



Friends of the Old Croton Aqueduct

Newsletter

No. 45, Winter 2014

Turning the Keeper's House into a Visitor Center

Ruth Gastel

What does it take to implement a vision? That's what the Friends have been asking themselves this past year while waiting for a start date for the rehabilitation of the house itself. We have an acceptable bid from an experienced construction company and expect work to begin this spring. Now we are looking forward to bringing to life our vision for the interior as a Visitor and Education Center. It's an exciting challenge to design and create exhibition areas with state of the art displays.

One purpose of the Visitor Center is to raise awareness of the uniqueness of the Old Croton Aqueduct so that trail users and residents will be more likely to value it and preserve it.

As the plan of the first floor on the next page shows, there will be three rooms open to the public. Room 1 will include a permanent exhibition devoted to the history of the Aqueduct; Room 2, a semi-permanent exhibit on the extension of the water supply system; and Room 3, a traditional park information center with the New York State Office of Parks, Recreation and Historic Preservation park manager's area.

Of course, there are

many kinds of museums. Some are historic homes with furnishings of the period. Others focus on an era or event.

Our subject is two-fold: the Old Croton Aqueduct and water supply needs in general, from pre-Aqueduct days right up to the current day. We will not use the old house and historical items to recreate a residence typical in every detail of the mid-1800s but as a backdrop to the Aqueduct story and eventually, we hope, as an exhibit space to stimulate discussion of today's water problems.

We already have access to items of historic significance, many collected by a Friends Board member, and copies of old drawings, paintings, maps and other images are readily available.

As with any project of this kind, there are many different approaches to developing an Education Center. One that appealed most to us would preserve the historic environment while at the same time using innovative exhibits to stimulate interest and entertain visitors of all ages.

To get a better understanding of what is possible,



Keeper's House, Dobbs Ferry, Aqueduct, 2010. Photo by E. Cain

The original house was a wood structure which was replaced by the current brick house in 1857 to serve as the home of the Superintendent of the Fourth Division of the Aqueduct. Now a designated landmark, it has not been occupied since 1962.

we have been tapping the expertise of people working in the fields of museum education and exhibition design, including a Board member who has helped develop interpretive programs for several well-known historic sites in the New York metropolitan area and a graphic designer with extensive experience in education and public service. As we discussed what we would like to achieve, they provided insights into new technologies and techniques for presenting material and showed us examples currently in use in museums in and around the city.

From the very beginning, our experts said, visitors must be engaged. We want them to know as soon as they enter the building that we are talking about water and how it was transported and distributed, back in the days when the Old Croton Aqueduct was in use.

