

The NEMES Gazette

Vol 4 No 48
April, 2000
© 2000

*The Newsletter of the New England Model Engineering Society,
Stephen C. Lovely, Editor, POBox 277 Milford, Ma 01757-0277, 508-473-8621
Ron Ginger, President, 17 Potter Road, Framingham, Ma 01701, ginger@acunet.net*

**Our Next Meeting is at 7:00 PM on Thursday
April 6, 2000 at the Museum, 154 Moody Street,
Waltham Ma.**

*Annual dues is \$20.00 - Please make checks payable to "NEMES" and
send to the NEMES Treasurer: Kay R. Fisher 80 Fryeville Road
Orange, MA 01364*

This Months Contents

President's Corner	1
The March Meeting	4
Calendar of Events.....	2
Treasurer's Report.....	2
Electric Vehicles	2
Shapers.....	3
Letters	7

From the Editor's Desk:

I missed the March meeting, but thanks to Max ben-Aaron there is a report on it. It's the first meeting I've missed, and I want to thank Max for the report because now I have an idea what I missed.

This issue marks the completion of the fourth year for the NEMES Gazette. As I've said before, when NEMES first started I wondered what it would be like to do a newsletter and figured I'd like to see for a while. After a couple of years I figured that it was an interesting thing to do but that it took a fair amount of time when I could be doing other things, so I decided to pass the editorship along after 50 issues. That means I'm going to do two more issues, and it's time for another editor to step forward. So, if you'd like to be an editor, now is your big chance. NEMES also could use a new Treasurer as Kay has been looking for a replacement for some time now.

See you next Thursday, scl.

The President's Corner by Ron Ginger

First, a personal note. My thanks to all of you that sent cards and expressed your sympathy to me on the recent loss of my mother. It is a great feeling to know I have made so many fine, caring friends through this club. We have a great group here, and it just seems to get better.

I hope everyone else enjoyed the March meeting with Rudy as much as I did. The workshop session seemed to be a success to all, and several of us enjoyed dinner with Rudy. Seeing the photos of his house and shop certainly

proves what a prolific fellow he is. I suspect we will have Rudy back again in a couple years.

February Show.

I didn't get to say much about the show in the last newsletter, since its publication date was too close to everything else to get much written. I was very sorry to miss the show, but it was good to see that the activities can run just fine without me. From all the reports I heard the show can be called a success, even though the snow certainly cut the attendance.

I understand we did have several fellows drive from as far away as Pennsylvania and Maine for the show.

We had a good range of prizes from several of our favorite vendors, and a number of guys went home with some very nice prizes. Our thanks to all the vendors for their support. And thanks to Steve Cushman for doing most of the work to encourage the vendors to give so generously.

Door Prize Winners

J&L supply donated a 2" throw dial indicator, won by Pat Fisher. A box of J&L hats and pens was distributed throughout the group.

New England Brass donated a Fowler thickness gauge won by Steve Cushman, a Journeyman's Measuring Set won by John Littlefield, a keyless drill chuck won by John Wasser, and a carbide boring bar set won by Geoff Brown.

Four lucky folks won a years subscription to Strictly IC magazine. Gene Martha, Ed Mann, Dick Koolish, and Wm Schoppe.

Wholesale Tool donated a box of Brown & Sharpe hats that were distributed through the group and six dial indicators that were won by David Bono, Todd Cahill, Peter Renzetti, Dave Robey, Max ben-Aaron, and Larry Keegan.

Brothers Machinery donated a \$300 gift certificate which was won by John Wishneuski.

April Meeting.

For April we will have a session about electric cars. When we lined this one up gasoline was still 'only' about \$1, just a couple months more of the price increases we've seen in the last couple months and we may all start building electric cars.

Our member Dave Robie has made the arrangements for this meeting, and he has written the following article about the meeting and his interest in electric cars.

May Meeting.

I've got a couple leads on this, no firm details yet. I am back to needing some more leads- come on guys, let's hear it for future meetings.

