Title: Cities of the Dead: New Orleans’ Cemeteries, Their History, Their Conservation, and the Technology That Sustains Them
ID: TH263
Date: 5/12/2011
Time: 6:00:00 PM—7:00:00 PM
LU: 1 HSW/SD/LU Hour, 1.00 GBCI

Program Summary
Examine the way the people of New Orleans sustained an urban burial place above and below ground in a finite footprint and on an unstable water table. Unravel layers of history, archaeology, and fascinating material conservation and technology. These cemeteries are compelling examples of the sustainability of materials and conservation of land. They are at once open city park space and a traditional place to bury the dead. Dense multiple family plots, stacked vertically, make up this haunting and charming eternal home for New Orleans citizens. Investigate the materials used and understand the ways in which the response to their environment over time. The seminar will present a historical overview of New Orleans’ cemeteries and burial practices, conservation insights, and strategies for documentation and preservation.

Learning objective
1. Outline a methodology for analyzing and documenting historical landmarks.
2. Examine and evaluate tools for detailed surveys of structures and sites, and identify how to memorialize and document elements of architectural significance.
3. Recognize material systems and applications in the preservation of structures meant to endure centuries and not just a generation.
4. Examine and assess masonry systems, stucco, coatings, iron, epoxy cements, grouting, mortars, carbon fiber straps and other systems of historical structures in terms of material sustainability.

Provider: American Institute of Architects Small Projects Practitioners Knowledge Group

Speakers: Leonard Kady, AIA,
Organizer

Mary F. Striegel, PhD, AIC
NPS National Center for Preservation Technology and Training

Rachel Witwer,
Save Our Cemeteries

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For More Information about Cemetery Conservation:

Websites

(AGS) The Association for Gravestone Studies   http://www.gravestonestudies.org/


(Chicora Foundation) Cemetery preservation http://www.chicora.org/cemetery-preservation.html


(Save Our Cemeteries) Restorations   http://www.saveourcemeteries.org/restoration/index.htm

(The Texas Historical Commission) Historic cemeteries in Texas http://www.thc.state.tx.us/cemeteries/cemdefault.shtml

Books/pamphlets


Cities of the Dead: New Orleans’ Cemeteries, Their History, Their Conservation, and the Technology That Sustains Them

Session ID: TH263
Date: May 12, 2011
Time: 6:00 PM to 7:00 PM

Acknowledgements/Credits

The AIA Small Project Practitioners Knowledge Group
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Save Our Cemeteries
Tulane University School of Architecture

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AIA Small Project Practitioners (SPP) Event

The AIA’s SPP knowledge Group is dedicated to:

- providing content to all AIA Small Firm Architects

The SPP publishes a journal, provides seminars and knowledge resources.

The SPP hosts a yearly Small Project Award Program to recognize small project practitioners for the high quality of their work and to promote excellence in small project design.

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Getting involved with the SPP

If you would like to get involved with the SPP to provide AIA members with knowledge, contribute journal articles, program events, contribute to the awards program and represent the SPP on AIA national boards, round tables and editorial boards.

Please contact: SPP@AIA.org
AIA Networking Event: Cocktail Party

Please join us, following this seminar (7:00pm):

For a cocktail party hosted by SPP and CRAN

OGDEN MUSEUM OF SOUTHERN ART
925 Camp Street
(corner of St. Joseph street) West of the Convention Center

Learning Objectives

- Outline a methodology for analyzing and documenting historical landmarks.
- Examine and evaluate tools for detailed surveys of structures and sites, and identify how to memorialize and document elements of architectural significance.
- Recognize material systems and applications in the preservation of structures meant to endure centuries and not just a generation.
- Examine and assess masonry systems, stucco, coatings, iron, epoxy cements, grouting, mortars, carbon fiber strips, and other systems of historical structures in terms of material sustainability.

"There is no architecture in New Orleans, except in the cemeteries."

—Mark Twain, Life on the Mississippi

New Orleans cemeteries have been a fascination to visitors for over 200 years. They were written about extensively in the early 1800's and they continue make cameo appearances in new film and literary works. The cemeteries are a place of physical beauty, with monuments of stone, iron, brick and marble that rival any other iconic site for their architectural and artistic value. Each year, over 100,000 tourists, scholars and artists come to visit and study these historic sites.
Early burials in New Orleans took place in the levees of the Mississippi because of course, they provided the highest ground.