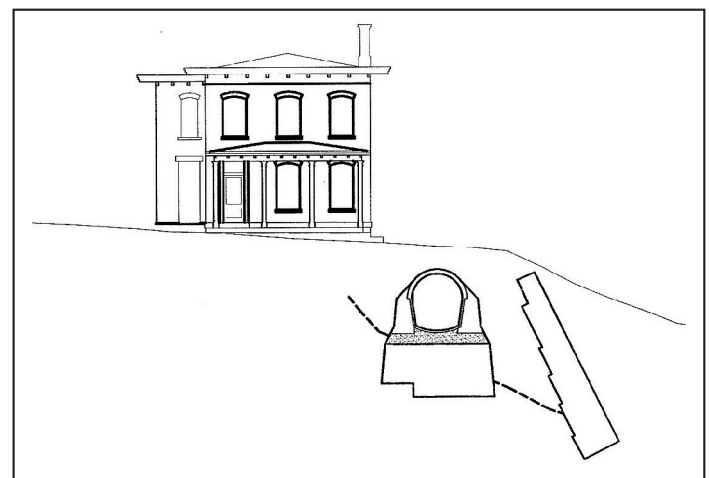
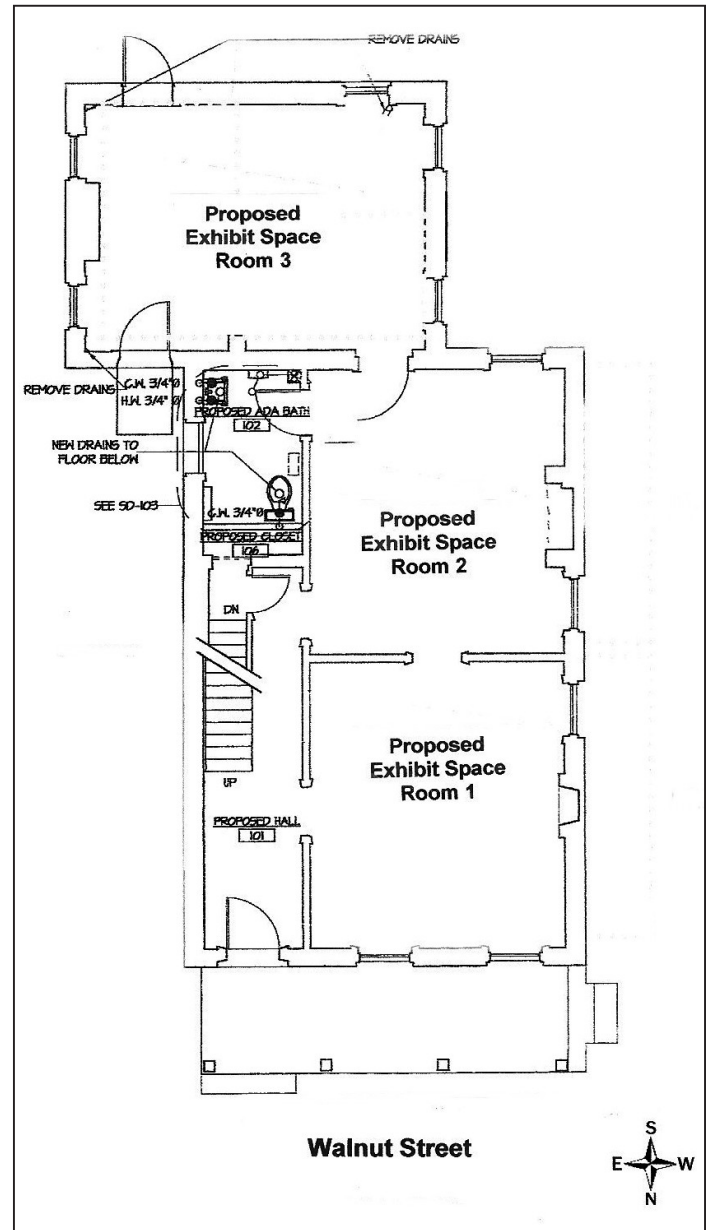
One idea is to install a movement-activated device at the entrance so that as visitors enter the hallway, they hear a sound recording of rushing water and see a very large, floor to ceiling photo of the inside of the tunnel. The first room could include, among other things, a map of the Old Croton Aqueduct projected onto the floor, a diorama that shows different sections of the tunnel, short films, and traditional interpretive panels hung on the walls that tell the Aqueduct story.

For visitors wishing to delve deeper into the history of the building and maintenance of the water tunnel, a touchscreen might allow exploration of archival documents that cannot be physically displayed because of conservation concerns. Each touch of the screen enlarges the previous selection so that tiny areas can be viewed at significant magnification.

For children, there could be games and exhibits that enable them to learn in different ways, including a treasure hunt checklist, an interactive scope that as the crank turns shows scenes in the life of an Old Croton Aqueduct keeper, and items of all kinds in drawers and under glass that challenge the curious.

This is just a sampling of ideas that we are gathering on the road to transforming the Keeper's House into a Visitor and Education Center. We hope that those who step through the door will have an enriching experience, maybe even a magical trip into the past and future at the same time, as they learn about the promise engendered by the building of the Aqueduct and potential water supply problems that concern us today.

Visitor Center, First Floor Plan



Existing site section and north elevation of Keeper's House drawn by cw/dje

Raffle Winners Announced

We're thrilled to announce the winners of our annual bike raffle! The drawing was held at the Keeper's House on November 2nd.

First prize winner of the trail bike is Jon Flores of Tarrytown, whose birthday happened to fall on our raffle drawing day. "I knew when I bought that ticket that I would win!" says Jon, who bikes the trail regularly. The Friends worked with Endless Trail Bikeworx, the Dobbs Ferry bike shop, to offer this outstanding bike.

Second prize winner of the goody basket filled with maps, hats and t-shirts is Dwayne Reith of Dobbs Ferry.



First Prize Winner Jon Flores of Tarrytown. Photo by K. Gates



Dwayne Reith and his daughter Mariella. Photo by K. Gates

Two Yonkers Members Go the Extra Mile

Shaun Gorman and his wife Ilona Fabian who live on Philipse Place in Yonkers are not only faithful supporters of the Friends; they are active trail ambassadors.

