MICROMOUNTERS OF NEW ENGLAND
NEWSLETTER

The MMNE was organized on November 8, 1966 for the purpose of promoting the study of minerals that require a microscope

No. 275 November, 2006

Current Meeting
Saturday, November 18th
Chelmsford, MA library
Doors open at 9 am

Map and driving directions are on page 8

For information regarding **MEETING CANCELLATION** due to inclement weather, contact:
Tom Mortimer
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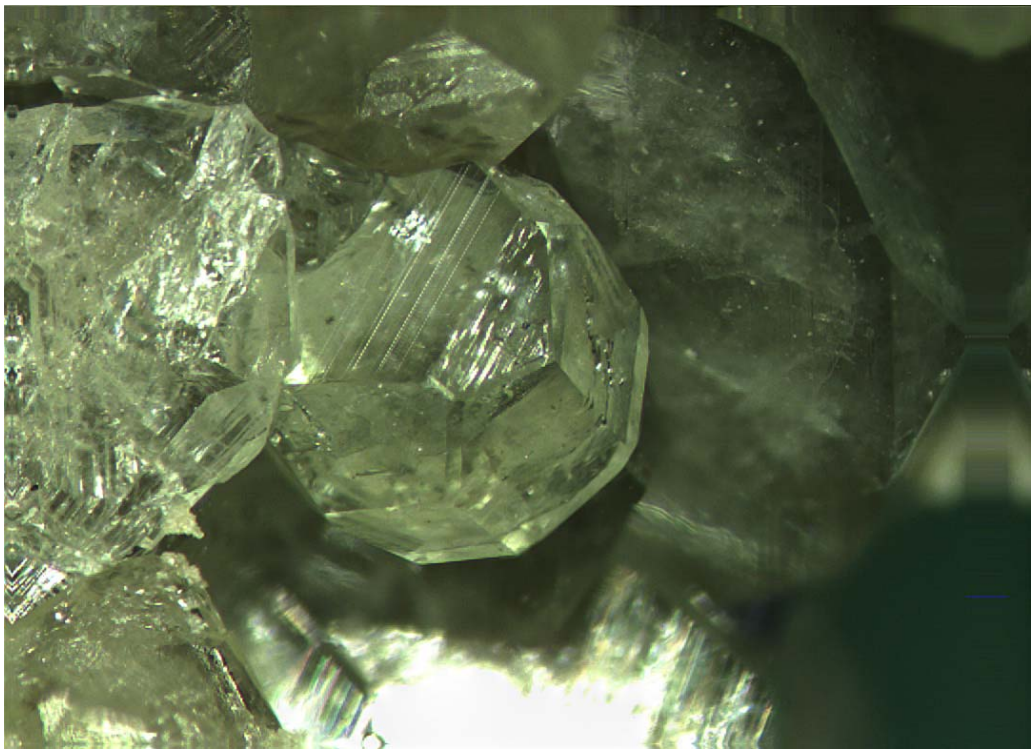
tjmort@aol.com

From the editor

Before moving to Boston I had never collected any phosphates, save for some fluorapatites and pyromorphites. Since rare phosphates seem to be a New England specialty, I decided I should spend some time prospecting the New Hampshire and Maine pegmatites. My first trip was the MMNE trip to the Palermo mine on May 21st. It took me a bit of time to get used to this unfamiliar geologic environment. After I stopped staring at the 2-feet long fresh triphylite crystals, I started looking for altered material. There was not many at this time, but thanks to Peter Christofono, I found a nice piece of massive ludlamite, which produced my first phosphate micromounts: ludlamite, vivianite, whitmoreite, strunzite, rockbridgeite, and laueite. I thought that was a good first trip. Last week-end I went back to New-Hampshire, this time for a BMC trip to the Chickering Mine, in Walpole. Massive phosphates are abundant here, including triphylite, heterosite-purpurite, eosphorite-childrenite, and a blue mineral that might be lazulite-scorzalite. Rusty samples from the quarry wall contained large (1/2") eosphorite-childrenite crystal sprays, in association with black, shiny crystals. *(continued on page 3)*