The city’s first official cemetery, St Peter Street Cemetery, was founded circa 1725. It was located in what was then the back of the city but what is now the area boarded by St Peter, Toulouse, Burgundy and Rampart Streets in the French Quarter.

St Peter Street Cemetery was a plot of swampy land, surrounded by ditches and the burials were in ground.

By 1788, St Peter Street cemetery was full and the Cabildo (the local government) started making plans for a new burial site. Since the city had grown, the new cemetery was initially a site located past the new boarders of the city, near the Carondelet Canal turning basin. Ultimately, however, it had to be moved due to unsightly issues caused by frequent flooding and
erosion.

So as a result, that cemetery was deconsecrated and subsequently, St Louis Cemetery No. 1 was founded.

The date on the cemetery gates says 1789 but research has indicated that the founding date was closer to 1796. It remains the city’s oldest extant cemetery.

The ground chosen for the cemetery was swampy and early burials appear to have been laid out in a haphazard manner but in fact the burials were laid according to the terrain. The cemetery frequently flooded during the early days.
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New Orleans Cemeteries: Cities of the Dead

St Louis Cemetery No 1 today. It’s smaller due to modern city planning. It’s located between Basin, Treme, St Louis and Conti Streets.

Looks like a city with the tombs = houses, pathways = streets.

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Why does New Orleans do what it does?

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Influences: Cultural

NOLA’s above ground burials and tombs may be unique to the United States but certainly not to the world. Such practices are common in the Caribbean, Mediterranean, Middle East and parts of Europe. New Orleans’ cemeteries are highly influenced by the French, Spanish and Caribbean cultures.

Pere leChaise - 1804
New Orleans’ development and existence is heavily influenced by its geography. The city has had a love-hate relationship with water since its inception. For New Orleans, water is both creator and destroyer.

First you will notice that the city is surrounded by water. Water, water, water, water, water.

Because of the low-lying ground elevations, high water tables and frequent precipitation, dry ground in the city’s early days was difficult to come by.

New Orleans remained restricted and isolated on the natural levee until the early 1900s when a heavy-duty screw pump was invented that allowed for water drainage.

- Ref: Association of Environmental and Engineering Geologists.
  http://www.aegweb.org/i4a/pages/index.cfm?pageid=3964
New Orleans also must contend with severe weather. Since 2005, New Orleans has been synonymous with Hurricanes.

In addition to the destruction (The floods.) The flood waters that inundated New Orleans carried a mixture of soil, sewage and industrial contaminants. When the flood receded, it left behind a layer of sediment -- in some places up to 4 inches thick. Sediment contamination by certain substances, such as arsenic and diesel fuel, was widespread.

Therefore, burials in such an environment must be able to withstand frequent rainfall and flooding. Indeed the city’s historic cemeteries have withstood hurricanes and flooding for over 200 years...and have weathered well.
By the mid-1800’s, psychological attitudes about death had changed. Before that time, death was widely feared and its causes unknown. Common burials were in mass graves with only the most prominent people receiving any kind of marker or monument. By the 1800’s, ancestors were honored and cemeteries became more for the living, resembling parks, etc.

Reuse of space was important, especially in a city where dry land was at a premium.


In spite of their historic and cultural importance, many of New Orleans’ cemeteries are in disrepair and in danger of falling into ruin.

Neglect, vandalism, theft, deferred maintenance and improper restoration all contribute to their current condition.

Seven of the cemeteries are operated by the City of New Orleans and the others are owned and operated by churches, fraternal organizations or private, for profit corporations.
The tombs within the cemeteries are owned by individuals and families.

By and large, it is the responsibility of the cemetery operators to maintain the common areas of a cemetery, while individuals and families are expected to maintain their respective tombs and plots. Unfortunately, some operating entities and families lack the financial resources, knowledge or skills to maintain and preserve these sites and structures.

Also, things are changing. Tomb building is becoming more of a business and less of a craft.
So, what is left of the historic cemeteries must be properly preserved and protected.

New Orleans cemeteries are cities within a harsh urban environment that can teach us about sustainable practices.