A couple of months ago, Shaun and Ilona asked to meet with Friends President Mavis Cain and Park Manager Gary Ricci to talk about problems on the trail in their neighborhood. They came, not with complaints, but with plans for action. They had already worked with neighbors doing trash clean-ups of the trail and even more significant, talked about the OCA (Old Croton Aqueduct) with city hall officials, including Mayor Spano who has long been interested in the Aqueduct.

The main concerns are the public dumping and littering on the OCA. Shaun tells us that Yonkers officials are keen to work with local companies on quality of life issues.

Companies that have participated in cleaning up the trail in the past include Belmay, a personal products company, Citi and Starbucks. We know that Mayor Spano is particularly interested in the Aqueduct trail and walks it often. We are so grateful for this kind of involvement. Shaun will keep us informed about these plans and whether the Friends can help in any way.

Shaun and Ilona are making a list of crosswalks that concern the Aqueduct and calling the city's attention to them. We know, too, that the city is making new antidumping signs that promise heavy fines for dumping. We hope these will be enforced. Under the watchful eyes of residents like Shaun and Ilona this should happen.

Ossining and the Double Arch Bridge

Ed Brody

1. Introduction

The joint celebration this past summer of the completion of the Double Arch Bridge repairs and Ossining's 200th anniversary is a reminder of the special relationship that exists between Ossining and the Old Croton Aqueduct.

The Village of Ossining is part of the larger Town of Ossining. The area was acquired in 1685 from the Sint Sinck Indians as part of Philipse Manor. When the manor was confiscated after the Revolution the area became known as Sing Sing, possibly because it was easier to pronounce.

Throughout the eighteenth century the Sing Sing hamlet grew into a successful port where local farm produce was shipped to New York City on the Hudson River. Construction on a prison began in 1825. In 1845 the town of Ossinsing (sic) was formed from the northwest part of Mt. Pleasant; its name was changed to Ossining a year later. In 1901 the village also changed its name to Ossining to avoid confusion with the now notorious Sing Sing Prison.

2. Constructing the Bridge

Ossining posed a challenge to the builders of the Aqueduct. On its journey from the Croton Reservoir to New York City the gravity-fed tube had to maintain a uniform descent of 13-1/4 inches per mile for water to flow at the desired rate. So tunnels were built through hills, embankments across valleys and bridges over ravines and rivers. About eight miles from the original Croton Dam the Aqueduct encounters Sing Sing Kill, with a 536-foot-wide valley and 82-foot-deep gorge.

An existing wooden bridge, connecting to a water mill, crossed the line of the Aqueduct at an angle at a lower level. It had to be accommodated. Further, to satisfy a law that the Aqueduct not impede local landowners, the bridge had to include a small passageway to provide a landowner access from his house on one side to his garden on the other side.

To satisfy these requirements, John Jervis, Chief Engineer of the Aqueduct, designed a bridge with an elliptical arch (technically called a five-centered arch). Wider than a comparable semi-circle, this design allows more water to pass underneath, thus minimizing the risk of flood damage. Jervis wrote that he used a "plain and substantial style" but with some ornamentation to avoid the impression that insufficient attention had been paid to certain parts of the structure that might suggest a lack of "firmness and durability."¹

A problem with elevated aqueducts was leakage that could lead to freezing and expansion of the supporting structure, thereby weakening it. Drawing on the work of



Double Arch Bridge, 1907 post card, Wikipedia/commons.

British engineers Jervis decided to use cast iron plates to line the aqueduct conduit in addition to hydraulic cement. The bridge masonry was stone with numerous internal cavities in the walls to reduce the weight and contain possible leakage.²

Work began in May 1837 with completion intended by October 1839. They soon discovered that there was less available bedrock than expected. So Jervis increased the arch width from 80 to 88 feet and its height from 25 to 33 feet and shortened the abutments that carry the weight of the bridge. He did this to find stable bedrock although it made the construction more expensive. A stone weir was also constructed to control the water flow in the tunnel.

In August 1839 the keystone was placed, although Aqueduct water did not actually flow until June 1842. A labor-intensive project, it cost around \$90,000 at the time. That would be \$17 million at today's unskilled labor rate. Even though the work was dangerous, there were no serious injuries or accidents. The structure was stable, settling less than a half-inch. The usually dour Jervis declared himself satisfied and offered praise.³

3. Later developments

In 1861 the old wooden bridge that ran under the Aqueduct Bridge was replaced by the village. The new bridge was a stone and brick arch with a 20 foot span. The two bridges gradually became known as the Double Arch Bridge. This was adopted as the official name in the early 20th century and later the bridge became part of the Ossining Town seal.

