Power Fibers Online Magazine

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Dedicated to the Making of Fine Bamboo Fly Rods

Inside this issue:

Watercolor on paper courtesy of Alfonso Jaraiz Puig (http://artificialfliesdrawings.blogspot.com)

The First Cast

Todd Talsma, Editor

Greetings from Michigan. After a long hiatus, we're back at it at *Power Fibers* and hope to be with you for a very long time.

I've completed my studies and graduated from Grand Valley State University with a Bachelors of Science degree in Liberal Studies, majoring in Leadership. I was able to study many different aspects of leadership using a interdisciplinary approach to research. It was a very interesting experience which has changed the way I approach issues and come up with solutions to these issues.

Right in the middle of my studies, I also changed jobs. I'm still with the same company, but instead of a job where I was on my own for much of my time, I'm now in charge of a department with five other individuals working for me. This allows me to take what I learned in my studies at GVSU and apply these ideas in a work setting. It's great to be able to put what I studied into practice and actually see the ideas I have about leadership affect people around me.

I want to make sure I mention the new offering Ron Barch has for the rodmaking community. He's worked to digitize all of the first 25 years of *The Planing Form* and has also created an index of the content of the 150 issues published during these years. If you don't have all of these issues, you owe it to yourself to get a copy of the DVD and it wouldn't hurt to get the index as well. I was hoping we'd see this for a very long time and I'm pleased to say my wait has been rewarded with an outstanding offering from Ron. Go to www.aldercreekpublishing.com and get your copy ASAP.

I can always use more ideas, feel free to contact me. If you have a suggestion about improving *Power Fibers,* drop me an email at the following email address: power.fibers@bamboorodmaking.com

Warning!

Because many aspects of bamboo rodmaking bring the maker in contact with machinery, bladed tools, volatile chemicals and gases, the editor and advisory board of *Power Fibers* ask you to exercise the utmost caution when attempting to build or mimic any devices or activities mentioned in this magazine.

Please have any devices you build and use in your shop checked by a safety professional before attempting to use such devices. This is to guarantee your personal safety and that of others around you.

If you choose to build any device or use any technique found in this magazine, you are doing so at your own risk.

Power Fibers

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Building a Hollow-Built Bamboo Switch Rod

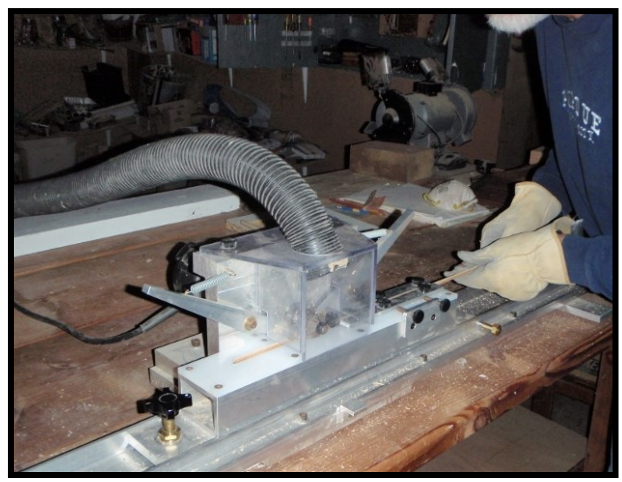
Text and photos by Dave Dozer

I thought it would be fun to document my process along the way, so here are some early photos. First, the bamboo is selected and split. For this Switch Rod, four pieces of matching bamboo were used.

Each piece of bamboo is split into 18 to 20 pieces.

Splitting into narrow strips.

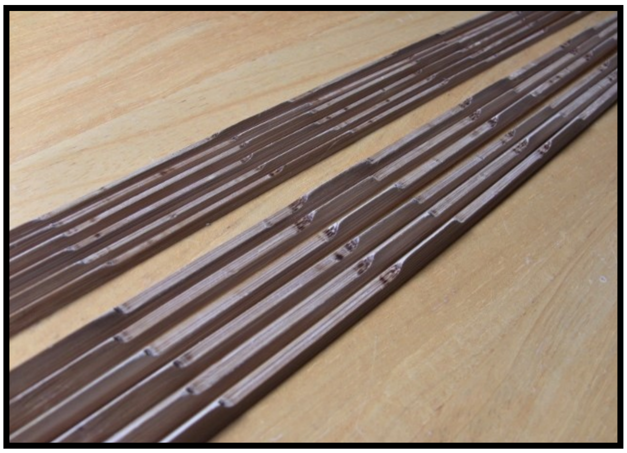
The strips for the Butt Section and Mid Section are done. The Tip sections still need to be split.



After heat treating, the bamboo strips are roughed out into a triangular shape on a Bellinger Beveler.

(Continued on page 6)

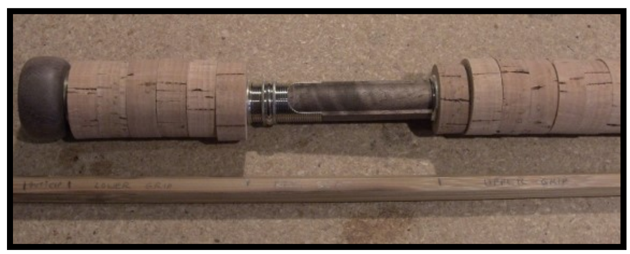
Hand Planing gets the strips down to the final tapered dimensions.



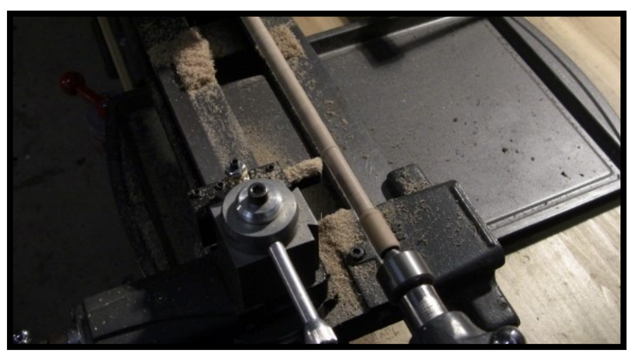
Each strip on the Butt and Mid Sections get hollowed with scalloped cuts on the inside edge.

