Society for Industrial Archeology · New England Chapters

VOLUME 34 NUMBER 1 **2013**

CONTENTS

NNEC-SIA President's Report 1
SNEC-SIA President's Report 2
NNEC-SIA Fall Tour, Bellows Falls, VT 2
"The Power of Water"
An Exhibit at the Historical Society
of Cheshire County (NH) 5
The "Iron Heritage Trail"
News from the
Mill Hollow Heritage Association 6
IEEE Milestones Commemorated in
Greater Boston with Links 6

CONTRIBUTORS

Marc N. Belanger, Gilmore Cooke, David Dunning, Robert W. Hayden, Malcolm Phinney

NORTHERN CHAPTER OFFICERS

David Dunning, President
Ray Breslin, First Vice President
Dennis Howe, Secretary
CarolynWeatherwax, Treasurer

SOUTHERN CHAPTER OFFICERS

Marc Belanger, President
Craig Austin, Secretary
Sara Wermiel, Treasurer

EDITOR

David Starbuck
PO Box 492
Chestertown, NY 12817-0492
dstarbuck@Frontiernet.net

NNEC-SIA President's Report

We held an annual meeting on October 27, 2012 commensurate with the fall tour in Bellows Falls, Vt. Following is a brief summary. Ray Breslin was elected Vice President to fill a vacancy left by the resignation of Rick Russack. Treasurer Carolyn Weatherwax gave the following report (as of 10/27). Income for the year: $1720, including $1110 in membership dues. Expenses: $1315, mostly newsletter and postage (exceeding dues income). Treasury balance: $5,093.87. It was voted to increase the membership dues from $15 to $20 per year. Twenty persons were dropped from the membership roster for dues nonpayment over two years. As of 10/27/12, we had 32 life members and 52 regular members. However, half of them are delinquent in their dues.

2013 Fall Tour Saturday, August 24th at Redstone Granite Quarries on Rattlesnake Mt. in Conway, NH. Rick Russack did a presentation on this site at the conference in Plymouth this January. Details can be studied at www.WhiteMountainHistory.org Scroll down the left column and click on Redstone.

2014 Fall Tour SIA headquarters has asked us if NNEC would like to host this national tour. They suggested the New Hampshire or Maine area. As of this writing, 3/27/13, we are giving it serious consideration. Someone from national is meeting with us on 4/4 to discuss it. If we take it on, it would be a two day tour in Maine. Day one would be at Bath Iron Works, The Maine Maritime (indoor/outdoor) museum and possibly a tide mill. Day two would be in Livermore Falls studying the history of Maine papermaking. It would include both historical sites and a visit to a modern working paper mill. One goal in hosting this would be to draw new chapter members from Maine. For a big two day event, we could get a lot of free newspaper and radio publicity. We need more new members to help balance our finances.

NNEC Web Site We again thank Marc Belanger for developing our great site. If you missed a tour (or missed all of them) you can revisit the tours through photos and information. From the national site, you can travel to and through tours all around the county. Site navigation is quite plain; just relax and explore. www.sia-web.org click on Chapters, select NNEC and settle back in your chair.

David Dunning
NNEC President
dunmark@tds.net
603-526-6939

SNEC-SIA President's Report

On February 23, the 26th annual New England Conference on Industrial Archeology was held at Clark University in Worcester, Massachusetts. It was the fourth time the event has been held at Clark, and the fifth time it has been held in the "City of the Seven Hills". With a forecast for afternoon snow, the turnout was a bit smaller than expected, with a total of forty-three attendees. However, aside from some frustrating Mac-compatibility issues, I am pleased to say that the conference was overall a success with a nice variety of high-quality presentations and lunch provided onsite, giving people a good chance to catch up and mingle. We also managed to finish just before the snow started to fly, at just about break-even with costs too. I'd like to extend a special thanks to Sara Wermiel for her help and advice with the preparations. My thanks to the other presenters as well – without you the event would not have been possible. During the conference, a short business meeting and election was held for the SNEC members in attendance. In accordance with the chapter bylaws, the meeting included a vote on member dues – which will continue at their current levels for this year. After one last call for candidates, I was elected your new president. Sara Wermiel and Craig Austin each noted that while they would prefer to pass on their duties of treasurer and secretary, respectively, in absence of willing volunteers, they would agree to continue in their roles for the time being.