Ludlamite, Palermo n°1 Mine, North Groton NH, Collection & Photo Etienne Médard

The ***Newsletter*** is the official publication of the Micromounters of New England (MMNE). The last by-laws revision was April 19, 2003. The MMNE is a member of the Eastern Federation of Mineralogical and Lapidary Societies (EFMLS) (http://www.amfed.org/efmls) and the American Federation of Mineralogical Societies (AFMS) (http://www.amfed.org). Material from the *Newsletter* may be copied in other rock and mineral publications if credit is given to the author and the *Newsletter* and permission has been obtained from the author. If there are questions regarding copying contact the editor. The club address is c/o the Secretary. Meetings are held monthly, September through May, except for December, and usually on an informal basis in July and August. Sites rotate and will be posted in the *Newsletter* as far in advance as possible. Visitors are welcome to attend all meetings. Bring a microscope and light source if you have one.

DUES are $12/year for a single person and $16/year for a family membership, levied on a calendar basis. The family membership includes two adults and all children under 18 living at the same address. One copy of the *Newsletter* will be sent on a family membership.

2006 CALENDAR OF UPCOMING EVENTS

November 2006

4-5 – Annual Show, Samford Mineralogical Society. Eastern Greenwich Civic Center, 90 Harding Rd. Old Greenwich, CT. Sat 9:30-5, Sun 10-4:30 Email: rzlapidary@yahoo.com.

14 – Boston Mineral Club - Business Meeting & Annual Specimen Competition, 8:00 p.m., Harvard University Lecture Hall, 24 Oxford St., Cambridge MA.

18 – MMNE meeting, Chelmsford, MA Public Library, 9am-3pm (Map and directions on page 8)

18-19 - Worcester Mineral Club Annual Mineral Show, National Guard Armory, 701 Lincoln Street Worcester MA, Sat-Sun 10-5. http://www.worcestermineralclub.org/shows.htm

December 2006

lots of trimming and mounting…

TABLE OF CONTENTS

(continued from page 1)

I spent some time on mindat, I looked at Bob Whitmore's wonderful book on Palermo, and I browsed the Newsletter archives on the MMNE website. Well, I still have no idea what this mineral might be. I'm pretty sure that I will get an answer next meeting, but, while looking at the old newsletters, I realized that there has never been any pegmatite phosphate picture! (well, maybe there have been, and I missed them) So, since I am also looking for newsletter material, what do you think of putting together a phosphate photo album for one of the next Newsletter? Would anybody be interested? We could get together a bunch of pictures, add a list of phosphate-related references, and I think that will prove very useful…

Bristol, NH; Henry David Thoreau and the "lead" pencil

by Bob Wilken

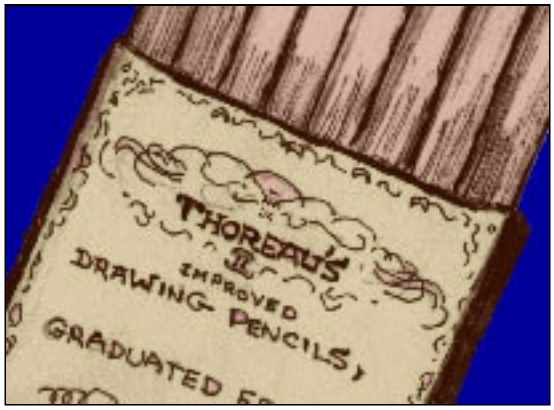
In The History of Bristol Charles Musgrove writes: "On the Samuel Hilands farm, east of Newfound Lake, is a mine of plumbago, or black lead, of considerable extent." (Plumbago and "black lead" were at one time the common descriptors for graphite.) From this description, the Hilands property was in the vicinity of what is today the Cliff Lodge. Musgrove goes on to say that the *Farmer & Little Gazeteer* of 1820 characterized the mine as "a large body of plumbago recently discovered in Bristol, which is pronounced as the best in the country." Subsequent to the discovery of graphite, the land was purchased by a Charles Dunbar from Concord Massachusetts. Dunbar's company, apparently working with a partner, was called Dunbar and Stow. As best as can be determined the mine operated from the early 1820's into the late 1840's about which time the deposit became exhausted. Musgrove states that by 1845 a company by the name of Zeabury, Olup & Watkins operated the mine. At this time the graphite was "ground and put up in small packages for shipment" on Water Street in Bristol.

