Some Notes on a 1:160 Scale Longboat

by Richard K. Simon

Figure 1. The finished longboat. All figures by the author.

While the subject of modeling ship's boats has been covered in a number of books and articles, I thought it might be useful to explain my own process and techniques for working in small (1:160) scale. I have built several ship's boats in this scale, and some of my approaches might be useful in larger scales as well.

The boat in question is a longboat for a French xebec, *Le Requin* (Shark), a Mediterranean warship of twenty-four guns built in 1750. While working on the main model, I decided to take a break and tackle the longboat, which is interesting in that it is both relatively large at thirty-five feet in length (2.75 inches in scale) and has some nice decoration on the quarter wash strakes. *Le Requin* is the subject of a monograph by Jean Boudriot, published by Ancre Press (in both French and English), as well as a model by Bernard Frolich, and the original 1750 builder's model is in the Musée de la Marine in Paris.

As an aside, a number of commenters on various sites have noted the challenge of having a large longboat carried on the deck of a moderately-sized (seventy-five-foot main deck) lateen-rigged xebec, and the difficulty a crew would have in launching it from there. Several authorities suggest that most often it would have been towed, which seems probable. My own question concerns the fact that all three examples noted above show the boat rigged for a single main mast, with no provision for a foremast or bowsprit or other lead for a jib. However

