAYS DE LA LOIRE / NANTES METROPOLE
http://plu.nantesmetropole.fr/PSMV/PDF/1-1_PSMV_Cahier-1_Interet_historique_et_patrimonial.pdf

4.3: PSMVs vs. Historic Districts Design Guidelines

Defining quality at the urban scale is a difficult problem for both France and the United States. Both countries have implemented legislation to help mitigate a problem that has existed for many decades on both sides of the Atlantic: the deterioration of historic urban centers. In 1962, France began implementing a series of regulations that would help cities and towns identify the elements with the qualities that are worth preserving and restoring. In France, these regulations are implemented by the local government but with technical and financial assistance by the State (nation), while in the United States, these regulations are implemented by the cities, with very little state (one of the 50 American states) or federal government involvement.

In 2016, the French government reorganized and consolidated the various urban planning documents and narrowed it down to two types: *Le plan de sauvegarde et de mise en valeur (PSMV)* et *le plan de valorisation de l'architecture et du patrimoine (PVAP)*. The PVAP is limited to controlling the exterior of historic properties, while the PSMV can also control the interiors of historic buildings. In Figure 4.9, a page from the Nantes PSMV shows the level in which the building interiors are defined as part of the historic urban fabric. PSMV's also go so far as to identify interior fireplace mantels, flooring, wood paneling, and plasterwork.

In the United States, the equivalent of these two documents is a city's Historic Preservation guidelines. While the National Park Service publishes some parameters that individual cities can follow, there is no formal mechanism to enforce them. These parameters are called "Creating and Using Design Guidelines"[43] and are as follows:

> GUIDELINES CAN
>
> - Explain, expand, and interpret general design criteria in the local preservation ordinance.
> - Help reinforce the character of a historic area and protect its visual aspects.
> - Protect the value of public and private investment, which might otherwise be threatened by the undesirable consequences of poorly managed growth.
> - Indicate which approaches to design a community encourages, as well as which it discourages.
> - Serve as a tool for designers and their clients to use in making preliminary design decisions.
> - Increase public awareness of design issues and options.

[43] "Creating and Using Design Guidelines," National Park Service. https://www.nps.gov/tps/education/workingonthepast/canandcannot.htm, accessed April 22, 2018

GUIDELINES CANNOT

- Serve the same legal purpose as the design review provisions of the ordinance. An ordinance is a law, but local design guidelines are typically not laws.
- Limit growth, or regulate where growth takes place. Guidelines address only the visual impact of individual work projects on the character of a local historic district. Growth itself is a separate issue that must be separately addressed through zoning ordinances and preservation planning.
- Control how space within a building is used. They usually deal only with the exterior, publicly visible portions of buildings, not with how interior space is laid out or used.
- Guarantee that all new construction will be compatible with a historic area or the [sic] guarantee creativity that is essential to the best sorts of sensitive design.
- Guarantee "high quality" construction. Since materials are general*ly* not specified in the design guidelines, the final visual results, again, cannot be guaranteed.

The differences between the French PSMV and the "CANNOT" parameters set forth by NPS are immediately apparent, with American guidelines being less restrictive. The PSMV is a regulatory document, whereas American Historic Preservation guidelines can never become law, although some jurisdictions have made the decisions to codify the guidelines so that they are regulations that are required to be followed. American guidelines can only address visual impacts, and not advise on growth of a city, whereas PSMV's are broader and address issues like population growth and management of public spaces. PSMV's are allowed to identify and govern interior spaces and interior elements, whereas American guidelines rarely address interiors. The City of Charleston, South Carolina's preservation plan makes recommendations in regard to building interiors, but it is not a full implementation:

> Protecting historic interiors requires thoughtful discussion and well-crafted strategies. Many of the interiors of Charleston buildings are world-class examples of design and craftsmanship … Recommendations [include] … Adopt an ordinance enabling interiors of publicly owned Category 1 and 2 buildings to be protected … Include historic interiors in the survey rating system … Increase education for prospective property buyers, real estate agents, contractors, architects, and current owners on the value of retaining historic interior materials and finishes … Encourage property owners who

> remove historic elements to salvage and store them on-site in basements or attics, or to donate them to a salvage program.[44]

Another difference between the two nations is that American guidelines cannot "guarantee that all new construction will be compatible with a historic area," which is telling because it implies the majority of infill projects are in fact contextual, and not overtly contemporary. There are a few cities that have attempted to be more encouraging of contemporary design, like Charleston, where their plan states "A uniform style code is neither realistic nor desirable; new construction should take a variety of forms and styles, with the consistent expectation of quality design."[45] In France, contemporary designs are almost always encouraged, and even codified as exemplified in the Nantes PSMV regulations that state that "The architecture of the new construction must both develop an architectural vocabulary that expresses our time and participate in urban continuity. On the other hand, the notion of singularity can be applied to constructs having a high symbolic value like some public buildings."[46] The influence of Alois Riegl is evident in the first sentence, and Viollet-le-duc is evoked in the second. The ability to codify these philosophies to allow for the creation of new structures (whether aesthetically similar or different) is testament to the ever-evolving nature of preservation.

Finally, the last sentence of the "CANNOT" list is telling. The only time that the word "quality" appears in the parameters is in reference to materials, which is considered the purview of the developer, owner, or architect, and not of the public realm or government. There are exceptions to the rule, like Charleston's plan that recommends:

> All buildings should employ high-quality materials in keeping with Charleston's rich heritage. Charleston can and should expect materials and designs on the same level with its architectural fabric. No exceptions should be made: the real

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[44] "Vision, Community, Heritage: A Preservation Plan for Charleston, South Carolina," p. 66. http://www.charleston-sc.gov/index.aspx?NID=891, accessed April 23, 2018.

[45] "Vision, Community, Heritage: A Preservation Plan for Charleston, South Carolina," p. 64. http://www.charleston-sc.gov/index.aspx?NID=891, accessed April 23, 2018.

[46]« US.11-2c. Enduits et badigeons
La peinture des enduits traditionnels est interdite. Certains enduits traditionnels, voire certaines maçonneries de pierre, étaient badigeonnés à la chaux ; cette technique peut encore être utilisée après leur restauration*. Le badigeon doit alors être réalisé selon les techniques traditionnelles.
Le traitement d'enduit à pierres vues peut être mis en œuvre, voire imposé, quand il correspond aux dispositions d'origine de certaines constructions anciennes, ou s'il s'agit de mettre en valeur certaines maçonneries.. »
SITE PATRIMONIAL REMARQUABLE DE NANTES Révision du
PLAN DE SAUVEGARDE ET DE MISE EN VALEUR PIECE N°2-5
Règlement du Plan de Sauvegarde et de Mise en Valeur
modifié après enquête publique et Commission locale du 3 mars 2017
Délibération en Conseil métropolitain du 24 mars 2017

> estate market, the booming economy, and Charleston's reputation allow the city to demand more.[47]

In France, the detailed regulation of means and methods is not unusual for a PSMV to dictate:

> Painting of traditional coatings is prohibited. Some traditional coatings, even some stone masonry, were whitewashed; this technique can still be used after their restoration. The wash must then be made using traditional techniques. The treated stone coating treatment can be implemented or even imposed, when it corresponds to the original provisions of some old buildings, or if it is to highlight specific masonry.[48]

While the word "quality" is not specifically defined in PSMVs, it is clearly the objective of the PSMV. There was a value judgement made at the level of the French State to support detailed planning efforts that can even explicitly dictate means-and-methods.

In the United States, the earliest effort of a Historic Preservation plan was in 1931 by Charleston, North Carolina. However, the implementation of plans across the United States is varied and depends on the city as well as the state. There is no set terminology for the name of plan, with cities referring to their plans as Historic Preservation plans, preservation plans, Historic Preservation guidelines, etc. In addition, there are Historic Preservation regulations, ordinances, laws, etc. that are enacted by local city governments and individual states, without any input from the federal government.

The difficulty of creating consistent Historic Preservation plans throughout the United States might be viewed as a detriment to the preservation movement since there have been and will continue to be opportunities lost. But, the loose regulations also allow each city to create a plan that suits the needs of its inhabitants that is unique and flexible.

[47] "Vision, Community, Heritage: A Preservation Plan for Charleston, South Carolina," p. 36. http://www.charleston-sc.gov/index.aspx?NID=891, accessed April 23, 2018.
[48]

Fig. 5.1
Hôtel-Dieu de Lyon
The restored cloisters of the old hospital (currently being converted into a hotel-conference facility).
Constance Lai. December 9, 2018. Taken during a site tour led by Didier Repellin.

5: Quality at the Scale of the Building

Of all the different scales in which Historic Preservation is observed and codified, the scale of the building is most similar in France and the United States. The decisions regarding why a building is considered historic, what architectural elements are considered character-defining features, and what is considered a quality restoration, are very similar. A French preservation architect (*architecte du patrimoine or architecte en chef)* and an American Historic Preservation architect would easily find a common language in how to research the history of a building, evaluate its significance, define repair scopes, and integrate HVAC and life-safety concerns. But, the layers of history and architectural styles can be cause for heated debates as to what to restore and what not to. For example, at the Hotel Dieu in Lyon, the juxtaposition of buildings from different eras exemplified in Figure 5.1, can evoke negativity due to the lack of stylistic continuity; or it can be an architectural historian's dream to dissect for hours; or it can be simply a restored cloister welcoming to all who care to linger and mediate. What constitutes a *quality* project depends on how the project is conceived, delivered, and ultimately read and experienced by people.