With this, I would like to stress again that the survival of this organization depends on more people willing to step up and participate! If you care about the future of the SNEC and are interested in volunteering as a candidate for either the role of treasurer or secretary for the next election in fall 2013, please let me know. I am willing to personally pay your $50 SIA dues for 2014 if you are successfully elected. If you are not sure what is involved with these tasks, a copy of the bylaws has been posted on the chapter website, as well as in the fall 2012 edition of the newsletter. If you have been on the sidelines wondering if you should raise your hand, now is the time! Or perhaps you feel you don't have the time to commit to being an officer, but would like to help out in some other way? I am also open to any new ideas and suggestions you may have.

One of my first goals as president is to simply increase awareness that the SNEC-SIA exists. This had been the case with me until a few years ago, as I had an interest in industrial places, spending lots of time driving around to visit and photograph old mills, bridges and other places, but I had never heard of SIA or the SNEC until by chance, a friend of mine posted some photos of the 2008 Clinton tour on Flickr. In a effort to increase our exposure, I have recently prepared a new rack card and membership flyer that I would like to distribute to various likeminded organizations such as museums, libraries, universities, civic organizations, etc. in the region, in order to help get the word out and raise awareness of the Chapter, the SIA, and the importance of IA in general. I am asking for a few volunteers to be part of a coordinated effort that will help distribute this information throughout the region. If you are interested please let me know.

Being the type of person that likes to uncover things, I have also recently completed scanning nearly all the back issues of the New England Chapters Newsletter, which Dennis Howe graciously loaned to me. Thanks Dennis! I am only missing the following eight issues: 1980 (fall), 1981 (both), 1983 (both), 1984 (fall), 1987 (fall), and 2004 (fall). If you have any of these issues and wouldn't mind letting me borrow them to scan, please let me know. The back issues have been a good chance for me to learn what most of you have been up to all these years! I am thinking that this information would be helpful to other new members too. However, after going through over thirty years of newsletters, amongst the many interesting articles and reports, I have also noticed a familiar and recurring theme of calls for new members, more participation and new ideas for tours. Some things never change, I suppose!

Marc N. Belanger
Taunton, Mass.
mnbelanger@comcast.net

NNEC-SIA Fall Tour

Bellows Falls, VT 10/27/2012

This tour was an updated version of the chapter's fall tour of 1987. Stewart Read, who led it last time, was extremely helpful now. Some sites had disappeared since then and some new ones were added to the tour. Stewart provided a wealth of historic pictures and opened his own building to display them for us. He also lined up other members of the Bellows Falls Historical Society to speak to us and answer questions.

Starting at the visitor's center, which was designed to portray a railroad station, we viewed many historic pictures with their accompanying explanations and watched a video. David Dunning, tour guide and president, told of the history of the Bellow Falls region. Before 1800, the only crop har-

vested in appreciable amounts in the CT River valley of VT/NH was timber for buildings. Logging boomed in the last quarter of the 19th century when wood pulp replaced cotton fibers in the making of paper. Logs were floated down the river and its tributaries to saw mills and later pulp mills here. The last large log run on the Connecticut River, 65 million board feet, mostly spruce, took place in 1915. The arrival of railroads in the valley about 1850 greatly improved the transportation of both raw materials and finished goods.

