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Introduction

I am a Chairmaker

My name is Jennie Alexander. Until 2007, my name was John Alexander. I thank all those who have been supportive and kind. Yes indeed, people change, times change, wood continues to be wonderful!

I am a chairmaker. I made my first post-and-rung chair in the late 1960s. My interest in chairs began much earlier when my mother, Dorothy Parker Lowe, gave me her two-slat post-and-rung chair. In 1978, I wrote "Make a Chair from a Tree: An Introduction to Working Green Wood," a practical book about post-and-rung chairmaking to document what I had learned up to that time. I call this book MACFAT for short. In 1994, in a second edition I added an afterword showing some updated methods. The book has been a part of the growing interest in the practice of traditional crafts with hand tools and green wood. It led me to coin the word "greenwoodworking."

By 1999, both editions of the book were out of print. With Anatol Polillo, a good friend and craftsman, I made a two-hour video of "Make a Chair from a Tree." It is now available from Lost Art Press. The two books, the video, extensive teaching and research have led me to the wonderful world of kind and sharing traditional craftsmen and scholars. I have learned more than I have taught. Thanks to them I have grown both as a person and chairmaker.

This third edition continues the process. The basic approach – working greenwood with simple hand tools, understanding how greenwood changes shape as it dries and taking advantage of those changes to construct a strong, long-lasting two-slat post-and-rung chair – remains the same.

Greenwoodworking is a traditional way of working a piece of wood that (initially) contains substantial moisture content by riving (splitting) and shaving. Saws are used only to cut across long fibers, not with them. In some greenwoodworking crafts not only is greenwood used in the initial stages, the shrinking and swelling characteristics of wood are employed and sometimes artfully avoided. That is true here. To make this chair, we need only hand tools. Tool expense is modest.

I use the phrase "post-and-rung chair" as a useful generic term for a crowded group of vernacular chairs: country, kitchen, ladderback, Shaker, Appalachian, Delaware Valley and so on. The basic post-and-rung two-slat chair described here has but four parts: four vertical posts, 12 horizontal rungs, two slats and fiber seating.

Where Did this Chair Come From?

I became a greenwoodworker by accident. My mother was a single parent. I helped around the house. She told Jerry at Boulevard Hardware that she would pay for any tools or supplies I needed. Jerry – or his sidekick, Miss Erma – gave me a Stanley loose-leaf notebook full of descriptions on the use of Stanley hand tools. I attended the Baltimore Polytechnic Institute, where excellent shop classes were mandatory. At mother's suggestion I framed and

finished my apartment in our basement. She then sent me to St. John's College in Annapolis, Maryland, where I repaired furniture in the abandoned woodshop. Through all this, first and last was the post-and-rung chair that Mother gave me! I grew up with it. It inherited me.

Before I made my first chair, I was a young lawyer reading books on woodworking and chairmaking and had collected some tools. My neighbor, Jack Goembel, let me use his shop. Later, another woodworking friend decided to stop woodworking to become a mail carrier and sold me his lathe, band saw and drill press. To buy them I had to take out our first-ever loan. It was at the insistence of my lovely wife, Joyce.

I joined the Early American Industries Association (EAIA) and met Charles Hummel, then curator of collections at the Winterthur Museum in Wilmington, Delaware. He brought out the best in me. Somehow, I wound up with a funny workbench, working seriously on furniture and visiting museum basements with Hummel to see broken pieces of furniture.

Hummel's landmark book "With Hammer in Hand" (1968) catalogs an extensive collection of woodworking tools, equipment, account books and furnishings produced by three generations of the Dominy family of East Hampton, Long Island, circa. 1760-1840. Hummel once told me, "We have a Dominy chair that when the humidity is down you

JA visiting the grave of Mother Ann Lee, founder of the Shakers. Watervliet, N.Y.

Photo by Geli Courpas

Sabbathday Lake Shakers, 1984. Front row: Minnie Green, R. Mildred Barker, Marie Burgess, Frances A. Carr. Back row: Elsie McCool, Theodore E. Johnson, Wayne Smith, Arnold Hadd.

can disassemble." We did so, and from this type of research I learned much of what I know about how old chairs were made. One example is a notch or groove turned in each tenon – the same notch I've seen in Southern chairs as well; hundreds of years and miles apart. I was fascinated and became an expert on busted chair parts.

Joyce and I made several trips to the Sabbathday Lake Shaker Community, where we met Sister Mildred. Our first visit was to see the chairs. Sister Mildred said, "You know, it's interesting. People think we're chairs." We visited a couple more times to see the chairs and also learn about the Shakers. Soon, I decided that I wanted to build a Shaker one-slat dining chair and managed it with a few tools and a lathe.