However, there are subtleties to the French system that influence the quality of a restoration project, namely the roles of the *conservateur* (which I have deliberately avoided mentioning in this report until now), the (Le) *conservateur régional des Monuments historiques* (CRMH), Les *Architectes des bâtiments de France* (ABF), the *architects-du-patrimoine* and the *conservateur-restaurateur.* In the first section of this chapter, the roles of these various professions and their interactions are key to creating a successful project are described.

In the second section, a description of a World Heritage Site, the Bassin Minier, will be highlighted. The various government, non-government, and design stakeholders – in an effort to maintain an aesthetic uniformity – created a quality control document that guides the owners of important residential structures in regard to the maintenance of their buildings.

Finally, the third section is a description of a project, the bibliothèque musée Inguimbertine, where all the persons involved were successful in creating an atmosphere of cooperation on the construction site that will hopefully then translate into a successful, quality restoration of the Hôtel-Dieu.

Fig. 5.2
L'inguimbertine, la bibliothèque musée de Carpentras
A restored assymetrical vault with Monsieur Jean-Francois Delmas, the Conservateur général for the project
Constance Lai. December 21, 2018.

5.1: Preservation Stakeholders

At the scale of a building, in order to create a quality project, there are many, many stakeholders involved. To the general public – in both France and the United States – it is always assumed that the Architect, with a capital "A", must be the person with the final word. But in both countries, this fact is rarely the case. It is always a group of individuals with varying degrees of responsibilities and powers that contribute to design decisions, budgetary decisions, and construction decisions (means-and-methods).

At the beginning of a project, the evaluation of the historic significance of a building needs to occur. In both countries, this evaluation is a combination of researching the history of a building, spending time doing archival research at a library, documenting the building through architectural surveys, and investigating decorative finishes, just to name a few. In the United States, the historical and archival research is usually completed by an architectural historian, the on-site surveys by an architect, and decorative finishes by an architectural conservator. In France, historical and archival research can be executed by a *Conservateur* or *architecte*[49], and the decorative finishes investigation by a *conservateur-restaurateur*.

The role of the *Conservateur* in France should not be confused with the role of the *conservateur-restaurateur*. For Historic Preservation architects from the United States, this differentiation can be very confusing because the *Conservateur* role in France is a higher-level professional designation than the *architecte-du-patrimoine* which is then in turn a higher-level professional designation than *conservateur-restaurateur* (which is equivalent to the architectural conservator (or confusingly, just "conservator") role in the United States. The equivalent of the *Conservateur* in the United States is a museum director or government-side Federal Preservation Officer (FPO), State Historic Preservation Officer (SHPO) or Historic Preservation Specialist within a federal agency, who come to their positions from various backgrounds. The word *Conservateur* is often translated as "curator" in English; however, the word "curator" is limited to individual exhibitions *(expositions)* and does not capture the range of responsibilities and power that a *Conservateur* actually has. They are trained as architectural historians, architects, preservation architects, historic preservationists, or even have a background in materials, with a background in architectural conservation (*conservateur-restaurateurs*). Depending on their role on any given project, they may or may not have full control over the design and construction budget. But, they have varying degrees of control over the final scope and direction of the restoration aspects of any given project. Finally, Les *Architectes des bâtiments de France* (ABF) are an interesting hybrid of American city-level Historic Preservation officers, city-level planning officials, and city-employed

[49] The test competitions that give rise to the roles of *architectes-en-chef* and the *Architectes des bâtiments de France* (ABF) are a fascinating subject that are beyond the scope of this report, although, from an educational standpoint, these competitions are a deliberate way to exercise control over the quality of architects who are allowed to work on historic structures.

project managers. They have control over zoning, design compatibility, and can also directly oversee projects.

In the United States, the prominence of architectural historians and Historic Preservationists as the arbiter of historic significance can be a source of conflict with Historic Preservation architects and architectural conservators, who might know more about the materials in the structure and their potential significance from a materials standpoint. This conflict between opinions regarding what to prioritize has very real impact to the final restoration of a building. Whether to prioritize the history of a building or space within a building (as architectural historians would), the architecture and style of a building (as preservation architects would), or the materials and craft (as architectural conservators would) is a continuous struggle that occurs at all phases of project, from inception until the end of construction.

In France, I did notice that that there were similar conflicts between all the various preservation stakeholders. In the best of cases, I believe the wide range of preservation agendas allows for a critical debate and time for self-reflection over what any given project symbolizes to the society and culture in which it is embedded. In the worst of cases, it can be a cause for bitter disputes that cannot be resolved and affect the final condition and quality of the project.

Whether one practices Historic Preservation in the United States or in France, the key to creating a preservation project of *quality*, is to understand the viewpoints of all the stakeholders. Even when the final design decisions do not represent the wishes of all the stakeholders, the strength of a society is its ability to, at a very minimum, listen to the arguments of all the stakeholders and document all the positions to ensure that an informed decision is ultimately made.

Fig. 5.3
Réhabiliter les maisons ordinaires de l'époque industrielle, Janvier 02, 2014
La direction régionale des affaires culturelles du Nord - Pas-de-Calais
http://www.culture.gouv.fr/Regions/Drac-Hauts-de-France/Ressources-documentaires/Actualite-des-parutions/Rehabiliter-les-maisons-ordinaires-de-l-epoque-industrielle-parution-d-un-cahier-de-recommandations, accessed April 23, 2018.

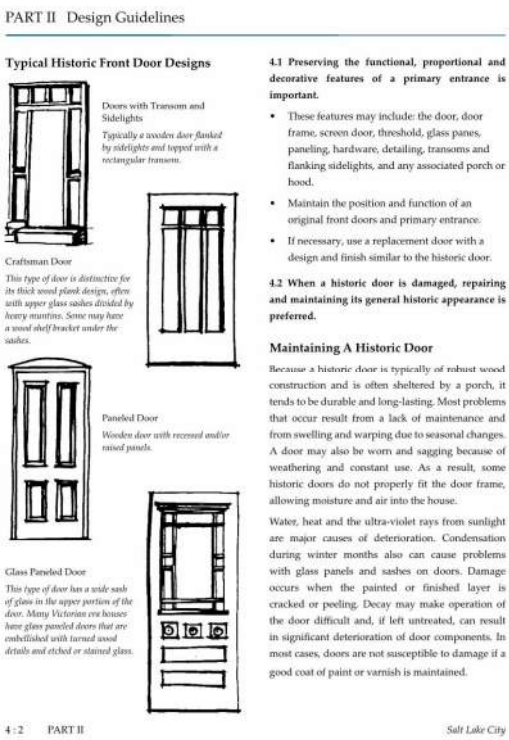

Fig. 5.4
A Preservation Handbook for Historic Residential Properties & Districts in Salt Lake City
Planning Division, Salt Lake City Corporation
http://www.slcdocs.com/planning/preservationhandbook.pdf, accessed April 28, 2018.

5.2: Residential Guidelines

Another Historic Preservation phenomenon that is popular in both the United States and France is the value of historic company towns and the vernacular residential structures located in these towns. The beginning of this movement in the United States started in 1960 when the Pullman Civic Organization was formed to help prevent the demolition of the town and its residential structures. In France, one of the most recent examples is the Nord-Pas de Calais Mining Basin (Bassin Minier) that was listed as a UNESCO World Heritage site in 2012.

The complexity of the Bassin Minier site is multi-tiered, e.g. the site spans two French departments, Nord and Pas de Calais; UNESCO, the French state (DRAC Hauts-de-France), and the local elected officials (les *élus*). All have different visions and priorities regarding the site as a whole and the resident population that lives in the historic residential structures are not always amenable to the preservation efforts that restrict their ability to change the aesthetic aspects of their houses. This last challenge was the impetus for a manual with guidelines that describes the basics of preservation to the owners of these residential structures. This manual, "*Cahier de recommandations : Réhabiliter les maisons ordinaires de l'époque industrielle"* was published in 2014 by the DRAC Hauts-de-France and consists of examples of both successful and unsuccessful restoration projects.

The ability for the French state to put together this manual is an example of the dedication to disseminating preservation guidelines to persons who might not otherwise be interested in preservation and would potentially consider guidelines an affront to their right to change their own property. This same struggle exists in the United States, and there are equally many examples of American cities and non-profit advocacy groups who have implemented similar handbooks, like the Planning Department of Salt Lake City, who issued the "A Preservation Handbook for Historic Residential Properties & Districts in Salt Lake City" in 2012.

