

Re·Presenting Water

Maria Suzette Bernardo Paulino

thesis submitted to the faculty of the
Virginia Polytechnic Institute And State University
in partial fulfillment of the requirements for the degree of

Master of Architecture
in
Architecture and Urban Studies

Marcia Feuerstein, committee chair
Paul Emmons, committee member
Susan C. Piedmont-Palladino, committee member

copyright © 2010 maria suzette paulino

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission from the copyright owner.

9.15.10
Alexandria, Virginia

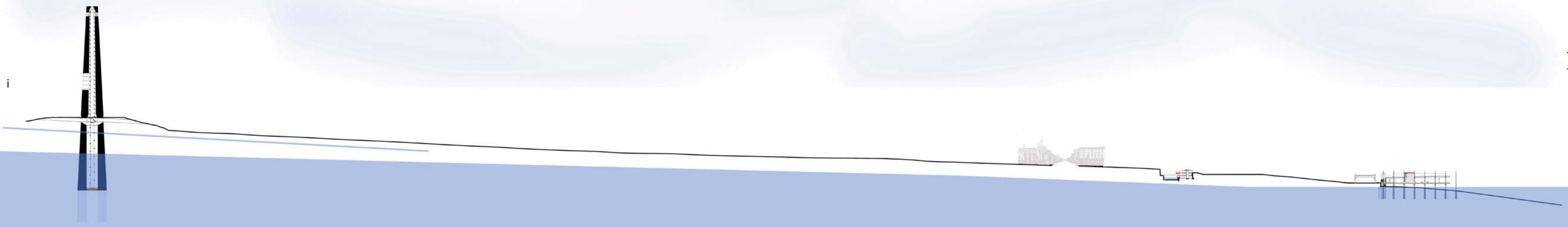
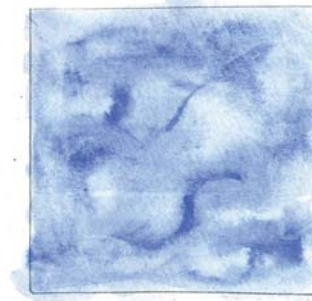
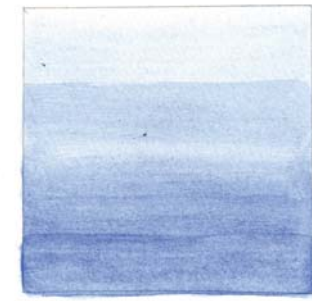
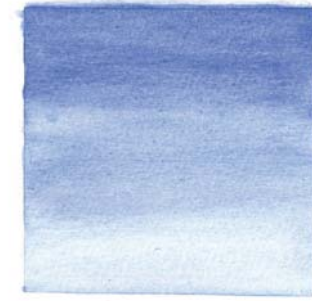
keywords: water, memory, flow, re present



contents

abstract	i
list of figures	iii
introduction	1
RESEARCH	14
MASTER PLAN	35
OBSERVATION TOWER	38
VISITORS CENTER	88
WATER TAXI TERMINAL	136
WISCONSIN AVENUE	175
final thoughts	178
bibliography	180
acknowledgements	181

The following thesis is an exploration into the influence that water has on the urban landscape and architecture. This project consists of three buildings that are connected to water. This water flows differently at each site; one is constantly churning, another is highly controlled, and the last is no longer there but it once was slow and steady. In each instance the landscape and the architecture are reactive to the water and as a whole the project re-presents the origins of the city.



1. Hutton, Wm. R. *Metropolitan Railroad*. 1855. Library of Congress Geography and Maps Division.
2. Smith, William Morris. *Washington, D.C. Georgetown waterfront with sailing vessels, seen from Mason's Island*. 1865. Library of Congress Prints and Photographs Division.
3. Parkyns, George Isham. *View of the Suburbs of the city of Washington*. ca. 1795. Library of Congress Prints and Photographs Division.
4. Russell, Andrew J. *Potomac River, looking down from Georgetown, showing Mason's Island, Long Bridge, &c.* 1861-1865. Library of Congress Prints and Photographs Division.
5. *Georgetown Waterfront*. 1923. Library of Congress Prints and Photographs Division
6. *Historic American Buildings Survey AQUEDUCT BRIDGE, PLAN OF 1841 Senate Document 178*. 1841. Library of Congress Prints and Photographs Division.
8. G.W. & C.B. Colton & Co. *Fredricksburg & Gordonsville Railroad*. 1869. Library of Congress Geography and Maps Division.
9. *C&O Canal from Wisconsin Avenue Bridge, Georgetown, Washington, D.C.* 1890-1940. Library of Congress Prints and Photographs Division.
10. Detroit Publishing Co. *Along the towpath, C & O Canal, Washington, D.C.* 1910-1920. Library of Congress Prints and Photographs Division.
11. *Historic American Buildings Survey 1967 SKETCH PLANS AND MEASUREMENTS OF GATE, LOCK #2*. 1967. Library of Congress Prints and Photographs Division.
12. *C & O Canal*. 1925. Library of Congress Prints and Photographs Division.
13. Russell, Andrew J. *Aqueduct Bridge, Georgetown, D.C., looking toward Washington*. 1861-1865. Library of Congress Prints and Photographs Division.
14. Bowen & Co. *Maps of the Washington Aqueduct, Md. and Washington D.C.* 1864. Library of Congress Geography and Map Division.
15. Goode, James M. *Capital Losses: A Cultural History of Washington's Destroyed Buildings*. Washington : Smithsonian Institution Press, c1979. p 353.
16. Sanborn Map Company. *Insurance Maps, Washington D.C.* New York: 1928
17. Sanborn Map Company. *Insurance Maps, Washington D.C.* New York: 1999
18. Sachae, A. *The National Capital Washington City, D.C., Bird's Eye View of Washington City*. Baltimore: A. Sachse & Co., 1884.
19. E. Sachse & Co. *Aqueduct of Potomac, Georgetown, D.C. / drawn from nature by F. Dielman ; lith. by E. Sachse & Co., Baltimore*. c. 1865. Library of Congress Prints and Photographs Division.
20. *Historic American Buildings Survey POTOMAC AQUEDUCT: PROJECT House Document 459*. 1838. Library of Congress Prints and Photographs Division.
21. *Potomac Aqueduct*. c. 1865. Library of Congress Prints and Photographs Division.
22. *Potomac Aqueduct Piers*. c. 1940. Library of Congress Prints and Photographs Division.
25. "Washington D.C." Google Earth. 15 Dec. 2010. <<http://maps.google.com/maps?hl=en&q=georgetown+dc&um=1&ie=UTF-8&sa=N&tab=wl>>
32. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1913. Library of Congress Geography and Map Division.
33. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1945. Library of Congress Geography and Map Division.
38. Orvieto, Italy. Personal photograph by Elizabeth Sumner. 1999
39. Orvieto, Italy. Personal photograph by Elizabeth Sumner. 1999
40. *Anish Kapoor Exhibit*. Dec. 2009. <<http://www.dbartmag.com/en/58/feature/anish-kapoors-memory-at-the-guggenheim-museum-in-new-york/>>
41. *Anish Kapoor – Memory*. Online posting. 23 Oct. 2009. Horse Think. Dec. 2009 <<http://horsethink.com/?p=2999>>
48. Tucker, Alex. *The Georgetown, canal freight boat, on the C&O Canal*. 5 Apr. 2006. Flickr. 12 Dec. 2010. <<http://www.flickr.com/photos/47515270@N00/2668222508>>
52. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1929. Library of Congress Geography and Map Division.
53. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1931. Library of Congress Geography and Map Division.
56. Beltramini, Guido and Italo Zanmer. *Carlo Scarpa: Architecture and Design*. New York: Rizzoli, 2006. p 163
57. Beltramini, Guido and Italo Zanmer. *Carlo Scarpa: Architecture and Design*. New York: Rizzoli, 2006. p 164
62. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1909. Library of Congress Geography and Map Division.
63. Baist, G. Wm. *Baist's Real Estate Atlas Survey of Washington, District of Columbia*. 1954. Library of Congress Geography and Map Division.

* all images, sketches, and illustrations were created by the author unless otherwise noted.