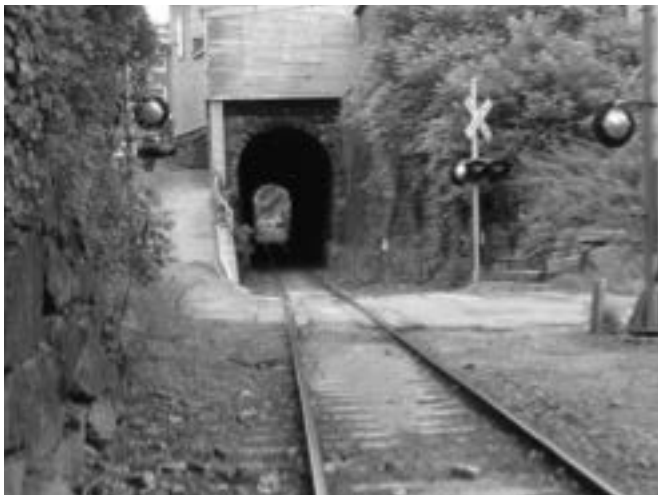
After that introduction, we drove across a bridge to the NH side and visited the Green Mt. Railroad yard and roundhouse and maintenance building. During its heyday much freight passed through Bellows Falls: lumber, cattle, talc, milk, mail, coal, soapstone, and grain. During this time up to 16 daily passenger trains also traveled through Bellows Falls.

Across from the Green Mt. Rail yard, we could look up and down the river and see where the numerous paper mills and other old factories used to be. We had a close up look at some very unique historic bridges, which there isn't room to describe here. One of them is on the site of the first bridge over the CT River, in 1785. We were fortunate to have someone on the tour that was in charge of rebuilding one of these. (If you don't come on these tours, you really miss out on a lot.)

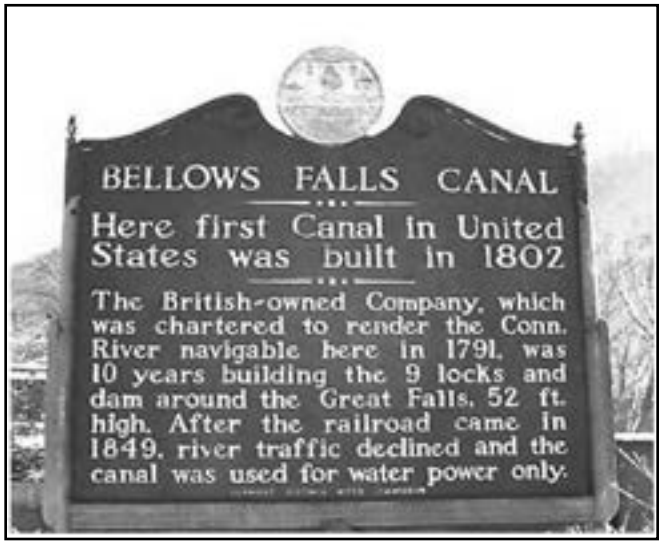
Driving back to the Vermont side, we then looked through the Bellow Falls railroad tunnel. It was originally constructed in 1851, right under the city streets. The tunnel is 278 feet long and partially cut through solid rock. Over its lifespan, the tunnel floor had to be lowered three times; in 1897, again in 1977 and recently in 2007 since the city streets could not be raised. This lowering was to allow higher trains to pass through on their way from NYC, etc. to Canada. The latest lowering was to allow double decked auto carrier cars through. This project had to be done within three days as the Montrealer couldn't be kept waiting. They removed the tracts and 750 cubic yards of material, lowered the track bed about three feet and got it all back together in time. To see a photo presentation of the job, sent by the chief engineer, go to our web site: www.sia-web.org . Click on Chapters, choose NNEC, click on Articles at the top. Then scroll down to Misc. Articles & Web Sites. Choose: Bellows Falls Tunnel Project.

The train tunnel runs right alongside of and close to the Bellows Falls canal; in fact there is often water seeping into the tunnel. When the track comes up out of the tunnel it crosses diagonally overtop of the canal. This first lock canal in the US raised Connecticut River boats and barges 52 feet through 9 locks. That's only about a 6 foot lift per lock but when it was built (1791-1802) they only had crude means of opening and closing the lock gates. All kinds of cargo was floated up and down the river that before had to be unloaded onto wagons, etc. and hauled to above or below the falls rapids and then reloaded. The locks saved a lot of time and work. The owners charged tolls but the original investors never got all of their money back. It was always a looser. In the mid-1800s, when the railroad came through, the locks became obsolete. A larger dam was built in 1871 and the canal was primarily used to turn water wheels, then turbines. Today, as we saw it, the canal feeds New England Power Company's hydroelectric station that was built in 1928.