In many ways these publications are very similar, the table of contents of the Bassin Minier booklet lists the Restoration of façade, roofs, windows and doors, and "la thermique", which in English is translated as "thermal comfort" and is most readily identified with "energy efficiency". The table of contents of Part 2 of the Salt Lake City manual lists Site Features, Building Materials and Finishes, Windows, Doors, Porches, Architectural Details, Roofs, Additions, Accessory Structures, Seismic Retrofitting, General Issues (that contains brief sections on mechanical equipment, landscaping, and color), and New Construction.

While the similarities of the content confirm a common sensibility in France and America, there are also differences, the starkest being the treatment of color. In the Bassin Minier document, the color of a new

limewash is to match the original, "*Restauration du décor avec badigeon à la chaux (couleur d'origine)*."[50] In the Salt Lake City guidelines, it states, "Replacement material *should* [emphasis added] match the original in color, texture and finish, including the color of historic concrete."[51] In addition, in the General Design Guidelines, the section that addresses color elaborates in red text (to differentiate it from the black text of the rest of the document): "Color is not a matter considered in design review in Salt Lake City. It can however dramatically affect the perception of a building and its contribution to its setting."[52]

Viewing this difference through the lens of quality brings to light the cultural values that separate the French and American preservation movements. At the scale of the building, the value of architectural elements, their proportions, and material composition is of utmost important and its these stylistic aspects of buildings that fall under the jurisdiction of review. However, in Salt Lake City as well as many other jurisdictions, the use of color is a very sensitive subject since it is considered the purview of the building owner. In addition, because paint colors are considered reversible, the choice of colors does NOT need to be historically accurate.

[50] Réhabiliter les maisons ordinaires de l'époque industrielle, Janvier 02, 2014, p. 99.
La direction régionale des affaires culturelles du Nord - Pas-de-Calais
http://www.culture.gouv.fr/Regions/Drac-Hauts-de-France/Ressources-documentaires/Actualite-des-parutions/Rehabiliter-les-maisons-ordinaires-de-l-epoque-industrielle-parution-d-un-cahier-de-recommandations, accessed April 23, 2018.
[51] A Preservation Handbook for Historic Residential Properties & Districts in Salt Lake City
Planning Division, Salt Lake City Corporation, Part II, 1-7.
http://www.slcdocs.com/planning/preservationhandbook.pdf, accessed April 28, 2018.
[52] Ibid., Part II, 11:1.

Fig. 5.5
L'inguimbertine, la bibliothèque musée de Carpentras
http://www.carpentras.fr/actualites/01-janvier-2018/mag-janvier-fevrier/linguimbertine-a-lhotel-dieu-cest-parti.html
accessed April 28, 2018

Fig. 5.6
L'inguimbertine, la bibliothèque musée de Carpentras
The manuscript room above occupied space (la bibliothèque musée de Carpentras).
Wood planks were positioned to traverse the insulation like "acqua alta" in Venice
Constance Lai. December 21, 2018.

5.3: Bibliothèque musée Inguimbertine

In the town of Carpentras, there is a very complex, ambitious project currently being built in the former Hôtel-Dieu. The nature of the project – from its conception to its execution – is in every manner, a difficult problem-solving process. At the scale of the building, this project is of particular interest because it operates at many different scales, all of which are interdependent of each other. From the feasibility study to construction, the project is being orchestrated by Jean-Francois Delmas, the Directeur de la bibliothèque musée Inguimbertine and Conservateur général in charge of the project.

In 1735, Monseigneur Joseph-Dominique d'Inguimbert, returned to Carpentras after spending two decades at the Vatican in Rome. His interest in culture, literature, and science led him to create two institutions in Carpentras, a public library and the Hôtel-Dieu. The public library is known as the Bibliothèque Inguimbertine and is an impressive collection of books and art. The Hôtel-Dieu, which opened in 1754, was a hospital for the poor that was run by Catholic nuns until 2002, when a new hospital was built for the town. When Monsieur Delmas became *Conservateur* of the Bibliothèque Inguimbertine in 2004, the facilities of the library were not meeting the contemporary standards required of a world-class manuscript and art collection. Therefore, he began the project to convert the recently abandoned Hôtel-Dieu to a museum to house the art collection of the Bibliothèque Inguimbertine, a research library to house the manuscripts, and a public library to serve the needs of the community.[53]

From a historical perspective, the building as a former Hôtel-Dieu created challenges in terms of how the former spaces would be preserved and adapted. For example, the decision to keep the chapel, apothecary, and grand staircase preserved in their current state was a conscious decision that allows future museum visitors to understand the history of the nuns who lived on the hospital premises to care for the sick. But in order to receive new visitors, a contemporary metal-and-glass assembly is currently being inserted into the structure by Atelier Novembre. The most innovative part of the project is the public library that opened to the public in November in 2017. It is a contemporary library where pieces of the art collection are interspersed between the various book and media lending areas.

The difficulty of managing a project as ambitious as this one from a quality standpoint was clear when I visited the site in December. First and foremost, the design team had to be a solid team. On the other projects that I had visited in France, the *architecte was* responsible for many tasks, from advising the client to researching the building to developing the scope to overseeing the construction schedule and budget to

[53] "Hôtel-Dieu of Carpentras, » https://en.wikipedia.org/wiki/H%C3%B4tel-Dieu_of_Carpentras, accessed April 29, 2018.

managing the sequence of craftworkers and trades to reviewing the work from a quality control standpoint. While this method allowed for the *architecte* to oversee the quality of the work from beginning to end, it would not be a feasible organizational structure for a project of this scale. Therefore, on this project, the level of quality depended on the team members, from the Directeur to the craftsworker.

Monsieur Delmas, as the Directeur, was responsible for guiding all aspects of the project, and since he was responsible for the conceptualization of this project fourteen years ago, he knew each design move, every compromise, and essentially every step of the process. To him, every detail was not too small to review, analyze, and approve, from which art work would be placed in the public library, to where the manuscripts would be housed, to what to do with a small religious pedestal that once held a statue of the Virgin Mary. On the design team, there were two architects, the main *architecte* and a preservation architect (*architecte du patrimoine*). These two architects worked in conjunction with each other to determine key design moves, including which areas were restored (like the chapel), what historic fabric could be removed (like deteriorated lime renders), and when structural treatments (like carbon-fiber rods) were to be implemented. On the construction team, there was a *coordinateur* (in America, a superintendent) whose main role was to manage the sequencing of the trades, as well as the *entretiens* (in America, sub-contractors). There were masons, woodworkers, electricians, and mechanical and plumbing subcontractors, who all helped to problem-solve on the site walk-through with the architects and Monsieur Delmas. The expertise that they brought to the table was invaluable and the freedom of the dialogue in order to create the best possible solution was refreshing to witness.

During my visit – which happened to be a few days before Christmas – there was a festive atmosphere on the job site as it was the last day of official work before the holiday break. After the job site closed, there was a celebration lunch at a restaurant in the adjacent town. At the restaurant, there were representatives from various stakeholders who all came to share a meal with the design and construction team. In the United States, large design and construction projects will implement group team-building exercises that require the involvement of all stakeholders, architects, and contractors in an effort to create trust and a bond between all parties. But on this project in Carpentras, it was readily apparent that this lunch was not a team-building exercise. Rather, it was a recognition that as a team, there was collective desire to restore and revive the Hôtel-Dieu as the *bibliothèque musée Inguimbertine*, to honor not only the importance of their town in history, but to keep the history alive for future generations.

