Learning how to bend timber when growing up became a useful skill for owner building

As an owner builder three times over, I have much to thank my mum for. When I was 10 I built myself a model yacht. I formed the curved hull by cutting the deck’s shape out of a straight piece of wood – the simplest way to form a permanent curve in wood. I made the ballast for the keel by melting old lead-covered electrical cable using one of Mum’s kitchen pots over an open fire. Why not? I read it could be done.

Building a yacht

At 14 I began a more ambitious project. I asked Mum if I could build a six metre two-berth yacht. I’d seen an advertisement for plans in a boating magazine. ‘Of course you can dear, if you can read you can do anything,’ came her affirmative reply.

The blueprints for the boat arrived in the mail from New Zealand. As I unrolled them a sea of white lines on blue background scribed the many curves of the yacht that was going to take shape in our driveway.

Mind bending

Wood fibres in the trunks of trees that building timber comes from generally run straight. Wood fibres are like long thin straws. Bundle and bind straws together and they will flex only slightly, just as a tree will only sway slightly in the wind. We come to perceive timber as a reasonably rigid material. Look at any piece of ‘real’ wood around your home or office and you will most likely see that it is either straight or a shape cut from a straight piece of timber. So when you see wood being bent it violates what you expect – it’s mind bending, exciting and an opening for new ideas.

I wrapped the stringer in towels (from Mum’s linen press), had two electric kettles working in relay and dribbled boiling water over the stringer for about an hour. At the same time I used a Spanish windlass to pull the end of the stringer into the stem. But for one failure, caused by fibre run-out (the straws did not run straight in the tree), the process worked.

Steaming

The first serious curve was the boat’s stem. No new skills needed here – it was made by gluing together several curved sections of wood cut from a straight piece of timber. I could manage this gentle curve by coaxing my one and only saw along the pencil line. A professional would use a band saw, a lesser novice perhaps a hand ripsaw, but my sole crosscut saw did the job.

Bit by bit, as my meagre pocket money and windfall wood deliveries from friend’s backyards allowed, the project progressed. It was not long before I was to have my next wood-bending lesson. I had to encourage a 50 x 38mm Tasmanian oak stringer around eight frames. From the stern the curve moved gradually to the boat’s widest point and then continued before tightening significantly towards the stem.

Steam bent rails were formed for the support for a winding path.
cells cool, the timber will closely hold its newly defined shape.

The next bending job of significance was the cabin roof. Crawling under the local church hall I uncovered several discarded oregon floorboards sleeping under blankets of dust. From between the holes left by handmade nails, I extracted several 180cm long 20 x 20mm lengths of wood. Being thin and narrow, I could easily bend these around a form and then glue-laminate three of them together to make up a cabin beam. These would span 180cm but together be strong enough to stand on.

As a general guide, if you can bend and hold a piece of wood in a curve, using only arm strength, and then glue-laminate three or more pieces together, you’ll have a strong, permanently curved, piece of wood.

I sold the yacht in my late 20s, having sailed and cruised on it with my twins for eight years. Somehow, I had to fund my foray into owner building.

On to houses

My first building was a tree house, with wattle and daub walls. My education in bending wood continued – this time unintentionally. I used 300mm green (freshly cut) beams to link a copse of trees (think ‘posts’) together. I flattened the tops of the beams to take the floor joists. Counter to what I expected, given the significant span of the beams, rather than sag, they bent upwards. The convex shape resulted when the natural tension held in the upper side of the log was removed but remained in the underside. So I thought why not build a curved-roofed house using green trees split down the middle? (A future project!)

The next owner builder experience was an all wood home made of timber sourced from the surrounding bush. There were many twists and turns in the 12 years of its construction but surprisingly, when I think about it, only one curved wood component made it into the building.

Similarly, the mobile, bush-pole, tiny house that my partner and I recently finished is made from ‘straightish’ wood. However, look closely inside this little building and you’ll see a bent treasure – we call it her grandfather’s knee.
For steam bending I use a 200mm reinforced rubberised pipe that I found at the local tip shop and generate steam using an old Fowlers preserving boiler. It sits nicely under my workbench (below). Total cost of bending system: $20.

Another steam box variation used for longer timbers is shown at right.

**Alex’s steam box**

Above L–R: A naturally grown knee was carved using axe, drawknife and spokeshave to become the rockers for this chair.

We tied together the 7.2m long sides of our tiny house using a wire Spanish windlass. It’s strong but gives the roof structure a light appearance. To hold the windlass in place we used an old wooden knee that we had kept after restoring grandfather’s 60-year-old wooden dinghy. The knee was a piece of fruit wood taken from the homestead’s orchard.

Knees, from crooks in trees, deliver extremely strong, pre-curved timber. Every naturally grown curve in a tree, be it a bend in a branch where a branch enters the trunk, or where the trunk diverges into tree roots, awaits creative thought. Knees are strong because the fibres have grown and are bundled together in the curved shape. If you can match your curve to the bend in the wood the fibres will run the full length of your piece. And it will be beautiful. (Curved roots will be more stable than branches as these have differing amounts of tension to support the branches’ weight.)
Curved timber – be it sawn from a straight section, constructed of thin laminations glued together, bent using a steam box and form, produced using the natural tension in green wood or taken from a grown knee – has an aesthetic that touches the heart. Perhaps it speaks of the trees from which it came.

Mum is no longer with us but I will forever thank her for what I think are the two most important owner builder beliefs she instilled in me. Belief 1: If you can read (nowadays extend that to search the internet) there is nothing you cannot do. Belief 2: Embrace failure. Creative building requires you to take risks and sometimes ‘bend the rules.’

Alex Jerrim from Wisdom Through Wood teaches traditional green woodworking at his property in southern Tasmania and helps friends with ‘interesting projects.’

Links & resources

- **Wisdom Through Wood**
  Woodworking courses, demonstrations, commissions, team building and professional development programs. Also a great range of green woodworking videos on the website.
  
  www.wisdomthroughwood.com

- **Steam bending resources**
  - *Timber Bending: The Secrets of Wheelwrighting* by M.C. Hendrickson.
    www.skillpublish.com.au
    Linden Publishing.
    www.woodworkerslibrary.com
  - YouTube videos – search for ‘steam bending.’
    www.youtube.com

- **Spanish windlass**
  Using just a rope and a stick, two posts can be drawn together. By securing the stick, this can become a permanent support.
  
  www.wikihow.com/Make-a-Spanish-Windlass

Top: Spanish windlass ties the walls of the tiny house together, secured in place with a grown knee.

Right: Grown knees were also used to restore grandfather’s dinghy.