What is a Jennie Chair?

The chair in this book emerged from the study of the joinery in those busted chairs, Shaker chairs, Appalachian ladderbacks and the human body. The chair is especially comfortable because the back posts are bent and have a characteristic flat shaved on the front face, giving rise to the name "mule ear" for chairs like this. The rear posts also flare outward, enhancing the curve of the back slats for more comfort. The position of the lower slat supports the sitter's lumbar spine.

At first, my slat backs were too heavy with hickory and big parts. I asked, can we lighten it up? Can we make it like a kitchen chair? Because that is a masterpiece. The mule ear is important to get the roundness of the post out of the way, and it looks good. I also asked: How many rungs and where are they? The wonderful kitchen chair I own is missing one rung compared to mine. Many, or even most, traditional post-and-rung chairs have just two rear rungs: the seat rung and the bottom rung. I want every rung to share the shock. It's like grass in the wind. I came up with this idea early in the process.

Detail of slats/post. The flat, or relief, shaved on the rear post makes it easier to bend and more comfortable for the sitter than a fully-round post.

The chair is attractive, strong and comfortable. It looks like a traditional post-and-rung chair. However, its construction differs. When put in service,

a post-and-rung side chair suffers its greatest stress in the fore and aft direction when sat upon, and when it is leaned back upon. Disregarding custom, we anticipate and respect these powerful destructive racking forces. Unlike "traditional" chairs, the side frames are constructed first. Then their rung tenons are firmly interlocked in place by the front and rear rung tenons. I have never seen nor heard of another post-and-rung chair so constructed. A cautionary note to myself: In a vernacular craft of long history, such as stick-chair making, it is all too easy to claim invention. With time we learn that there is little new under the sun.

I suggest you make your first chair "by the book" then go on from there. These features make a Jennie Chair.

Cautionary Words to the Experienced Craftsperson

This book contains all that you need to know about making post-and-rung chairs from shaved greenwood. My goal is to provide enough information for woodworkers of all levels to be able to make a chair from a tree.

But in ways this text is a bit pedantic, cautionary and repetitive. I envision my reader as a married homemaker in Cincinnati, Ohio, who plans to learn chairmaking in one-half of the family's two-car garage. I wrote this for her. So please bear with us.

— Jennie Alexander
1930-2018

Chapter 8
Finishing the Rungs & Forming the Tenons

November 1978. Woodcraft Supply invites me to do a country woodcraft slide presentation in Massachusetts. Perhaps I can make a stop going north in Baltimore to meet JA in person. JA enthusiastically agrees to meet a kindred soul. An over-nighter seems appropriate, except that the Alexanders will also have two other house guests for the weekend. (Somehow, Joyce Alexander agrees!) The other guests are Richard Starr, a junior-high woodworking teacher, and John Kelsey, the first editor of Fine Woodworking *magazine and also editor of "Make a Chair From a Tree." Alexander meets me at the airport, a little guy with lots of big guy energy. JA talks full time during the drive home, and I then meet JA's wife, Joyce, a slight woman who is gracious and very friendly. Starr and Kelsey are also there, busy talking about MC (moisture content) of chair joints. There's also a teenage neighbor, Geli Courpas, who is introduced as JA's apprentice.*

For the first time, I actually see several Alexander chairs. And of course sit on them. In real life these chairs look even better than the photos. And they are satisfyingly comfortable. Meanwhile the other guys are talking away about chairmaking technicalities. It's new territory for me, so I'm mostly listening during the dinner conversation. In the morning after breakfast, Starr and Kelsey leave for the Winter Market. Conversation with JA turns to the possibility, and soon planning, for a chairmaking class at our place next summer. It's a complicated undertaking. JA pretty much knows how to make the chair, but not how to teach making one to a class in five days. I'll do my best to help. And JA will bring Geli. We'll need tools and shaving horses for up to 10 students. JA can supply some tools from the ever-growing collection. My biggest task is procuring a veneer-grade red oak log, pre-splitting some of it, and leaving some round for the students to split and work green wood.