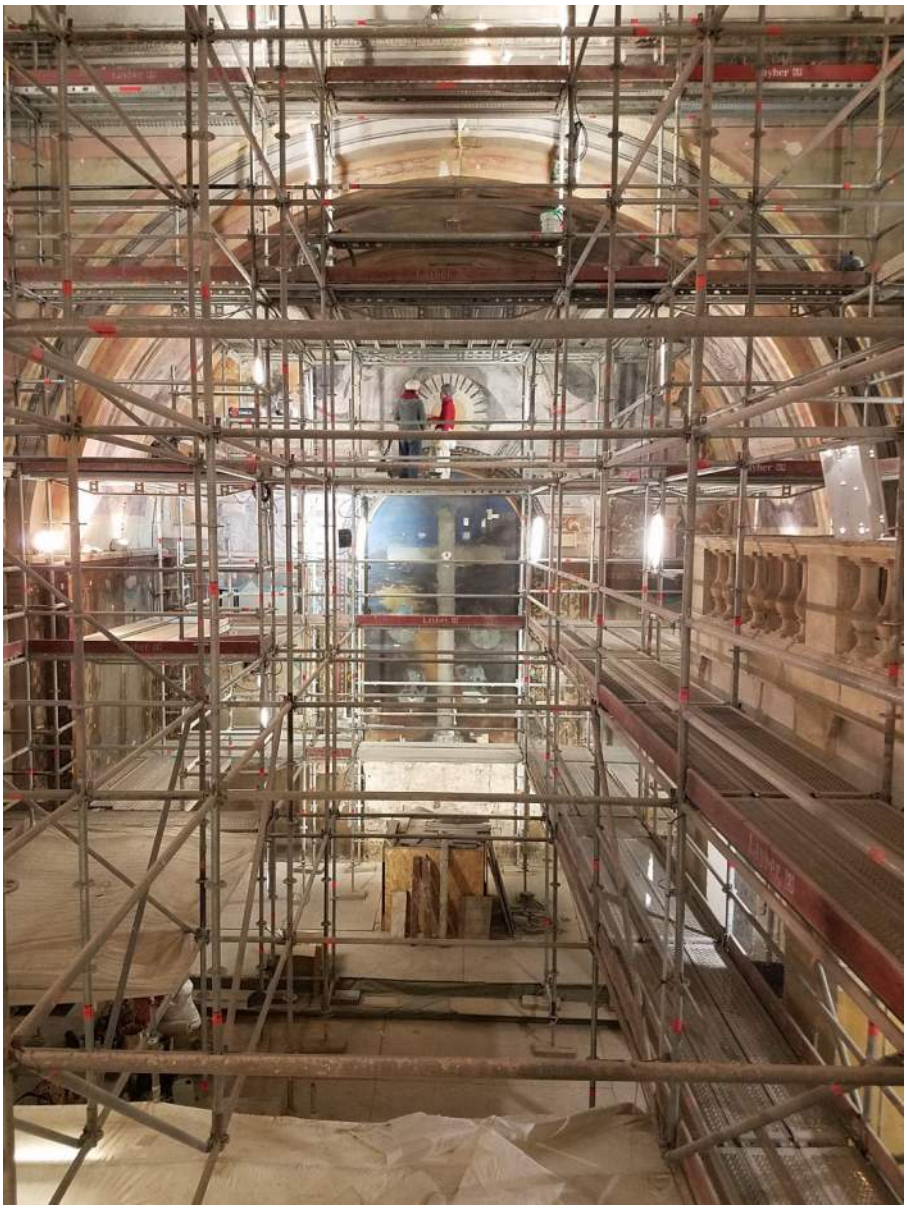

Fig. 6.1
Decorative Paint Exposure and Scaffolding
Cathedrale Notre-Dame de Nazareth. "Restauration des Decors Peints"
Constance Lai. December 6, 2017.

6: Quality at the Scale of Historic Finishes

The scale of finishes spans multiple disciplines which creates challenges in terms of quality. There are preservation architects, in both France and the United States, who feel comfortable making decisions regarding decorative finishes, and there are ones who do not. The ones who do not feel comfortable making these decisions depend on interior designers, architectural conservators, and the craftsmen/women to help evaluate finishes.

The first section of this chapter will discuss the restoration of decorative paint on multiple projects. The main challenge in France, due to its long history, is the difficulty of deciding which decorative paint scheme to restore when there are multiple extant campaigns.

The second section of this chapter will discuss the use of mortar repair materials (ragréage) and the different philosophies between France and the United States. In France, the use of ragréage is the preferred option for repairing voids in existing stone. In the United States, Dutchman repairs are the preferred method.

Finally, in the third section of this chapter, there is a brief discussion regarding how decorative paint finishes that are found during the construction process seem to always be the most at-risk part of any project, whether it is in France or the United States.

Fig. 6.2
Decorative paint exposure showing two campaigns
Cathedrale Notre-Dame de Nazareth. "Restauration des Decors Peints"
Constance Lai. December 6, 2017.

6.1: Which Decorative Paint Campaign?

The restoration of decorative paint in the United States is a discipline that has grown popular in the past twenty years. The publication of "Preservation Brief 28: Painting Historic Interiors" by Sarah B. Chase in 1992 only briefly touched upon the complexity of paint investigations. In contemporary practice, there are still very few American preservation architects who can properly oversee the execution of a decorative paint restoration project.[54] For major projects, preservation architects will hire an architectural conservator who specializes in decorative paint to create exposure windows, manage the laboratory work to identify paint types, and produce the cross-sections to document the stratigraphy of the paint layers. If the conservator is not hired as a consultant to the architect, the conservator is required by specification to be hired as a subcontractor (*entretien*) during the construction process. In France, this process is very similar, but the *conservateur-restaurateur* (like all *entretiens*) is hired directly by the owner.

After the initial investigation is completed, the most difficult decision for the owner, architect, and conservator is the decision regarding which decorative paint scheme to restore. At the Cathedrale Notre-Dame de Nazareth in Orange, France, there were three campaigns that were uncovered by the *conservateur-restaurateur*. In Figure 6.2, the inset window exposure highlights a later campaign, of the German Aesthetic style, while the surrounding exposure is the earlier neo-classical decorative paint scheme that will be restored in full. The value judgement to remove the later campaign to restore an earlier campaign was not without careful consideration and much debate. In terms of quality, there was a determination that the earlier campaign had more historic integrity, but, at the level of the *conservateur-restaurateur*, the level of quality of their work is their ability to remove the later campaign without damaging or removing the neo-classical paint. In addition, the use of consolidation chemicals and restoration paints are also subject to varying levels of quality, depending on their location and reason for use.

At the Église de Saint-Germain-des-Prés in Paris, there are also multiple decorative paint campaigns. However, the decision was made to restore the mid-1800 aesthetic-style decorative scheme by Victor Balthard. In Figure 6.3, the difference between the un-cleaned capital and the restored capital is impressive. However, the decision to over-paint losses to bring back the original design intent is equally not an easy decision to make. The aura of the soiled capital can be very appealing to those who follow a "Ruskin" philosophy, and likewise, the newly restored capital can be interpreted as "un-true" or "un-real." While these value judgements definitively have an impact on whether or not the restoration is considered of the highest quality, it is the duality of these capitals together that allows the visitor to visually read the "before-

[54]Interestingly, the German Aesthetic style was transported to the United States in the 1870s and there are many instances of this style on the East coast. I spent five years (2007 – 2012) managing the restoration of over 26 decorative paint schemes in the Eisenhower Executive Office Building.

and-after" states of the decorative paint and come to his or her own conclusion. The decision by the *architecte en chef* to create very obvious differentiations between the old and new is a deliberate move to make the visitor experience the duality and become an active reader and interpreter of history. In the end, the visitor is the ultimate arbiter of quality.

Fig. 6.3
Before and after restoration
Église de Saint-Germain-des-Prés, Paris
Constance Lai. November 22, 2017.

Fig. 6.4
Ragréage
Abbaye de Senanque. Project by Didier Repellin.
Constance Lai. December 6, 2017.

6.2: Ragréage or Dutchman?

The use of mortar repair material to fill in losses (ragréage) is a preservation method in France that is used almost exclusively; while in the United States, the use of mortar repairs (also known as mortar patches) is used when there is a budgetary issue or the stone quarry is no longer active. In France, the limestone quarries are still active, yet the prevailing decision is to install mortar repair materials, in lieu of a repair made of the same stone. Why is there such a stark difference between repair methodologies when a stone needs to be repaired?

In the United States, if the stone quarry is still active and there is enough budget, a Dutchman repair is installed. The term "Dutchman" comes from a stereotype that craftworkers from the Netherlands are frugal and would rather spend less money repairing only the part of a stone or wood piece that is deteriorated, than to spend more money replacing the whole element. While the political correctness movement has waxed and waned in America, it has yet to shine its light on the preservation field, hence the continued use of the term, "Dutchman repair," or "Dutchman" for short. In addition, the proper material of a "Dutchman" is from the same quarry as the mother stone. This requirement does not take into consideration that the stone that is currently being mined in the quarry might be aesthetically different and/or might not have the same physical characteristics, like compressive strength and permeability.

For this reason, in France, the predominant repair method is the leveling of the surface (*ragréage)* with a compatible mortar repair material. The science behind the different types of *ragréage* is much more advanced in France than in the United States, which probably accounts for the heavy use of the material. In the States, there are only a couple of materials to choose from (Cathedral Stone Jahn Products and Edison Coatings repair compounds) and a couple distributors of European mixes (French St. Astier® Lithomex and Italian Biomix). Over the past few decades, litigation regarding mortar repair products proved that failed installations were due to improper methods used by the masons; but the hesitation to use them is more than often justified by the desire to create a more "proper" repair by using stone from the same quarry.

In addition, the failures of repair material and the subsequent fall onto pedestrians below is another reason why Dutchman repairs are favored. Dutchman repairs always include the removal of mother stone to create a pocket in which the new stone sits, held there by gravity and usually a stainless steel threaded rod (also known as a "pin") that is epoxied into both the mother stone as well as the Dutchman stone. The creating of a mechanical attachment is viewed not only as life-safety measure, but also a durable repair that is to last many years.

The opposite philosophy reigns in France, where the *ragréage* repairs are almost considered sacrificial, with the intention and understanding that it will ultimately fail before the mother stone deteriorates, and that the

next generation of stone masons will come back and install another *ragréage.* In this respect, the French take an approach more similar to an architectural conservator, where the correct preservation protocol is to maintain as much historic fabric (of the mother stone) as possible, avoiding the cutting away of the stone to create a pocket, as well as the installation of a foreign structural member (pins).