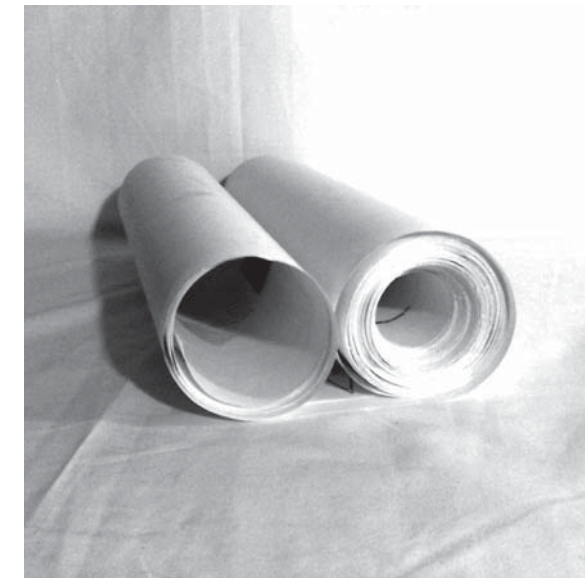
Georgetown is one of the oldest areas of our Nation's capital and its location on the Potomac River was highly intentional. Today, when visitors come to Georgetown they see retail shops on M street and affluent neighborhoods. There is little known about the influence that water has on the siting of Georgetown and waters invaluable contribution to its industrial and eventually its commercial industry.

My intent is to understand the history of a place and re-present it in my architectural decisions. I have lived in the Washington DC area most of my life and as a child Georgetown was always my favorite part of town. If you put aside vanity, Georgetown is beautiful because of its dramatic topography and its proximity to the water. Why is it different from the rest of the city?

In my research I discovered that water was vital to Georgetown, but today it is hardly apparent. M Street is the main thoroughfare in Georgetown and because of the Whitehurst Freeway, most pedestrian views from M Street down to the water is impeded.

Another area in Georgetown that is hardly seen is the Chesapeake and Ohio Canal. It was once a busy waterway, but today it is appreciated. The National Park Service maintain the canals out of a small office in the basement of a row house. They are in need of more space to show all their collection of artifacts. It is evident that Georgetown needs to reconnect with its past.

Garret Ekbo wrote that landscape architecture "is at one time and the same time a generalization of the past, a vitalizer of the present and a projection of the future (Swaffield)." I believe that this same thought can be applied to architecture. Some might say that Georgetown is finished, there is no more room for development. But change is the one constant in nature and in order for Georgetown to develop any further it has to acknowledge its past.



Earlier writers adopted static, dualistic meaning to LA.
"nature and culture or formal and informal" p. 5

Interpretation: is the opposite of nature really culture?

Landscape for Living · Gaarett Eckbo · 1950

"Theory is a generalization of social experience..." p 9

Interpretation: in any discipline it's an understanding of past experiences.

"It is at one time and the same time a generalization of the past, a vitalizer of the present and a projection of the future." p 9

Interpretation: statement is referring to the theory of Landscape Architecture but I believe it can be interpreted and applied to Architecture.

to understand what I am going to do, I have to know the past, and the future is embodied in what I do at the present.

Each step forward - technically, culturally, socially is an idea (theory) that "has come about through this process of analysing the past in the present toward the future." p 10

How to study Landscape · JB Jackson · 1980

"... the dwelling is not only the most important element in the landscape but is the key to understand all other elements in the landscape: the social order, the economy, the natural resources, the history, the culture." p 14

Interpretation:

JB Jackson's definition of DWELLING: a home, residential

Normberg-shultz's definition of DWELLING:

- 1.) to meet others for exchange of products ideas and feelings
- 2.) to accept values a set of common values
- 3.) having a small chosen world of our own.

Theory in Landscape Architecture: A Reader
Simon Swaffield

Introduction "Landscape theory is specific, not general. Like Feminist criticism, landscape architecture design and theory are based on observation, or that which is known through experience, or the immediate and sensory - that which is known by all the senses, not only visual. Thus landscape architecture theory is situational, - it is explicitly historical, contingent, pragmatic and ad hoc. It is not about idealist absolute universals. It finds meaning, form and structure in the site as given."

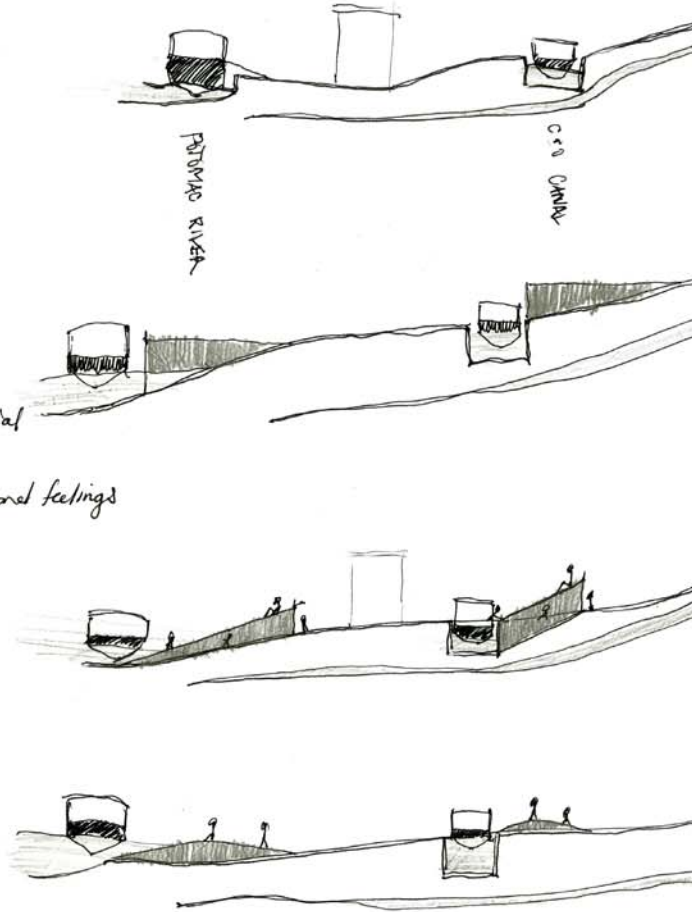
-p. 2 Meyer, "Landscape Arch. as Modern Other"
pp 30-31

Interpretation:

observation based, known through experiences (senses)

situational: historical, pragmatic, ad hoc
form and structure is influenced by site

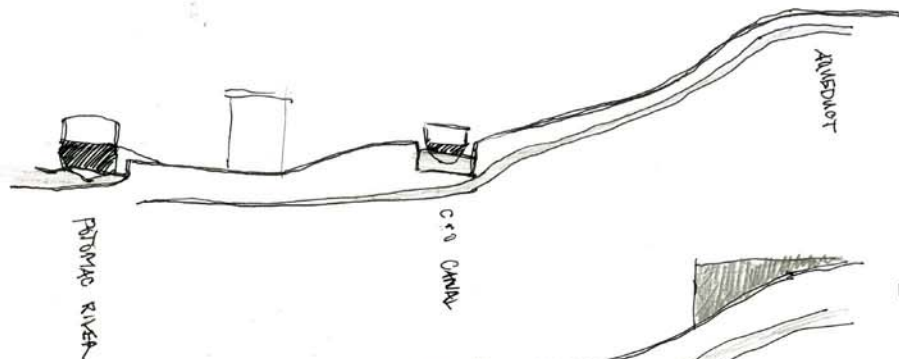
EXISTING CONDITIONS



To collect my thoughts linearly, I kept all of my notes and sketches on a continuous roll of paper. This allowed me to clarify my line of thinking, while also telling the whole story of my project.

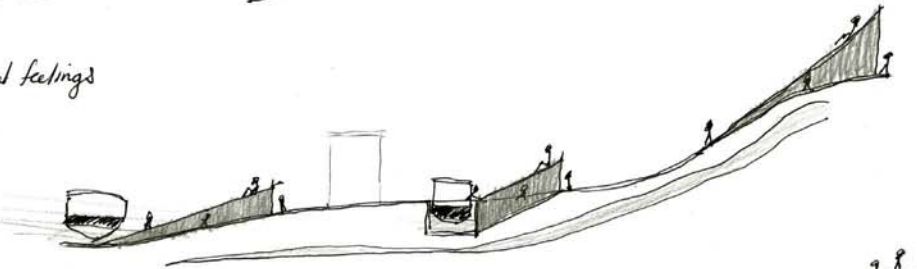
ROLL: The following notes are from readings that influenced my designs.