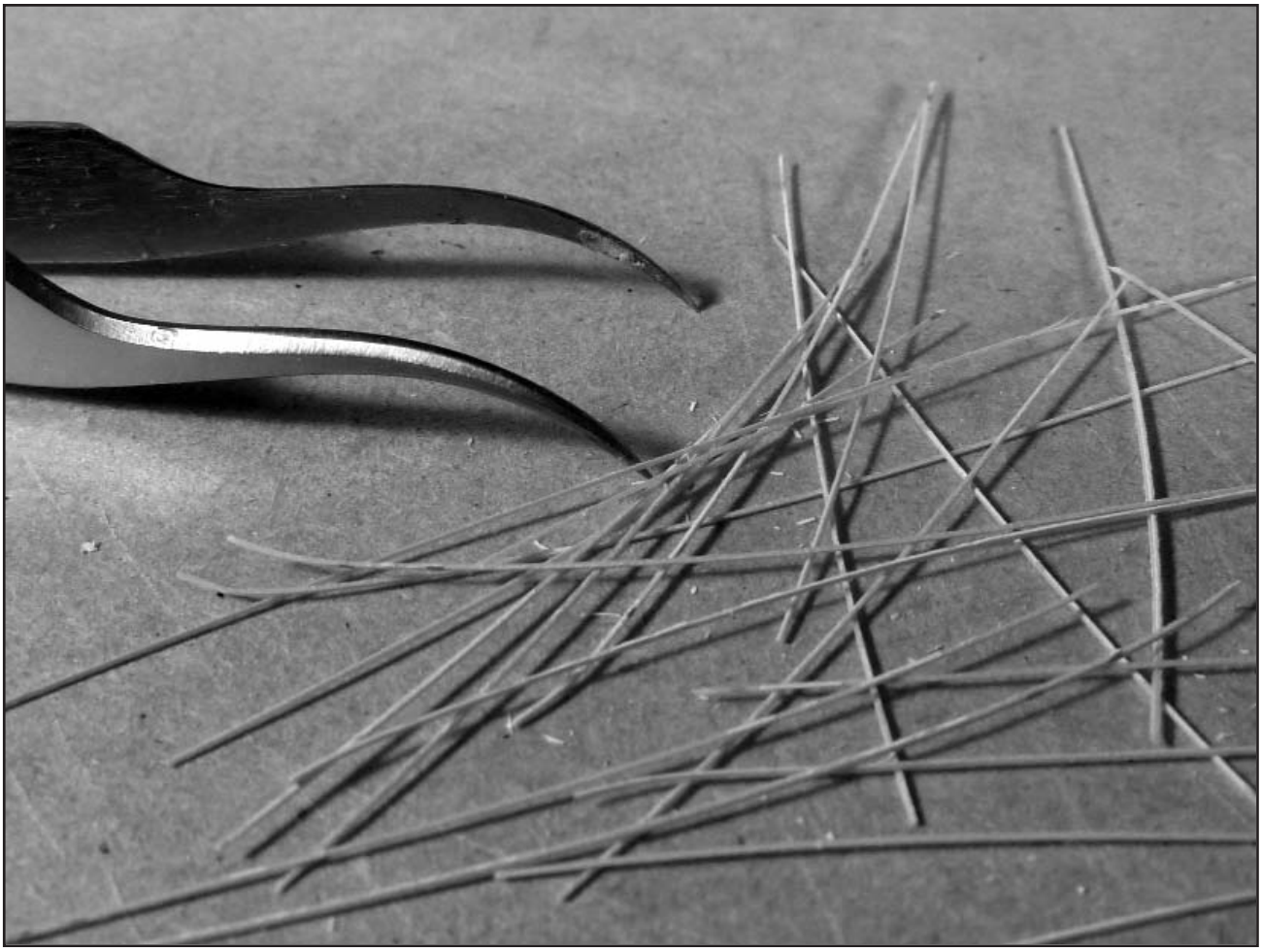

Figure 2. Frame stock.

it might have been rigged (most probably with a lateen sail, since it was used in the Mediterranean, and because the single mast is approximately amidships), having a single mast on a thirty-five-foot boat seems insufficient to me. It undoubtedly was rowed most of the time, but that is a lot of boat under sail, and most larger longboats I have seen have provision for a foremast. Nevertheless, I chose to follow precedent and provided for a single mast.

Woods

While numerous woods are useful for model ships, there are only a few that really work for small-scale work. Apple wood, for example, is a beautiful wood that looks great as planking 1:48-scale models; it does not, in my opinion, look good in 1:160-scale use. I have seen it used in small-scale work, but in general I think the grain is too prominent.

I limit myself to three woods: boxwood, ebony, and pear. For boxwood, I prefer Pyrenees to Turkish or South American. I do use the latter for deck planking, as I like the slightly rougher appearance, but use only Pyrenees boxwood for side planking, carvings, and details. It is often hard to come by and is not cheap, but a hundred dollars will buy two or three eighteen-inch logs four to five inches in diameter, which, even with waste and flaws, is enough for a lifetime, or at least a fleet in my scale. For ebony, only gaboon has the blackness and consistency one needs, but the dust is very toxic and dangerous, and the wood should be used