These cemeteries are compelling examples of the sustainability of materials and conservation of land.

- New Orleans cemeteries are a dense necropolis that used every inch of space. Materials chosen where intended to last an eternity.
Architectural conservators can help interpret the knowledge gained from the study of cemeteries.

- Architectural conservators are trained to understand the materials, history and architectural designs of our built heritage.
- Cemeteries can serve as microcosms of preservation issues because they incorporate:
  - Landscape issues
  - Archeological issues
  - Built structures
  - Materials Issues
- Interventions used in cemeteries have applicability in the built environment.

Semi tropical climates, high water tables, natural disasters, and space limitations made burials of the dead difficult throughout the history of New Orleans.

Photo by Liz Roll, FEMA Photo Library, Accessed 05/03/2011.
The inhabitants of the city adapted and used materials best suited to their harsh environments.

Space was a premium and above ground tombs were constructed to maximize vertical space. Above ground tombs also prevented problems associated with the high water tables in a city below sea level. The St. Louis cemeteries tended to grow up in the marshlands not suitable for other development and away from populations.

Previous generations of craftsmen used the materials that they had available nearby. Lime could be created from burned shell. Shell lime production were available until recent years. Sand and lime created soft mortars used in the masonry. Failure of the mortar was expected before failure of the low fired brick. Use of hard cement mortars such as Portland cement can
cause the loss of brick before the loss of the mortar.

- Brick tombs were often finished with a breathable lime stucco. Subsequently, lime washes in a variety of colors were applied to the surface.
- Earth elements were used as pigments because of their stability.

Lime stuccoes are:
- Chemically stable
- Moisture Permeable
- Flexible
- Small cracks are self healing
- Visually appealing
- Time tested
Lime Washes

- Robin Ware lime washing mausoleum at St Louis No 1.
- Lime washes are made up of lime and water. They are often the consistency of skim milk.
- They are applied in multiple coats result in a luminosity seldom found in other finishes.
- It is not unusual to see 5-15 coats of lime wash.
- Moreover, they have a certain ability to “self-heal” from marring.
- Lime washes provide some antiseptic properties due to their high pH.

Lime wash preparations

- Lime washes were applied in a time when materials were relatively inexpensive and labor was cheap.
- Preparation of the surface
  - The surface must be moist so that it doesn’t pull moisture from the lime wash
- Today, labor costs for the multiple coats needed are the limiting cost factor.
- Here we see Jessica Cleaver dampening mausoleum at Lafayette Cemetery No 1 prior to applying a new lime wash.
Basic lime wash recipe of lime and water was used because anyone can mix it. Additives to lime wash become more complex and there is more room for error. Additives, such as salts or sugar, were often mixed into the lime wash to slow the carbonation rate and allow for a more durable surface finish.

- Here we see the use of field stone to create the double tomb.
- It is unlikely that the stone was found regionally.
- The uniformity of color indicated stone quarried from one source.

- The rich quality of white marble cannot be mistaken for other materials.
- Marble was a favored stone for memorials because of the way in which it could be delicately carved by hand and the seeming durability of the stone.
- Note how the vertical emphasis of the tomb can be seen repeated in the complexity of the surrounding iron fence.
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- Granite’s hardness makes it a long lived material that has found favor in contemporary cemeteries.
- Granite was used in cemeteries after the development of pneumatic tools to engrave and carve the stone.
- It’s hardness hinders elaborate carvings.
- Granites are susceptible to salt deterioration.

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- Air pollution, the result of burning fossil fuels, produces sulfur dioxide that can interact with calcareous stones such as marble or limestone.
- The interaction results in gypsum crusts that tend to build up in sheltered areas and are washed away on exposed surfaces.
- This results in the melting appearance that can be seen here.
- Also, Microorganisms can feed on air pollution and result in biological attack on the stone.
- This type of deterioration of marble would not have been seen or expected in previous centuries.
Sculptural elements can be found throughout the New Orleans Cemeteries.

On the left we see the results of an inappropriate repair using hard cement mortar.

On the right, is an overview of the tomb on which the urn is placed.

Note that one urn on the base of the tomb should be seated on a base and may not be part of this tomb.

Here we see the before and after of a tomb with ornamental fence in St. Louis Cemetery #2.