EXISTING CONDITIONS

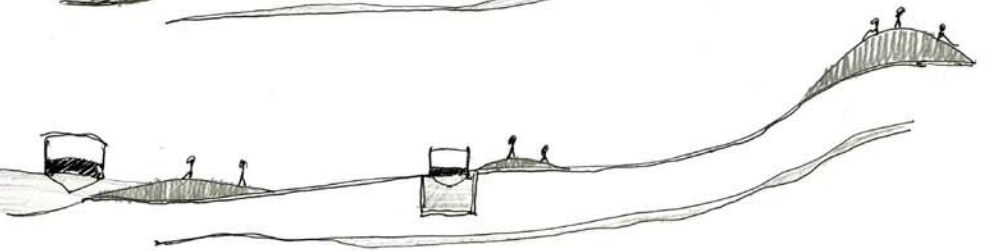


Walls: barriers as thresholds allow for a barrier to water but does not meet here a connection to water (stand off)

and feelings

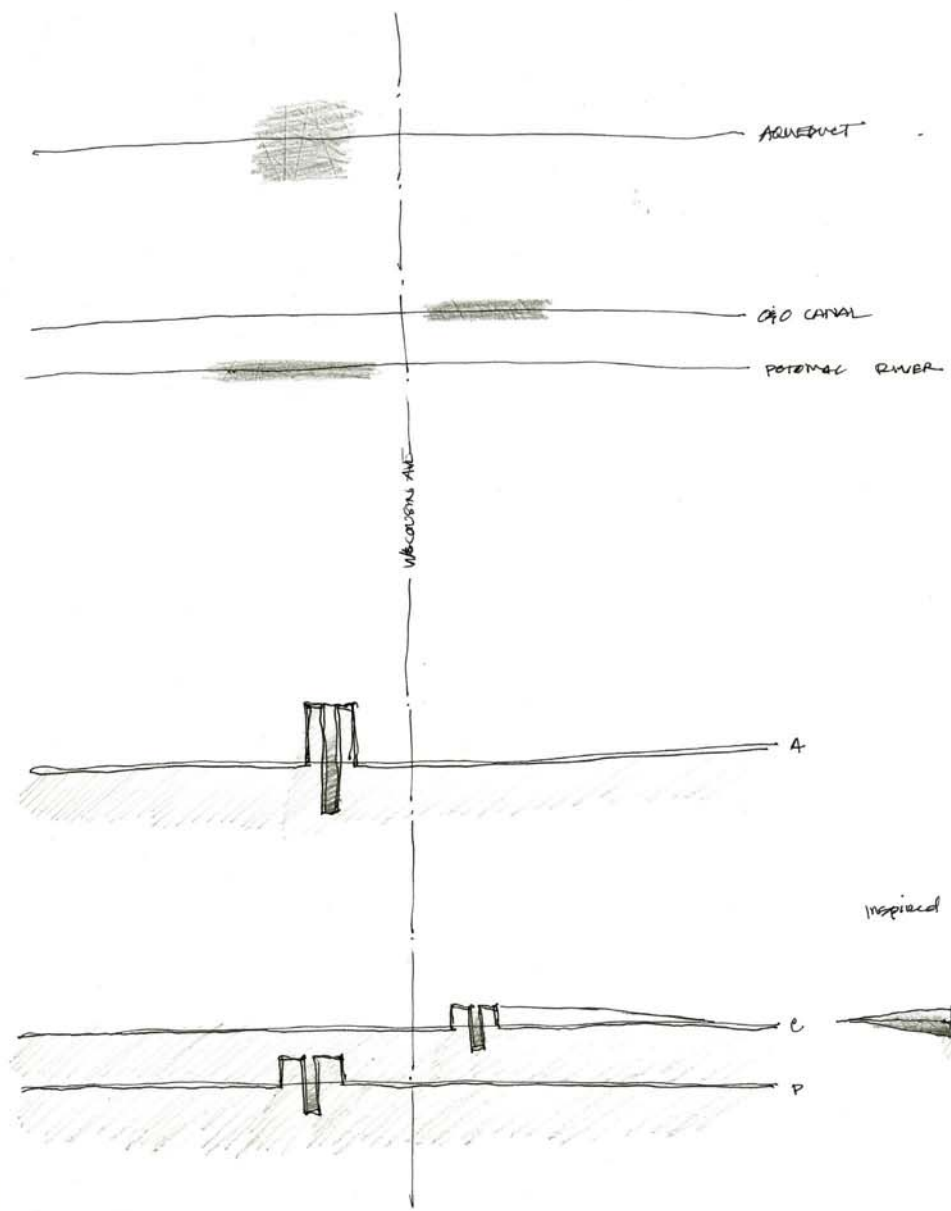


Tapered/Inclined: allows for interpretations of light and habitation.



Burns/Mounds: naturally pleasing but unworkable

ROLL: The sketches above are the beginnings of my site analysis. I was trying to understand how each site could be tied together. Ultimately, I discovered that they each crossed Wisconsin Avenue.



All LEVELS OF WATER: each level is as much about the above ground as below ground. The Aqueduct is less than the others, but it has the potential to be revealed above ground.

Inspired by Galfetti: Rising from the dark to emerge into the light and rejoin in water.

I do
"Seeing"

similar to these drawings that info of understanding

"I draw because I want to see"

- Carlos Scarpa

"Seeing with the hand."

- Glenn Karcott

similar to these architects I want to make drawings that inform and reveal ideas and ways of understanding that is not quite apparent.

How do we see what is not seen?

A process of re-seeing

REVEAL ⇒ REPRESENT ⇒ RE-PRESENT
To show again.
In a different light.

Robin Evans; "Translation from Drawing to Building" (1997)

"To translate is to convey. It is to move something without altering it" p. 154

"... seeing is forgetting the name of the thing one sees." p. 155 (Paul Valéry)
- seeing anew, with different eyes and so the subject no longer is what it was.

"... drawing as a function of projection"

elements require:
a source of light
a subject upon which it plays
a surface behind the subject
p. 163

"... because without drawing there could be no architecture." p. 164

"... she conceives; he does" p. 164

Diboutades... is held to exist prior to its representation. this is not true of architecture, which is brought into existence through drawing." p. 165

[drawing ⇒ existence vs. existence ⇒ drawing]
ARCHITECTURE ART

"Words are such correspond to stand as proof example"

"What comes out Architecture has an attempt to both meaning through drawing"

what is essential

"Words are such powerful things, and ^{when} they correspond to visual impressions... they may reasonably stand as proof." p 175

example: Royal chapel, Arret by Philibert de l'Orme 1547-52
the dome is projected to the floor but not exactly. Translation was not complete

"What comes out is not always the same as what goes in. Architecture has nevertheless in which been thought of as an attempt to at maximum preservation in which both meaning and likeness are transported from idea through drawing to building with minimum loss." p 181

What is essentialism?

"Things are supposed to degrade as they move from idea to object." p 183

"... neatness is a sign of civilization." p 185

vs.
"...unpremeditated and unregulated as signs of art and feeling." p 185

JOHN RUSKIN, The SEVEN LAMPS of ARCHITECTURE

The Lamp of Memory (pp. 176-177)

(architecture personified) "we can not remember without here" p 178

"... conquerors of forgetfulness of man, POETRY and ARCHITECTURE." p 178

"... not only what men have thought and felt, but what their hands have ~~not~~ handled, and their strength wrought, and their eyes beheld." p 178

Duties of national architecture p. 178

- to render the architecture of the day, historical
- to preserve, as the most precious of inheritances, that of past ages

"... in becoming memorial or monumental that a true perfection is attained by civil and domestic buildings..." p 178-9

"... to build our dwelling with care, and patience, and fondness, and diligent completion, and with a view to their duration at least for such a period..." p 181

"In public buildings the historical purpose should be still more definite." p 183

"Better the modest work that tells a story or records a fact, than the richest without meaning. There should not be a single ornament put upon great civic buildings, without some intellectual intention." p 183

"They may look to posterity as an audience, may hope for its attention, and labour for its praise." p 185

interpretation: Build for the future ←

"... the farther desire to be a laboured for, of our success

"Men cannot be can benefit the pulpits from there is none +

"When we build, be for present will be held sa

"See! this ~~is~~ our

Law of good & we sacrifice that the impres

interpretat
copp
ston
wake
See

"... the farther off we place our aim, and the less we desire to be ourselves the witness of what we have laboured for, the more wise and rich will be the measure of our success." p 186