In the mid 1800's, much of Bellows Falls was engaged in the lumber business. The falls were a natural choke point for all of those logs coming down the river from VT and NH. In 1870, William A. Russell developed a process for making paper out of wood pulp. Until then, it was all made out of used textiles (like old clothes). He founded the Fall Mt. Paper Co. that year. In 1898, he and 17 other pulp and paper companies in the northeast formed International Paper Co. The newly formed company supplied 60% of all newsprint in the country. At the turn of the century, Bellows Falls had the largest concentration of papermaking companies, buildings, etc. of any city in the country.



Bellows Falls train tunnel



Roller Gate Dam

The Abenaque Machine Works was just below Bellows Falls in Westminster Station, VT. Abenaque was formed in 1894 to make automatic scales and farm and marine gas engines in the ¾ to 15 horsepower range. The company ended up making a full line of powered farm equipment up to 25 HP. They went out of business about 1911 due to a company split, fierce competition from larger manufacturers and other complications. Only a few buildings remain and they are now used for other manufacturing.

In the late afternoon we explored the multistoried Adams Grist Mill. It started operation in 1831 as a mill for processing cracked corn, then grinding it into meal for household use or into feed for farm animals as well as processing other grains. Ten thousand bushels were ground in a day. The mill discontinued operation in 1961. Today the chutes and elevators shafts and pulleys are still intact and operable. Although some of the equipment has been replaced over the years, the original stone section remains, the waterwheel is still in place and the amazingly square hand-hewn beams are there, plus ancient fire buckets, etc.

Pictured here is Bellows Fall's unique (if modern) roller gate dam that was built in 1933. It's the main dam that holds back the Connecticut River as it enters the town and feeds the hydroelectric station. Because a heavy rain storm can fill up the river basin quickly from its two-state watershed, the giant rollers in this dam can be rotated up to regulate the water level and spill water quickly if needed. The two roller gates, each 115' long by 18' high, have a maximum opening of 10.5'. The roller gates are also used for "peaceful purposes", to adjust the water level of the reservoir behind the dam feeding the hydroelectric station. It has three Francis type turbines, at a combined rating of 54,000 h.p., at a design head of 57', operating at 85.7 RPM. The station has a nominal plant capacity of 49,000 KW.

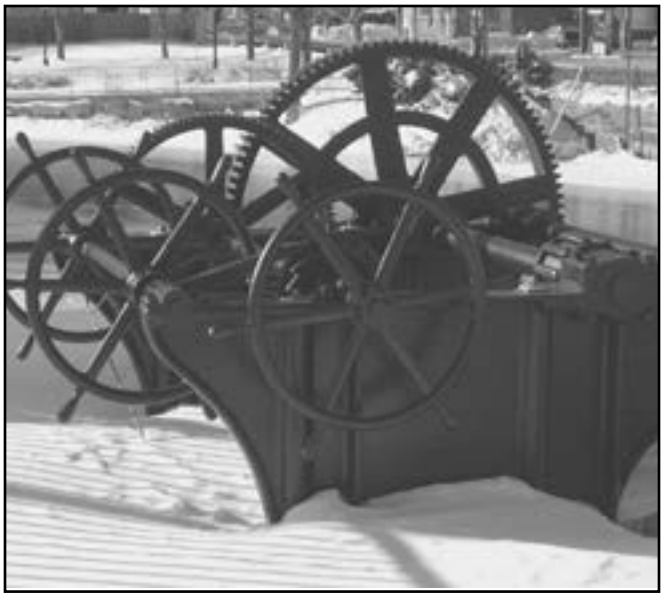
David Dunning
dunmark@tds.net
603-526-6939

The Power of Water: An Exhibit at the Historical Society of Cheshire County (NH)