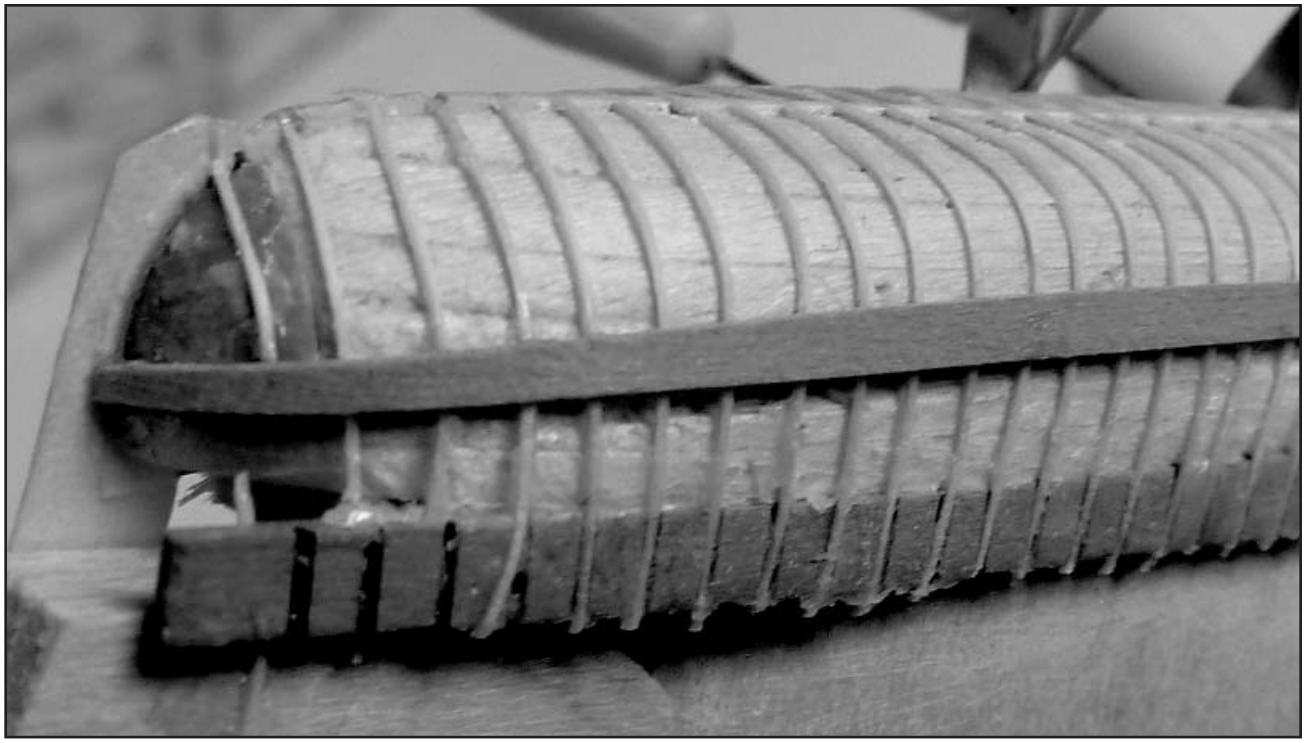

Figure 3. Frames and sheerstrake installed.

carefully. I think Swiss pear is the best of the brown or reddish woods, with a generally tight grain. When cut into small or thin pieces, it becomes a bit delicate and easy to mar, but it is excellent if handled carefully.

The Mold

I begin in the conventional manner with a mold for the frames and planks. I use basswood for the mold as I find it easy to sand and shape. Once the mold is shaped, using plan views and sections from the drawings, I cut away portions of the bow and stern and insert plugs of Swiss pear, which are also shaped. These plugs are not glued, but will be held in place by other pieces described later. I also cut a central slot where the keel will be located. When finished, the basswood is coated by rubbing on regular (stick form) beeswax and then brushing on an additional layer of gel beeswax (I use a hair gel: Murray's 100% Pure Australian Beeswax) to assure easy removal when completed.

I then create guides for the frames. There are thirty-four frames on this boat, so accuracy is important. The guides consist of three slotted pieces—one on each side of the mold and one forming a sort of keelson—so that each of the very small dimension frames will have three points of support. I cut the guides together on a table saw, using either the plans or measurement to locate the slots, and a 0.012-inch blade. The two main guides, made here of Swiss pear, are glued to the sides of the mold below the level of the upside-down sheer strake, with the boxwood keelson set in the central slot. Care is taken to ensure that the frame slots in all three pieces are aligned.

The frames are 0.009-inch square boxwood, shaped mainly by sanding. When working in small scale, I find thin styrene sheets, used mainly by model railroaders, to be very helpful, as they are available in fairly accurate thicknesses of 0.005-inch, 0.010-inch, 0.015-inch, and upward. They can be cut for use as sanding guides for final thick-

nessing of wood, with the wood and the guides double-face taped to a work surface. The addition of a piece of Scotch "Magic" tape to the styrene can add 0.002-inch to the thickness for odd dimensions such as .012-inch. I mark the top surfaces of the guides with a pencil, and stop once the sanding starts to remove the marks, using very fine sandpaper for final finishing. (Figure 2)

As another aside, I keep a stock of MDF boards, mainly small pieces of ½-inch-thick material, which I find invaluable for both disposable work surfaces and for use in various jigs.