--Ron

Calendar of Events

April 1-2 Sat & Sun 10am

The Woodworking Show
Eastern States Exposition, W. Springfield Ma.
310-477-8521

April 6, 2000 Thur 7PM

NEMES Monthly Club Meeting
Waltham, Ma.
Charles River Museum Of Industry 781-893-5410

April 15

Quinebaug Swap Meet
Rt. 395 Exit 87 Plainfield, Ct
Call: Larry Dudek 860-376-2306

April 29-30

NAMES Show
Wyandotte, Michigan
Ron Ginger 508-877-8217

April 30

Belltown Show

Firemans Field Rt. 16, East Hampton, Ct
Call: Larry Emmons 860-267-8584

May 4, 2000 Thur 7PM

NEMES Monthly Club Meeting
Waltham, Ma.
Charles River Museum Of Industry 781-893-5410

May 7

Dunstable Show
Dunstable, Ma.
Call: Jay Wilkie 207-748-1092

May 20-21

Rhinebeck Show
Dutchess County Fairgrounds, Rhinebeck, Ny
Call: 914-635-3217

May 20-21

Bangor, Pa
Jacktown Community Center, Bangor, Pa
Call: 610-588-7466

May 20-21

Cranberry Flywheelers Meet-
Carver, Ma
Call: David Moore 508-697-5445

May 27-28

Bernardston Show
Rt 10 E Off Rt 91 Bernardston, Ma
Call Wes Ball 413-648-9450

May 28 Owls Head

MOPAR/Chrysler Auto Meet

For a listing, please send name and brief description of event, time and place and a person to call for further information to: Bill Brackett at wbracket@ultranet.com or 508-393-6290

March 2000 Treasurers Report

Previous balance -----	\$3496.67
Peterson Party Center (table rent)-	-177.00
Service Charges Reversal -----	1.50
Dues Deposit -----	24.00
Show concession profit -----	207.37
Bob Neidorff (newsletter expense)--	-100.33
Shooting Star Tech (dues refund) ---	-12.00
Shooting Star Tech (dues deposit) ---	20.00
Service Charges -----	-3.00
Rudy Kouhought (speaker fee) -----	-50.00
Dues deposit -----	40.00
Rudy Workshop deposit -----	110.00
Charles River Mus. (Rudy Workshop)-	-110.00
New balance -----	\$3447.21
=====	

Our show this year showed a \$40 profit thanks to the concession booth.

The Rudy Kouhought work shop had 22 attendees each contributing \$20. This resulted in \$330 to Rudy and \$110 to the Museum for the use of the facility.

Respectfully
Kay R. Fisher

ELECTRIC VEHICLES - THE EASY WAY
by Dave Robie

Over the past few months electric vehicles (EV's) have suddenly become a much more desirable alternative mode of transportation than fuel burners for reasons closer to our hearts - namely, our wallets.

Commercially available EVs are expensive and always will be for many reasons, and they are as yet, imperfect. Also, commercial EVs are unobtainable at present in numbers sufficient to both conserve dwindling hydrocarbon

supplies and reduce airborne pollution and global warming effects. Commercial EV's such as GM's EV1 are not presently a cost effective alternative to gasoline driven vehicles .

But there are people out there now who drive EV's every day - vehicles that are in many cases superior to the commercially available, a whole lot lower in price, and therefore cost effective, and use today's technology. Rather than waiting for 'pie in the sky transportation developments' these people have 'pie now'- and have proven all of the advantages of EV's, and disproven the fallacies of detractors of the genre.

These people are the home shop mechanics, degree ME's and EE's, tech hobbyists, even 'start from scratch' frustrated environmentalists who have converted standard vehicles to electric power and now thumb their noses at the gas pumps.

Vehicle types are many. From electrified bicycles, mopeds and motorcycles to mid size autos, even fullsize pickup trucks. These vehicles do the 90% of general utility driving that is in the daily range of most of us. At surprisingly high efficiency and performance standards. Using a fuel that is cheap. These vehicles, which are easily self-maintained, are also fun to own and fun to drive.