In the very early 1800's the "lead" pencil was a relatively new and somewhat unsophisticated writing tool. German and French pencil makers were busy experimenting with processes designed to improve it. Though somewhat behind, American pencil makers were also attempting the same, "often under the veil of secrecy". As early as 1812, David Munroe of Concord, Massachusetts was mixing graphite with an adhesive material, spreading it onto slabs of cedar with grooves, which were then sawed into individual pencils. Early on, Munroe hired a cabinetmaker, Ebenezer Wood, to help him operate and mechanize his production.

Soon after Charles Dunbar, owner of the Bristol graphite property, discovered graphite in 1821, he invited his nephew, Henry David Thoreau to join him in a pencil making enterprise. The man we think of as author of the transcendental American classic Walden was also a capable engineer and inventor. Thoreau ascertained a process by which inferior graphite could be mixed with a clay binder so as to result in a product that would not smear. Whether he secretly gleaned this information from German pencil making sources is not known. Thoreau also determined that by varying the amount of clay the pencil lead could be made harder or softer.

In the 1830's Thoreau and his father built a milling system to refine graphite. In an article entitled "The Machine in the Wetland: Re-imagining Thoreau's Plumbago-Grinder" the author concluded that Thoreau's grinder "may have been widely replicated". About this time Ebenezer Wood left Munroe's operation and started his own grinding facility and pencil making company. He apparently benefited from the Thoreau's unpatented grinding methods.

Wood, a talented inventor in his own right, "is credited with using the first circular saw in the pencil business, inventing a grooving machine, a molding and trimming machine, a wedge glue press, (and) creating the hexagonal and octagonal pencil." (Like Thoreau, Wood never bothered to patent his inventions.) It is unclear why Thoreau did not grind his own pencil graphite, especially in view of the fact that he is credited with the development of the grinding equipment. Nevertheless, both Munroe and Thoreau ended up buying milled graphite from Wood. Because Thoreau's "business was larger and more lucrative" than Munroe's he managed to prevail upon Wood to cut back on Munroe's graphite supply.



There is nothing to indicate that the Bristol, NH graphite was the **only** graphite used throughout these early years. Indeed there were sources in Massachusetts itself. Eventually, pencil makers resorted to sources of supply as far away as Canada. The Bristol graphite was trumpeted as being of high quality, but American graphite in general did not match that which was mined in England. It was Thoreau's process that was able to turn the graphite into a product that was suitable and of high quality.

Sources:

History of Bristol, Vol I Annals by Richard Musgrove, 1904
"The Machine in the Wetland: Re-imagining Thoreau's Plumbago Grinder" by Randall Conrad, http://thoreau.eserver.org/pencils.html
"Thoreau's Pencils" by John H Lienhard, http://www.uh.edu/epi339.htm
"Early American Pencils" http://www.town.acton.ma.us/LSCOM/EAPencils.htm

(If you have read this far you have just read the third consecutive newsletter contribution by Bob Wilken. You can tell I am running out of material since this has nothing whatsoever to do with microminerals. I'm no Bob Janules. Help!!! Some of you must have more pertinent material to share?)