That morning JA also wants to get me started with my first chair, and phones Geli to come over to help. The Alexanders have a tiny backyard that is crowded with chairmaking paraphernalia and a haphazard looking collection of hardwood logs. Some are still round; other logs have been split into halves, quarters, whatever. JA also has a small boat filled with water, to keep split logs wet. Geli shows up and we begin to split a perfect-looking straight hickory section into the required posts, rungs and slats for my first chair. We also do some rough drawknifing (and maybe axe hewing) to get the parts closer to their eventual size. The plan is that JA will keep the parts wet (in the boat) and bring them to the class next summer. After lunch I catch the plane to Boston. My chair-making career has begun.

— Drew Langsner

What we see in the joint cross section (next page) is the uppermost side rung; its bone-dry tenon is driven all the way home, bearing on the mortise bottom. The front (or rear) rung is lower, and intersects the side rung, pinning it in place. Its tenon also bears on the mortise bottom, but in this view, you see the sides of the tenon flattened to lessen the chance of splitting the post.

The growth rings are horizontal, the radial plane vertical. The top and bottom of the tenon must be a tight fit in the vertical, unchanging plane of the post's mortise. (Once the mechanics and moisture situation of this joint were worked out, JA would accept nothing less than this level of perfection in the chairs' mortise-and-tenon joinery.)

The Rung Story

The mortise-and-tenon joint is the heart of the post-and-rung chair. This chair incorporates several techniques designed to strengthen and protect the joint. But without a carefully dimensioned and shaped tenon and a carefully bored mortise, the chair will fail before its time. Post-and-rung chairs were made for centuries without using calipers reading in thousands of an inch to check the tenon. I did so. I got by without them by using a compression technique for years and will explain how below. But in recent years, dial and digital calipers have become inexpensive. I am convinced the extra $20-$30 and wading through decimals is a good alternative to the more traditional approach to achieve the slightly oversized tenons needed to make a chair that will enjoy a long life.

Remove Rungs from the Kiln

Earlier you placed about 20 3/4" octagonal rungs into a kiln with the temperature set to 110°F-120°F. As you measured and recorded their combined weight you would have noticed that the weight dropped quickly at first, then more slowly until eventually they stopped losing weight. The initial moisture in the rungs was transferred to the warm air moving through the kiln and out into the room. The rungs have now lost nearly all moisture, both

This cross section of a test joint tells the whole story. (This was Alexander's favorite undertaking – more than making the chairs, more than riving and shaving wood, it was understanding what's happening inside that thrilled her the most. All throughout her career, she was making test joints and cutting them open to peek inside.)

Sawing the rungs to length is made easier by using the notched wooden bench hook.

free and bound water, and are oven-dry – bone-dry is the term I use. Their moisture content (MC) is close to 0 percent. Remove one or two rungs and examine them closely. When you placed them in the kiln they clunked when tapped together and were a tight fit in the 3/4" go/no-go gauge across all sides. Check them now – a tight fit no longer. Tap them together and they make a clear, ringing sound. Their length is unchanged, but the cross section has shrunk and is no longer symmetrical. In Chapter 2 we learned that wood is anisotropic – its tangential plane has shrunk more than the ray plane.

From now to assembly, keep rungs in the kiln under heat. All further rung and tenon work is done one at a time in the shortest amount of time and promptly returned to the kiln. A warm, bone-dry rung takes no lunch break out of the heat. It is a sponge taking on moisture – hygroscopic. Interruptions? Back goes the rung. If you have a wedding in Hawaii, turn off the kiln, plastic bag the rungs, suck out the air and thoroughly seal the bag, and record its weight. When back on the job, reweigh the rungs. Do not work on a rung until the batch weight is as before.

Examine each rung carefully. Some may have bent slightly as they dried out. OUT WITH THEM. Others may have been mis-shaved. OUT WITH THESE, TOO.

Select the 12 rungs that you plan to use. One at a time, accurately saw one end perpendicular to its central axis. Using your rung stick, mark the 17" length for the three front rungs and the 14" length for the nine short rungs. Saw each to this length, again accurately and perpendicular to the central axis. Work on the longer front rungs first. If a long rung doesn't measure up it may be suitable for a short rung. All three front rungs and all nine short rungs must be exactly the same length, straight, and with their ends exactly perpendicular to their central axis.

Re-draw the central ray plane line on both rung transverse surfaces. The ray plane lines are crucial at each step until they vanish into their mortises.

Shaving the rungs is much like what you did on the posts. Same idea, different scale.

Larry Barrett's round rung scraper. The blade is from an old saw blade with a 3/4"-diameter half-circle at the cutting edge. Shifting it just a little bit one way or the other gets at half the circumference of the rung without repositioning the rung.