The Monadnock Historical Societies Forum is an organization of historical societies in the southwest corner of New Hampshire. Since 2006 they have organized an exhibit on regional history every three years. The current exhibit on water-powered mills may be of interest to SIA members. A limitation on local historical societies is that their collections tend to be whatever local citizens donated rather than items carefully selected to create a coherent collection. The current exhibit does a good job of overcoming this limitation by selecting related artifacts from many such collections, all connected by a chosen theme. Past themes have encompassed places of worship and places of learning and this one is devoted to places of work. For the SIA member the exhibit gathers together much material that might otherwise be unknown or inaccessible in small societies with limited hours. Perhaps even more valuable to those with serious historical interests is the guidebook that accompanies the exhibit. Rather than merely reproducing the pictures and placards on display, the book is a systematic regional history of water power. It begins with an overview chapter which is followed by individual coverage of 14 towns. The emphasis is on completeness which has the virtue that Keene, the largest industrial site in the area, and Harrisville, the best known and best preserved, do not dominate the narrative. No individual water-powered site gets much depth but the sheer number of sites covered is very impressive.

The Society also provides other resources of use to those who wish to explore this area's industrial history on their own. In the Shadow of Monadnock is a driving tour of the area that includes all manner of historical sites. Industrial ones are not the main type of site mentioned, but neither are they excluded as they usually are from typical tourist literature. Shire Town By Foot is a similar walking tour of the region's largest city, Keene. Also of interest is 18 Mile Historic Tour of Swanzey Covered Bridges. (There are five -- and don't miss the Ashuelot covered bridge in nearby Winchester.) Visitors to the water power exhibit should also peer into the permanent collection in the basement. This is made up primarily of various sorts of tableware (including Stoddard glass) along with many Kingsbury toys made in Keene. The exhibit ends 29 June 2013. The Historical Society of Cheshire County is located at 246 Main Street in Keene, New Hampshire, and is open year-round. In the summer months they also have open the Horatio Colony House (The Colonies were the principal mill owners) and the Wyman Tavern, which dates from pre-industrial Colonial times. You can find more information about all of the above at the Society's website at http://www.hsccnh.org/.

Robert W. Hayden
Jaffrey, NH
bob@thesitebelow



The "Iron Heritage Trail"

The idea of the "Iron Heritage Trail of Southeastern Mass." came about after the SNEC/NNEC conference at Clark University a little more than one year ago. Sara Wermiel and I were discussing the research she had done on the Tremont Nail site in Wareham. From that the "Iron Trail" idea took root and I have been pursuing it ever since. We had our first official meeting last October in Wareham where we discussed the formation of the "Iron Trail" and decided that there was enough interest to move forward. We also visited the Tremont Nail site. I have contacted 16 towns and about 50 organizations and individuals. While I have not heard back from all (contact information is not always reliable) there has been much interest. Many people have shared with me information about the iron industry in their area. Our second meeting was held May 4, 2013 at the Old Colony Historical Society Museum in Taunton. Jane Hennedy, Director, Cindy Ricciardi, President, and their staff were our host. A slide presentation which covered a brief history of the iron industry in southeastern Mass. and introduced the "Iron Heritage Trail" was given. This was followed by a tour of the museum with an emphasis on the Iron industry in the Taunton area. Refreshments were served as part of a celebration of the 160th birthday of "The Old Colony Historical Society," followed with a presentation by Andrew D. Boisvert on the archival information available at the museum. Development of the "Iron Trail" will continue with the help of a number of interested individuals, many of which are members of SNEC/NNEC. My slide show and presentation is available to interested groups. I have so far shown this on three occasions and am scheduled for two more. If you know of an interested group, please contact Mack Phinney mbp43mack@gmail.com or phone 508-295-4225.

News from the Mill Hollow Heritage Association

Mill Hollow Heritage Association
801 Forest Road
Alstead, NH 03602
millhollowheritageassoc@gmail.com
May 2013

Greetings!
In the past months, the Board of the Mill Hollow Heritage Association has been gaining ground toward making the Mill in Mill Hollow a working museum. It is time we let you know our progress.
At this point here is where we stand:

- We have six Board members with diverse skills and experience
- We have a mission statement and bylaws
- We are accepted as a non-profit organization by the State of New Hampshire
- We are awaiting 501(c)3 status with the IRS
- We have 'Seven to Save' status with the New Hampshire Preservation Alliance

The plan is to purchase the building from the current owners, Mow Kazati and Kate Morgan, and stabilize the structure. The first major goal towards the working museum is repair of the water works as the Mill's unique feature. There are also many smaller, but important, projects along the way. Our present efforts include planning a strategy for fund raising, finding experts who might be of help, gathering volunteer help, and planning a membership structure with a growing mailing list.