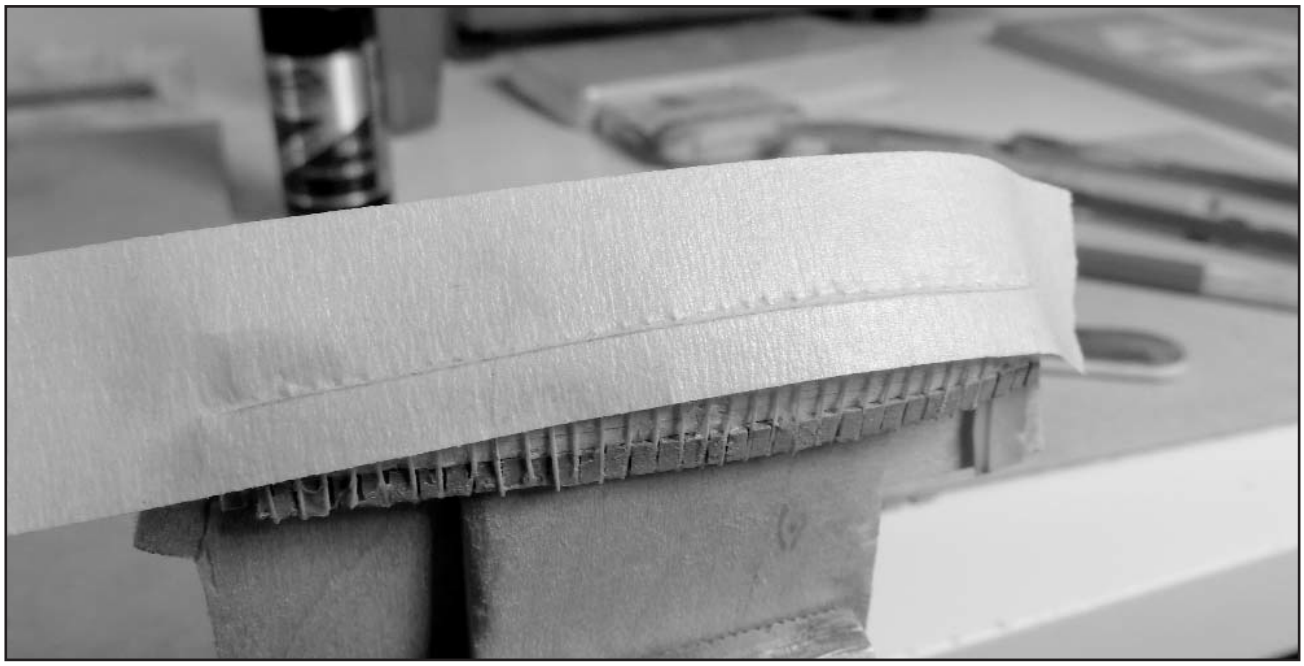

Figure 4. Using masking tape to spile a plank.

Figure 5. Spiling the final plank.

Figure 6. Jeweler's wax holding a plank for finishing.