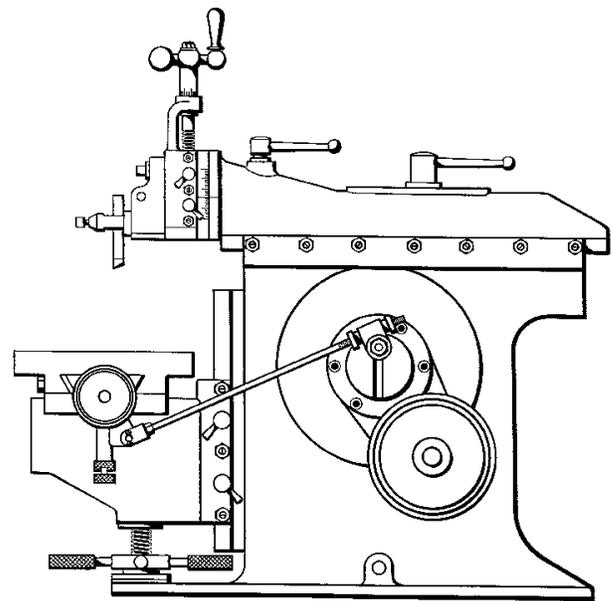
You will meet these people at our April meeting and hear about these conversions, learn where the hardware comes from, and more. And you will learn that among other things, a person interested in building up an electric vehicle does not have to be an electrician, or even have much electrical knowledge. Among other interesting parts of the program is the easiest, cheapest, lightest, and most reliable way to build an electric bike or trike. Massachusetts classes these as mopeds and they do not need registration.

Brian Matheny, of Bellingham Ma, an officer and member of New England Electric Automobile Association (NEEAA) will give a presentation regarding EV conversion, and EV's in general. There will be at least one converted EV present to inspect in the 'museum loading dock' parking lot before the talk, Brian's own everyday transportation vehicle, a 'kit converted' Chev S10 pickup truck, which he will be driving up from Bellingham MA.

Our guest speaker is an old hand at EV conversions, owning 3 himself and he doesn't even own a gas powered automobile. There may be other NEEAA members coming along, and a possibility of electric scooters and bikes also, including this writer's own solar powered adult tricycle.

I myself am a NEEAA member. Although not (yet) involved in large vehicle conversion, for the past 3 years, I have been mowing my 'large and lumpy' lawn with a commercially built battery powered electric lawn tractor (collect them, have 4). Also, pretty near ready to put on the road is a 'ground up' restored Vanguard Citicar, which was manufactured, like the electric garden tractors, during the energy crunch of the 70's. A well conceived and built personal 'round town' vehicle of which 3000 were made but proved to be a marketing failure, as the garden tractors were, the public was not ready for them.

Please talk this meeting up to your 'mechtech' friends, as this environmentally friendly and relatively low cost simple technology is coming to it's time in this new millenium.



Metal Shapers by Kay R. Fisher

As promised this month starts with a list of shaper documentation resources (the most frequently asked question).

Operating a Shaper videotape by Rudy Kouhopt. \$53.95 Post paid as of this writing. It is available through:

New Life Video Productions
P.O. Box 351
Interlochen, Michigan 49643
Phone & Fax (616)276-7194

The following books are the only dedicated shaper books currently in print. Shapers by Emanuele Stieri ISBN 1-55918-146-X \$8.95

plus \$1.00 shipping. 50 cents for each additional book. Part number 21460 from:

Lindsay Publications Inc.
P.O. Box 538
Bradley, IL 60915-0538
Phone (815)935-5353
Fax (815)935-5477
www.lindsaybks.com

Shaper Operations by J. W. Barritt ISBN 1-55918-103-6 \$7.95 plus \$1.00 shipping. Part number 21036 from: Lindsay Publications Inc. (See above)

Build a Metal Shaper by Dave Gingery \$9.95 plus \$1.00 shipping. Part number 187 from: Lindsay Publications Inc. (See above)

The following books have some significant shaper content.