Initial Shaping

The rungs for this chair must have flat ends and no shoulders. Upon assembly, these 24 flat tenon ends will seat flat against their matching flat mortise bottoms. As a result, inevitable stress and trauma will be opposed, transmitted, shared and diminished throughout the entire understructure.

The first step in finishing the rungs is to shave the bone-dry octagonal rung into a cylinder. Spokeshaves are the tools of choice for this task. I usually finish the rungs by eye and feel. The objective is to create rungs that blend smoothly into the tenon and are consistent in size. Beyond that, it is up to you.

Rungs can be shaped to be straight from tenon to tenon or can taper slightly from the center of the rung to the beginning of the tenon. The difference for me is aesthetic. I prefer a straight rung understructure that contrasts with the slender curved posts and slats above. I prefer to leave the striations left by the spokeshave. I like the way the light reflects on the rungs. But if you want a smoother rung, use a card scraper to remove these striations. Larry Barrett made a concave-bladed scraper from an old sawblade that he uses to finish shaping his rungs. When you are satisfied, give the rung a brisk rubbing with dry shavings. The wood's silica is the finest abrasive you will ever need.

Tenons

Tenon formation is one of the more challenging chairmaking tasks. Our goal is to make a slightly oversized smooth-surfaced tenon with essentially an oval cross section – all of this to quite demanding dimensions. It is crucial to avoid severing the long fibers on the tenon's surface. Shaving in the direction of the tenon's long fibers will provide the maximum bonding surface.

Avoid the tempting hollow auger, rounder, rasp or abrasives OF ANY KIND. These will sever the crucial long fibers on the tenon surface. You will learn more about wood and the mortise-and-tenon joint shaving the tenon by hand. I have found over the years that a 1"-deep mortise made with a 5/8" bit works well for these chairs. The chair posts have a 1-3/8" diameter. A 1"-deep mortise comes within 3/8" of the outside of the post at its center and is slightly closer at the outer edges of the 5/8" mortise. So, our objective is to form a 1"-long tenon, slightly oversized for the 5/8" mortise.

A key to the success of this chair is the interaction of the still-moist post and the bone-dry tenon when the chair is assembled. The rung will be oriented in the post with its radial plane vertical and in line with the post's vertical direction. The rung's growth-ring plane will be aligned partially with both the growth-ring plane and the ray plane of the post, depending on the orientation of the post. There will be movement in both the post MORTISE and the rung TENON as they gradually reach EMC and

Marking tenon length in a test hole.

the movement will be greatest in the growth ring plane of both the mortise and the tenon. As the post shrinks and the tenon swells, the resulting interaction in the growth-ring plane could lead to the post splitting. To preclude this unfortunate event, we modify the radial planes of the tenon. Think of the end of the rung as a clock face, with the ray plane oriented in the 6 to 12 o'clock direction and the growth ring plane in the 3 to 9 o'clock direction. Shave flats on the tenon from 2 to 4 o'clock and from 8 to 10 o'clock. It doesn't take much and is best done as a final step after you are satisfied that the tenon is complete. The completed tenon cross section will now be oval, not round.

Forming Tenons: The First Method

One method to form the slightly oversized tenons involves no additional measurement tools. I have used it successfully for many years and taught this method in my classes. At first it may seem complex. However, it regularly produces successful tenons. Take the piece of scrap that went in the kiln with the rungs and bore a dozen shallow holes, using the same bit you will use to bore the mortises. This scrap of wood will become your tenon test plate.

After you have shaved the first rung to a rough cylinder, mark the tenon length on each end of the rung. Drill a 3/4" hole 1" deep in a piece of scrap wood. Insert the tenon in the hole, lay a pencil at the edge, rotate the rung, leaving a light pencil line at the 1" depth.

Using a knife, lightly chamfer the tenon end. Now place your tenon test plate on your bench, place the rung tenon directly over the first test hole and rotate the rung. Usually the tenon will not fit into the test hole, but the rotation will leave a shiny embossed mark on the end. This will be your guide as you continue shaving the tenon. Skew the spokeshave and take light shavings. Check your progress frequently. When you think you have reached the edge of the embossed area, test again. If you can just barely force the tenon into the test hole you are done.

Testing the end of the tenon in the test hole. The resulting burnished end gives you a target to shave down to.

Slicing off the radial side of the tenon. Keep your thumb back out of the way as you pull the knife upward.

Hold the tenon up and look at its entire 1" length. You want to make sure there are no high areas that can cause trouble when driving the tenon home. If all looks well, the last thing to do is to remove a very thin slice from each side of the tenon to make sure the sides are "out of the joint." Now you are done with this tenon. Move on to the other end and repeat, this time using the second hole because the first test hole may be deformed slightly.