The planed and hollowed bamboo strips are then glued together using Unibond 800 adhesive and a Bellinger Binder (see picture below left). The thread holds the strips together under a constant tension until the glue cures.

Work is continuing on the hollow-built switch rod. The next step was to glue on and fit the ferrules. There is a #20 ferrule on the Butt/ Mid Sections and a #14 ferrule on the Mid/Tip sections.



Then it was time to layout the grip and reel seat on the butt section.



The butt section needed to be turned down on the lathe to accommodate the reel seat and lower grip.

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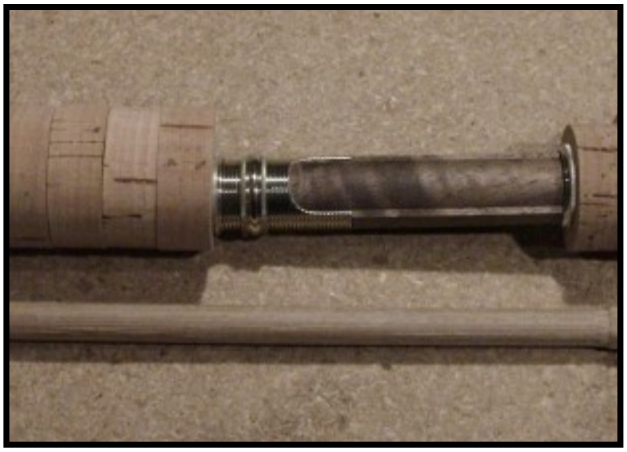
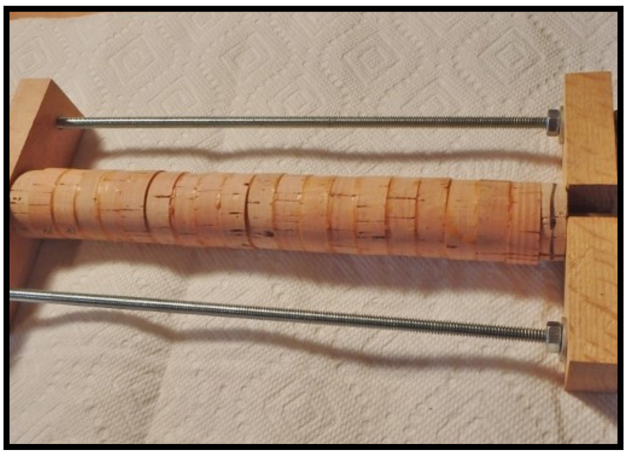
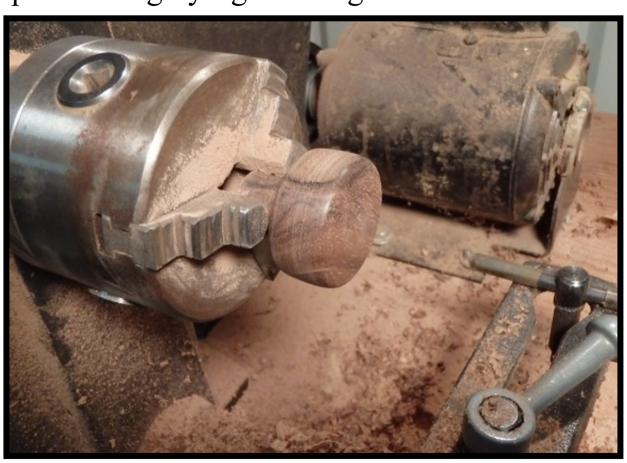


The Butt Section was now ready for the upper cork to get glued on.



Cork for upper grip.

A little sidetrack…I needed to turn a reel seat and butt cap on my wood lathe. I chose a new piece of highly figured English Walnut.



Turning the Butt Cap on the lathe.

Turned Reel Seat.

Now it was time to sand down the upper cork grip, glue on the reel seat and hardware, glue on the lower cork grip and sand it, and finally glue on the butt cap. This resulting finished grip section of the rod came out looking great.

Finished grip section on my switch rod.

The next step was making a custom winding check. Bill Bennett at Bellingers made a few of these for me last year and has inspired me to build my own. I machine small pieces of nickel/silver for the winding check, and then machine and polish black acrylic as the trim piece. They look pretty nice on my switch rods.

(Continued on page 8)

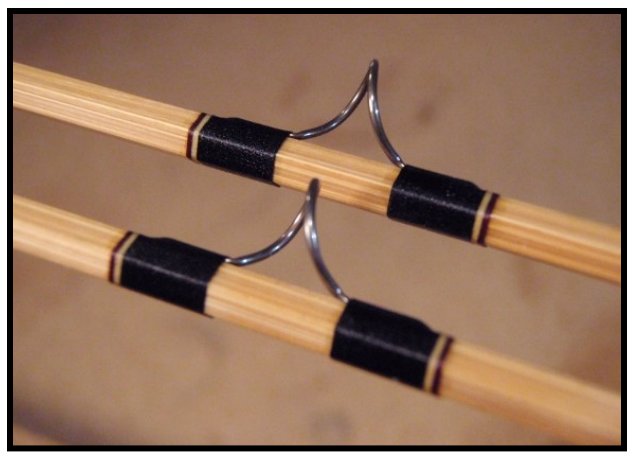
Custom Machined Winding Checks.

Then it was time to blue the ferrules. I use Brownells Oxpho-Blue liquid gun bluing solution on my nickel/silver ferrules. First, the areas I don't want blued get masked off with tape. I then wipe a cotton swab drenched in the bluing solution over the ferrule, always making sure I move over the entire surface that I want blued. It takes about 30 to 45 seconds at room temperature to get the desired effect. Here is what it looks like:

Bluing a Nickel/Silver Ferrule.

It's important to rinse the ferrule very well in running water to remove all the residual bluing solution. Let it dry, and then spray the blued surface of the ferrule with a clear lacquer to protect it. I use Rust-Oleum Painter's Touch Crystal Clear Gloss in a spray can, but any good clear lacquer should work fine. Then it was on to wrapping the guides. As with all my switch rods, I use black thread with straw and claret tipping on my wraps. I use Pearsall's Naples thread on the ferrules, and Pearsall's Gossamer thread on the snake guides. The Stripping Guide is a 16 mm Black Banded Agate guilde.

Wrapping a Black Banded Agate Stripping Guide.