"Men cannot benefit those that are with them as they can benefit those who come after them; and of all the pulpits from which ~~man~~ human voice is ever sent forth, there is none from which it reaches so far as from the grave." p 186

"When we build, let us think that we build forever. Let ~~us~~ it not be for present delight, nor for present use alone;... stones will be held sacred because our hands have touched them. p 186

"See! this ~~is~~ our fathers did for us." p 186 ←

Law of good composition under any circumstances:
we sacrifice no enduring quality
that the building shall not depend for its
impressiveness upon any thing that is perishable. p 187

interpretation: Materiality of endurance

Copper
stone
water
steel

Restoration: "a destruction out of which no remnants can ^{be} gathered: a destruction accompanied with false description of the thing destroyed." p 194

"... but do it honestly, and do not set up a lie in their place." p 196

Care of an old building:

"Count its stones as you would jewels of a crown; set watches about it as if at the gates of a besieged city, bind it together with iron where it loosens; stay it with lumber where it declines; do not care about the unsightliness of the aid: better a crutch than a lost limb; and do this tenderly and reverently, and continually, and may a generation still be born and pass away beneath its shadows." p 196

concrete is held together by water



G3841
.P3
1855
.H8
RR 460

1. This map of the Potomac River from 1855, shows the tributaries and major landmarks of that time.



2. Georgetown waterfront ca.1865

There are several stories as to why it is called the Potomac River. One account is that it means “place where people trade” or “the place to which tribute is brought”. The lands that are now Georgetown were owned by George Gordon and George Beall, many believe that it was named after them while others believe that it was because it was founded during the reign of King George II.

Located just below the fall line, Georgetown was positioned on the Potomac because it was the farthest that a seagoing vessel could navigate. Consequently, it is also where salt water and fresh water meet. This brackish water is ideal for preserving the piers that would one day support the docks that lined the shores. Georgetown was founded in 1751, when Maryland purchased the land from Gordon and Beall. It became part of the District of Columbia on June 1, 1871.

The Georgetown waterfront has a long history as an industrial area. Products included: flour, cement, soap, and lumber, which all later contributed to the contamination of the Potomac River and the Chesapeake and Ohio Canal.

The McMillan Plan of 1901 recognized the importance of the waterfront areas of Washington, but Georgetown was not part of the rehabilitation of the city. Plans for cleaning up the waterfront were still overlooked when the supposedly temporary Whitehurst Freeway was built in 1949, which ultimately separated the city from the water.

The Georgetown Historic District, which was created in 1967 propelled the revitalization of the area. In 1980, the National Harbour complex in Georgetown near the Potomac River, was built on land previously owned by the CSX Railroad. The Georgetown Waterfront Commission was formed in 1996, with the intent to build a park and transfer it to the hands of the National Park Service. Eventually, the waterfront park would link to other parks leading to the National Mall.

3. This image depicts Georgetown ca. 1795, as a suburb of Washington DC.

4. This photograph taken between 1861 and 1865, shows Georgetown as a thriving port.

5, 6, 7. These images compare the development of the Georgetown waterfront from 1923 to 2011.



3.



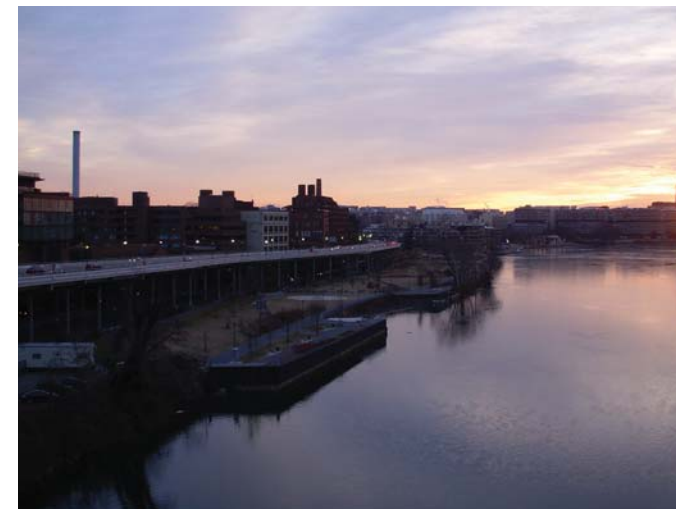
4.



5. Georgetown in 1923



6. Georgetown waterfront sometime after 1949



7. Georgetown in 2011



chesapeake & ohio canal 20

8. This map shows the full extent of the Chesapeake and Ohio Canal by 1869.



9. Chesapeake & Ohio Canal and industrial plants, 1890-1940

Before the railroads came, water was the primary method of transporting large amounts of goods. George Washington dreamed that the marsh lands of the Capital would be navigable. In 1799, men began to dig 5 canals to circumvent the Great Falls further up the Potomac River and traverse the marshy areas near the Capitol.

By the 1820's the Potomac became filled with silt and industrial waste. City founders, inspired by the Erie Canal, decided to build a canal to transport goods further up the Potomac River Valley. The Chesapeake and Ohio Canal was begun in 1828 and was in construction until 1850 when the company went bankrupt due to competition from the railroads and flooding. In 1843, the Aqueduct Bridge and canal were built to connect the canal system to Alexandria. Designers intended this to be part of a larger system through the Alleghenies and the Ohio River Basin.

The Baltimore and Ohio Railroad eventually bought the canal and sold it to the National Park Service in 1938. The final length of the canal is 184.5 miles and consists of 74 locks.

10. Barges are pulled by donkeys along a tow path that runs next to the canal. In this image the path runs under Wisconsin Avenue.

11. This sketch shows the size of the timbers that make up the locks on the canal.

12. At times the locks would generate enough traffic that there would be long lines waiting to travel down the canal.

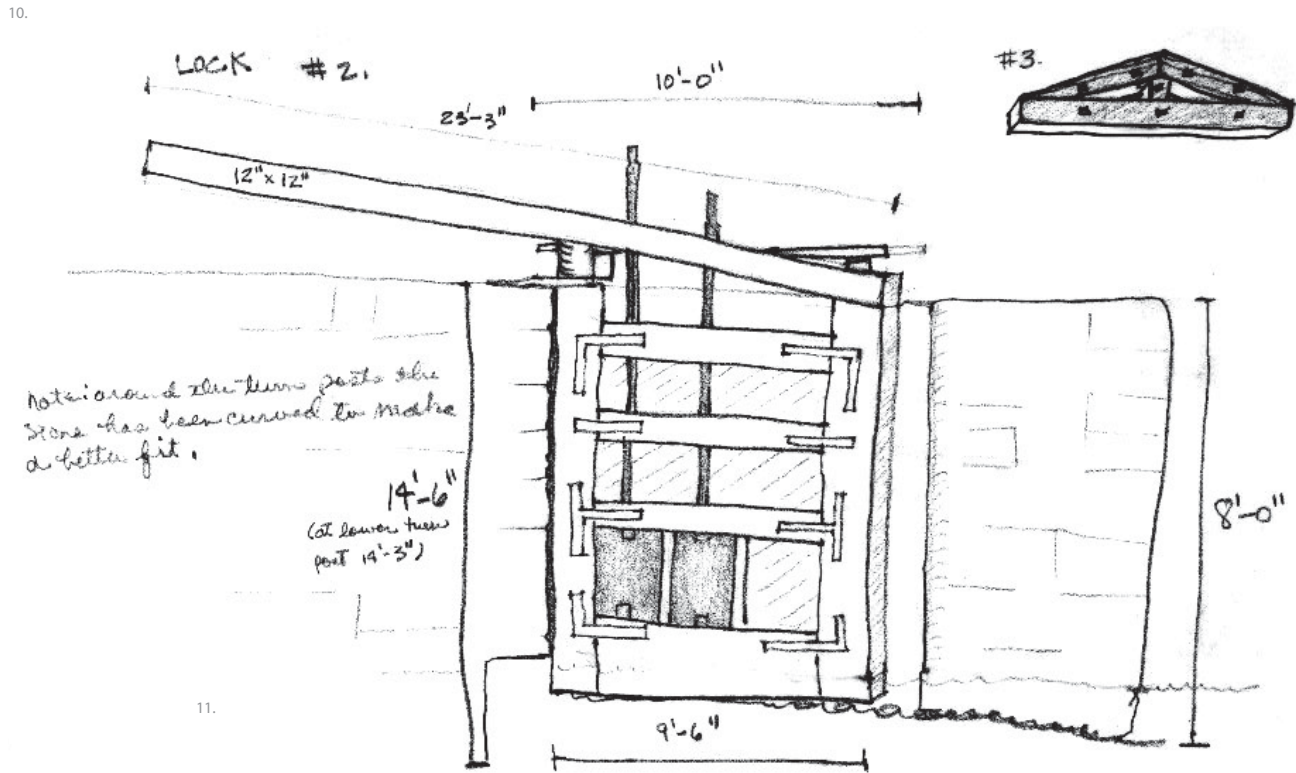
13. In this image the one can see the connection between the Chesapeake & Ohio Canal and the Washington Aqueduct System.