Drilling & Surfacing Practice by Colvin & Stanley \$19.95 plus \$1.00 shipping. Part number 21729 from: Lindsay Publications Inc. (See above)

Advanced Machine Work by Robert H. Smith ISBN 0-917914-23-6 \$29.95 plus shipping. Part number 4236 from: Lindsay Publications Inc. (See above)

The Shop Wisdom of Rudy Kouhopt - Volume Two \$36.00 plus shipping. Available from:

Home Shop Machinist Magazine
P.O. Box 629
Traverse City, MI 49685
Phone (800)447-7367

The Amateur's Workshop by Ian Bradley ISBN 0-85242-482-5 £8.95(\$14.63 American) plus shipping. Available from:

Tee Publishing
The Fosse, Fosse Way
Radford Semele, Leamington Spa
Warwickshire, CV311XN
England
phone (011)44-1926-614101
www.fotec.co.uk/mehs/tee

The following books will be useful if you are considering refurbishing an old shaper.

Machine Tool Reconditioning by E. F. Connelly \$92.95 plus \$5.00 shipping and handling from:

Machine Tool Publications
935 Holley Ave.
St. Paul Park, Minnesota 55071
(612)458-1540

Secrets of Hand Scraping \$3.00 plus shipping. Available from: Lindsay Publications Inc. (See above)

Busted Tractors and Rusty Knuckles by Roger Welsch ISBN 0-7603-0301-0.

http://www.micrord.com/rogerwelsch \$14.95. Available from all major book stores and from:

Motorbooks International
729 Prospect Ave.
P.O. Box 1
Osceola, WI 54020-0001

This last book is out of print but could probably be found in England.

The Shaping Machine by Ian Bradley out of print

In the book, there is a page for each reference above with a picture of the book and a review. I plan to include those reviews (less the pictures) in this column in the future as space allows. If you have any reference material I missed please let me know. Also, if you have any of the above please send me your review.

I received some good questions in my email which I promise to get to in a future column. Keep sending letters and email with questions and interesting shaper stories. My mailing address is at the top of the newsletter and my email address is Kay.Fisher@Compaq.com

Minutes of NEMES meeting March 3, 2000.

Max ben-Aaron

Ron Ginger opened the meeting, remarking that the annual model show apparently was a success. "It shows", he said, "that this bunch of nuts don't have enough sense to stay home during a blizzard".

??? announced that Wollaston Foundry will cast items in aluminum bronze or cast iron if you bring a pattern. Some unknown NEMES member brought in a pattern in a couple of years ago and never came back to collect the casting. Who??

Don Strang showed a brochure on cubic boron nitride abrasives that members could borrow. He announced that ISIS has reprinted George Watkin's book "Textile Mill Engines". This book has pictures of many engines that no longer exist. The price is \$34.

Ed Borgers brought in the half horsepower single-to-three-phase inverter he got from Deal-erselectric in Brooklyn.

Dave Piper made a statement about 'Motortronics' (check with him on the net). Don

Strang suggested that we should co-ordinate with them.

Henry Szostek is in the process of restoring a concertina that was made about a hundred years ago. The bellows are made of cardboard, joined together with leather and covered with paper. Each cardboard segment has edges that are bevelled at 45 degrees. He bought a paper cutter to form them, but it made square edges that were unacceptable. He tried using dykes (side cutters), which gave a nice bevelled edge, but entailed lots of clipping. To do the whole operation in one step he built a beautiful 'guillotine', with posts like those on a production shear he saw. He used one of Rollie's shock absorber shafts for the rod rotating the cam. It seemed to work like a charm.

The recommended glue is water-based white glue. As soon as he applied the glue to it, the edge of the cardboard segment swelled out to square again! Back to the drawing board.

Paul Ruckes wanted information about a brass gearbox that he found in a cellar in Brighton about 20 years ago. It has an input crank and ten output speeds. The gears look like they were hand-made. A label on it says that it was built by O. Pilquest (Hillcrest Manufacturing) in Pittsburgh. The Carnegie Library in Pittsburgh told him that Pilquest was registered as a model-maker in 1880 and died in 1894. Ron astutely guessed that it was probably the gearbox for a model of an orrery, which is a model used to simulate the motions of the planets about the sun.