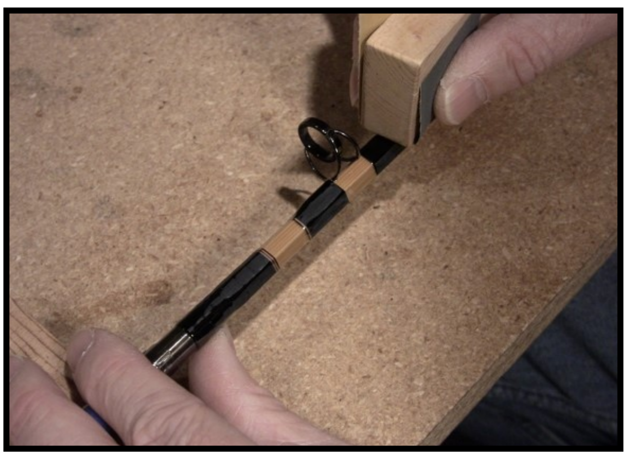
Snake Guides on my Switch Rod.

Finally, after coating all the guide wraps with eight coats of Varathane 900 Gloss, the rod was ready for finishing in my dipping tube process. I put on six coats of polyurethane on my rods, using a dip tube filled with finish. Each rod section is dipped into the finish and slowly pulled out. The finish just runs off all the guides. It takes about two hours to dip an entire rod.

(Continued on page 9)

The Butt Section coming out of the dip tube of finish.

It's a slow process…kinda like watching paint dry! After a day of drying time, each section gets a thorough sanding with 1500 grit sand paper, first the flats on the thread wraps, and then the flats on the bamboo.



Sanding the thread wraps after the fifth coat of finish.

Finally, after six dips and a final 48 hours of drying time, the finish gets rubbed out with a polishing compound. I use Meguiars Mirror Glaze 83 as a polishing compound and a small felt pad. This process helps take out any dust particles that have made their way onto the finish coat.

Polishing after the final finish dip.

And that's it. After doing a final fitting of the ferrules, the Hollow-Built Switch Rod is finished.

The finished Hollow-Built Switch Rod.

Seven Section Interchangeable Rod

Text and photos from Phil Kosmas

When I started on this project, my vision was to build an all-purpose rod that was not only interchangeable for a variety of conditions, but one that offered a different action supplied by two mids and four tips in variable lengths and dimensions. The rod is basically a 5/6 weight but will cast a range of lines from 4 to 7, subjectively. Depending upon the configuration, the action of this rod is best described as a moderate to fast action and performs equally well with streamers, weighted nymphs and dries. This taper can easily be made into a 7'3" – 7'6" – 7'9" rod by shortening/replotting in Hexrod or simply by cutting/removing the required amount of blank material, respectively.

(Continued on page 12)

Seven (7) section 3/2/4 Interchangeable 7’4” - 7’8” - 8’

	Butt	Mid A	Mid B	Tip 1-L	Tip 2-M	Tip 3-H	Tip 4-L
0	.248	.169	.169	.069	.073	.076	.071
5	.264	.186	.184	.085	.090	.095	.087
10	.285	.203	.196	.098	.105	.111	.101
15	.293	.222	.211	.113	.123	.127	.118
20	.311	.235	.222	.129	.141	.138	.139
25	.325	.242	.239	.146	.160	.152	.157
30	.332	.249	.248	.159	.176	.163	.176
35	.332	.254		.174		.174	

Ferrules: 16/64 & 11/64 - Super Z

Butt, mid-A and tips 1 & 3 measure 32”

Mid-B and tips 2 & 4 measure 28”

<u>Guide spacing</u>

Mid A: 6, 15-1/4, 26-3/4 (from female ferrule)

Mid B: 6-1/4, 14-3/4, 24-1/4 (from female ferrule)

Butt: 6-1/2 (from ferrule)

Tips 1 & 3: 3-1/2, 8, 13-1/2, 20-1/2, 28-3/4, 31-3/4

Tips 2 & 4: 3-1/4, 7-1/2, 12-3/4, 18-3/4, 26

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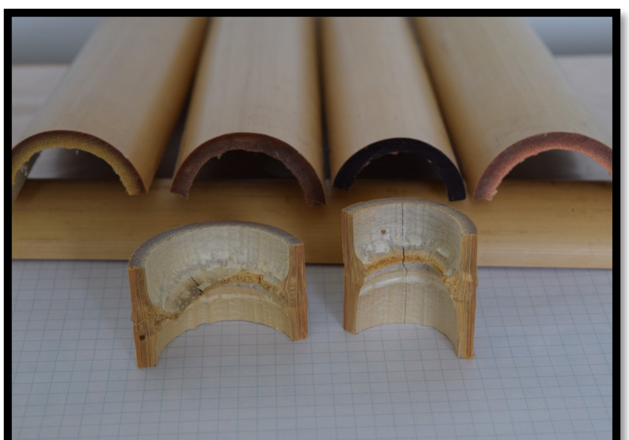
Nodeless Construction

Text and Photos by Ed Berg

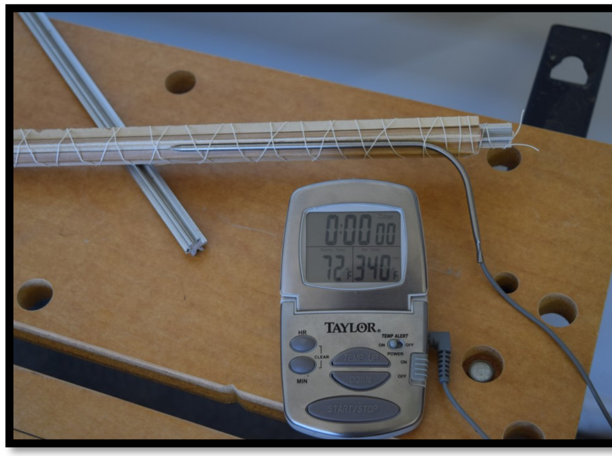
Editor's note: This article has appeared in IBRA's Bamboo Journal. When I announced I was going to reboot Power Fibers, Ed was the first to offer up an article to be published in the magazine. Thanks to Ed and the rest of the authors who contributed to this issue. Oh, and make sure you go over to the IBRA web site (http://www.rodmakers.eu/) and download the Journals!