In addition, the use of stains to match the adjacent material is much more prevalent in France than the United States, which is a much more practical approach. In the United States, countless hours are spent trying to micro-manage the mixing and curing process of mortar repair installations to achieve an integral color that matches the adjacent material. This requirement, which is imposed on the masons by the preservation architects is impractical and almost impossible to achieve. In France, the understanding that the *ragréage* is a modern intervention that can be stained and re-stained as necessary is an approach that should be more widely accepted in the United States.

The difference in repair methodologies for stone losses showcases how far apart the French and American preservation worlds are in some respects. In terms of quality, the continuation of the cross-Atlantic dialogue is imperative so that the advancement of the discipline can occur.

Fig. 6.5
Decorative Paint Exposure
Hôtel de Belleval. Montpellier. Project by Phillipe Prost.
Constance Lai. December 14, 2017.

6.3: Unforeseen Conditions: Finding Finishes During Construction

There are moments during a preservation project when discoveries are made. Sometimes these discoveries are made during the design phase; sometimes during the construction phase. But, it is the ones that are found during the construction phase that always seem the most important and the most urgent because the clock has already started. The feeling that one is pressed for time to evaluate and document a found condition, make a decision regarding its restoration, and then execute the restoration is a very palpable feeling, common to projects on both sides of the Atlantic.

When I arrived at the Hôtel de Belleval in Montpellier, the *conservateur-restaurateurs* were busy stabilizing decorative paint throughout the building prior to the full construction project commencing. During my stay in France, I noticed that this protocol was not un-common and when it was implemented, the *conservateur-restaurateurs* would breathe a sigh of relief, as they know how damaging the construction process can be to fragile plaster substrates and the friable decorative paint on top. In the United States, these protocols are rarely specified by the preservation architect, and it is left to the general contractor to schedule the protection of the historic surfaces in a timely manner … with only varying degrees of success.

In Figure 6.5, the decorative paint motifs uncovered by Atelier de Ricou were elaborate plant vine motifs. But hidden in the upper wall, the vines give way to delicate flowers that surround a figure of a small girl, with a bow in her hair, gazing directly down at the person looking up. There is an inevitability to these discoveries that makes one stop and contemplate the history of space, the name of the child, the reason for painting her, etc. As of my visit, there were no definitive plans made to restore this decorative paint, to showcase this child, so she hovers above our heads, in limbo, waiting.

In terms of quality, the one factor that is always mentioned, but never fully acknowledged is *time*. We always use the word "time" as an excuse, as in, "If we only had time, we would have restored this element." The stress that comes from giving *Time* the upper-hand leads to compromised decisions, which ultimately affect the level of quality of a project. The design suffers, the means-and-methods suffer, and in the end, the project as a whole suffers. While France is definitely better than the United States at not allowing *Time* to dictate the restoration of important structures, it is definitely not immune, especially since there are more and more projects that are being implemented by developers (*promoteurs),* whose only goal is to turn a profit in a specific time frame. In this respect, the French and American preservation worlds need to create a common language to help facilitate best practices, in order to ensure that there will always be enough *time* to create a high quality project.

Fig. 7.1
NPS Conservator (government staff) and Masonry Craftsman (private company) reviewing the cleaning of marble stone with dry ice. Constance Lai. August 14, 2018.

Fig. 7.2
Closeup view of marble after first pass of adhesive removal with dry ice. 10X microscope view. Constance Lai. August 14, 2018.

7: Quality at the Scale of the Microscopic

Defining quality at the scale of the microscopic is probably the most difficult out of all the scales. It is a scale that requires the use of a microscope at a minimum and the use of more advanced techniques like x-ray diffraction (XRD) and/or the aid of a specialized laboratory. Why did the preservation discipline begin to embrace a scientific mindset to solving problems? How have both countries been able to meld traditional craftsmanship with scientific analysis to further the preservation of cultural heritage? And how are things that can't be seen – such as lead and silica – be mitigated so that the public can enjoy these structures for generations to come?

This chapter will begin with a comparison of how both countries have supported preservation science at the highest level of the government. In the United States, the federal government program (NCPTT) and the French government program (LRMH) are very similar in their mission, but completely different in how they operate.

The second section will highlight laser cleaning technology and how it has evolved in both countries throughout the past two decades. This technology is an interesting case study in the melding of science and craft to clean historic structures.

Finally, the third section will discuss the presence of hazardous materials on an Historic Preservation construction site and how both countries have implemented procedures to mitigate exposure to these materials.

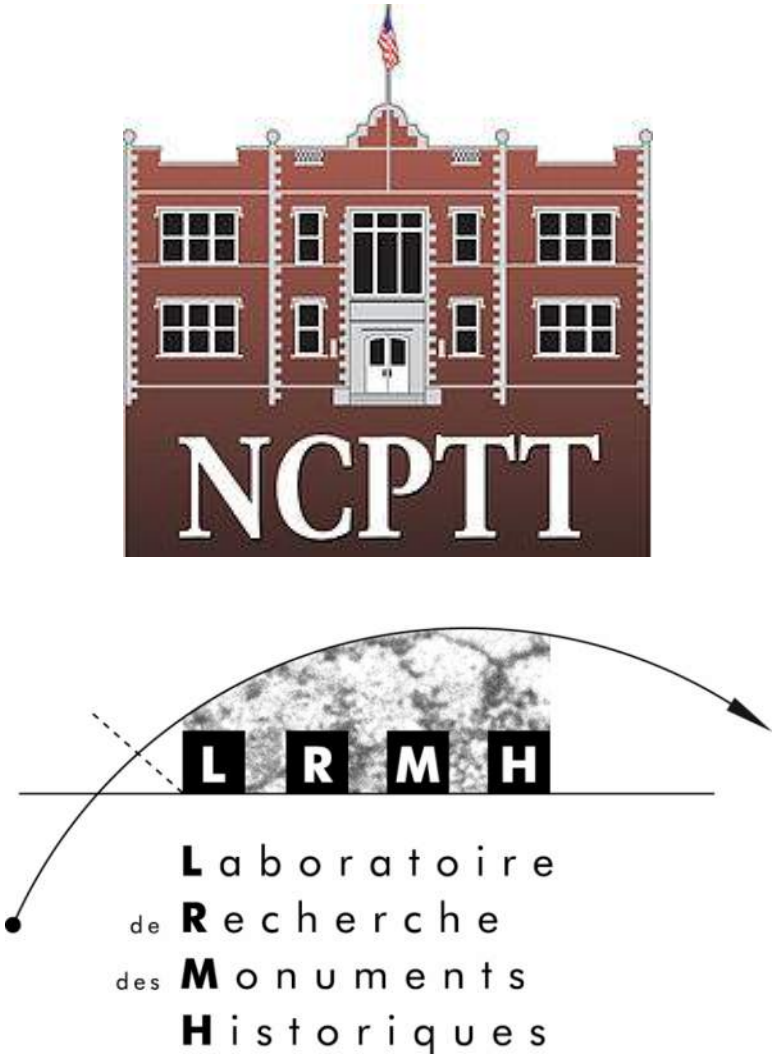

Fig. 7.3
The logos of the two national preservation research centers
In the United States, the research center is National Center for Preservation Technology and Training (NCPTT).
In France, the center is National Center for Preservation Technology and Training (LRMH)

7.1: LRMH versus NCPTT

The impetus of the inception of France's *laboratoire de recherche des monuments historiques* (LRMH) and the United States' National Park Service's National Center for Preservation Technology and Training (NCPTT) are surprisingly similar even though they were founded 27 years apart – LRMH in 1967 and NCPTT in 1994. For Jean Taralon, General Inspector of Historical Monuments, he was becoming concerned with traditional methods being used in the restoration of historic monuments and wished to see conservation operations better supervised with scientifically validated methods.[55] In September 1986, the United States Congress assessed the industry and noted that there was a "critical need to establish a federally funded institution 'as a mechanism to coordinate research, disseminate information, and provide training about new technologies for preservation'."[56]

In fact the mission statements of both organizations are also very similar:

> LRMH: "To provide a scientific and technical assistance to the works of conservation and restoration of historical monuments (buildings, decorative sets, furniture)."[57]
>
> NCPTT: "NCPTT helps preservationists find better tools, better materials, and better approaches to conserving buildings, landscapes, sites, and collections. It conducts research and testing in its own laboratories, provides cutting edge training around the U.S., and supports research and training projects at universities and nonprofits. NCPTT pushes the envelope of current preservation practice by exploring advances in science and technology in other fields and applying them to issues in cultural resources management."[58]

While the missions are similar, the execution of these missions could not be further apart. This fact is most readily seen in their areas of expertise. LRMH emphasizes the "Scientific Areas" (Pôles scientifiques) which are as follows: Wood, Concrete, Decorated caves, Metal, Wall paintings and polychromy, Stone, Textile, Stained glass, and Micro-biology. At NCPTT, the emphasis is on "Research Priorities" which are as follows: Archeology, Architecture, Collections Management, Engineering, Historic Landscapes, and Materials Conservation. While there are research projects similar to the ones undertaken by LRMH, under the Research Priority "Materials Conservation," NCPTT's focus is on a more diversified approach.

