

The joys and challenges of building a wooden canoe for the first time by Chip Asbury

Beginnings

In September 2018, I attended the Port Townsend Wooden Boat Festival on a mission. I had attended the boat festival many times before. But this particular fall, a notion had crept into my head that I wanted to build a wooden boat, in my garage, with my young son, Matthew. So I attended the festival with more of a purpose. I looked at boats – especially little ones – and each time thought to myself, “should I build one of these?”. “Or how about one of these?” “Or one of these?”

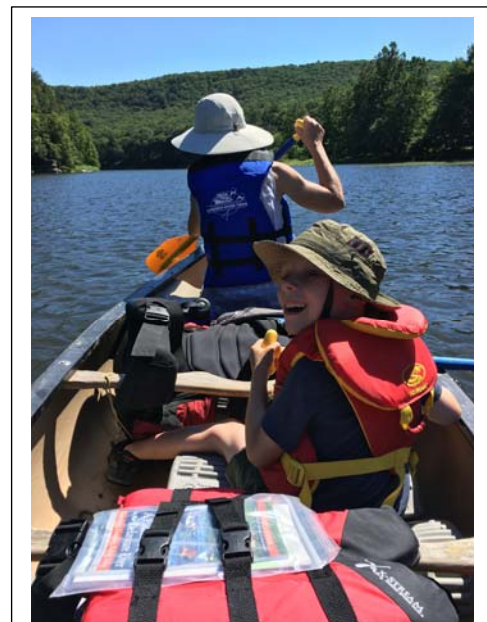
There are so many beautiful little boats at the festival that my head spun with possibilities. Gradually, over the course of a day spent ogling at the boats, I came to realize there was one feature my boat absolutely must have: It must have *ribs*. I don’t know why, but I decided the beautiful skeleton structure is a major part of what I love about wooden boats. This decision ruled out some modern stitch-and-glue kits I had been considering; but still, there are a lot of beautiful little wooden boats, with ribs, at the festival. My head still spun with possibilities – that is, until I had the good fortune of encountering the NW WCHA display at the festival.



Matthew beside a boat-fest favorite, a Spitzgatter.

Club members had a couple of canoes on display, one being raffled off. I believe the beautiful raffled canoe was one built by Martin Ferwerda. My memory is hazy, and I apologize that I cannot recall with certainty who I met during that first encounter. But I will never forget the knowledgeable friendliness of the members I chatted with. I asked how the canvas is filled and was shown a small sample of canvas covered with filler – it felt more tough than I’d expected. I asked how the ribs were shaped and learned they are steam bent. I entered but didn’t win the raffle. I began to think, “maybe a canoe is what I should build”. A seed was planted.

Perhaps it’s obvious I’m a ruminator. I dislike making quick decisions but rather prefer to let things roll around in my head for a while. So the idea of *maybe* building a canoe rattled around inside my head for four months. It collided with childhood memories of weeklong summer Adirondack canoe treks I enjoyed as a Boy Scout, in the 1980s, together with my dad, who was Scoutmaster. It bumped into memories of a multi-day paddle during college, on the Buffalo River in Arkansas. It mixed with memories of a 3-day paddle on the Delaware River that my family and I took a year earlier. Eventually, these rivers of thought – about maybe building a canoe and about occasional but very enjoyable paddling trips over the years – all converged and reached a flood stage. In January 2019, I committed to building a wood-canvas canoe.



Matthew and my wife, Karen, paddling the Delaware River in 2017.

The kindness of strangers

My first step was to try to remember, “what was the name of that canoe club at the boat fest last fall?” There is no denying. Our club name, the Northwest Chapter of the Wooden Canoe Heritage Association, does not roll off the tongue easily, nor is it easily recalled by anyone unfamiliar. Luckily, a Google search for “wooden canoe club” reveals the name in a matter of seconds. A couple more clicks brings up the club newsletters, with contact information for members. I was delighted and a little bit surprised when my brief email inquiry, asking for advice about building an Atkinson Traveler, was answered within two days by seven different club members. Thus began the generous outpouring of support that has been an absolute joy to receive and invaluable to me as I attempt the most ambitious woodworking project of my life.