The main talk was by Rudy Kouhoupt, who had given a master-class that afternoon. He brought a selection of the engines he had designed and built and some plans and videos for (very low-key) sale. He also brought many of his famous models, which were displayed on the table in front of the auditorium.

Rudy started by answering a popular question "What is your workshop like?" by showing pictures of his workshop. His first shop was so small (5.5' x 6.5') that Joe Rice, Editor of HSM used to say that he (Rudy) worked in a closet. About ten years ago he upgraded by having some Amish carpenters in Pennsylvania build him an 8" x 12" shed. It was trucked in to his home in New Jersey from Pennsylvania and set up on a slab that was made ready for it. It is a wood-frame structure with double doors and it measures 7'4" x 11'4" on the inside.

He only needs a small shop because the things he builds are small. "It has been humorously suggested", he said, "by people who look at the pictures I use to illustrate my articles, that

my shop is so clean because I have two shops - one for photography and an untidy one I actually work in. Not true. The tool I use most is my vacuum cleaner."

As soon as it was erected he started wiring it, drilling holes through the frame members and then he insulated it to R16. He panelled it with the cheapest acceptable plywood panelling, built in benches, and tiled the floor. The ceiling provides storage space. "I need my materials be right at hand", he said, "because if they are some distance away I am liable to forget what I went for."

He took great delight in what he did because it exercised both hand and mind. "There is much satisfaction", he said, "in starting with a clean sheet of paper and seeing your efforts come to fruition. Then, too, there is the pleasure of seeing others build your models".

On the right, as you enter the shop, at an angle, he has a 9" South Bend lathe. "I literally rescued it from the dump". It had no back gears. The cross-feed screw was hump-backed and had threads worn to a razor-edge. He rebuilt the lathe completely. The space under it is occupied by an old dentist's compressor and his bandsaw.

To the left of the lathe he has an old Atlas horizontal bench-mill that he also rebuilt. He went to Texas to collect it from the friend who donated it to him. It is well designed and constructed, held together by Woodruff keys. It was well-worn, having been used for production, and was full of sharp steel splinters; it took years to get rid of them all. He uses a 4" cutoff blade in the mill for cutting plate. Saves operations because the material has a clean, accurate, square edge after it is cut.

His shaper, built by Edw. Temple, was very rusty when he got it, but under the (cosmetic) rust it looked hardly used, with all the original scraper frosting, perhaps because the table was cracked. He patched the table and the shaper is now as good as new.

His vertical mill is a Benchmaster which is 25 years old. This is the only machine in his shop that did not require extensive rebuilding. It sits on a sturdy steel stand with an 11" Rockwell bench drill. The drill looks to be about 50 years old, because the belt guard is cast iron.

Pride of place is given to a Sakai lathe/mill. The lathe has a 1 1/2" swing. It is on a substantial steel stand because it weighs 130 lbs and has about that much weight again in accessories in the drawers. The Sakai company asked him to evaluate it for them before marketing it. He recommended changing it from metric

to Imperial and making the hand-wheels larger. They did.

In the dining room of his house, which his father, a carpenter, built, he has a 5 1/2 foot cabinet which holds all his models that "can move themselves", 8 locomotives (and highly detailed coaches), tractors (including the one in 'Popular Mechanics' - for which plans are still available - , a fire engine and so on.

To get the best out of the designs, especially for hot-air (Stirling) engines, you need to measure the speed and to see what the valves are doing. so he designed and built a mechanical stroboscope and a mechanical revolution-counter, which have been featured in HSM. Some of his other work, an adjustable angle plate, an indexing device, and a precision vise are also well known through articles and cover photos in HSM.