10.

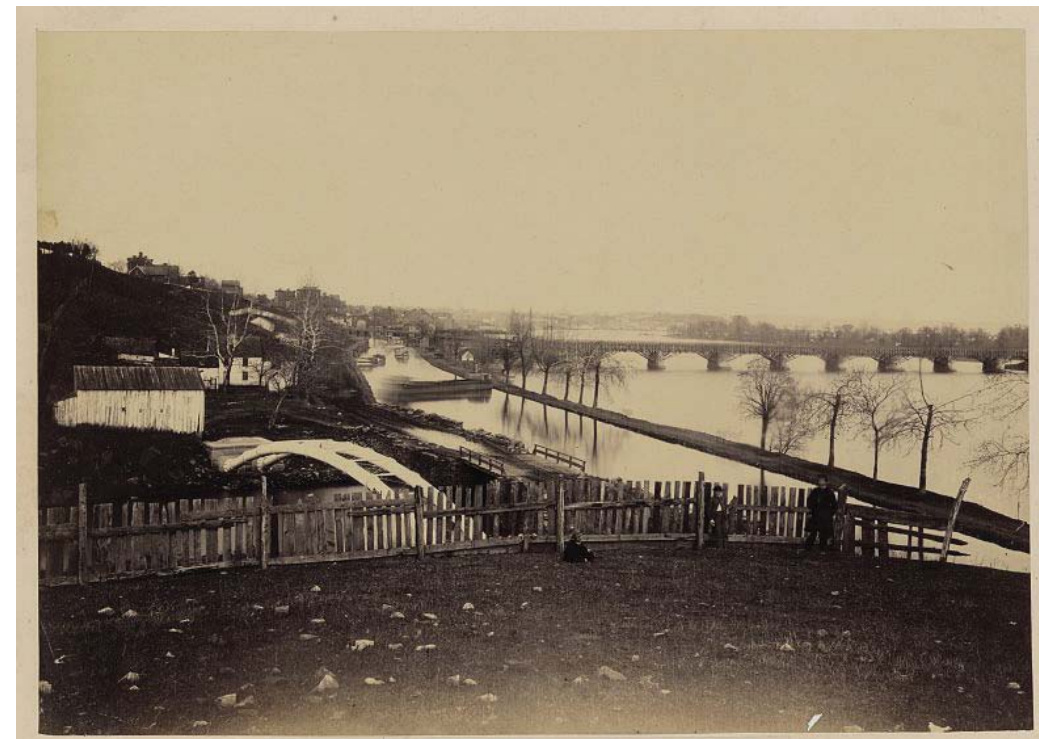


12.



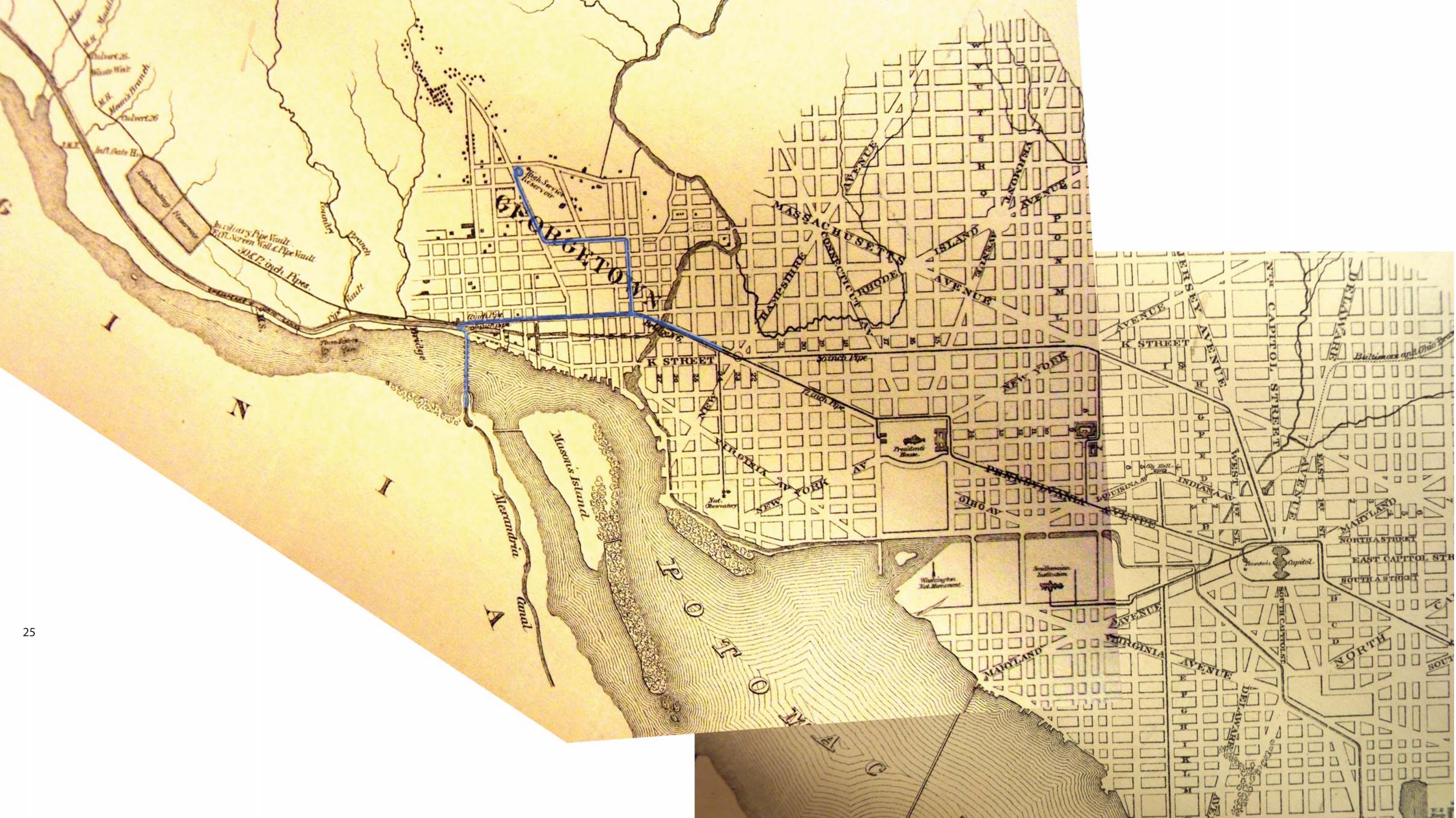
11.