I’m a rank amateur at boat building. I’ve picked up a few simple woodworking skills while maintaining my sailboat, a 25-foot Cheoy Lee Frisco Flyer, “Olive”, and her tender, “Sweet Pea”. But nothing I’ve built out of wood compares to the size, complexity, and beauty of a wood-canvas canoe. The excellent books by Jerry Stelmok and Rollin Thurlow have provided key information (*Building the Maine Guide Canoe*, and *The Wood & Canvas Canoe*). I bought copies of both books, read them immediately, and have re-read all the relevant chapters several times over the past 18 months. But while these terrific references can guide a new builder through the process, there are several stages where an amateur builder must make a tricky maneuver, navigating a section of the river-build that they’ve never paddled before.

Reading the books taught me that wood-canvas canoes are built over a form. Initially, I imagined building a form first, and then a canoe. But the forms are nearly as complex, time-consuming, and expensive to build as the canoe itself. I was committed to the project overall, but I wondered if I would have the patience and tenacity to complete both a form and a canoe. Luckily, I visited Bill and Ursula Paine in February 2019. Bill showed me his amazing shop, his two beautiful canoes, and a 16-foot canoe form that I could borrow. At that time, I was leaning toward building a longer canoe, the 18-foot Atkinson Traveler, so I wasn’t sure Bill’s form was right for me. But the idea of borrowing instead of building the form had instant appeal, of course. I assumed it would take a while to locate the right form and arrange to borrow it from club members, either locally or perhaps from more distant WCHA chapters. But Bill took it upon himself to find and alert me about additional forms that I might borrow. By early March, Bill had sent me pictures of a 15-foot Cheemaun form that was being stored at Mary Norton and Joe McElroy’s property in Snoqualmie, and an 18-foot Traveler owned by the Center for Wooden Boats on South Lake Union. Because of Bill’s generous help, I now had three forms I could consider borrowing, all kept locally so that I could easily go look at them myself.

Ultimately, I chose the 15-foot Cheemaun, for several reasons. Measurements of my garage showed that building an 18-foot canoe, while possible, would be very tight in the space available. Considering that my usage would be mainly for day trips, sometimes solo and sometimes with my wife and son, and that all of us are small in stature, an 18-footer began to seem a bit too large. Among the smaller two forms available locally, the Cheemaun also had the advantage that all necessary materials can be



Phyllis & Scott Christianson with Matthew,
at the Spring meet.

purchased together, as a kit, from Rollin Thurlow’s Northwoods Canoe Company. This avoids the need to calculate the amounts of rib and planking stock needed, and the need to locate sources for the various woods, some of which are required in very long, clear lengths. I had discussions about various western wood varieties with Michael Davidson, Scott Christianson, Bill Paine, and Rollin Thurlow. As an amateur, it became clear that avoiding these planning and supply challenges would allow me to start building much sooner than I otherwise would have.

In May 2019, my son and I attended the canoe club meet at Camp Bishop. Mary and Joe had encouraged me to attend with my family. They made sure we had clear directions to the camp and made us feel truly welcome – as part of the club. Matthew and I brought our new-to-us truck camper, “Hoss”, and our sailing dinghy, “Sweet Pea”, and we had an absolutely terrific time. We met more wonderful club members. We were able to paddle many different styles of canoes. The whole experience solidified my eagerness to build a canoe and convinced me that a canoe around 15 feet in length would be ideal.