Another cabinet, 7 1/2' tall houses all his model engines. One of these, a steam engine started its life as a pump, 70 years ago, made by Duro. It drew water from a well for the house for many years, until the water table dropped too low, because of development in the area. The casting was so nice that Rudy could not get himself to scrap it. The inside passages had been cast so well, using cores, that the parting-line was invisible. He kept the cross-head, built a cylinder head, extended the crank for an 8" fly-wheel (which was adapted from an old flat-belt pulley, perhaps from a thresher) and made a double-action semi-rotary valve with 75% cut-off. This was one of the models on the table during the talk.

It is difficult to get any power out of hot-air engines. Rudy has one alcohol-fired vertical, water-cooled engine with a 1 1/2" bore and stroke that puts out enough power, driving a generator, to light a couple of Xmas-tree lights. It has not been published (and will not be), but the plans are for sale. Some of his other models will not be published either, but their plans are also available.

One of his models is a caboose that is exquisitely detailed, even to the calendar on the wall and a pencil on the desk. To take pictures of its interior he had to design and build a special camera. The pictures (and the details) are so good that it is difficult to tell if you are looking at the real thing or a model. Joe Rice asked him to write an article on it and after it was published, the editor of 'Popular Photography' asked him to write an article about the camera, which he did.

Asked to expand on the methods he uses, particularly about the "Rudy finish", he said that the finish is not something that happens at the

end. To get a superb finish you have to start with that in mind and carry it through the whole process. He always starts with a layout drawing, which helps nail down the desired characteristics the model will have.

For a locomotive, for example, it encompasses the mechanical motions - crank dimensions, clearances, travel of crankpins, valve proportions, cut-off point, steam ports and so on. In the upper right hand corner he enumerates all the major dimensions. By this time he can 'see' the completed engine in his mind.

When the layout is done, he starts on detailed isometric drawings of sub-assemblies, beginning at the bottom and working up. At the end of this process, all the drawings are still in pencil. The last preliminary step is a full assembly view, generally isometric, but sometimes including regular top and side projections.

When the drawings are done, he goes into the shop and starts making chips and builds and tests the engine, followed by painting and detailing and photography. He does all his own camera work -- black and white photography and dark-room processing. For a 'Live Steam' article he takes a color cover-photo.

The last step is to retrace all drawings, on vellum, in ink, to be supplied to the magazine.

All his models, he said, should be built exactly as specified. He told of an exchange with 'George', who had built a model of one of his hot-air engines.

George: My model doesn't work like your does. What's wrong?

R.K.: What did you change George?

George: Nothing.

R.K.: What did you change George?

George: Nothing.

R.K.: What did you change George?

George: Nothing.

R.K.: What did you change George?

George: I made one small improvement. I made the piston out of graphite instead of Cast iron.

R.K.: Do it again in cast iron.

Several days later, George called to say that his model works just like Rudy's.

Rudy's tip: To clean tarnished brass, use a hydrochloric-acid-based toilet cleaner.

Letters

I would like to remind the members that the following reamers and taps are available for use by the members for any projects or restorations they are doing:

#7 Jarno
#9 B&S
#3 Morse on a #3 Morse shank
#11 B&S
3/4-8 LH Double Acme
3/8-8 LH Acme
1/2-10 Square thread
1-10
3/4-10 Acme
3/8-12 Stub Acme
1-1/2-6 std
1-4 Acme
1/2-8 Acme LH
1-1/4-4 Acme LH
1-14 NF
1-1/4-7
1/2-20 LH std
5/8-16 std
3/4-18
11/16-14
5/8-40
9/64-40
5/16-50
7/32-40
1/2-24 (I'm always looking for anything 40tpi-LH)

Also, has anyone built the 2 cylinder compound engine by Rudy K.??

Thanks.

Howard Evers @508 987-0654
hwevers@earthlink.net

Steve,

I am interested in acquiring a small shaper for my workshop. Ideally a 7" South Bend in as original condition as possible and with tooling, manual etc. One just sold on eBay for over \$900 can you believe. I bid in the low \$400s.

Perhaps you could put a "Shaper Wanted" add in the next newsletter with my contact details. I am more interested in condition than price but don't exactly have a blank check either.