Analysis of some New Hampshire Garnets

by Tom Mortimer

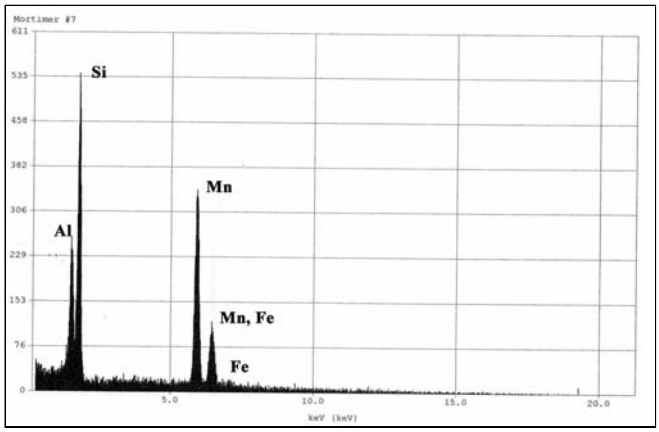
My collecting focus for the past several years has been to obtain as many New Hampshire mineral species as I could find. How many are there? Depending on which particular reference list you choose to use, there are close to 300 unique mineral species in New Hampshire. The reference list I am presently using has 278 entries. One previous benchmark of NH species was a display I coordinated for the Nashua Mineral Society's 1995 mineral show. For that show, our display committee solicited specimens from over 20 New England mineral collectors and museums. The show display exhibited 214 unique New Hampshire species. Our reference list had 256 entries, (distilled from several sources, including the 1990 New Hampshire "Rocks and Minerals" issue, Phillip Morrill's list, and a list from Janet Cares). Since 1995, I have added 27 species to my working version of the NH list and deleted 10 species. Bob Janules' study of the Mascot Mine in Gorham, NH is responsible for many of the recent additions. Certainly any state species list is a fluid document. Present and future collectors will keep it growing.

A proven New Hampshire Spessartine garnet was, until recently, absent in my collection. Differentiating the Almandine and Spessartine garnet series is difficult for the amateur collector, (for me anyway). There is a solid solution series that traverses the chemistry between the iron, Almandine, garnet and the manganese, Spessartine, garnet. Some specimens may have an intermediate composition between Fe rich and Mn rich.

One test method I have tried with some success is to intensely heat garnet fragments with a propane torch. This apparently changes the oxidation state of any iron present. The result is that when the fragment cools, if it is an iron garnet, the grain will be attracted by a small, strong, magnet. Some garnet grains will show a moderate attraction to the magnet, others a week or no attraction. Try this test for yourself with a known Almandine garnet fragment.

This fall I have had five candidate New Hampshire Spessartine garnets analyzed using an EDS microprobe service. The analysis results and the locality details for these specimens follow.

Locality 1: A quartz outcrop, north of the Ore Hill Mine, Warren, NH.
Specimen Description: Crude, manganese stained, crystals in quartz, with glassy, orange, interior. Crystal size, about 1.5 cm.
Analysis: Because these "crystals" are so crude, I was uncertain if they were actually garnet. My propane torch test showed no magnetic response. However, the EDS[1] analysis clearly showed the mineral to be Spessartine, with only a slight trace of iron.



Ore Hill, Warren, NH - Spessartine

Locality 2: East shore, Lake Warren, Alstead, NH. A personal communication from Carl Francis of Harvard had informed me that Spessartine had been found in a Biotite schist near Lake Warren, in Alstead, NH.
Specimen Description: The pink garnets I found were in pegmatite boulders on the east shore of Lake Warren. Although the crystals were not especially aesthetic, their light pink color looked promising for a NH species collector seeking Spessartine. The broken crystal in photo is about 1 cm across
Analysis: The EDS analysis of these Alstead garnets showed them to be Almandine-Spessartine, with the iron content exceeding the manganese content.

