Weekly work updates from February 2004 through December 2004 on the restoration of the 1895 lumber schooner *C. A. Thayer* 

November 8 – 12, 2004

It's been awhile since the last report. For the last months, the Bay Ship gang has been replacing framing. At this point, 90+% of the framing is either new or to be retained.



Futtock with pattern.

The framing work became to some extent routine. The process was worked out in the mid-body, where there is relatively little bevel in the frame futtocks. Light plywood or "doorskin" templates were made for each futtock, based normally on the space between the outer ribbands and the inner ceiling plank. Whenever possible, one of the futtock pairs was retained initially, so that the doorskin pattern lay directly against the retained futtock. In every case, the changing bevels of the futtock to be replaced were carefully noted on the doorskin pattern. Bill Elliot, the CEO and majority owner of Bay Ship and Yacht was out there regularly checking the bevels and the accuracy of the taking-off process. Tim Mahan, a graduate of the Northwest School of Wooden Boatbuilding at Port Townsend, has been the lead in pattern making.



Trimming exact butts on futtocks.

The framing becomes trickier as you move toward the ends, and the work has slowed a bit. The curves and the bevels become more extreme, and working the futtocks into place become more difficult. The hull, however, has now achieved a reassuring level of structural solidity.



Looking aft, note progressive change in frame shape.

We had a lot of discussion as to how the floor timbers in the ends were to be replaced. The upshot was that we stripped the garboard strakes off fore and aft, and removed the forward and after sections of lower sister-keelson. We were then able to insert new timbers as required across the centerline of the keel. We seem to have achieved a reasonable stagger of butts in the bottom framing fore and aft.

On the keelsons, we have been trying to determine whether or not to lift out the rider keelson. Bill Elliot suggested that it would be prudent to do this, in view of the condition-found of the upper sister keelsons. He also suggested that the steel drift fastenings were likely much weakened and would compromise the strength of the keelson structure. However, taking out the rider keelson would require taking down all of the centerline stanchions and stripping off the centerline salt pocket. We are not eager to get into this, and would prefer to live with the rider keelson in place.



From left: x-ray source, x-ray film, and image showing steel rod and wood grain.

We contracted with an industrial X-ray company to have a look at the condition of the fastenings and surrounding timber in the rider and main keelsons, and through the frames into the keel. Our x-ray guys were inexperienced in working in wooden structures. Their normal work is on welded seams, steel castings, and concrete structures. Initial tests on a section of eight-inch ceiling plank indicated, however, that we would be able to see both the condition of the drifts and the relative soundness of the surrounding timber. A long Saturday yielded about 40 images, taken at three locations. We are still examining the images, but it looks like only the forward portion of the rider keelson shows notable deterioration of the fastenings.

With the framing solidified in the bow area, disassembly in the interior is now going ahead. The fishermen's forecastle bulkhead has been taken out in two major pieces. The chain locker bulkhead is also out, as is the deck framing forward of it. Both sets of pointer timbers forward have now been removed. We were relieved to see that both of the pointer knees are in excellent shape and can be reused. The arm timbers of the forwardmost, or #1, pointer are also in good shape, but the arms of the heavy #2 pointer are rotted enough that they will have to be replaced. These are structurally very important pieces, and they want to have all of their designed strength.

With so much of the interior structure cleared out forward, we were able to get a good look at the forward end of the rider keelson. There is enough rot there that the forward end will have to be replaced. As built, the rider is a single piece fore and aft. We will make the compromise of putting in a new forward end with a long scarf, starting aft of the foremast step at frame #15. We will take a look at the top of the main keelson when the section of rider is removed, but have our fingers crossed that it will prove to be all right. Dismantling forward is continuing with the thick ceiling coming out.



Starboard bow framing.

On the outside of the bow, the upper portion of the stem post has started to come off. This was the portion that was installed as a partial repair in 1969. The next step will be to remove the original lower portion. The whole stem post will finally be replaced as a single piece, as in the original construction. The upper portion of the original structure is the gammon knee, which forms the forward arching "clipper bow" effect of the upper stem. We hope to be able to find a suitable knee among the material rejected for replacement of lodging and quarter knees. The sweep of the grain required for the

gammon knee is a much wider arc, and one of these pieces should work well. This is the piece that has the decorative scrollwork carved into it. The knee will probably be attached to the stem post on the floor before the whole assembly is fitted to the hull, but the carving will likely be done with the piece in place.

The biggest job of the week, and the most emotionally satisfying in a long time, was the final sagging down of the keel. You may recall that early in the project we settled 12 inches of hog out of the keel, leaving the bottom of the keel essentially straight and level on the blocking. This turned out not to be the whole solution to restoring the shape. We had not realized that the forward portion of the four-inch worm shoe had been removed, perhaps as early as 1903, following damage when the vessel grounded on the bar at Grays Harbor. So, the forward twenty-five feet of the keel was drooping by four inches as the vessel sat on level blocks. Secondly, we noted that the line of the rabbet, where the lowest or "garboard" strake of outer planking meets the keel, was arched up by about four inches amidships. We figured that this arch was caused in part by the droop of the bow, due to the loss of the worm shoe, but was in part the result of sag built into the original line of the keel. This would presumably have been done to spring-load the hull against the hogging stress that would arise as soon as the vessel was floated. Clearly, the line of the rabbet was intended to be straight. The garboard strake would have been almost impossible to fit accurately with the negative curve built into it.

So, this week we settled the keel down amidships until the rabbet was straight and lifted the bow by about four inches to allow for the installation of the full worm shoe. Professional house movers were called in to help. Screw jacks were fitted along the keel, and backed off to bring it down, and two eighty-ton hydraulic were used to lift the bow. It worked. For the first time in maybe 100 years, the *Thayer* has her original keel profile back.