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[55] "Laboratoire de recherche des monuments historiques » https://fr.wikipedia.org/wiki/Laboratoire_de_recherche_des_monuments_historiques, accessed August 18, 2018.
[56] "About NCPTT," https://www.ncptt.nps.gov/about-us/, accessed August 18, 2018.
[57] "The LRMH Team," http://www.lrmh.fr/The-LRMH-team-215.html, accessed August 18, 2018.
[58] "About NCPTT," https://www.ncptt.nps.gov/about-us/, accessed August 18, 2018.

A key difference between LRMH and NCPTT is that the conservation scientists at LRMH actively participate in solving conservation issues on design and construction projects throughout the country. There is a national mandate that requires the conservation scientists to help the Inspecteur Générals with both laboratory and on-site investigations. Even on the most important historic structures in the United States, the critical material conservation research is done by conservators in private practice in conjunction with both private and public (museum, non-profit, university) laboratories, not NCPTT.

Of course, there are always exceptions to the rules in both countries. In France, LRMH takes on the challenges for the most important buildings in France, while private laboratories are hired for the remainder. In the United States, while there is no on-call conservation laboratory at the government level, at times, there are cross-agency research agreements where a National Park Service (NPS) unit or the Smithsonian Institution (SI) conservation laboratory may aid another agency's government-funded project. If one is fortunate to be on a construction project that is owned by a federal agency that has conservators on staff, they can be active participants throughout the process. In Figure 7.1, on a prominent site in Washington, DC, the conservator, an employee of the National Park Service, is reviewing the post-cleaning of adhesive from a historic marble substrate with the masonry contractor who performed the dry-ice removal process. In addition, the National Institute of Standards and Technology (NIST), which is equivalent to France's Centre Scientifique et Technique du Bâtiment (CSTB), can also participate in government-funded research. In France, if there is a structural problem with a historic stone structure, the Inspecteur Général can request the aid of the engineers at CSTB since LRMH does not have engineers on staff.

In addition, LRMH scientists have an ability and ease in which they collaborate with institutions that are *not* preservation centric. For example, the preservation of buildings from the Modern movement in France has become an important aspect of the Ministry of Culture's mission, as they are now considered *patrimoine*. To understand the deterioration and repair methods of these concrete structures, LRMH has a concrete scientist, who is spearheading the research effort to help maintain these architectural structures that influenced buildings all over the world, including the United States. She actively learns from and participates in the concrete industry's conferences and research activities. Likewise, the textile scientist came to LRMH from industry, so he is able to implement the latest technologies and processes to the conservation of textiles. Finally, the LRMH micro-biologist scientist actively works with CSTB scientists to create and solve problems of mold and bio-growth.

There is also an interesting relationship that LRMH has with preservation trades and industry that is worthy of mentioning. LRMH scientists are collaborating with the Compagnons du Devoir on a book on metals that will describe how traditional means and methods and scientific research can work together to better preserve metal sculptures and architectural elements. This type of collaboration, while not unknown in the

United States, has yet to happen at the government-funded level. There is usually a divide between science and craft in America that has yet to be bridged. In addition, the ability of LRMH scientists to work with industry to verify the integrity of products, like the Debitus Thermo-formed Protective Glazing for Stained Glass (which perfectly mimics the historic, in-situ distortion of any given historic stained glass window)[59], is also a unique collaboration that proves that the public and private realms can benefit each other for the benefit of culture overall.

[59] http://www.debitus.com/verres.php, accessed August 18, 2018.

Fig. 7.4
North transept of Saint Denis. portail des Valois.
The carved figures have darkened over time after the laser cleaning process was performed
Constance Lai. December 1, 2017.

7.2: Laser Cleaning

In France, when lasers are considered as an option, LRMH is heavily involved in the decision-making process. The scientists carefully review the stone at a microscopic level during trials to ensure that the correct parameters are being used. The goal is to ensure that only the gypsum crusts (croûtes noires) are being removed and that existing patina or protective layers are not accidentally removed in the process. Only after these parameters are set can the laser cleaning commence. In France, the laser cleaning is performed by masonry tradesmen. In the United States, laser cleaning is predominantly performed by conservators or conservation technicians who work under direct supervision of a conservator. Also, in the United States, the level of scientific investigation prior to the use of laser cleaning in the field is completely dependent on the client and architect, usually in conjunction with a conservator. In the past two decades, there have been projects where there is a high level of involvement from a conservation scientist and other projects where the criterion is purely based on visual evaluation of removed crusts (without the aid of any microscopes).

Another difference between France and the United States is the difference in how projects are executed from a time and budget standpoint. In France, there is more emphasis on getting to a desired end-result that satisfies conservation tenants, no matter how long it might take. This qualitative approach to preservation in France is virtually unknown in the United States. In the United States, all masonry cleaning scopes – whether they are privately-funded or government-funded – are priced in one of three ways: as "lump-sum", "cost per square foot", or by an "hourly rate". All three of these cost parameters present challenges when bidding out a laser-cleaning project. A "lump-sum" fee will more than likely cause the conservators who are bidding on the project to overstate the cost of the work since there is so much risk involved in terms of 1) setting working parameters for the laser in an effort to not cause damage to the stone, 2) the inability to quantify whether dark areas are gypsum crusts (to be laser cleaned) versus atmospheric soiling (that can be removed with just water or with a chemical product); and 3) the inability to quantify the thickness of the gypsum crust and the number of passes with the laser that will be required to remove the gypsum crusts.

A "cost per square foot" model of bidding the work minimizes the risk on the conservator's part because if there are any additional areas found – like tucked behind a sculptural element or cornice element – then, there is a basis for getting paid for the additional work. However, this model still does not account for adjusting laser machine parameters and the unknown thickness of any given gypsum crust layer. Finally, the "hourly rate", seems the fairest to the conservator who is executing the work because payment is dependent on how much time is needed to clean any given surface. In the eyes of the owner, none of these methods are desirable because there are too many unknown factors to ensure that the project is finished on time and on budget. There are ways to mitigate this risk that are starting to be utilized, like the implementation of a pre-

bid mock-up that sets the rate of cleaning (e.g. 2 square feet per hour) and the laser cleaning parameters (1064 nm). In these cases, there is a better chance for the owner to receive pricing and a schedule that are in line with projections.

In France, there have been many recent discussions regarding laser cleaning (nettoyage par laser) which has been essentially halted throughout the country. At Saint Denis, the gradual darkening of the yellow tint on the limestone statues at the north transept (*porte des valois*) was the impetus for a PhD thesis recently completed at LRMH, «*Jaunissement de la Pierre par Laser: Origines et Remèdes* »[60] which verified that a combination of ferrous content within the stone itself and ferrous content within the gypsum crusts was the cause for the permanent yellow staining of the limestone. It is this type of research that has precipitated the halting of laser cleaning in France and fostered the resurgence of micro-abrasion as an accepted cleaning methodology.

In the United States and Canada, the use of lasers to clean gypsum crusts started in the early 2000's but has only now started to gain momentum. There are at least four laser cleaning machine manufacturers, at least four conservation companies who have worked on large-scale projects; and there is enough comfort level with the technology that architects – in conjunction with conservator consultants – are including laser cleaning in the masonry cleaning specifications. While the laser cleaning community is quite strong in the rest of the world, the University of Pennsylvania School of Design held the first major workshop in the United States, "The Laser Cleaning Workshop for Art & Architecture," in the fall of 2016 and was well attended by the architecture, construction, and conservation communities.[61]

Here in the United States, the yellowing of stone after the removal of gypsum crusts has been witnessed[62], but there have also been recorded instances where the stain was successfully removed by poultice. Since the majority of laser cleaning in America occurs on white marble, the amount of yellowed stone is not at the same scale as it is in France. It is probably too soon to predict the longevity of laser cleaning as a method on preservation projects in the States, but, at a minimum, it will more than likely be used in select cases where there is no presence of iron and rigorous testing has validated its use.

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[60] Marie Godet. Jaunissement de la pierre par laser : origines et remèdes. Science des matériaux [cond-mat.mtrl-sci]. Museum national d'histoire naturelle - MNHN PARIS, 2017.

[61] https://www.design.upenn.edu/historic-preservation/events/laser-cleaning-workshop-art-architecture, accessed August 18, 2018. Note that I was lecturer at this event and presented the talk, "Incorporating Laser Cleaning Into Large-Scale Construction Projects: Case Study".

[62] From 2015 to 2017, I was the Quality Control Manager overseeing the restoration of the North Extension (Senate) of the US Capitol, where laser cleaning and consolidation were both used to great extent.

Fig. 7.5
Decontamination area at a construction site
Constance Lai. November 22, 2017.