Between 1881 and 1886 several weirs were modified to be able to totally divert the water flow into local streams. This

would allow maintenance of a section of the Aqueduct without draining the entire system. In Ossining it was decided to build a new weir, leaving the old weir standing a short distance further north.

As New York City expanded, new water sources were developed which reduced the need for the Old Croton Aqueduct. In 1955 water flow to New York City was terminated but continued to Ossining until 1965 when the weir was decommissioned. New York City sold the Westchester section of the Aqueduct to New York State in 1968. In 1987, after modification, Aqueduct water flow resumed in Ossining, now the sole user, providing 57 percent of its needs.⁴



Overhead View Looking North (no date), Library of Congress, Prints and Photographs Division, HAER NY, 60-OSS, 2A—15.

In 1982 an Ossining Urban Cultural Park (now Ossining Heritage Area) opened as part of a statewide system. It included the weir and Double Arch Bridge. In 1991 a visitor center was created at the Heritage Area with an extensive permanent exhibit on the Aqueduct called “Down the River,” to complement a Sing Sing exhibit called “Up the River.” In 1997 tours of the inside of the weir and tunnel began.

4. Renovation

When water flow stopped, maintenance of the Aqueduct declined. The bridge’s exterior stonework and deck were allowed to deteriorate. In 2009 State Parks inspected the bridge⁵ and found a lot to do: a new drainage system, new cement tiles and lighting on the bridge deck (which had become a pedestrian walkway) and re-pointing and resetting the stonework were the major items. The weir roof would also be repaired with new wiring and lighting for the tunnel.

Work finally began in early 2013 with \$1.2 million from Governor Andrew Cuomo’s “New York Works” program.⁶ The general contractor worked feverishly to finish most of the work just prior to the ceremony organized by the Friends of the Old Croton Aqueduct on July 20, 2013 – a combined celebration of the Double Arch Bridge and the 200th anniversary of Ossining Village.⁷

The following references were used: crotonaqueduct.wordpress.com; en.wikipedia.org, “Ossining (village), New York”; Gerard Koeppel, *Water for Gotham: a History* (2000, Princeton University Press); Hudsonriver.com, Ossining | Historic Hudson River Towns; villageofossining.org, “Ossining Significant Sites and Structures Guide.”

Notes

1. F. Daniel Larkin, “Preliminary Plans for the Old Croton Aqueduct...” p. 21-22 in *Hudson River Museum, The Old Croton Aqueduct* (1992).
2. A detailed discussion of the design problems is in Larry Lankton, “Valley Crossings on the Old Croton Aqueduct,” *IA: J. Soc. Ind. Archeol.*, Vol. 4, No. 1, 1978, pp. 27-42.
3. Much of this section is based on Gerard Koeppel, *Water for Gotham: a History* (2000, Princeton University Press), pp. 197-198, 239-242.
4. *Ossining Annual Drinking Water Quality Report for 2011*.
5. An article by Charlotte Fahn in Newsletter 35 (Spring 2010) has details and an old photo of the exposed aqueduct during a 1913 bridge renovation.
6. An article by Tom Tarnowsky in Newsletter 44 (Summer 2013) has details and pictures of the renovation.
7. E-mail from Philip Pierce, Sr. Principal Engineer, CHA Companies, 25 Sep 2013. New York State Plan for the Old Croton Aqueduct.

New York State Plan for the Old Croton Aqueduct

The New York State Office of Parks, Recreation and Historic Preservation is preparing a management plan for the Old Croton Aqueduct State Historic Park. Public meetings were held in 2013. For more information go to: OCA.plan@parks.ny.gov.

The Old Croton Aqueduct State Historic Park is 26.2 miles long. The Aqueduct was purchased from New York City in 1968 by the Office of Parks, Recreation and Historic Preservation for use as a recreational corridor. It sits atop a subterranean aqueduct system and offers many opportunities for trail enthusiasts in a unique historic setting.

History and Development Timeline*

1833 – The New York City Water Commission is established.

1835 – The public votes to proceed with construction of the Aqueduct.

1836 – John B. Jervis is appointed as Chief Engineer of the Croton Aqueduct Project.

1837 – Construction of the Aqueduct begins.

1842 – Construction of the Aqueduct is completed, including such structures as the receiving and distributing reservoirs, Archville and Clendening Valley crossings, Sing Sing Kill and Nepperhan/Saw Mill River bridges, and ventilators and weirs. Water first enters the distributing reservoir at Murray Hill on July 4th.