In the before photograph we can see both cast and wrought iron elements as well as the use of case zinc pieces.

Zinc was frequently used to cast finials and ornamental elements in the fences. It has a low melting point and is easily cast.

Zinc quickly oxidizes to the bluish surfaces seen here. Most often the fences were painted and there was no distinction between the iron and zinc ornamentation.

Because Zinc is a soft metal, it can be more easily bent or broken.
• Wrought iron designs result from heating iron rods then working them with a series of tools to create designs which tend to be more linear in form.
• Owner Darryl Reeves is a self-taught blacksmith that specializes in wrought iron preservation in New Orleans and original wrought iron creations. He is skilled in a variety of iron working techniques.
• On the right we see a lyre element found in St. Louis Cemetery #2.
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- Cast iron uses molds to create more ornamental designs found in fencing and finials.
- On the left, Reeves shows a cast iron shell form along with the original mold.
- Reeves designs replacement parts for ornamental cast ironwork in New Orleans, but the casting are no long poured in the state.

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- Conservation of iron work is usually a four stage process.
- In preparation of preservation, the surfaces of other areas are covered with protective plastic. Then the iron surfaces are gently cleaned using small wire brushes to remove loose rust.
- Next the iron is treated with chemical rust converters to stabilize the surface.
- Once the rust converter has dried and set, a primer is painted on the metal.
- Finally, a protective paint coating is applied. While we commonly think of the ironwork as black in color, other colors such as green, white, or bronze may have been found in the cemetery.
Condition Assessments

- Condition assessments are the starting place for most cemetery preservation efforts.
- When resources for preservation efforts are limited, there is a balancing that must be done between documentation and actual treatments.
- Development of a master plan is critical to future efforts.
- Condition assessments allow us to better understand how materials behave over time.
- It allows us to identify major deterioration agents and use that information to develop appropriate conservation treatments.

Ways to gather information

- Delesia Hill performing assessment of mausoleum at St. Louis No 1 before limewashing.
- Information needs to be gathered systematically.
- A variety of cemetery documentation forms exist.
- Forms should be tailored to the individual needs of the project, based on scope and size of the project.
- Information can be gathered on paper forms then entered after field work.
- Alternately, information can be entered directly into custom databases using handheld devices, smart phones, or laptop computers.
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Types of Information:
- Burial information
- Grave description
- Landscape info

- The information recorded serves as a snapshot in time
- Record of Cemetery Conditions
- Burial information tells one about the individual person and the culture they lived in
- Grave description helps one to understand how the grave site was constructed and documents unique features
- Landscape information allows us to understand the site.
- Historical Documentation (primary resources)
- Evaluation of Safety Issues
- Source of information for developing work specifications
- Source of information for developing cost estimates

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Document conditions

- Conditions document requires a range of knowledge including an understanding of materials, construction styles, surface finishes, and basic methods of deterioration, among others.
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- Map information can be computerized and combined with other types of information into a geographic information system.

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- Linking location data with burial information and existing conditions allows one to
  - Study the evolution of the cemetery over time
  - Plan emergency stabilization
  - Triage monuments and memorials for treatment

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Photo documentation is one of the best methods of capturing the conditions of the grave marker or tomb.
Important to capture additional information in the photograph. Note the detailed info on the board along with scale and color card.
Laser Scanning can accurately document the three dimensional surface of a monument of tomb. The technique can be used to scan streetscapes, such as the San Antonio River walk.

Scanning requires major computer power and processing time. Laser scanning is not a simple automated process. Laser scanning requires a direct line of view and cannot record what it cannot see, e.g. the top of monuments or areas where objects impede each other.

Accurate CAD drawings that meet the Historic American Buildings Survey standards have been generated for some tombs in New Orleans Cemeteries. These drawings allow us to understand changes in the condition of the tomb over time.
A variety of instrumental techniques can be used to document the conditions of a monument. Here we see the use of a portable colorimeter. This instrument allows us to determine the color of the surface and to measure changes that may be caused by subsequent treatments to the marble.