As the year 2013 marks 250 years since the Town of Alstead received its charter, many activities have been planned to celebrate. The Mill is on the Sestercentennial tour list. This month we will be working to clean and clear it in readiness for that.

We plan to send out newsletters whenever there's something new to report. If you know anyone you think would like to receive it, please send the appropriate address directly to Mow Kazati, mowkazati@gmail.com.

Best wishes from the Board of MHHA,
Dan Bartlett, Deborah Dunnell, Dan Curll,
Mow Kazati, Tom Dowling, Margaret Perry;
Secretary, Kate Tarlow Morgan
and Attorney, Bruce Montgomery

IEEE Milestones Commemorated in Greater Boston with Links

MIT Radiation Laboratory, 1940-1945
The MIT Radiation Laboratory, operated on this site between 1940 and 1945, advanced the allied war effort by making fundamental contributions to the design and deployment of microwave radar systems. Used on land, sea, and in the air, in many adaptations, radar was a decisive factor in the outcome of the conflict. The laboratory's 3900 employees made lasting contributions to microwave theory and technology, operational radar, systems engineering, long-range navigation,and control equipment.
http://www.ieeeghn.org/wiki/index.php/Milestones:MIT_Radiation_Laboratory,_1940-1945

Electric Fire Alarm System, 1852
On 28 April 1852 the first municipal electric fire alarm system using call boxeswith automatic signaling to indicate the location of a fire was placed intooperation in Boston. Invented by William Channing and Moses Farmer, this system was highly successful in reducing property loss and deaths due to fireand was subsequently adopted throughout the United States and in Canada.
http://www.ieeeghn.org/wiki/index.php/Milestones:Electric_Fire_Alarm_System,_1852

Power System of Boston's Rapid Transit, 1889
Boston was the first city to build electric traction for a large-scale rapid transit system. The engineering challenge to design and construct safe, economically viable, and reliable electric power for Boston's rapid transit was met by the West End Street Railway Company, beginning in 1889. The company's pioneering efforts provided an important impetus to the adoption of mass transit systems nationwide.
http://www.ieeeghn.org/wiki/index.php/Milestones:Power_System_of_Boston%27s_Rapid_Transit,_1889

First Intelligible Voice Transmission Over Electric Wire, 1876
The first transmission of intelligible speech over electrical wires took place on 10 March 1876. Inventor Alexander Graham Bell called out to his assistant Thomas Watson, "Mr. Watson, come here! I want to see you." This transmission took place in their attic laboratory located in a building near here at 5 Exeter Place.
http://www.ieeeghn.org/wiki/index.php/Milestones:First_Intelligible_Voice_Transmission_over_Electric_Wire,_1876

First Wireless Radio Broadcast by Reginald A. Fessenden, 1906
On 24 December 1906, the first radio broadcast for entertainment and music was transmitted from Brant Rock, Massachusetts to the general public. This pioneering broadcast was

achieved after years of development work by Reginald Aubrey Fessenden (1866-1932) who built a complete system of wireless transmission and reception using amplitude modulation (AM) of continuous electromagnetic waves. This technology was a revolutionary departure from transmission of dots and dashes widespread at the time.
http://www.ieeeghn.org/wiki/index.php/Milestones:First_Wireless_Radio_Broadcast_by_Reginald_A._Fessenden,_1906