Central Spine

At 1:160 scale, accurate rabbeting is not really feasible, at least for me. Instead, I start with the "keelson" described above. Before the frames are added, I glue it very carefully to the forward and after plugs while it is resting in the central slot. The bow plug is also slotted to accommodate a piece of boxwood that will be shaped later as a sort of sub-stem, but for now is glued to the plug and the lower portion of the mold to hold the plug firmly in place and provide an end point for planking strakes. At the stern, I make a finished transom slightly thicker than its final dimension, and glue this to the stern plug. To give this rigidity, I then glue a layer of paper to the transom and then glue a fairly solid piece of basswood to both the paper-covered transom and the bottom of the mold. The paper layer will allow the basswood support structure to be removed easily later, when the transom will be sanded to appropriate thickness. Once the frames are in place, I sand the "keelson" flush with the tops of the frames. After planking, I will add a keel on top of this, along with the stem and stern post. (Figure 3)

Planking

The carvel planking is also conventional, with a couple of preferred variations. Blanks for the strakes are sanded to thickness using the method described above. To match new strakes to the profile of those above or below, I use masking tape (Scotch Magic tape also works), which I lay against the existing plank and describe its exposed edge, first with a fingernail and then with a pencil. I then transfer the tape to a piece of card, cut that to shape and test fit. Once I

Figure 7. Clamping a plank.

am satisfied with the fit, I transfer this template to the planking wood. (Figures 4 and 5)

For refining the matching shape and shaping the second edge of the strake, after a preliminary cut with a blade, I generally use a flexible sanding stick and a favorite tool: a jeweler's wax block. This wax, used for lost wax casting, comes in a range of sizes, shapes and hardnesses. What I am using here is a piece of blue wax, which is of medium hardness, in which I have cut several channels of different depth with a razor

Figure 8. The hull wrapped in clingfilm.

Figure 9. Making the external support mold.

Figure 10. Fitting out the hull in the external support mold.

Figure 11. Ceiling planking in place.

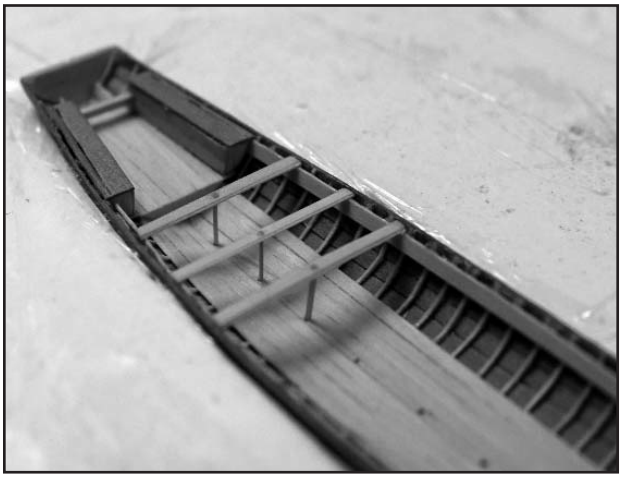

Figure 12. Thwart stanchions installed.

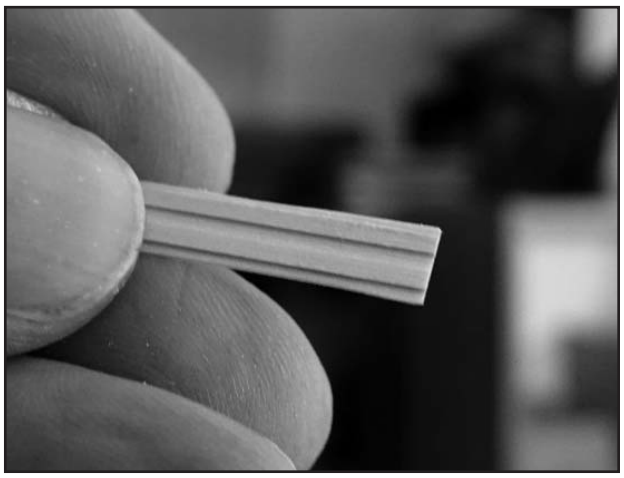

Figure 13. Making thwart stock.

saw. (Figure 6) The benefits of the wax are: first, it is easy to cut as needed, and second, it tends to grip the strake being worked on, making it easier to achieve a clean final profile. While I use this for 1:160-scale planks, I see no reason why the wax would not similarly be useful in larger scale work with channels cut to appropriate dimension.