Nodeless construction of bamboo fly rods offer some advantages and requires its own techniques. I have developed several methods and jigs that make the process much smoother for me. What follows are some of these methods and tools. This is what works for me.

The initial step is to saw out the nodes and approximately 3-4 cm on each side of the node. This leaves the beautiful straight grained material that will be used for the rod. I mark the butt of each section with a different color to identify its direction and position on the original culm.

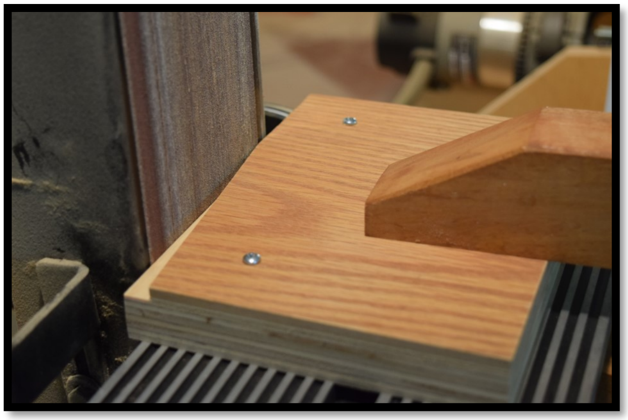


Splitting the material is straight forward with the nodes removed. We can now split much finer strips for tip sections for more efficient use of the cane. Heat treating the strips must be done at this point to prepare for accurate splices. I use the MD fixtures now being sold by Harry Boyd of the Ozark Rod Making School in the USA. One 5' section of the fixture can be cut into four equal lengths that work perfectly for our nodeless lengths. I bind the strips onto the fixture along with a probe from a digital meat thermometer. This allows very accurate heat treating in a common household oven. No special oven must be constructed or purchased. Time and temperature of heat treating will depend your cane, age and storing conditions, and local humidity.

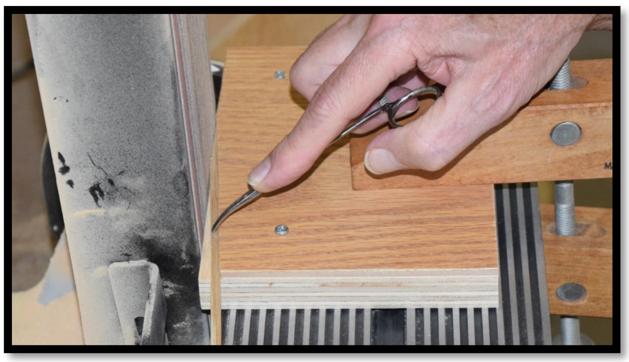


Once the strips have been heat-treated and cooled, we are ready to cut the scarf joints that will join our sections. The first step is to scrape off the enamel and flatten the strip. On these narrow strips this will not take much. This flat surface is essential for accurate splices. My jig uses a table belt sander to quickly and easily cut the scarf joint angle.

(Continued on page 15)

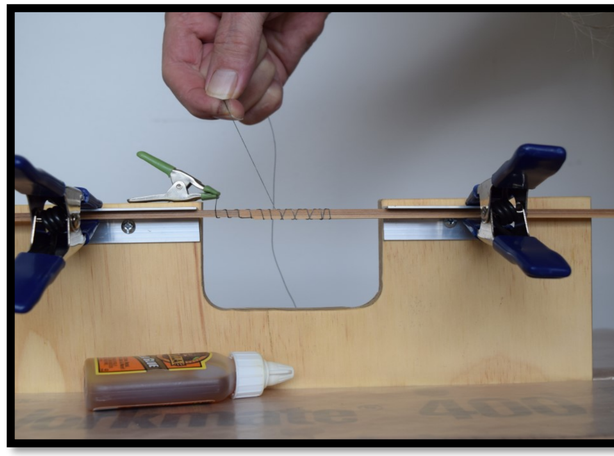


I use a bent-tip forceps to keep the strip aligned on the jig and keep my fingers safe.



Almost all bamboo strips will have a slight 'sweep' curving away from the power fiber surface. My binding jig is adjustable for this 'sweep' and allows the actual joint area to be aligned accurately.

Clamp both sections into the jig and adjust as needed. I use Gorilla Glue for my scarf joints. Lightly moisten the strips, and then apply a thin layer of glue to each joint surface. Wrap each joint tightly with the same binding thread you use on rod sections. Remove the joined sections from the jig and make any necessary final adjustment to ensure the power fiber surfaces are properly aligned. Set aside to dry. When dry, use the same techniques to join two 'doubled' sections together. Usually four sections will be long enough for a butt or tip section on a rod. Longer rods, of course, will require more sections.



Remove the binding thread and clean up each joint. Now you will proceed with rough and final planing the same as conventional methods. When planing, I totally ignore the direction of the splice and have never had any problems.

I stagger the splices in a 3X3 pattern in each section. Nothing more complex is required.

This is my procedure for nodeless construction of bamboo fly rods. I hope you will try it and decide if it has something to offer you.

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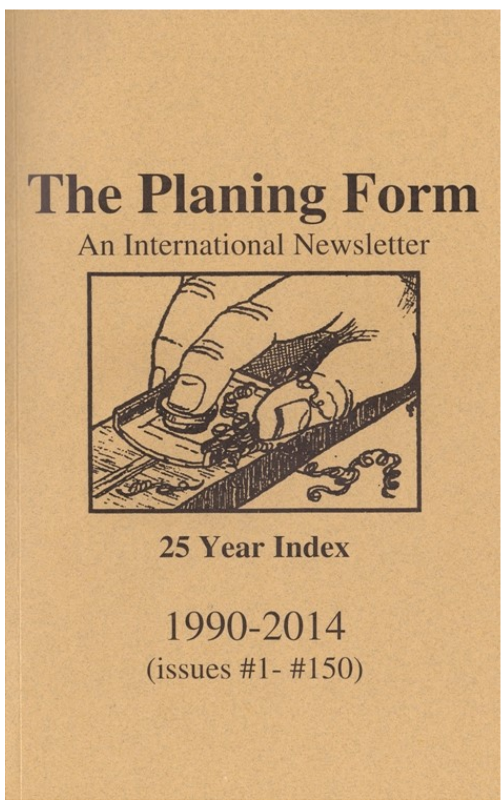
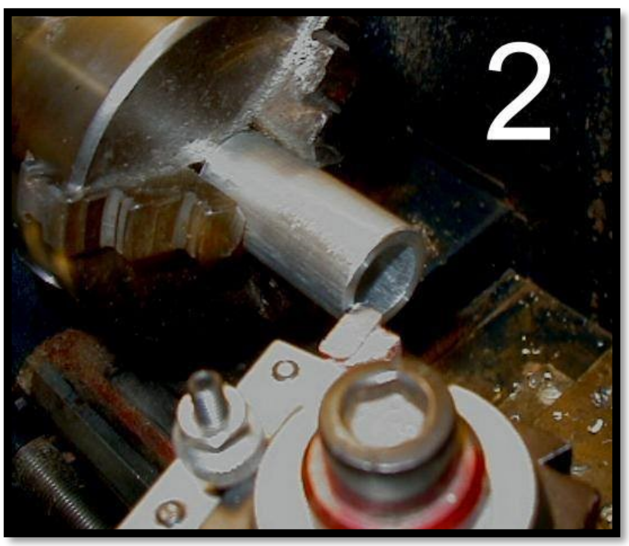