Chesapeake and Ohio Canal, Georgetown
Sketch and Measurements of gate, Lock #2

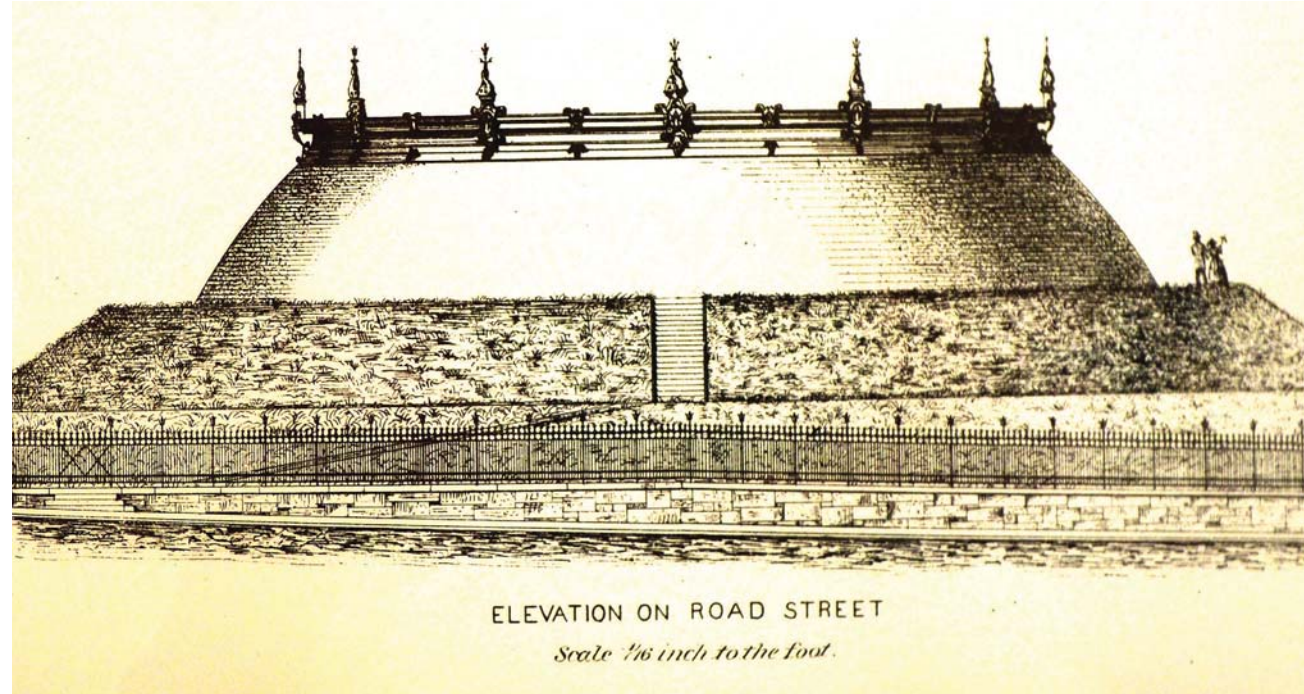


No. 721 - AQUEDUCT BRIDGE, GEORGETOWN, D. C.,
Looking toward Washington.

13.



14. This map from 1864, shows the path of the aqueduct pipes through Georgetown and its influences to the rest of the city.



15.

In the mid 1800's, Georgetown and Washington relied on natural springs, wells, and rainwater collected in cisterns for drinking water and fire protection. At the time, many cities like New York and Boston, had completed and were highly successful in creating an aqueduct system. In 1850, Congress voted to authorize the Army Corps of Engineers to improve the water systems in the District. Two men, Col. G. W. Hughes and Lt. Montgomery C. Meigs, each proposed designs. Hughes advised to bring water from upper Rock Creek to the two cities. Meigs advocated an aqueduct system from the Potomac River beyond the Great Falls. Congress decided to adopt the aqueduct system.

Construction started in 1852 with a total cost of \$3.5 million to lay 14 miles of pipes from Great Falls, Maryland through Georgetown and finally to Washington City. Three reservoirs were also built as part of the original system. A dam was built above the Great Falls and a 9 foot diameter gravity conduit brought water to a 56 acre area then commonly called the receiving reservoir or now known as Dalecarlia. It was used to store and process sediment from the water.

From Dalecarlia, the water traveled via conduit to the distribution reservoir on Conduit Road, which is now MacArthur Boulevard. Today it is known as the Georgetown Reservoir. Its placement on a high elevation allowed water to travel down to Washington City through large pipes under M street and Pennsylvania Avenue.

Because Georgetown was significantly higher in elevation to the M street water pipes it had to be pumped up to a high service reservoir located on R Street and Wisconsin Avenue. The higher elevation ensured good water pressure for all of Georgetown.

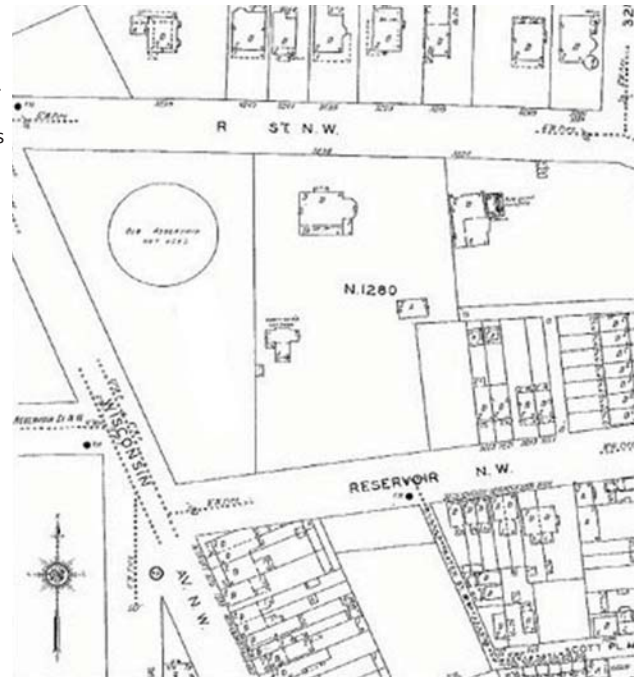
After the Civil War, Washington began to grow more rapidly, which caused city officials to build a second larger high elevation reservoir in 1896 on Reno Road. The Georgetown Reservoir closed the following year.

Today the aqueduct is a private water supplier to the District, Arlington County, and Falls Church. The Army Corps of Engineers continues to operate the Washington Aqueduct.

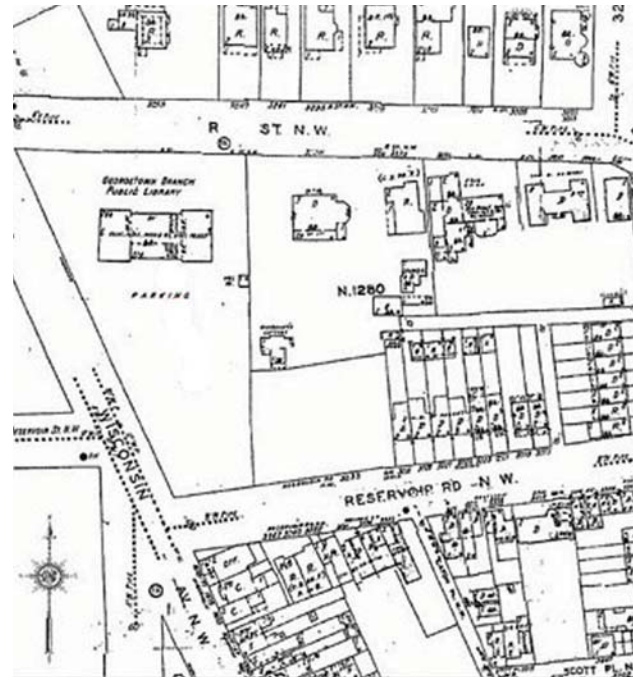
16. The Sandborn map from 1928 shows the placement of the reservoir.