As most of the planks I use are of Swiss pear, shaping them for the bow is easy. They need just a short bath in alcohol and careful bending around a form, generally a paintbrush or tool handle slightly smaller in diameter than the final curvature needed.

Obviously, at this small scale, conventional clamps will not work. To hold planks in place, and for other clamping tasks, I use small electronic wiring clips. Mine are copper, which is less likely to mar wood, and without teeth. For holding planks, I clamp them to a pin inserted in the mold, as illustrated. (Figure 7)

Starting the Interior

When the boat's body is removed from the mold, the first step is to clean up any glue or beeswax residue from the frames

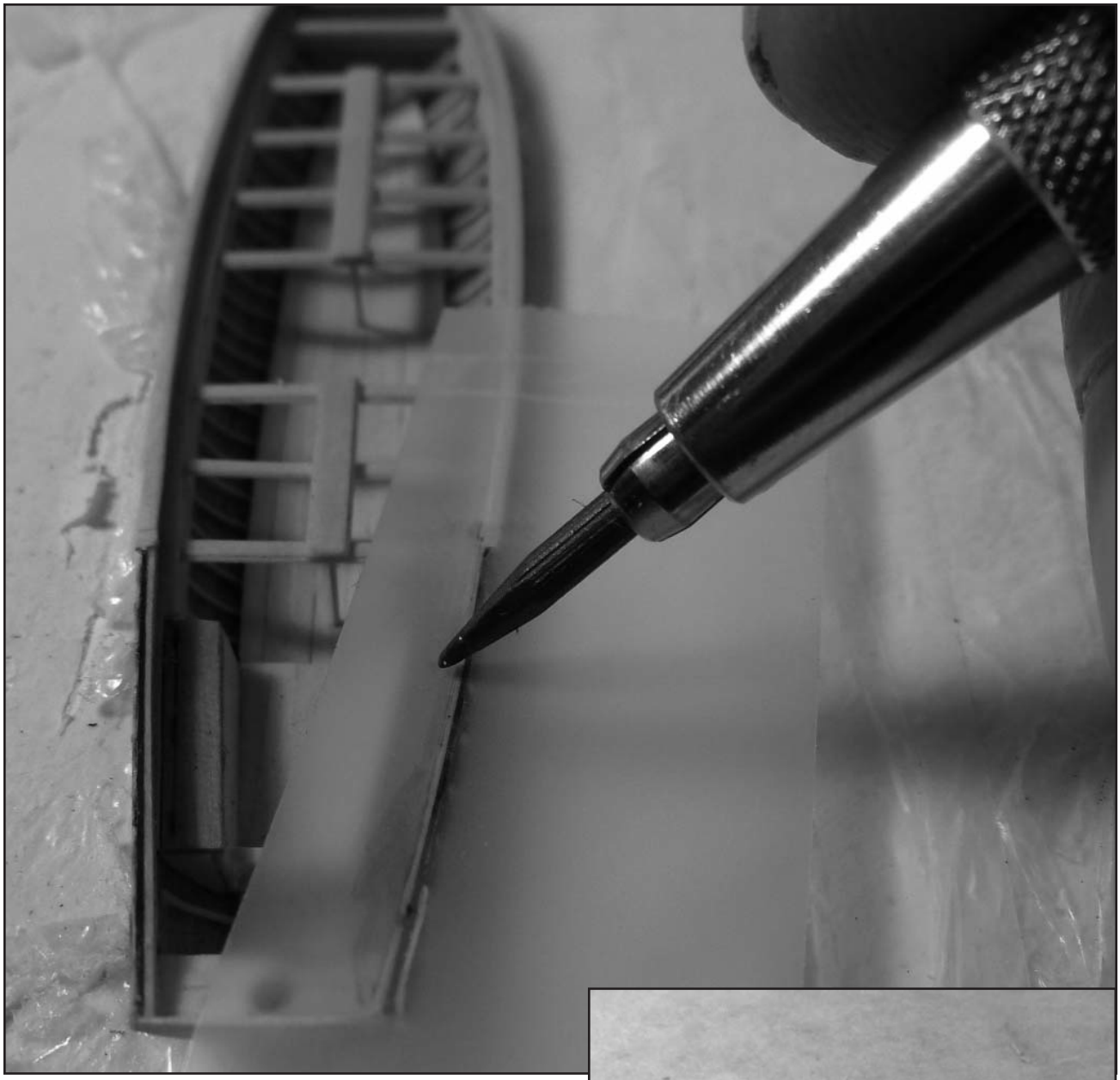

Figure 14. Marking the shape of the sheer for the upper mold.

and fix or replace any that have been damaged during the removal (it does happen), followed by the inevitable touch-up and smoothing of the exterior surfaces. The latter is best done by re-mounting the body on the mold (that mold MUST be saved) using a little more of the gel beeswax, as well as my fingers, to hold it in place. At this point, I add the keel and stem.

The interior of the boat is another matter. With its thin frames and planking, this boat weighs almost nothing, so it is dif-

Figure 15. The upper molds.

Figure 16. Making washboard laminates of ebony and boxwood.

ficult to handle, but very easy to distort or even crush. So, for interior work, it needs the same kind of support as is provided by the mold for the exterior work.

For that, I use a new mold. I remount the boat on the original mold, and wrap both with a small sheet of kitchen shrink wrap. (Figure 8) Holding this taut, I dip the wrapped boat in plaster of Paris, which I have mixed and poured into a shallow container. I let the boat/mold stand (the plaster should be mixed just thick enough to hold it) for an hour, then remove it, along with the wrapping, and let the plaster fully set overnight. The result is a very close match to the shape of the boat, which will be held firmly for the next phase. (Figure 9)