Trials and tribulations

In June 2019, I visited Mary & Joe at their property. My intention was only to look at the Cheemaun form, to double-check that I liked its shape and consider how I might transport it to my home later. I arrived unprepared, with a bunch of junk cluttering the bed of my truck, and without any tie-down straps. But the form looked great, and Joe encouraged me, “Why not just take it home now? We’ve got plenty of straps

you can borrow.” I couldn’t argue with that. Using a forklift, Joe put half of the two-piece form on my truck’s roof rack. The other piece fit inside the bed, under the cap (despite the other junk in there). At home in Seattle, I had no forklift, so I used a block-and-tackle suspended from a tree in our front yard to hoist the heavy form pieces onto a wheeled dolly. To fit them into my small garage, I stood each half-form on-end against one wall. The garage ceiling was too low, so I cut away sections of the old plaster ceiling, enabling the form ends to project up into the rafters. I suppose these were my first trials – the first problem-solving challenges in the build process. Joe joked that modifying my garage for the project was part of the “grand tradition” of boat building.

I ordered my Cheemaun kit from Rollin in early October 2019 and received everything before the end of the month. The kit includes pre-bent stems, pre-built seats already caned, all the required fasteners, canvas, filler, paint, and varnish. The white cedar ribs are pre-cut. The spruce inwales are pre-tapered at their ends and pre-treated on their outside faces with shellac. The shellac is meant to protect the surfaces that will be visible between ribs and difficult to varnish after the canoe is assembled (because they will be obscured by the outwales). But I didn’t appreciate this and accidentally sanded off the shellac before I understood its purpose. This was my first rookie mistake. Luckily, it was easily fixed by laying on a few coats of varnish. For my kit, I chose flat-sawn white cedar planking, rather than the more expensive quarter-sawn stock. I chose mahogany decks and outwales, which were already



A block and tackle was used to hoist the form off the truck. Holes cut into the ceiling allowed the forms to stand upright.

shaped. I built a steam box, bought a steam-generator from Rockler, and was ready to start building. The first step was to cut notches into the stems and install them onto the form, together with the inwales.

The next step, steam-bending the ribs, was an absolute joy. Matthew helped throughout this process, which we completed in several sessions. Scott Christianson provided sage advice during our first session. Rollin had pre-tapered the ribs, rounded their edges, labeled them with their lengths, marked their centers — little helpful touches that together helped me avoid major mistakes. The smell of the wet cedar and the joy of



Matthew removes a rib from the steam box and then installs it.



Matthew nailing ribs to the inwale. Forty-four ribs, bent on!

seeing the skeleton take shape was indescribable. We broke or badly creased four or five of the ribs that require the most extreme bends. This is normal, and Rollin had clearly anticipated some breakage, supplying more than enough extra ribs to complete the job. Work and holidays caused some delay. So the steam-bending only began in mid-January 2020. About one week later, all 44 ribs were bent on.

Planking was also a delight. One minor challenge arose when I initially drove some ring-nails, which fasten the first planks (the garboards) onto the stems, too far from the centerline, such that the nail shanks were partly exposed on the inside of the canoe. The ring-nails grip the hardwood (ash) stem incredibly tightly, and they are difficult to remove. But with patience and a pair of sharp-jawed tack-pullers that Bill had loaned me, I was able to remove the nails and reset their positions. A fun challenge was designing the pattern of goring planks, which are trimmed to accommodate the curves of the hull,

and the pattern of shear planks. I sketched four or five different patterns before I discovered one that minimized the number of triangular planks that taper to a sharp point. We finished planking by late February 2020.

After the goring planks are installed, there is a moment of pride when the canoe is removed from the form and the



Matthew nailing planks.

builders get their first inside look at the beautiful rib cage. Scott Christianson joined and helped with this unveiling, which also marked the start of another challenge, fastening the ends of the canoe together. Like the ribs, the finished ends will become beautiful aspects of the canoe. They are also vital intersections, where four key structural elements, the stems, twin inwales and decks, must all come together to form a strong and symmetrical joint. Mistakes here could be costly. The stems and inwales are already integrated into the hull and would be difficult to replace if their ends were accidentally broken or mis-cut. Symmetry is also crucial, to avoid creating accidental twist in the canoe's shape, which would be embarrassing. The stems and inwales of the Cheemaun have beautiful curved shapes, and they must be strained to bring them all together. I chose to connect them by a method Rollin suggested, in one of his many advisory emails written in response to questions from me. I cut a mortise

into the bottom of the deck and a corresponding tenon on the end of the stem. With the stem captured inside a little pocket, no fasteners are needed to secure it. But getting everything to fit together nicely requires some fussing. After a dry fit, everything is taken apart so the mating surfaces can be sealed with marine adhesive.