The Second Method

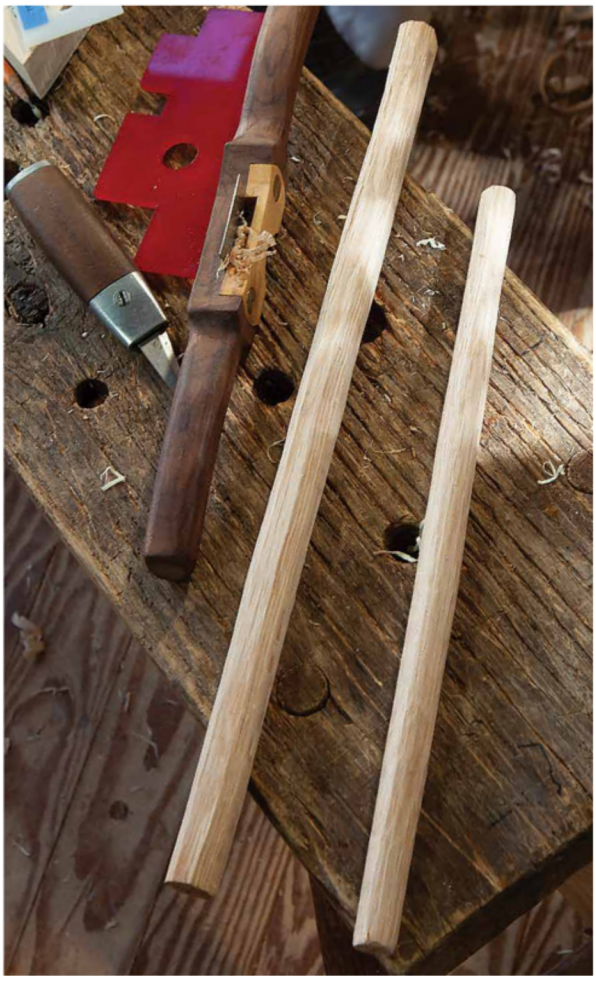
With this method we can quantify and measure "slightly oversized" using a dial or digital caliper. You may already have one in your shop. If not, fairly inexpensive ones are readily available, and they are handy for many things around the shop.

The mortise will be bored with a 5/8" bit. Convert this to a decimal .625" because most dial or digital calipers read to .001" accuracy. The objective is to shave the tenon so that it is oversized by approximately .01", or to a .635" diameter. Start as before by rounding the rung with your spokeshave and mark the 1" depth of the tenon as described above. Examine the tenon area (the last 1" of the rung). Using calipers, slowly rotate the rung, checking at several points along tenon length. The calipers will jump around, maybe wildly. At this point the tenon is oversized and not close to round. Note the high points.

Begin shaving the tenon with small, regular shavings, rotating the rung "by the numbers," using the mark you placed on the tenon end to gauge your progress. Take an extra shaving on the high points. Once around then check with the calipers. Rung too fat? Go around another time. Too slender? Discard, clearly mark it defective, put it back in the kiln and save it for pegs. Take a substitute from the kiln, make it cylindrical and continue. Use your caliper frequently. Be critical. This diameter is no joking matter. Shave a tenon that is "just right." This is

Measuring the tenon diameter with the digital calipers. The flats on the radial sides of the tenon are undersized to reduce the chance of splitting the post.

Microchamfer on the shavehorse.



A rough rung (left) and a finished rung (right).

Goldilocks-ing of the first order. You have oodles of spare rungs. It is nearly impossible to get the tenon exactly round but continue until the caliper settles down in the .640" to .630" range as measured in several places along the entire length of the tenon. When you get to this point, STOP.

When you are satisfied with this tenon, take a very thin slice off each side to ensure the sides are "out of the joint" and carefully refresh the quite light penciled tenon length line. This will prove essential at assembly to ensure the tenon has been seated at its full depth. Make the line as light as possible lest it stand out on the sides of the mortise.

Chamfer the end of the tenon. Too wide a chamfer will waste valuable bonding surface. Carl Swensson suggested holding the rung at 60° and lightly rubbing the edge against a dry hardwood transverse surface. I use the end of my oak shaving horse's work surface. This mini-chamfer is astounding. It allows the tenon to travel home. Easily accomplished, it burnishes and compresses the wood fibers rather than removing any, thus removing no crucial bonding surface. Now complete the tenon on the other end in the same manner.