7.3: Hazardous Materials

In France and the United States, the preservation discipline is in a constant battle with decades worth – if not centuries worth – of hazardous materials, like lead, asbestos, silica, and PCB's. It is not easy to convince someone who is going to inhabit a historic building or space that the lead paint is adequately encapsulated and will not flake off the walls or that the air-borne contaminants on a construction site will be cleared to less than harmful levels once it is time to move in. As a result, there are government regulations, government agencies, entire specification sections dedicated to abatement, insurance company rules, and safety departments in construction companies, all which deal with the stabilization, removal, and setting of acceptable limits and exposure parameters (like parts per million, PPM). While in France, there is more of a general appreciation of historic buildings by the general public and acceptance that hazardous materials will inevitably be present; in the United States, the perception of old buildings as dangerous places that present seemingly inevitable health hazards has been the justification for countless instances of demolition of historic structures in their entirety.

The preservation industry on both sides of the Atlantic are at the mercy of the air testing protocols, agencies, industrial hygienists, and testing laboratories that essentially rule this part of the construction industry. The results of a laboratory analysis can be the impetus for the loss of important historic fabric – like decorative mural with lead paint – at the hands of clients who do not take cultural significance into account. At best, a positive test for a hazardous material might create a cost-prohibitive removal requirement that then forces a stabilization strategy to be implement instead, which then preserves the historic fabric in-situ. All too often, the identification of hazardous material in a historic structure is not thoroughly documented prior to construction and the location and types of hazardous materials are not coordinated adequately with the construction documents. In the end, it is always the historic fabric that suffers. What can be done to help mitigate this phenomenon? Preservationists need to learn the verbiage, regulations, and construction budget and schedule impacts that hazardous materials have.

In current practice, the newest hazardous materials to be heavily regulated are lead dust in France and silica dust in the United States. While the emphasis on "dust" might lead to the conclusion that they would be mitigated in the same manner, it is not true. In France, lead dust control on construction sites is similar to asbestos control procedures in the United States. Areas where lead dust is present and being removed are cordoned off from the rest of the construction site in "containment" areas, the persons who are performing the removal need to wear proper personal protection equipment (PPE) like respirators and Dupont Tyvek suits, and there are shower stalls that are used to remove lead dust from the body prior to exiting the containment area (Figure 7.5). In addition, there are construction sites in France where there are pools of water at the entrance/exit of the site that help to remove lead dust from the soles of special construction

boots. This process helps to keep lead dust from being tracked onto public sidewalks and being inadvertently brought to workers' homes after the work day is complete.

In the fall of 2017, the United States' federal government issued the Respirable Crystalline Silica Standard which regulates the amount of silica dust a construction worker can breathe per day. These rules are being administered through the Occupational Safety and Health Administration (OSHA). For the Historic Preservation construction industry, these rules are forcing a major change in how the use of grinders are being used on construction sites. For masonry restoration contractors, the labor cost doubles for cutting out a masonry joint since there needs to be another helper to hold a HEPA-filtered vacuum cleaner or water-to-blade delivery system. The masonry equipment industry has begun to respond to this need and is already selling grinders and drills with internal vacuums (like HILTI) at a premium. In the end, the higher cost of these tools is justified as it helps to reduce the cost of labor. It is important that the Historic Preservation community understand these new rules and how they will affect the execution of preservation projects in the future.

In the United States, the loss of historic fabric within hazardous material containment areas due to the inability of Historic Preservation specialists to enter a containment area is a story that has been repeated countless of times. The training process that is required to enter a containment area is extensive and many companies and clients will not support the request, for both cost and liability concerns. On a particular project, I was certified to enter asbestos containments only to find that I needed to enter the containment with a trained supervisor. Basically, it was too much of a liability risk to let me enter on my own. On another project, an architectural conservator was trained as a supervisor only to find that he would not be able to enter at all since he was not an employee of the company who pulled the permit with the city government. Unfortunately, the hazardous material abatement companies in the United States are usually demolition contractors, whose focus is to destroy everything on the contract documents without much thought to any historic fabric that might be hidden behind a wall or false ceiling. From the perspective of the preservation architect, it takes a lot of patience and effort to communicate to the relevant parties the importance of what is and could be discovered in containment areas.

Hazardous materials present multiple challenges to the Historic Preservation discipline, but they are not challenges that cannot be overcome. More diligent testing and planning during the design phase; more thought to potential cost and schedule impacts during the construction phase; and the ability to anticipate unforeseen conditions during construction will all help to minimize loss of historic fabric.

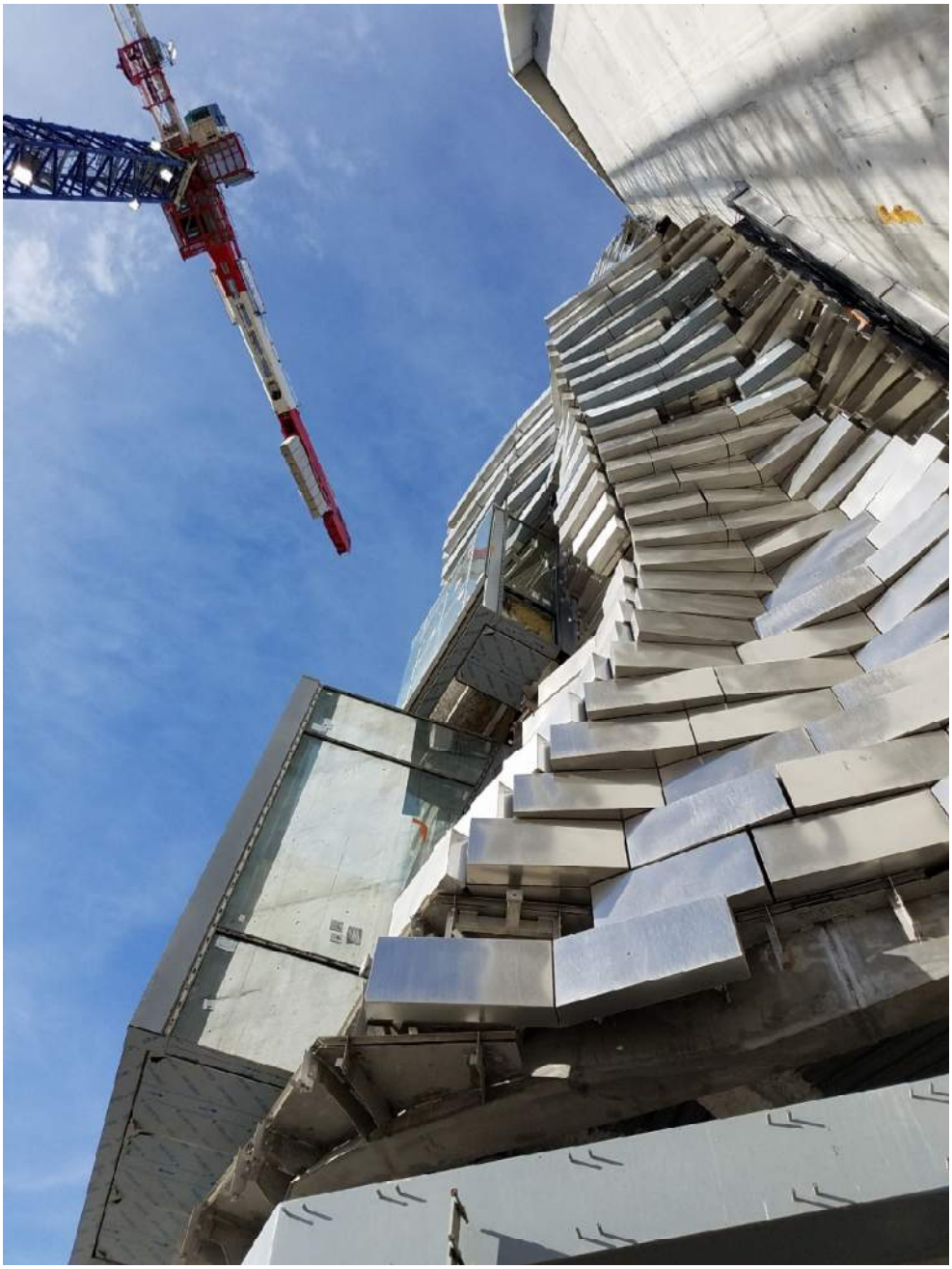

Fig. 8.1
Frank Gehry's Tower for Project Luma, Ales
Each stainless steel box is custom-fabricated from a BIM model.
A detailed quality control process was implemented by the entretien (CityNox) to achieve the specified dimensions and finish.
Constance Lai. December 22, 2017.

8: Conclusion

The quality of any given preservation project, no matter if it is in the United States or France, depends on the people who are invested in the project. From the scale of the city to the scale of the microscopic, each person who touches a project has an essential role to play to ensure that the project is the best it can be. Even when the subjective nature of the terms "quality" or "best" are acknowledged as such, there is a value in the debate itself. It is only by seeing the other point of view that one's own view becomes stronger *or* possibly – unintentionally – weaker. Yet, while these debates are rich and thought-provoking, there is another place where preservation discipline should also take cues from … the world of new construction.