1842 – Day-long festivities, including a 5-mile-long parade, take place on October 14th to celebrate completion of the aqueduct and the introduction of Croton water to the city.

1848 – The High Bridge is completed.

1857 – The Dobbs Ferry Keeper's House is completed.

1862 – Lake Manahatta (now Jacqueline Kennedy Onassis Reservoir) is constructed. Decommissioned in 1993.

1862 – The capacity of the High Bridge is increased with the addition of a 90-inch-diameter pipe.

1870s – Clendening Valley Crossing is replaced by an inverted siphon.

1872 – As part of the High Service Works to serve developing parts of northern Manhattan, High Bridge Tower and High Bridge Reservoir are constructed.

1882 – A new weir is constructed in Ossining.

1899 – Demolition of the distributing reservoir (Murray Hill Reservoir) begins. The site is eventually occupied by the New York Public Library.

1917 – The New York City Water Commission shuts down the Old Croton Aqueduct as a precaution during WWI.

1924 – The Archville Crossing over Route 9 in Mt. Pleasant is replaced by an inverted siphon. A new bridge is installed in 1997.

1927 – Five of the High Bridge's original masonry arches are replaced with a single steel span, making the Harlem River more navigable for large ships.

1931 – The receiving reservoir (York Hill Reservoir) is drained and filled in to become Central Park's Great Lawn.

1955-65 – The Old Croton Aqueduct is withdrawn from service.

1968 – New York State purchases 26.2 miles of the original 41 miles from New York City for use as a linear park.

1972 – The High Bridge and High Bridge Tower are listed on the National Register of Historic Places.

1973 – The site of the Old Croton Dam is listed on the National Register of Historic Places.

1974 – The Westchester County portion of the Old Croton Aqueduct is listed on the National Register of Historic Places.

1975 – The Old Croton Aqueduct is designated a National Historic Civil Engineering Landmark.

1992 – The Old Croton Aqueduct up to the Manhattan end of the High Bridge is designated a National Historic Landmark. Included are its ancillary structures and the path on top of it.

1999 – Reflecting the Aqueduct's new status within the State Park system, the park's name is changed from Old Croton Trailway State Park to Old Croton Aqueduct State Historic Park.

2013 – Waste weirs, ventilation shafts and the Ossining Bridge are rehabilitated as part of the "New York Works" Program.

2013 – Restoration of the High Bridge begins.



Bicycling on the Aqueduct. Photo by C. Fahn

**Based in part on information available at OCA.plan@parks.ny.gov and on Friends' research. The listing is not intended to be comprehensive.*

Mercy College Students Work For The Friends

Suddenly our volunteer group looks younger! Thanks to a grant received by Mercy College encouraging students to take volunteer jobs with non-profit groups like ours, we have had a fresh new presence of youthful enthusiasts on the trail and at events like Ferry Festa in Dobbs Ferry. The grant pays the students a reasonable wage – and we profit. Camila Gerard and Niesah Pena, Vet-Tech students, and Michael Kerrigan, who is studying criminal justice, have been manning tables on the trail, talking to walkers and bikers, selling our maps and encouraging participation in our bike raffle. Mavis Cain keeps track of their assignments and time spent working for the Friends. Gary Ricci, our Park Manager, and Tony and Jeff have enjoyed their company at the trailer and seeing them on the trail. Many of our members have commented that they enjoy having a chat with these enthusiastic young people who really enjoy this outreach program.



Above: Volunteer Camila chats with a fairgoer. Photo by A. Minoff



Volunteer Michael is an enthusiastic helper.



Volunteer Niesah with raffle prize. Photo by A. Minoff

Mercy College student coordinator, Kathleen Finneran, is our College contact. It has been a pleasure to work with her on this new relationship between Mercy and the Friends.

— Mavis Cain

MEMBERSHIP COUPON

Your tax-deductible contribution helps to protect and preserve the trail.

- | | |
|---|---|
| <input type="checkbox"/> Renewal | <input type="checkbox"/> New Member |
| <input type="checkbox"/> Friend \$20 | <input type="checkbox"/> Students & retirees \$10 |
| <input type="checkbox"/> Good Friend \$50 | <input type="checkbox"/> Best Friend \$100 |
| <input type="checkbox"/> Other _____ | |
| <input type="checkbox"/> Additional donation to Keeper's House Fund \$_____ | |

Please make check payable to Friends of the Old Croton Aqueduct. Send it with this coupon to the Friends at Keeper's House, 15 Walnut St., Dobbs Ferry, NY 10522-2109.