17. The Sandborn map in 1999 shows the Georgetown Library in the exact place of the reservoir.

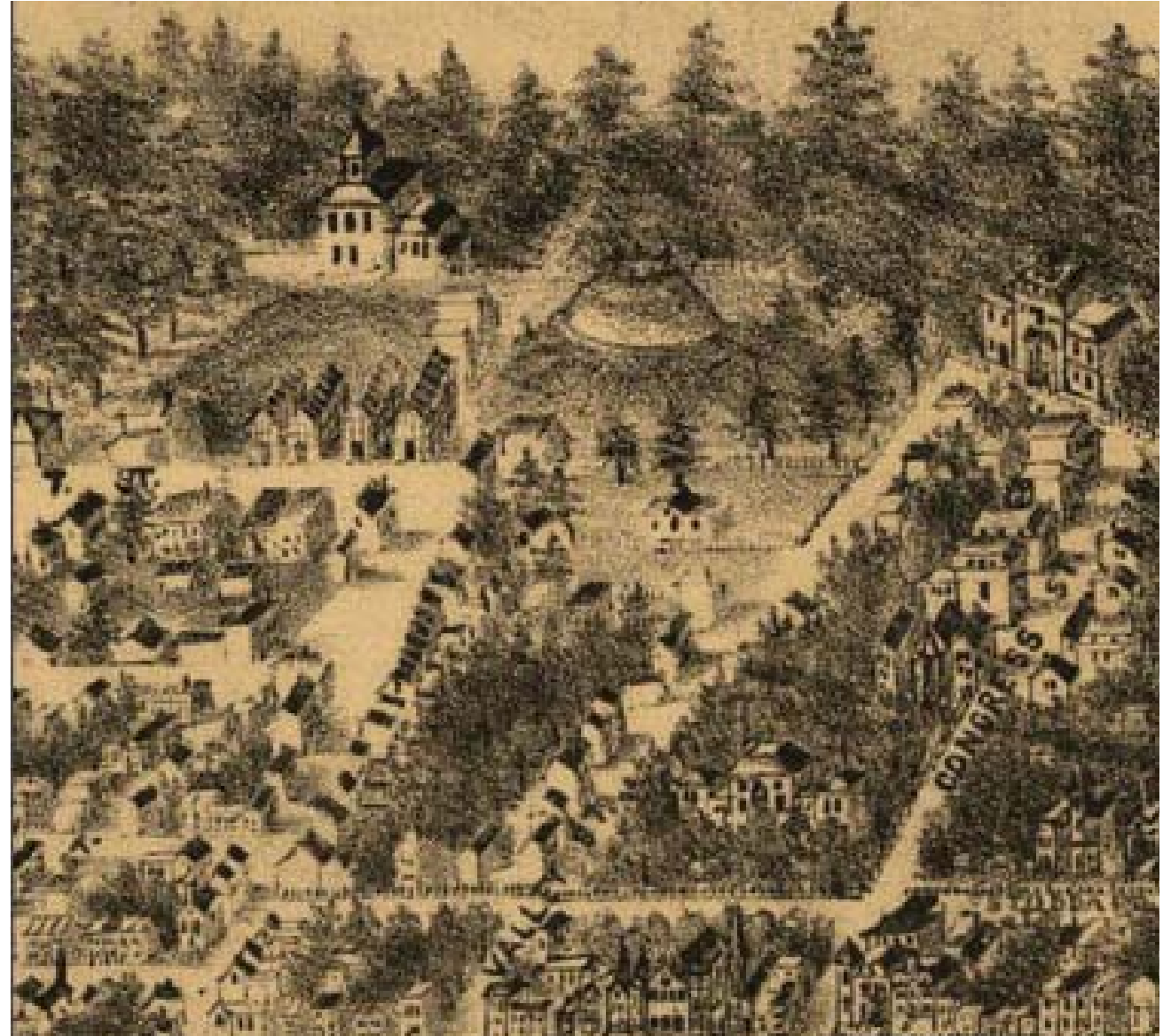
18. This image depicts the Georgetown Reservoir and the surrounding neighborhoods in 1884.



16.



17.



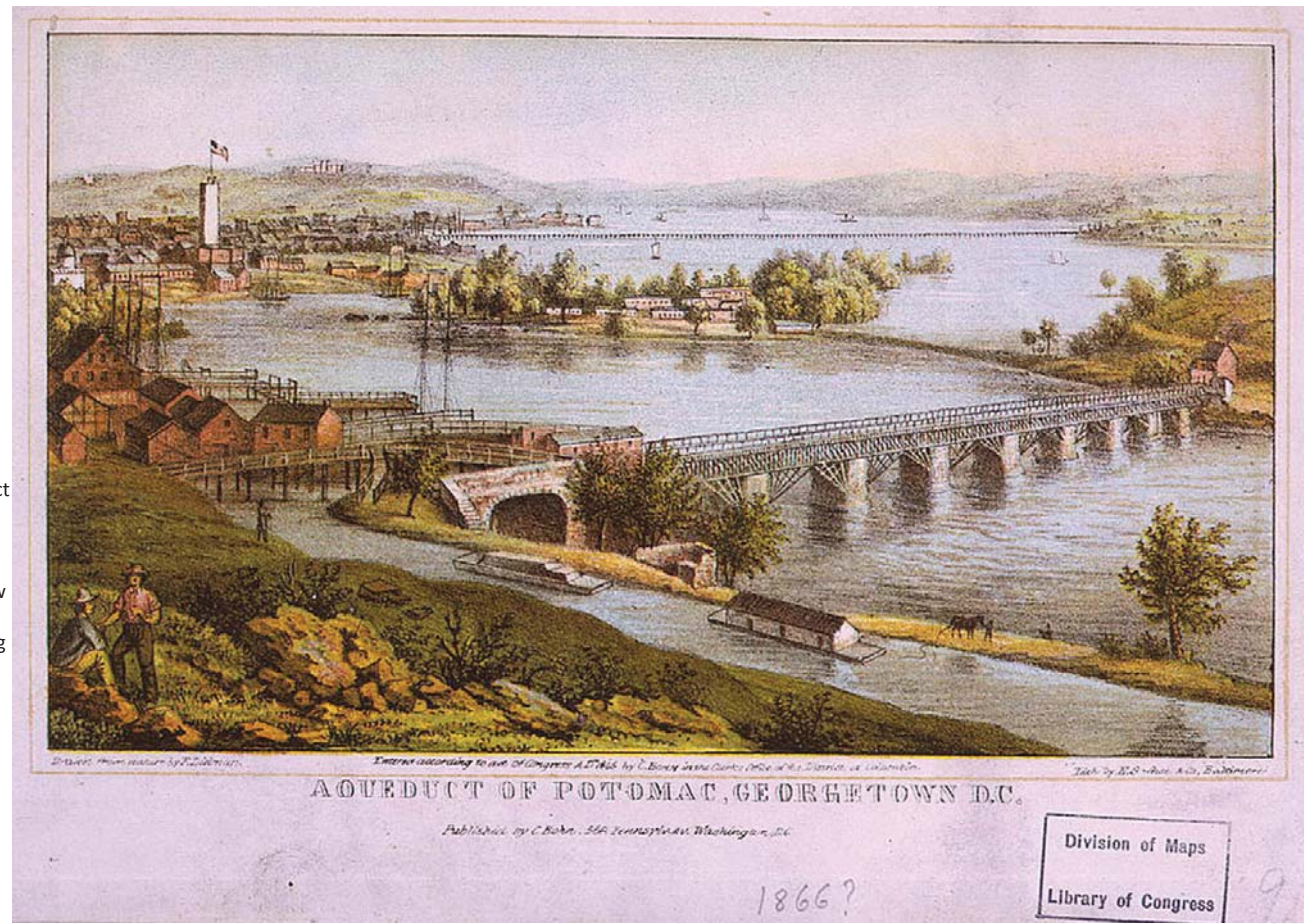
18.