Rod Turning Chuck

Text and photos by Tony Spezio

I acquired a 6 RPM gear motor from a electric surplus company on the web. I planned to make a rod turning setup for varnishing wraps. To do this, I would need to make a rod chuck for the motor.

First, I cut a three inch length of thick wall aluminum pipe (Photo 1).



After chucking the pipe into the lathe, I trued up the front end on the lathe (Photo 2).

Now we need to remove the inner burr with a boring bar (Photo 3).

(Continued on page 18)

Polish the outer portion of the tube and beveling the front edge with 240 sanding strip (Photo 4).

Using a parting bit, cut a groove a half inch from the front end (Photo 5). This will be the line to drill and tap the screw holes

Place three equal marks around the tube. These will show the location for three screw holes (Photo 6)

Center the drill bit in your drilling fixture. This will center the hole when the round body will lay in the "V" channel (Photo 07).

(Continued on page 19)

Drill holes for the screws. Use a #29 drill bit to create a hold to tap an 8/32 thread (Photo 8).

The holes are drilled (Photo 9).

Tapping the holes (Photo 10).

Nylon screws are threaded into the holes drilled and tapped in the chuck (Photo 11).

You will now need to make a plug for the back side to attach the chuck to the motor.

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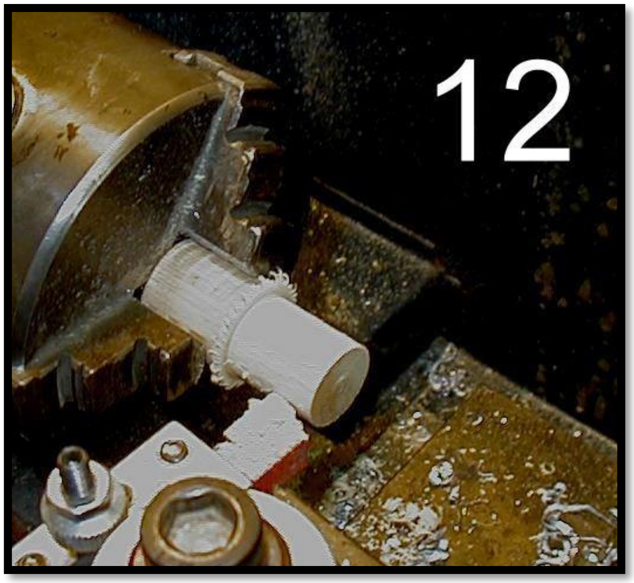
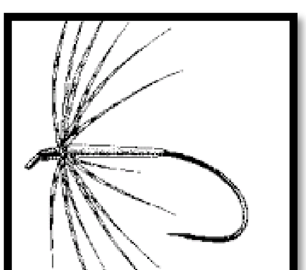
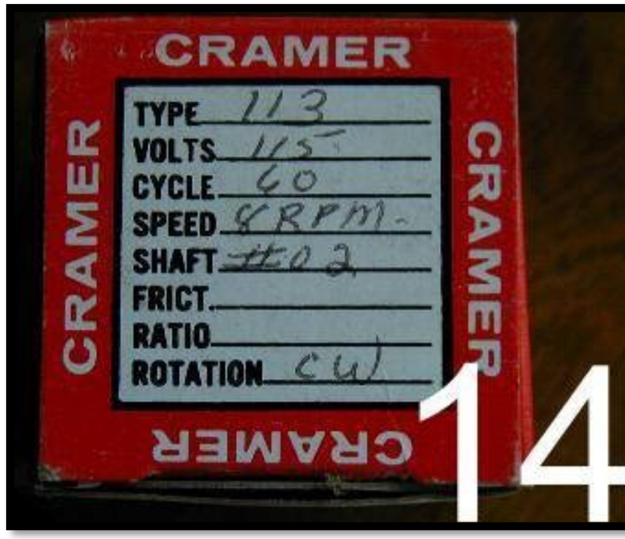


I decided to turn a length of dowel to fit the ID of the chuck body. This dowel should be a snug fit about 3/4 inch long (Photo 12).

Check the fit of the plug to the body of the chuck often for a snug fit (Photo 13).





These are the specifications for the motor I'm using for the project (Photo 14).

Measuring OD of motor shaft (Photo 15).

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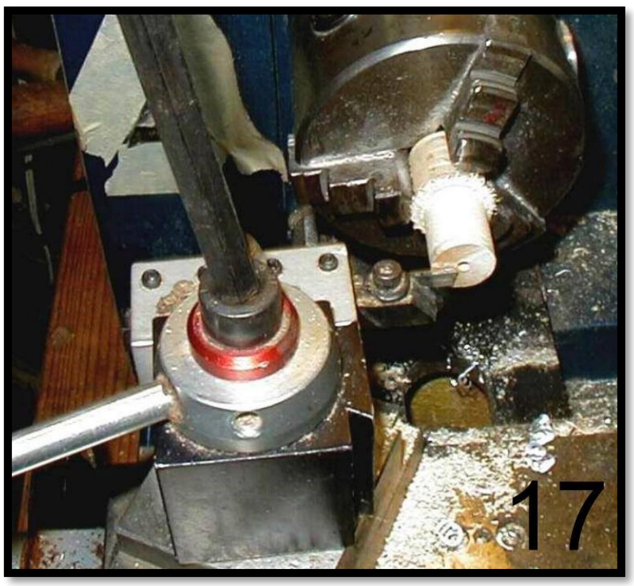
Drill a center hole for the motor shaft. This hole needs to be a really snug fit on the motor shaft (Photo 16).