Name _____

Address _____

City/State/Zip _____

Please let us know if you would like to volunteer:

- | | |
|---|--|
| <input type="checkbox"/> Cleanups | <input type="checkbox"/> Vine-cutting |
| <input type="checkbox"/> Computer help | <input type="checkbox"/> Database help |
| <input type="checkbox"/> Events planning | <input type="checkbox"/> Outreach at events |
| <input type="checkbox"/> Blog/website | <input type="checkbox"/> Publicity (all media) |
| <input type="checkbox"/> Graphic design/signage | <input type="checkbox"/> Newsletter articles |
| <input type="checkbox"/> Lead (or assist with) walking tours | |
| <input type="checkbox"/> Outreach on the trail (meet and greet) | |

For inquiries about Old Croton Aqueduct State Historic Park or to report trail conditions, call Park Manager Gary Ricci at 914-693-5259; mailing address: 15 Walnut Street, Dobbs Ferry, NY 10522.

Friends of the Old Croton Aqueduct
Keeper's House
15 Walnut Street
Dobbs Ferry, NY 10522

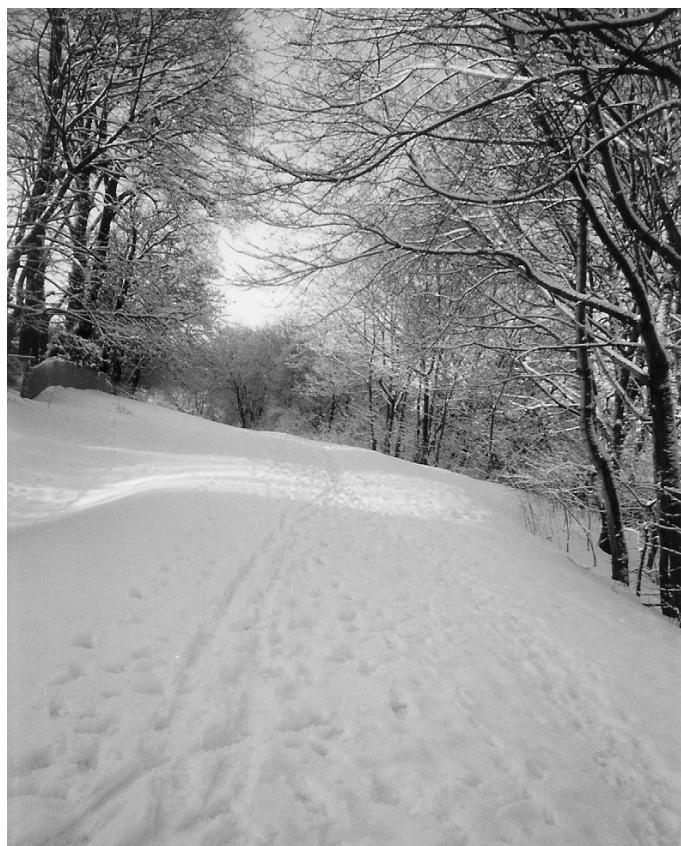
Nonprofit Org.
US Postage Paid
Permit 3038
White Plains, NY



Newsletter: Ruth Gastel, *Editor*. News items, reminiscences, and comments welcome: 914-479-1414 or ruthg@iii.org or by mail c/o the Friends.

© Friends of the Old Croton Aqueduct, Inc., 2014

Newsletter No. 45 Winter 2014



*"This is why we love it."
Looking south on the Aqueduct from Chestnut Street,
Dobbs Ferry, Winter 1994. Photo by B. McManus*

Friends of the Old Croton Aqueduct is a private, non-profit, volunteer organization formed to protect and preserve the Old Croton Aqueduct. The Friends work to raise public awareness of the Aqueduct and trail, and to secure the resources that will enable this historic greenway to remain unspoiled in perpetuity. *Address:* Keeper's House, 15 Walnut St. Dobbs Ferry, NY 10522-2109; *telephone* 914-693-4117, www.aqueduct.org.

Board of Directors

Mavis Cain *President*

Robert Kornfeld, Jr. *Vice-President*

Edward Brody *Treasurer*

Holly Daly *Secretary-Membership*

John Flack *Secretary-Meetings*

Frederick Charles

Carl Grimm

Laura Compagni

Joseph Kozlowski

Douglas Emilio

Constance Porter

Charlotte Fahn

Thomas Tarnowsky

Ruth Gastel

Ildiko Viczian

Katharine Gates

Lesley Walter

Elisa Zazzera