A mortise cut into the deck traps a tenon on the end of the stem.

After I applied the 3M 5200, I had difficulties getting things back together, and managed to spread the sticky goo all over myself, my tools, the decks, the inwales, and the floor of my garage. A few choice words were spoken. But eventually I was able to fasten the ends and clean up the mess. This job was finished in early March 2020. The results were extremely satisfying, and well worth the consternation caused by working with sticky marine adhesive goo.

The next task was to clinch the ~2,000 tacks holding the planking to the ribs. This job usually requires two people, unless you have monkey arms long enough to reach all around the canoe. Luckily, I was able to convince my 10-year-old son, Matthew, to help. Matthew preferred hammering the tacks, so it was dad's job to hold the bronze iron – another sweet tool

loaned to us by Bill Paine. After a little while, Matthew and I got into a rhythm, where I would place the iron and call out the position, and Matthew would then bang away until I signaled that the tack was fully clinched. Me: "Garboard plank, lower tack!" Matt: *bang, bang, bang* Me: "OK, now middle!" Matt: *bang, bang, bang*. Me: "OK, upper!" Matt: *bang, bang, bang* (You get the idea.) A few hour-long sessions like this, and the job was done. I was grateful for Matthew's help and proud to get him involved in another truly essential aspect of the project.



Matthew, a tack-clinching monster!



2,000 tacks, clinched – the canoe is ready for interior varnish.

At this stage, in early April, I decided to sand and varnish the inside. The Stelmok-Thurlow books describe a different order of operations, with varnish added last. But I was itching to see the interior varnished, and it seemed fine to do this first.

The next major trial is stretching the canvas and tacking it over the hull. This step caused me more apprehension, both in its planning and its execution, than any other part of the build. The method described in the Stelmok-Thurlow books involves a custom-made stretching rig, designed to suspend the

canvas like a huge, over-tightened hammock, or a giant taco shell, into which the canoe is forcefully pushed downward. At first, I did not relish the idea of building such a rig myself. And I had discussed the possibility with Bill Paine of bringing my canoe to his

terrific shop, which includes a well-built canvas stretching bay. Bill had generously agreed. But then the pandemic hit, and it seemed irresponsible to bring my canoe, and potentially spread covid virus particles, into Bill's shop. Moreover, after a bit of tinkering in my garage, I came up with a workable plan for building my own, makeshift stretching rig. Bill provided a copy of his 30-min video of the canvassing process, which was invaluable.

Using a concrete drill and six expansion-bolts, I fastened a short length of strut-channel to the wall of my garage, to anchor one end of the rig. My garage is too short to accommodate the full length, so the other end of the rig needed to be anchored several feet outside the garage door, in the driveway. For this end, I bolted two long 2x4s together with a length of strut channel to form a very stiff, 10-foot beam. Leaning this beam against my brick house and securing it to my truck's bumper provided another strong anchor point. I fashioned clamps to hold the canvas from scrap wood and leftover fasteners and bought a ratcheting power-puller from the Home Creep Show (Home Depot). Bill loaned me his canvas pliers and, by the first week of May, I was ready to stretch canvas over the boat.

I woke up early Saturday morning – just five days ago, as of this writing – to make final preparations. The outside of the hull needed a little more sanding, and a liberal coat of boiled linseed oil mixed 50:50 with turpentine. Matthew and I setup the stretching rig together, installing the canvas, and with help from our neighbor, Alex DeRobertis, lifted the canoe into its giant canvas taco shell.



Matthew and I assemble the canvas stretching rig.



Matthew stretches the canvas.