Face off the plug (Photo 17).

Part off the plug from the stock (Photo 18).

Press the plug into body (Photo 19).

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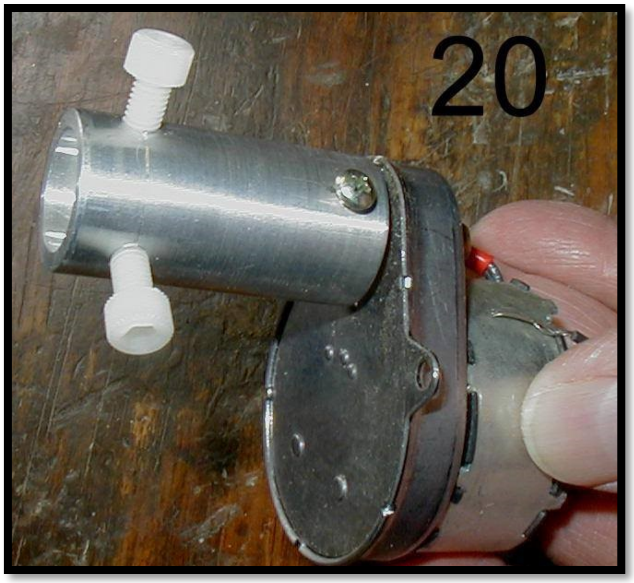

Fitting chuck assembly too the motor (Photo 20). I forgot to mention to drill a hole through the body a bit back from the back end to accommodate a screw that will screw all the way through the plug and rest against the motor shaft as noted in the photo.

Photos 21, 22 and 23 show the rod ends inserted in the chuck.

This works very well for me. I assemble the butt and one tip and put that in one turner that will take the reel seat and use this turner for the second tip section. That way I can apply varnish to all the wraps at the same time.

Some Myths of Bamboo Rodmaking and Beyond

Text and photos by Dr. Peer Doering-Arjes (www.Springforelle.de) and Goran Schmidt (www.growme.de)

What is fascinating about our craft is making a graceful, highly flexible fishing rod from a natural material, which has nodes and often has not grown straight. The deeper I became involved with rod making, the more questions arose for me about processing methods, bamboo species used, and the occurrence of bamboo. The scientific literature contains few facts about Tonkin (*Pseudosasa amabilis*, in the past the scientific name was *Arundinaria amabilis*), the bamboo species which is used almost exclusively for rod making. Opinions are numerous, but facts are few; a most unsatisfying situation for me as a natural scientist and biologist. Here I point out some of what I call myths of split-cane rod making. I also take the opportunity to tell something about my bamboo research and my project "Tonkin for Europe."

Myth 1: Power fibers should not be harmed

The shoot of a bamboo culm escapes from the earth already endowed with its maximum culm diameter and all nodes. It then expands like a telescopic rod within several weeks up to its maximum length. The shoot achieves this so quickly by forming a scaffold of hollow fibers. Afterwards, growth takes place only inside (Fig. 1), completely filling most of the hollow fibers in three years.

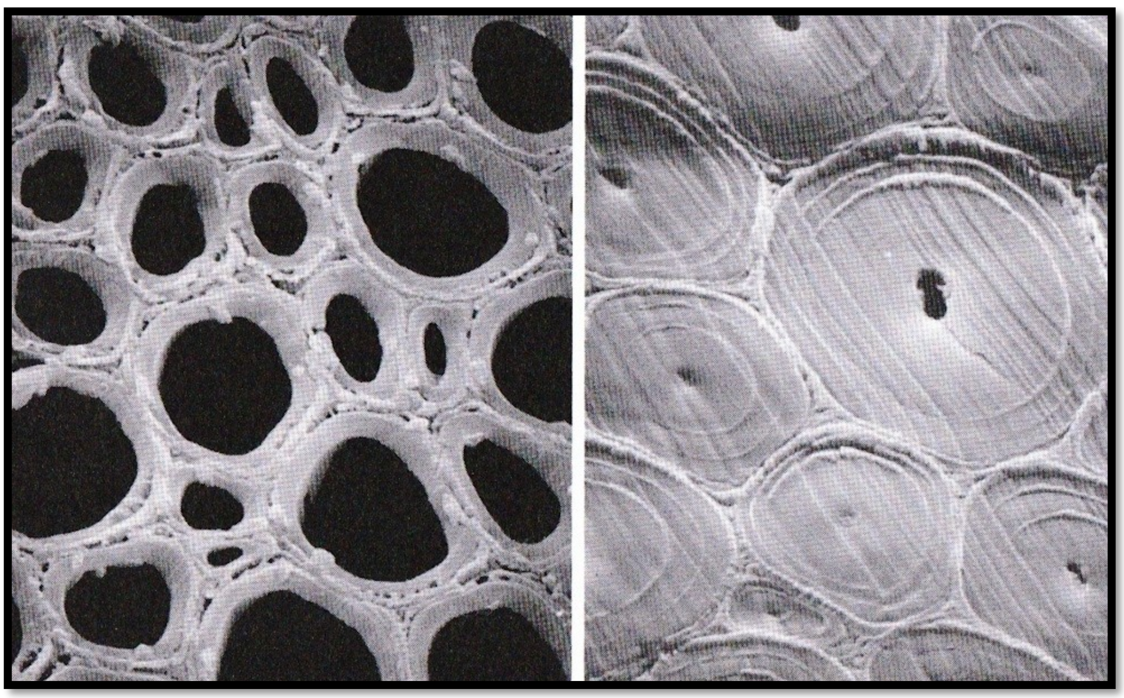

Fig. 1 Cross-section of fibers from *Phyllostachys viridiglaucescens* one (left) and six years old (Liese & Weiner 1996).

(Continued on page 25)

Rod making books misleadingly talk about power fibers, which should not be harmed. There is only one type of bamboo fiber and the word “power” is best omitted. A single Tonkin fiber is on average two millimeters (0.079”) long and thinner than a human hair (Fig. 3). Those fibers form sheaths surrounding the vascular bundles, which transport water up and sap down the culm (Fig. 2).