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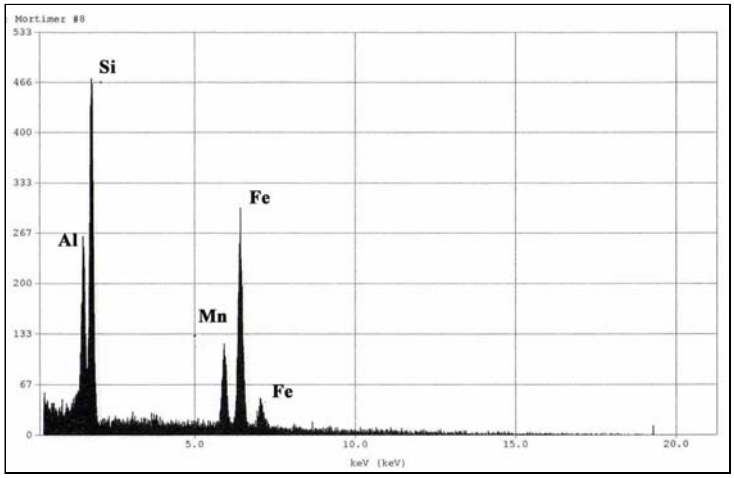
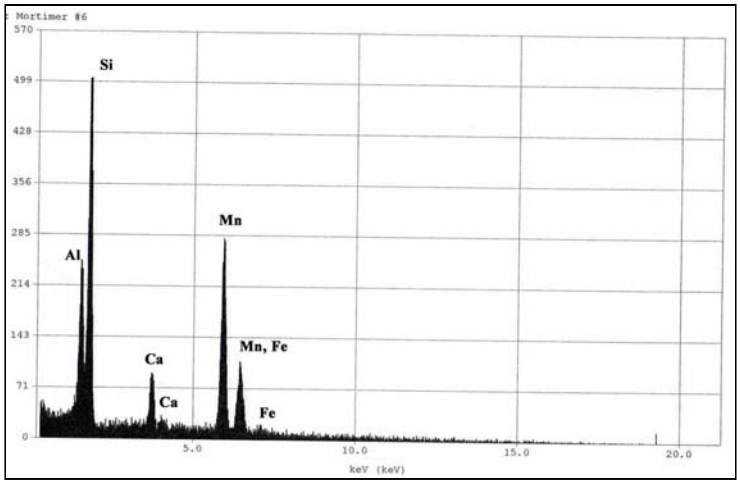
[1] The element cutoff for the EDS instrument used for these analyses was Sodium. Elements with atomic numbers less than Sodium, (includes Oxygen and Carbon), do not show up on the plots. An excellent tutorial on the subject of EDS analysis may be found at http://jan.ucc.nau.edu/~wittke/Microprobe.



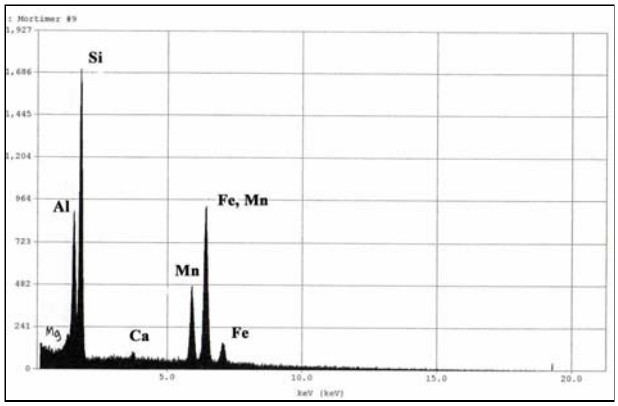
Alstead, NH –Almandine-Spessartine

Locality 3: Tower Hill, Hinsdale, NH
Specimen Description: Small orange-red garnets are associated with the manganese mineral deposit on Tower Hill in Hinsdale. This environment makes this a likely site for Spessartine garnets.
Analysis: These specimens are predominantly manganese garnets, with lesser amounts of iron and Calcium present. These qualify Spessartine garnets, but the presence of Calcium and Iron indicates some mix of Grossular and Almandine in the recipe.