19. This image from ca. 1866 depicts the connection between the Aqueduct Bridge and the Chesapeake and Ohio Canal.

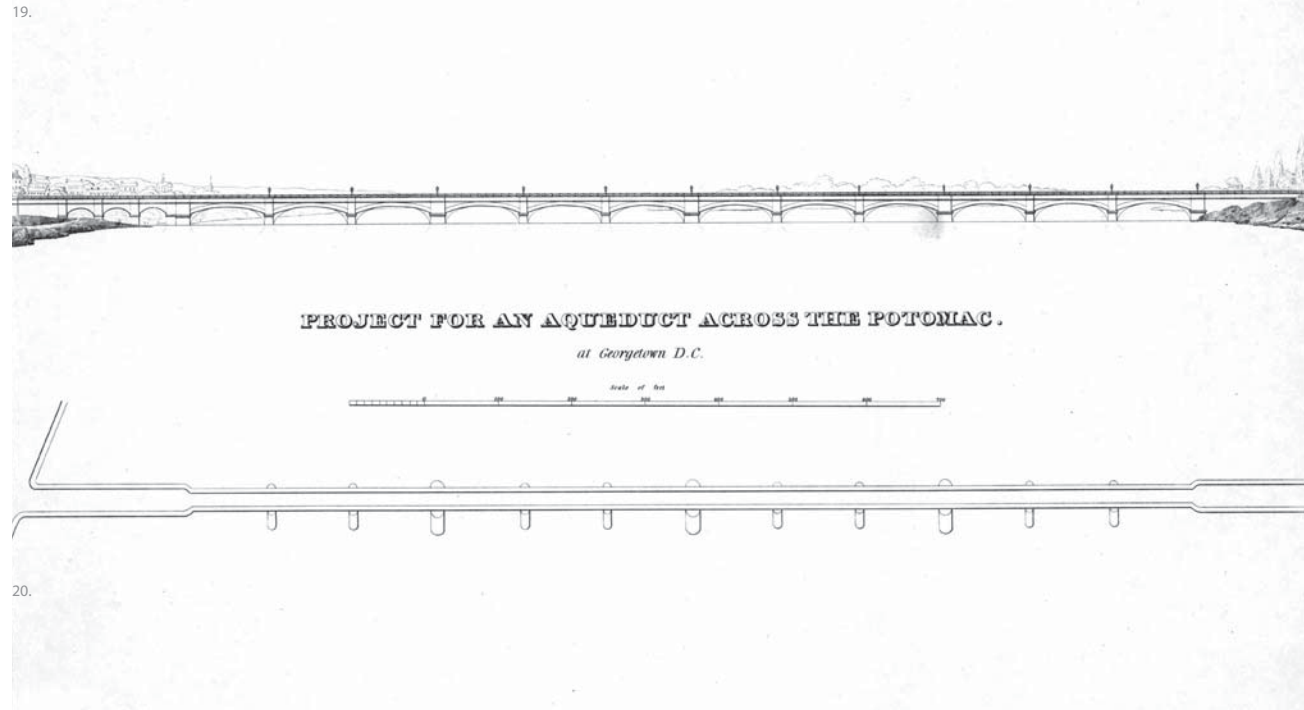
20. Aqueduct elevation and plan view

21. This photograph was taken during the construction of the Aqueduct Bridge ca. 1865.

22. The foundations of the Aqueduct Bridge are still at the bottom of the Potomac River. The middle foundations were later knocked down to allow the safe passage of water craft.



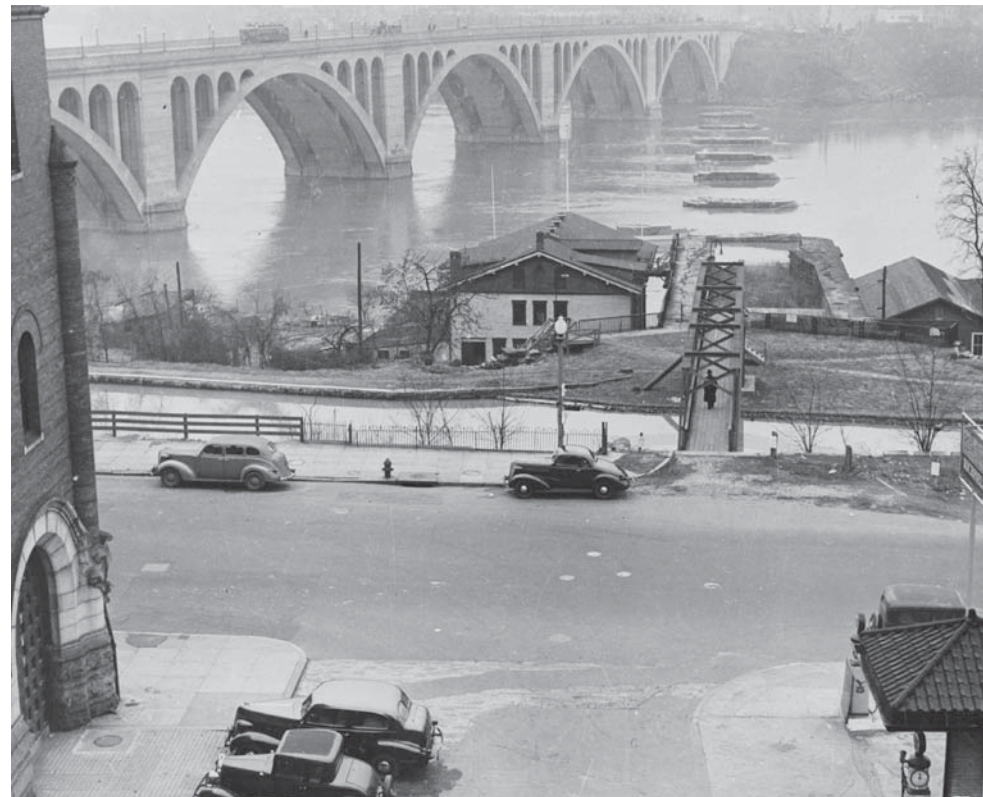
19.



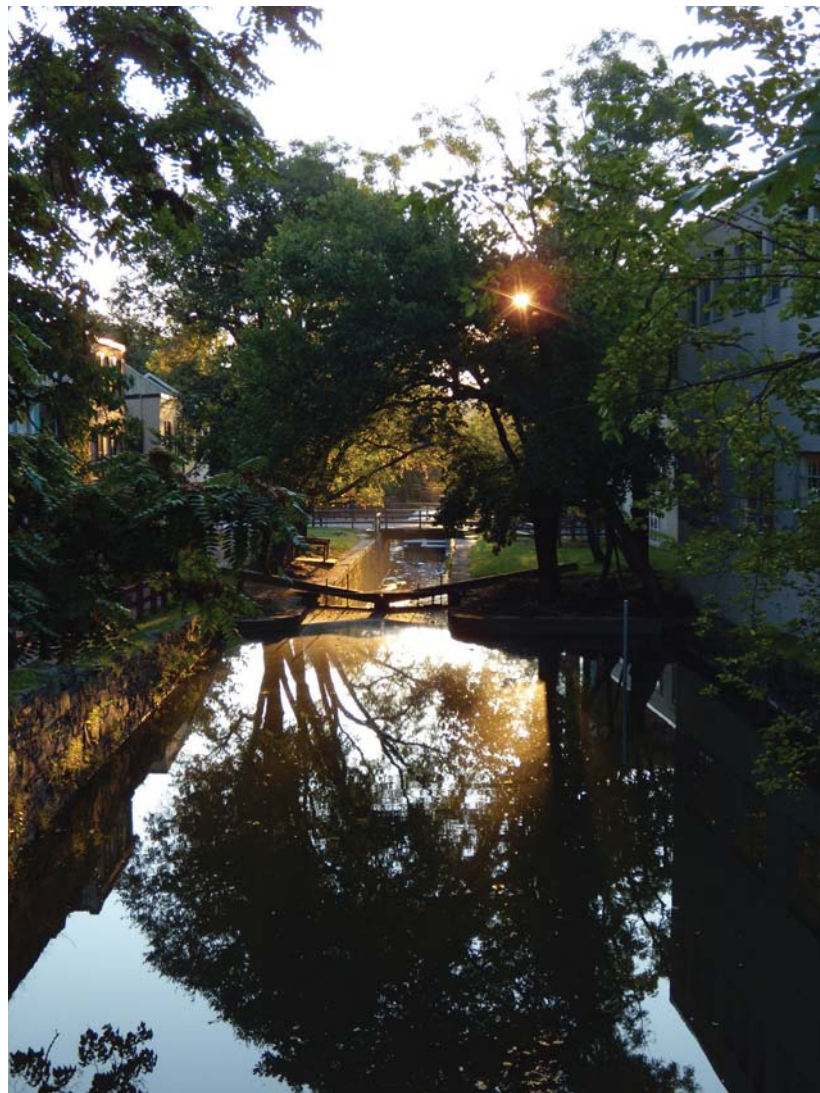
20.



21.



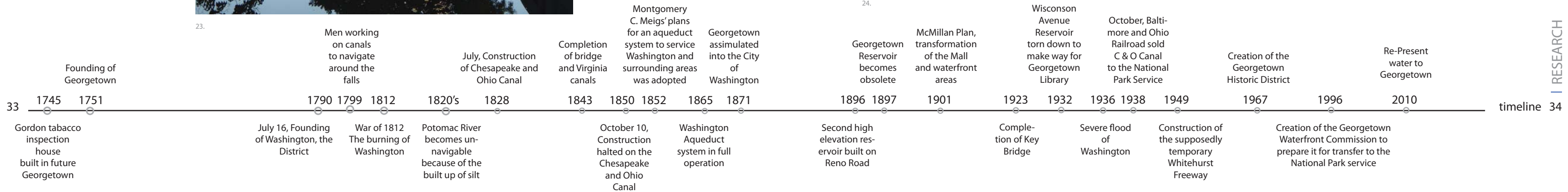
22.



23.



24.



- 1. Observatory Tower
- 2. Georgetown Visitors Center
- 3. Water Taxi Terminal