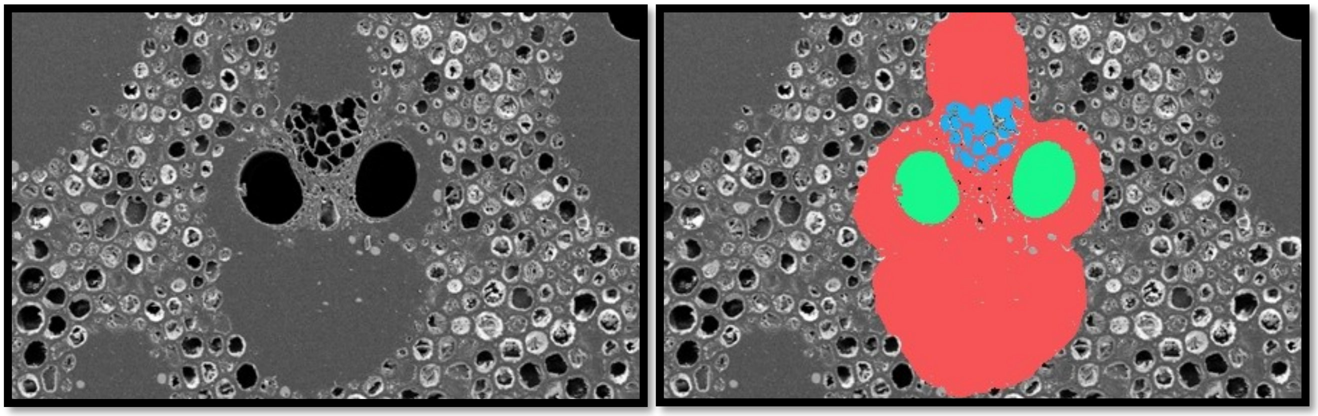

Fig. 2 Fiber bundles of Vietnamese Tonkin; red: fiber sheath, green: vascular bundle, which transports water up, blue: vascular bundle, which transports sap down.

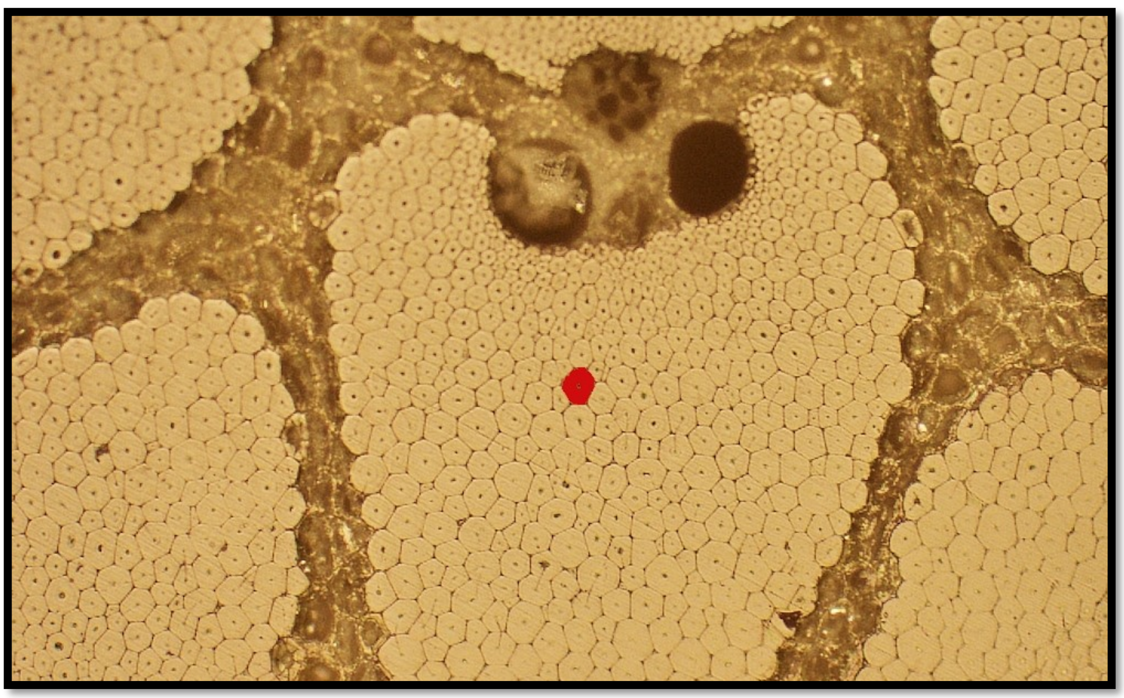

Fig. 3 Cross-section of a fiber bundle of Chinese Tonkin. Single fiber marked in red is 0.03 mm (0.001”) across.

The maximum height of a Tonkin culm is thirteen meters (43 feet), which means that the fiber bundles consist of thousands of single fibers from bottom to top of the culm. With this in mind, the common rod-making advice to not damage fibers seems absurd. While planing, inevitably very

(Continued on page 26)

many fibers will be cut. Better advice is: as few fibers as possible should be removed from the outside of the culm, because there the bundles are more compact and thereby provide the greatest stability. Electron-microscope images show that the first fiber bundles lie below a 0.01 mm (0.0004”) thick layer of enamel and a further cell layer of 0.06 mm (0.002”) thickness (Fig. 4). Thus, even removing a tenth of a millimeter (0.004”) damages the first fiber bundles. My experiments show removing just half a millimeter (0.020”) diminishes the breaking strength significantly (Fig. 5).