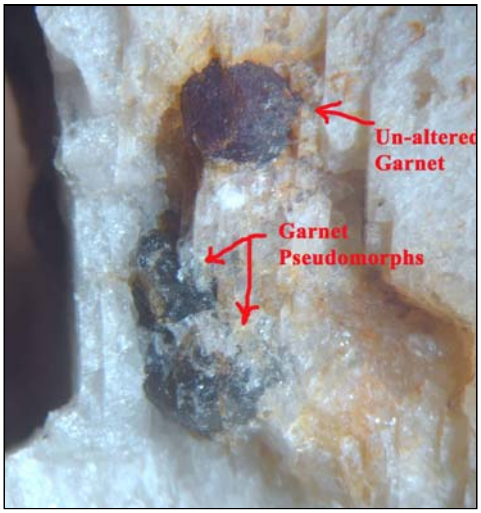
Hinsdale, NH
1 – 2 mm Spessartine garnets

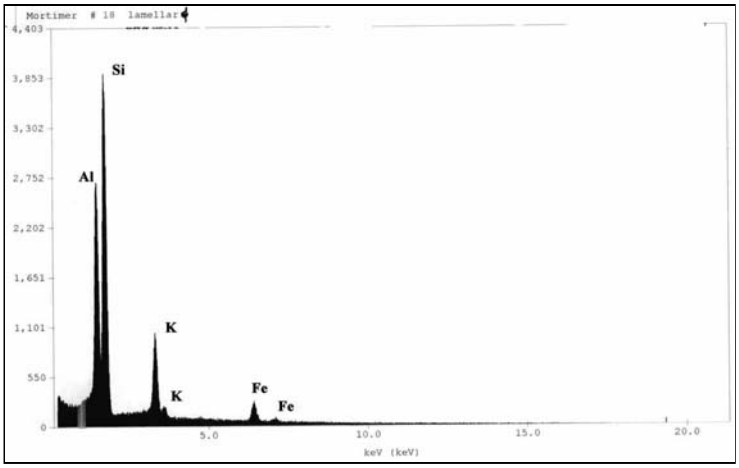
Locality 4: Joe Hill Area, Springfield, NH. Many veteran NH field collectors have heard of the Joe Hill Farm locality in Springfield, NH, where "all (old time) collectors got there spessartites", (Phillip Morrill). Many collectors, including myself, have searched for this lost locality, but no one I know has found it. Perhaps it is simply "worked out." When I was searching the area in 1995, I did find some garnets in a pegmatite ledge in this area.
Specimen Description: 7 mm red garnet in a feldspar muscovite matrix.
Analysis: The EDS analysis shows my Joe Hill garnet to be Fe rich with Mn present, thus another Almandine-Spessartine garnet.



Joe Hill Area Springfield, NH Almandine-Spessartine

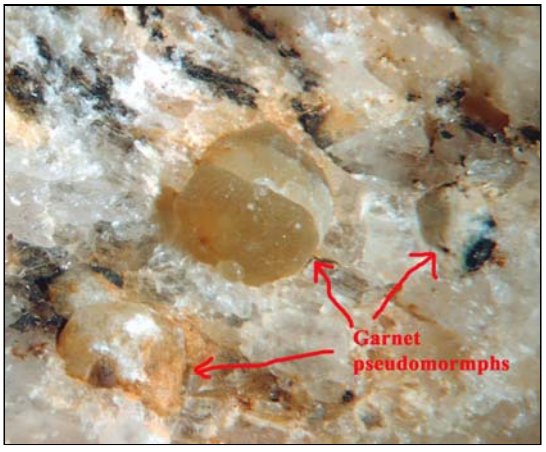
Locality 5: EE Smith Mine, (upper pegmatite cut), Alexandria, NH.
Specimen Description: I discovered 1 to 2 mm yellow green "garnets" in association with some manganese stained red garnets in pieces of a vuggy albite mine dump rock. The shape of these crystals clearly said "garnet", but the color was unlike any New England garnet I had seen.
Analysis: These small crystals are apparently not garnet. The prominent element present, other than Aluminum and Silicon, (and implied Oxygen), is Potassium. On closer inspection, the interiors of these "garnets" appear to be mica-like. They are easily scratched with an Xacto knife. My guess is that these are Muscovite or Glauconite pseudomorphs after Almandine-Spessartine. I will be seeking the opinion of others at our next meeting.