- Jason church uses a portable digital microscope to look at the microstructure of the deteriorating marble of this monument.
- Visualizing the microstructure at 140 X magnification allows us to differentiate between pollution caused decay and biological decay

- Jason Church takes an X-ray fluorescence spectrogram on a fence in St. Louis Cemetery #2.
- This X-ray fluorescence analyzer can identify chemical elements that are present on the fence and enables us to identify pigments.
• Brian Robinson using boroscope to investigate wall around Lafayette No 1
• Boroscopes allow small cameras to be placed inside structures for evaluation of internal conditions.
• The information can be used to identify potential damage and material failure that is not intuitively obvious from the exterior.

(How do you prevent subjective choices like color changes. The Creole used bright colors and now everything is muted (Rome used to be ochre until it was restored to white and beige for the jubilee).

Through paint analysis we can look at the striations of paint materials used over time. This allows us to determine original materials used including color schemes and understand changing aesthetics over time.
• The gathering of information through condition assessment, documentation, and analysis is intended to inform a master plan for cemetery preservation.

• The master plan includes:
  • Conservation plan
  • Maintenance plan
  • Emergency Response plan

• The conservation treatment plan includes establishing priorities:
  • Health and Safety First: Identify unstable grave markers that present hazards to people
  • Evaluate sites and landscapes for erosion and hazards

• Establishing priorities continued:
  • Addressing vandalism.
  • Determining historic significance.
The National Center for Preservation Technology and Training works towards informed treatments through laboratory testing to field trials. For example, here we see on the left an evaluation of intermittent water misting as a cleaning method for fragile marble. On the right, we see the treatment applied to a monumental marble grave marker.

- Reversibility
- Durability
- Strength factors
- Epoxies
  - Migration issues
  - Modulus of elasticity
  - Water Permeability issues
- Pinning issues:
  - Material choice: Nylon, Stainless Steel, Carbon Fiber, and others
  - Smooth or threaded: Need a “Bite” to the rod for long term stability
  - Strength of material to be repaired: Don’t want pins significantly harder than material
  - Must have sufficient material to pin compared to the size of the pin
  - Possibility of new breaks
• Don’t remove original surfaces
• Don’t use bleach or other salt laden cleaners
• Don’t power-wash with high pressures
• Don’t sand blast or use harsh mechanical methods such as power tools
• Don’t use strong acids or bases
• Do No Harm
• Do select the gentlest cleaning method to accomplish the task
• Do perform small tests before cleaning the entire stone
• Do follow manufacturers’ recommendations
• Do follow manufacturers’ safety guidance
• Do exercise patience.

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Alignment
Nylon Rods
Climate change can threaten our cultural heritage.

- Climate change may be leading to stronger storm systems, rising sea levels, and greater temperature extremes.
- When a disaster strikes a cemetery:
  - Remember that response is a step by step process.
  - Take a deep breath and understand that the damage is already done. Don't rush your response. Make informed decisions so that well-meaning efforts don't cause more damage.
  - Identify the hazards. Make sure that unstable tree limbs and monuments are identified and roped off or flagged. Before work begins, note any holes, downed wires, and disrupted insect nests such as ants, wasps, bees, etc.
  - Stabilization may be needed to prevent grave markers from toppling. This can be done using wood timbers and clamps.
  - Do not discard monument or fencing material until it has been properly assessed and documented. These materials may be reusable to make repairs. A rapid assessment form is one of the links below.
  - Volunteers can assist in written and photographic documentation of the damage. They can help remove small tree limbs so that damage can be more thoroughly assessed.
  - Professionals who are sensitive to working in and around historic features should remove the trees. As you know, tree removal can be a dangerous...
undertaking. Professionals are recommended. This is not a job for volunteers.

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Historic Cemeteries teach us valuable adaptation lessons for the future.

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Architects and Conservators must work hand in hand to better understand our built environment.
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Where to Learn More...
- Save Our Cemeteries, http://www.saveourcemeteries.org
- Tulane University, http://architecture.tulane.edu/programs/mps-masters-in-preservation-studies
- National Center for Preservation Technology and Training http://www.ncptt.nps.gov
  - Online Resources
  - Videos
  - Webinars, Conferences, Workshops

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Where to Learn More...
- Campbell Center, http://www.campbellcenter.org
- National Preservation Institute, http://www.npi.org

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Evaluation
Speakers
A list alphabetically by last name regardless of speaking order
- Leonard Kady / session coordinator
- Mary F. Streigel
- Rachel Witbear
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