When I use the exterior mold, I first again wrap the boat with shrink wrap, which I then leave in place on the mold after I remove the boat. This makes the mold easier to use and eliminates the risk of any

Figure 17. The washboards installed

Figure 18. Quarter badge carvings.

plaster residue adhering to the hull. I paint some matte medium around the edges of the mold opening to glue the excess wrap down, so it will stay out of the way of my work. Tape will not work for this, as it will not stick to plaster. (Figure 10) I actually used two molds in this case, the first somewhat deeper for the main interior work (ceiling, thwarts, and so on) and the second shallower to allow work on the upper wash strakes, which were added as described later, and gunwales.

Interior

There is not much unique here. First, the remaining part of the "keelson" is sanded flush to the frame bottoms. Then boxwood ceilings are installed, with the center plank marked for the location of pillars that support the thwarts. (Figure 11) These marks are carefully drilled so that the pillars will be properly located and fixed. Since all but the fore and middle thwarts (the latter having the metal strap holding the mast) are covered by central fore-and-aft planks (a sort of walkway between the pairs of rowers), I glue the pillars to the holes in the floor, leave them long, drill a central hole in the thwarts, feed them onto the pillars and set them on the side clamps. The pillars are then cut and sanded flush with their tops hidden by the walkway. (Figure 12)

The thwarts themselves have a slight rabbit on their edges. I make this by cutting shallow slots, separated by the width of the thwart minus the rabbit, in a piece of boxwood, and then sanding the top part down to make the rabbits shallower. (Figure 13)

Figure 19. The stern quarter carvings.

The underside is then sanded to appropriate thickness, and the piece cut into strips which, when sanded to the correct width, form the thwarts. Because they are so thin, the thwarts can be given an appropriate camber by slight finger pressure.

Other conventional interior details then are added, including the ceilings above the thwarts, two athwartships bolsters for lifting tackle, the forward platform, and the stern seating area.