Rob McDougall

Ph: 781 647-0689

email: rcmcdougall@mediaone.net

At the March meeting, there was a brief side discussion on local availability of iron foundries, but we ran out of time to pursue it further. Interested in learning more myself, I called around to a few I had heard of with the idea of

providing a short resource list for NEMES members. Here's what I found out.

There are at least four foundries in the area that will do one-off castings in iron using the customer's pattern. They are:

D. W. Clark Foundry

692 North Bedford St. (on Rt. 18)

East Bridgewater, MA 02333

Tel: (508) 378-4014

Nashua Foundry, Inc.

5 Foundry St.

Nashua, NH 03060

Tel: (603) 882-4811

Henry Perkins Foundry

180 Broad St. (on Rt. 18)

Bridgewater, MA 02324

Tel: (508) 697-6978

Wollaston Foundry

39 Fayette St.

North Quincy, MA 02171

Tel: (617) 471-8233

Everyone I spoke with at each of the above foundries was courteous and helpful. They seemed to be receptive to the idea of doing one-off castings and, I expect, would be helpful to an amateur patternmaker. Of the above foundries, only the Henry Perkins Foundry does castings using the Meehanite process. However, the other foundries said they used similar processes which yield comparable quality at a lower price (because they don't have to pay the Meehanite licensing fee). Nashua Foundry also offers full pattern shop services (I'm not sure about the others).

They offered a number of suggestions and comments that would help us to obtain better results. First and foremost, "The pattern is everything." Appropriate design of the pattern is fundamental to obtaining good castings. Some key factors are moldability (can this thing be cast in a sand mold?), sufficient draft on the sides of the pattern, and proper allowance for shrinkage. Another general design requirement is properly applied fillets to create radii where different planes of the casting intersect. Proper wall thickness is also critical in sand molds - a minimum thickness of 5/16 of an inch is recommended.

Loose patterns are acceptable, but mounted patterns are preferred. Use decent wood for your pattern - mahogany or cherry are best, clear sugar pine is OK. If you whittle your pattern from a hunk of 2X4 fir or other coarse grain wood, the coarse grain tends to stick in the sand to the detriment of the casting's finish. If your pattern requires cores, you will need to provide the appropriate core boxes along with the pattern.

Do not use shellac as the finish on your pattern. Although it is the traditional finish for patterns, Peter at Nashua Foundry says the sand they use is sometimes still warm enough to soften the shellac, then the sand sticks to the pattern and then - well, you get the picture.

One theme came through loud and clear in my conversations. These guys want to put out a good product. To that end, they are willing to help you in a friendly and generous manner with advice on preparation of your patterns and core boxes. However, as with any business, their time is money and they are not running free schools for amateur patternmakers. If you are not familiar with some of the processes and concerns mentioned above, a little research at the local library or perhaps a couple of books from Lindsay on patternmaking and sand casting would be good investments. Prices for castings depend almost totally on the complexity of the pattern, but even the simple ones are pricey. Taking the trouble to get educated will go a long way toward getting good castings and also building a good working relationship with the your foundrymen.

If you know of other foundries that should be added to the above list, please let me know at fdorion@home.com or send me a note at 23 Black Birch Road, Plainville, CT. Thanks. - Frank Dorion

Talked with Ron, and have a plan for showing some of the scrapheap challenge shows.

We are going to run them before the meetings - - 5:45 in the lecture space on the main floor of the museum. I will try to run them in order, so I will be showing first season/first show -- Task is to build a device that can fling vegetables. One team made a trebuchet, the other a mangonel. Turnips and cabbages were duely flung. Since the shows run 50 minutes, I will have to be prompt about starting, so the regular meeting isn't delayed.

We are supposed to hear tomorrow if our team will be participating. (used up the fingernails, gnawing on hands now). I will send you a message if the answer is yes. (should know by noon)

Jeff Del Papa

The NEMES Gazette

newsletter of The New England Model Engineering Society
c/o Stephen C. Lovely
Post Office Box 277
Milford, Ma. 01757-0277