On the last day of my scholarship, I had the opportunity to visit the new Frank Gehry tower that is currently under construction in Arles, France. (Figure 8.1) The quality of precision of the exterior stainless steel panels – each one being unique – was absolutely incredible. Every single ripple and every single metal bend was meticulously digitally detailed at Gehry's office in Santa Monica, California, and then relayed to the manufacturer, CityNox, who then created the electronic patterns and executed the production of the panels. This effort included a step-by-step quality control process in the factory, where a dedicated person verified and signed-off on every single bend, ripple, and attachment tolerance. Each panel was given an electronic numerical tag that tracked the panel from the factory to its location on the construction site. The worker who installed each panel could even be tracked, in order to hold each worker accountable for his own work. The preservation disciplines are not at this level of sophistication … yet. But similar quality control processes could be used to ensure that stones or bricks are re-installed in their original locations; that welds on bronze statuary are ground down flat prior to leaving the foundry; and that the installer of a piece was in fact a master and not an apprentice. It will be interesting to see these types of processes start to cross over into the preservation and conservation world.

While there is an ocean and a language separating France and the United States, there is the Internet; there is email; there is a desire to communicate and learn from each other. But in the preservation world, there always seems to be a struggle on the execution side. We need to learn from each other's mistakes and work on problems *collaboratively* in order to move the discipline forward. The gaps are not so vast that they cannot be bridged, since there is more in common than not between the practice of Historic Preservation in the United States and the practice of Conservation in France. If the new construction industry can effectively communicate (to design a tower in Santa Monica and have it built in Arles) then the preservation industry can do it too!

Appendix: Itinerary

November 20, 2017 through December 22, 2017

Date	Contacts	Notes
Nov. 20-22	**Agence de Pierre-Antoine Gatier** Pierre-Antoine GATIER, ACMH Pauline VOISIN Houssem	I spent three days observing the architecture firm, visiting construction sites, and attending a preliminary design meeting at the DECH. It was a fascinating introduction to the process of preservation architecture from the beginning of the design (projet) to the end (realization). Petit Château, Château de Chantilly Le Grande Ecurie, Château de Chantilly DECH (Département des Edifices Culturels et Historiques), Paris L'Eglise Saint Germain du Prés, Paris La Bourse de Commerce, Paris
Nov. 23-24	**Les Compagnons du Devoir, Paris** Jose FONSECA Cecil CERET Marcelle LE PORTE	Jose spent the day introducing me to the unique trade/craft educational system of the Compagnons. Cecil gave me an enlightening overview of the process required to meet government education standards. Finally, the day I spent with Marcelle included a walking tour of Paris and a primer on how to read centuries worth of French building styles. The Compagnon's motto will always stay with me: "Ni s'asservir, ni se servir, mais server" (Not to be enslaved, neither to be self-serving, but to serve.)
Nov. 27	**Les Compagnons du Devoir, Coubertin** Jose FONSECA Pascal REMY Eric GOETZ Franck HERNANDEZ	An incredible day visiting the Atelier St. Jacques. The master-apprenticeship relationship is alive and well in France. The level of craftsmanship of the trades is unparalleled. It was refreshing and inspiring to see the craftsmen work in their studios with pride and passion for their work.
Nov. 28	**Francois Chatillon Architecte** Francois CHATILLON Marion HASLE	The visit to the Palais D'Antin and the roof of Le Grande Palais was a construction tour for the press. The tour included access to the roof top (with incredible views of the city) and ended with a construction-side summary of the work being done inside of the attic spaces of the building.

Nov. 30	**Centre Scientifique et Technique du Bâtiment (CSTB)** Charlene VIGNAUD Sophie MOREAU Herve CHARRUE Isabelle LACAZE Rukshala ANTON Stephane MOULARAT Bruno MESUREUR Hafiane CHERKAOUI Frank LEGUILLON Pierre PIMIENTA Jean-Baptiste CHENE	As an architect who has worn many "hats" in my life, it was amazing to visit the laboratories at CSTB, which is at the forefront of building science technology. As my primary host, Sophie explained the current structure and relationship of CSTB within the French government and their relationship with the private sector. The remainder of the day was spent learning about the diversity of the research currently underway, from 3D GIS systems to bio-growth detection systems to building envelope enclosure software to fire-rating testing to acoustic simulations. In addition, the laboratory's responsibility to verify the quality of building materials was a fascinating aspect of the French and European building industry that we in the United States are only beginning to implement at a large scale. Special thanks to Pierre who introducing me to Dale Bentz at the National Institute of Standards and Technology (NIST) who I was able to visit upon my return to the U.S.
Dec. 1	**Basilique Cathédrale de Saint-Denis** Saadia TAMELIKECHT	Meeting Saadia was the beginning of a very important aspect of my journey. In the United States, we (myself included) have only begun using lasers to clean gypsum crusts (crute noir). However, to see the Porte Valois – where the yellowing of the stone due to laser cleaning played a key part in the decision to stop the use of lasers – was truly eye-opening. The visit solidified my resolve to ensure that the communication paths between France and the United States stay as open as possible so that we can learn not just from each other's successes, but more importantly, from each other's mistakes.
Dec. 4-9	RL&A Didier REPELLIN, ACMH h, IGMH h. Antoine MADELENAT Sixte DOUSSAU	There was nothing as magical and/or sublime as the week I spent with Didier Repellin. Whether it was driving through the French countryside to Vaux-le-Vicomte; feeling the excitement of the Lyonnais/e to see the Fountaine Bartholdi back in the Place de Terreaux; crunching through the morning frost at the Abbaye de Senanque; marveling at the multiple decorative paint schemes at the Cathedral Notre-Dame de Nazareth; experiencing the Fête des Lumières (with Brigette Scharff); or watching Didier weave a story about the Hotel Dieu to captivate an audience, whether on the expo floor of Rocalia or on a Saturday morning construction tour, there was a very palpable sense of temporal and spatial continuity … between the past and present and between the old and new that simply re-affirmed my desire and enthusiasm for preserving historic spaces and places.
Dec. 11-12	**Ministère de la Culture** Hélène RIBLET Marie-Laure PETIT Julia GARTNER-NEGRIN Celine GUICHARD Francois GOVEN Philippe HENAULT	The visit to the Ministry of Culture was a wonderful experience where my hosts taught me about how detail-oriented the French government is in their city and urban planning; the importance of the Ministry functions from the state level to the local level; the various ways the Ministry disseminates information through publications; and the importance of education (for the architects) and maintaining quality (through Ministry functions as well as through industry-led certifications).
Dec. 13-16	**Atelier D'Architecture Philippe PROST** Lucas MONSAIGNEON Phillipe PROST	The first day – spent with Lucas – entailed visiting the Nord-Pas-de-Calais Mining Basin (Bassin Minier) and observing an engaging, philosophical debate about the difficulty of dealing with such a large UNESCO World Heritage Site. The second

	Gael LESTERIN Catherine SEYERS-PROST	day was spent in Montpelier, where I visited a quiet, beautiful construction site; explored the city; and conversed with Gael about architectural education, sub-contractors, and developers in France. It was Gael who introduced me to Stephanie LETREZ (Asselin Economistes), an economiste, whose daily routine is very similar to mine, as a general contractor. I hope to explore the role of the economiste in France more someday. Finally, I visited the atelier and visited the Monnaie on a public tour led by Philippe.
Dec. 17	**La Propriété Caillebotte à Yerres** Olivier SERGEANT Valerie DUPONT-AIGNAN	A Sunday with Michele, Jose-Maria, and my mother who recorded a Chinese translation of the introduction video to the Yerres property, followed by a wonderful lunch and tour of the house.
Dec. 18-19	**Laboratoire de Recherche des Monuments Historiques** Aline MAGNIEN Thierry ZIMMER Aurelia AGEMA, Metal Isent DE KERNIER, Library Stephanie DUCHENE, Paint Mohamed DALLEL, Textile Faisl BOUSTA, Ph.D., Microbiology Myriam BOUICHOU, Concrete Claudine LOISEL, Ph.D., Stained Glass Jean-Didier MERTZ, Stone	If there was one place I wish I could have spent more time, it would have been here, at LRMH. In the unassuming stables of the Château de Champs-sur-Marne, the conservation scientists here are at the forefront of conservation research. I thoroughly enjoyed learning about all the projects, both old and new. Their enthusiasm and passion for their work will be imprinted in my mind forever, and maybe in the future, we will see a similar "research/field-applied" system implemented here in the United States.
Dec. 21	**l'Inguimbertine et du Musée de Carpentras** Jean-Francois DELMAS	Architecture is only as alive as the stories that it can tell, and there was no place that I visited that had as many stories as the Hotel-Dieu in Carpentras. Its story-teller, Mr. Delmas, was a gracious host and guided me through the philosophies and theories that were the basis for the original hospital and how they informed the new design and continue to resonate through the entire complex. The project is ambitious, inspiring, and truly visionary.
Dec. 22, 2017	**Fondation Luma CityNOX** Lionel PALIX Loic PENEL	The intelligence that is embodied in historic structures is very rarely matched in new construction. However, Loic and Lionel are part of a project – the Frank Gehry tower in Arles for the Fondation Luma – that is at the forefront of technology. It was a pleasure discussing building envelope technology, BIM modeling, quality control in the factory, and even debating the relationship of theory and practice (while marveling at the Jean Prouvé houses).