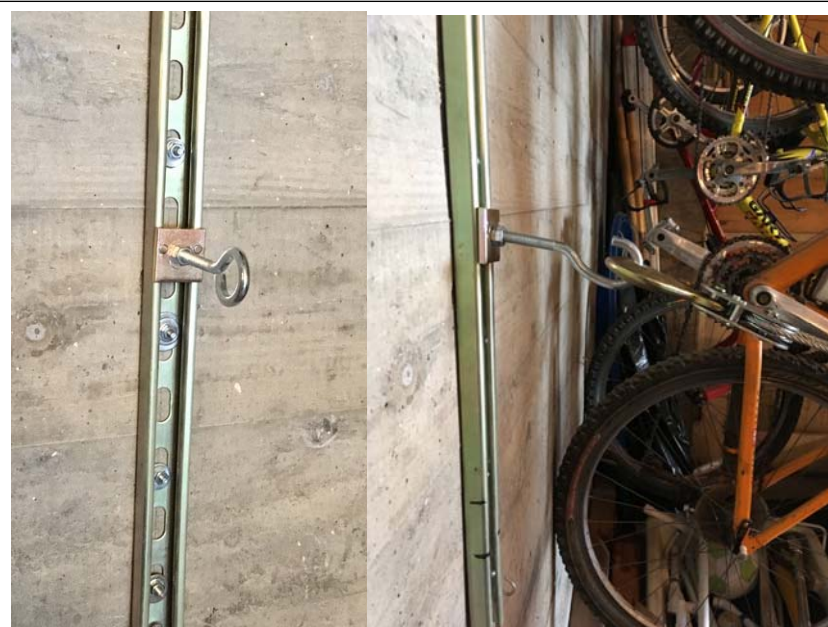
Then began the next trial. Although the canvassing process is well-described in the books, and despite Bill's excellent video, I failed to appreciate the amount of downward force required to get it stretched tightly over the entire hull. The Cheemaun is rather beamy amidships for its length, and perhaps its flared shape makes canvassing a bit more challenging than other designs. I climbed into the hull myself and pushed downward. I cut braces to push downward from the



Uh oh – the braces just broke through the ceiling!

ceiling, hammering them into place onto stepped base plates carefully placed on the inside of the canoe. I adjusted and readjusted the horizontal tension. I cut new, longer braces to push down more forcefully. At one point, both vertical braces broke through the ceiling, creating holes in the plaster that I then covered with short lengths of 2x4, to spread the load. For about 12 hours I worked, at times frustrated but determined to complete the job by the end of the day. At about 6 pm, I noticed that the eyebolt securing the rig to the garage wall had become badly bent, its end deformed from a closed circle into an open hook. The canvas at this point was closer than ever to being properly stretched, except for two small, persistent creases on the centerline where it approached the stems. Trying to eliminate these creases by adding more downward force would risk a failure of the eyebolt, potentially causing the whole apparatus to crash to the floor. Perfection should not be the enemy of good. I proceeded to tack the canvas to the shearline.

Currently, I think I might need to tuck little folds into the canvas, where it approaches the stems, to take up a little bit of excess fabric there. But maybe I can eliminate the excess as I



The eyebolt before (left) and after tensioning the canvas (right). Note its deformation into an open, bent hook!

fasten the end-flaps to the stems. This will be the challenge for next weekend. Those of you with canvas experience can expect me to reach out for advice!

Forward leaps Cheemaun

Matthew and I have decided to name this canoe "Bean", in keeping with our other two boats, "Olive", and "Sweet Pea". Before we can launch her, the canvas will need to be fastened to the stems, filled, and painted, and the outwales and seats must be installed. We are so eager to paddle her for the first time!

My plan is to explore the easy (class I, class II-) sections of local rivers, such as the Sammamish, Green, Snoqualmie, Cedar, etc. I hope WCHA members will join us on these trips.

One of the greatest joys of building this canoe has been meeting club members, learning from you all about the building process, and becoming part of this wonderful community. Thank you for being so wonderful. I look forward to seeing you all – in person I hope – at the next meet.



The canvas tacked onto the hull at the shearline.