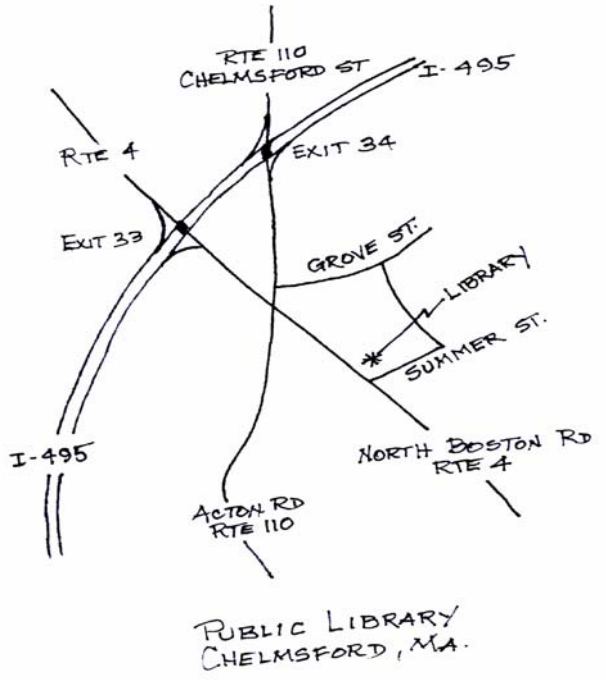




EE Smith Garnet and Garnet pseudomorphs

EE Smith Garnet pseudomorphs Center crystal 1.1 mm





DIRECTIONS TO CHELMSFORD PUBLIC LIBRARY

From I-495 Northbound

Take Exit 33 and turn right (South) at bottom of ramp onto Rte 4. Follow Rte 4 approximately ½ mile through several sets of lights to traffic island in center of town.

*Continue on Rte 4 to the right at the island and proceed past the Mobil station on your left (Note that you are on a one way street). The library is on the same island as the Mobil station. Continue on Rte 4 staying to the left for several hundred yards. The back side of the library is to your left. Take Rte 4 North, a left hand turn, and the library is the first building on the left. Park in the lot and enter through the front doors. The meeting room is to the right, just inside the entrance.

From I-495 Southbound

Take exit 34 and turn right (South) at the bottom of the ramp onto Rte 110. Follow Rte 110 (Chelmsford Street) to junction of Rtes 110, 129, and 4. Go straight into Chelmsford Center, staying to the right of the Mobil station and follow directions from I-495 Northbound (*)

OR take Exit 33 and follow the directions from I-495 Northbound.

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MEMBERSHIP FORM, NEW AND RENEWAL

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E-mail address: _____

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☐ Family $ 16.00

Family membership includes two adults residing at the same address and all children at that address under the age of 18. Only one copy of the Newsletter per family membership.

Newsletter: The Newsletter is available as hard copy sent through the mail, or via e-mail, which may have color photographs included. Please indicate choice of format. The Newsletter is published in January, February, March, April, May, Summer Issue (June), September, October and November (no December issue), and is send out approximately two weeks prior to the next scheduled meeting.

☐ hard copy only

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- ☐ Microsoft Word (for Windows) .doc format
- ☐ Adobe .pdf format

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