First Real-Time Speech Communication on Packet Networks, 1974 to 1982

In August 1974, the first real-time speech communication over a packet-switched network was demonstrated via ARPANET between MIT Lincoln Laboratory and USC Information Sciences Institute. By 1982, these technologies enabled Internet packet speech and conferencing linking terrestrial, packet radio, and satellite networks. This work in real-time network protocols and speech coding laid the foundation for voice-over-internet-protocol (VoIP) communications and related applications including Internet videoconferencing.
http://www.ieeeghn.org/wiki/index.php/Milestones:First_Real-Time_Speech_Communication_on_Packet_Networks,_1974_-_1982

AGC -Apollo Guidance Computer, 1962 to 1972

The Apollo Guidance Computer provided spacecraft guidance, navigation, and
control during all of NASA's Apollo Moon missions. It was developed under the leadership of Dr. Charles Stark Draper at the MIT Instrumentation Lab - now Draper Laboratory. This pioneering digital flight computer was the first real-time embedded computing system to automatically collect data and provide mission critical calculations for the Apollo Command Module and Lunar Module.
http://www.ieeeghn.org/wiki/index.php/Milestones:Apollo_Guidance_Computer,_1962-1972

LORAN, 1940 to 1946

The rapid development of Loran -- long range navigation -- under wartime conditions at MIT's Radiation Lab was not only a significant engineering feat but also transformed navigation, providing the world's first near-real-time positioning information. Beginning in June 1942, the United States Coast Guard helped develop, install and operate Loran until 2010.
http://www.ieeeghn.org/wiki/indexphpMilestones:Loran,_1940-1946

Whirlwind Computer, 1944 to 1958

The Whirlwind computer was developed at 211 Massachusetts Avenue by the Massachusetts Institute of Technology. It was the first real-time high-speed digital computer using random-access magnetic-core memory. Whirlwind featured outputs displayed on a CRT, and a light pen to write data on the screen. Whirlwind's success led to the United States Air Force's Semi Automatic Ground Environment - SAGE - system and to many business computers and minicomputers.
http://www.ieeeghn.org/wiki/indexphpMilestones:Whirlwind_ Computer

SAGE - Semi Automatic Ground Environment, 1950 to 1958

In 1951 the Massachusetts Institute of Technology undertook the development of a continental air defense system for North America. The centerpiece of this defense system was a large digital computer originally developed at MIT. The MIT Lincoln Laboratory was formed to carry out the initial development of this system and the first of some 23 SAGE control centers was completed in 1958. SAGE was the forerunner of today's digital computer networks.
http://www.ieeeghn.org/wiki/index.php/Milestones:Semi-Automatic_Ground_Environment_(SAGE)_1951-1958

Boston Section home page is www.ieeeboston.org

This article is from a presentation delivered on February 20, 2013, at the Boston Public Library's Build Boston Lecture Series. The presentation was entitled "Milestones in Boston's Electrical Engineering History." Ten IEEE Milestones awarded by the Boston IEEE section were discussed. SIA members may recall presentations on some of these projects. The lecture also included future plans to nominate additional milestones. Please contact Gil Cooke for additional information.

Gilmore Cooke
IEEE Boston Section
Chair, Milestones and History Committee
(617) 759-4271
gilcooke@ieee.org

Northern New England Chapter (ME, NH, VT)
Membership and Dues for 2013

Member Renewal: $20.00
Student: $10.00
New Member: $15.00

Send to:
Carolyn Weatherwax, Treasurer – NNEC-SIA, 305 Heritage Way, Gansevoort, NY 12831

Name: _____ Occupation:_____
Address:_____
Phone: _____ Email: _____

Southern New England Chapter (MA, RI, CT)
Membership and Dues for 2013

Regular: $10.00
Student: $8.00
Lifetime: $150.00
New member: $8.00

Two members at one address pay only one membership fee. As we are communicating increasingly by email, it is vital that we have your current EMAIL address.

SNEC-SIA is your best opportunity to gain a close-up on-site look at extraordinary technologies and exciting engineering history. Join us for another year of newsletters, tours and more. Complete and return this with your check made payable to SNEC-SIA.

Send to:
Sara Wermiel, Treasurer – SNEC-SIA, 70A South St, Jamaica Plain, MA 02130-3143

Name: _____ Occupation:_____
Address:_____
Phone: _____ Email: _____