Upper works

For this model, I chose to make the wash strakes and upper stern wash strakes as separate pieces rather than as additional strakes on the mold. This was dictated, in part, by my decision to use ebony rather than black paint for the outside of those strakes, which needed plain boxwood on the inside. There is certainly nothing wrong with using paint—indeed, the prototype boat itself and the museum model both were so treated—but I just prefer the look of natural wood on models, and so use the gaboon ebony for appropriate surfaces and structures where possible. Doing so can be a laborious process.

To achieve my desired end, on this boat and elsewhere, I build a sandwich, first shaping a boxwood strake and then epoxying it to a thin sheet of ebony. To shape the boxwood, I begin with pieces of basswood to create yet another set of molds. I mark the plan views of each side using tape and card, as with the strakes. (Figure 14) Then I glue

Figure 20. Carving tools.

each side's card to the basswood and carve and sand the plan view shape, reducing it a bit to allow for the ultimate thickness of the strakes. I then do the same for the sheer profiles. (Figure 15) Once satisfied with the fit of the molds (checking with a light source from behind), I glue pieces of boxwood of appropriate thickness to them using Titebond and, when set, sand the bottoms of the boxwood pieces flush with the basswood. This should result in tight-fitting strakes that are, as yet, too tall. I then separate the boxwood pieces, using an alcohol bath to loosen the glue, and sand each to the proper height as I did with the other strakes. After making up and adding an upper wash strake at the stern quarter, these assemblies are then epoxied to the ebony, which was heat-bent for the bow curve. (Figure 16) When set, the same sanding process produces a closely-matching boxwood-and-ebony strake for installation on each side. (Figure 17)

I suspect most model builders reading the foregoing will opt for paint, but I offer it as an alternative to consider.

Decoration

Decoration on my small models is of two types: carvings and assemblies, the lat-

Figure 21. Punching out boxwood for carvings.

Figure 22. Modified syringe needles and the ceramic stone for fine finishing.

ter for extremely small details, such as the quarter drop panel on an earlier model, and the aft wash strake on the longboat. (Figures 18 and 19) My method is pretty simple. I cut pieces of an appropriate shape from thin boxwood (in this instance, 0.005-inch to 0.008-inch thick). The curved "drape" shapes on the longboat are cut with small gouges, and the buttons are made by stamping boxwood with a small glue syringe needle. These can be purchased in sets of varying diameters; here I have inserted the smallest diameter into a larger one to prevent bending. (Figures 20 and 21) Along with these shapes is an "S" piece, which I also made with the aid of syringe needles. I ground off a portion of the tips to create semi-circular cutters. I chuck a fine ceramic dental abrasive tool in a pin vise for use to smooth small edges. (Figure 22)

The various pieces then are tacked to the ebony surface with just a touch of acrylic

Figure 23. Turning tholepins.

Figure 24. Tholepins in place.

varnish, which sets slowly enough to allow adjustment. Once set, the excess varnish easily can be cut away, and the piece fixed permanently with some thin cyanoacrylate glue. When the decoration is complete, a light spray of flat or semi-gloss enamel varnish provides additional security for these pieces.

Tholepins

With a maximum diameter of about 0.008-inch, it is almost impossible to turn wooden tholepins. It can be done, but the breakage rate is substantial, and the resulting pin is very weak and susceptible to risk of further breakage during and after installation. Instead, I chose to turn down 0.010-inch brass rod, which is shaped in the lathe with files, installed, and then painted. (Figure 23) The result looks reasonable, and the actual pins would have been of a different wood from the gunwales or pads in which they sit, so I am satisfied with this alternative. (Figure 24)

I have started work on the oars, chocks and gripes for the longboat, and then it will be back to working on the ship itself. If there is interest, I will report on that, but leave with a picture of *Le Requin*'s grumpy-looking "shark" figurehead. (Figure 25) I know it does not really look like a shark, but the builder in Toulon in 1750 apparently thought it did.

Figure 25. The figurehead for *Le Requin*.