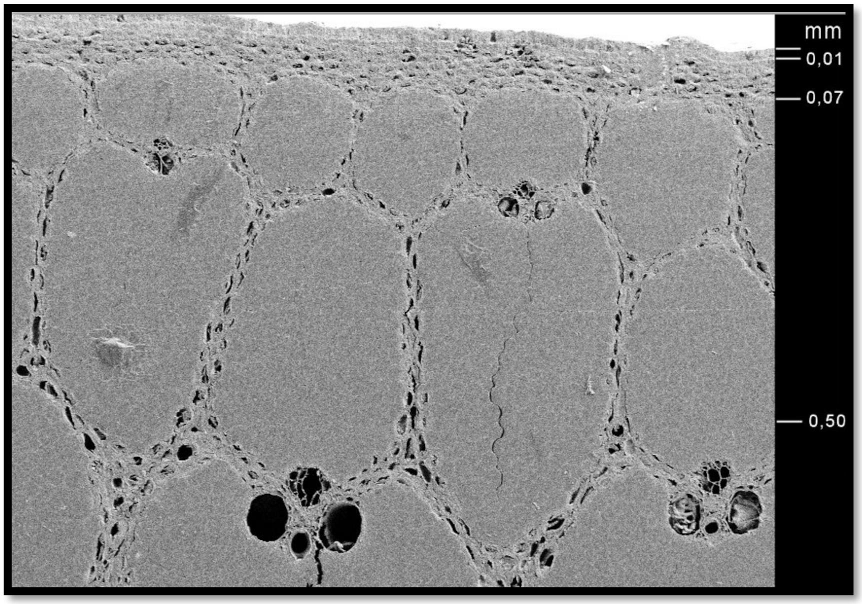

Fig. 4 Cross-section of the outermost area of a Tonkin culm showing, at the top, a 0.01 mm (0.0004”) thick enamel layer, underlain by 0.06 mm (0.002”) of soft tissue, and, below that, fiber bundles.

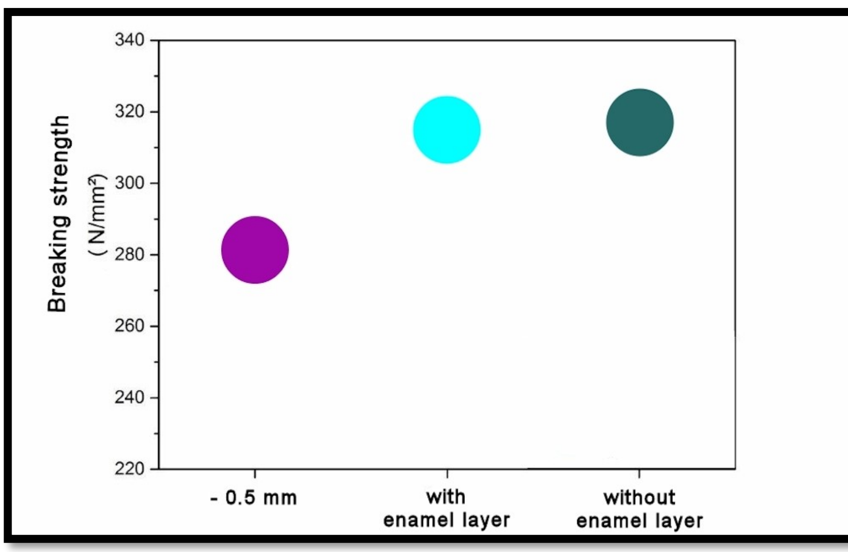

Fig. 5 Breaking strength of standard samples (3 x 5 x 80 mm) (0.12 x 0.20 x 3.15”) without outermost 0.5 mm (0.02”), without enamel layer, and with enamel layer.

(Continued on page 27)

Myth 2: The best bamboo species for rod making is Tonkin

Today, Chinese Tonkin from the area around Huaiji in the province of Guangdong is used almost exclusively for rod making. Marden (1997) writes that Tonkin possesses the highest fiber density of all bamboo species. Thereby it should have the highest breaking strength, which is of great importance for fishing rods. Garrison and Carmichael's "A Master's Guide to Building a Bamboo Fly Rod," often considered the bible of rod making, notes that Tonkin is the best natural material for building fly rods. It is fair to assume that a comparison of bamboo species occurred, but no specific documentation remains if and what other species or other places of origin were tested. I know of one exception: Ivor Davies, a former employee of Hardy Brothers wrote me that Tonkin was not selected by chance. In the early 1880's Hardy in Alnwick tested numerous samples from various regions of China for toughness and recovery power. Hardy did make rods from "Calcutta" cane and, in the then secretive world of cane rod making, information on bamboo species may have been shared informally.

More than 1,400 bamboo species are known of which only a few hundred are "woody" bamboos. *Pseudosasa* belongs to the temperate woody bamboos. Even if only a small percentage would be suitable for rod making, this represents considerable potential for possibly better rods. Interestingly enough, the species Madake (*Phyllostachys bambusoides*) is used by some Japanese rod makers.

I started to investigate the mechanical properties of Tonkin with 3-point-bending tests because of the lack of published data such as is available for other bamboo species which serve, for example, as construction material. In our case, perhaps it might be best to conduct these tests by breaking entire rods. This would be very laborious, and I decided that it is sufficient to break samples of accurately defined size and to know what part of the culm they originated from. I explored the properties of the outermost three millimeters (0.118") of Chinese Tonkin, Vietnamese Tonkin, and Tam Vong. A crucial factor for breaking strength and stiffness is the density of the fiber bundles in this outermost area, which is the part of the culm used for rod making. The fiber density of Tonkin allows, without doubt, the making of marvelous rods. A bamboo with a higher fiber density might allow building a split-cane rod with even better mechanical properties. Are there better bamboo species for rod making? The question remains unanswered, but fascinating.

Myth 3: Tonkin comes only from the Chinese province of Guangdong

Only four publications about Tonkin appear in generally accessible literature databases. Recently a colleague from China sent me publications about Tonkin from his country, which describe three sub-species of Tonkin growing in the province of Guangdong (Xu and Xu 1984). Essentially all books about bamboo rod making cite only this province as a source for Tonkin.

An occurrence of Tonkin in Vietnam was reported verbally to me and, in 2015, I set off to find out for myself. The year before, I was lucky to meet Professor Dr. Dr. h. c. mult. Walter Liese, the pioneer of bamboo research, who helped me gain insights and contacts in the world of bamboo. He provided me with detailed knowledge about the mechanical properties of bamboo and provided contact to the bamboo scientist Dr. Tang Thi Kim Hong in Vietnam, who guided me to an occurrence of

(Continued on page 28)

Tonkin east of Hanoi. There I took samples in a forest containing bamboo used by the local population (Fig. 6). The Vietnamese Tonkin differs from the Chinese Tonkin in that the internodes, the sector between the nodes, are up to 70 cm (28") long, while the Chinese variety has a maximum internodal length of 50 cm (20"). This is significant for the rod maker because fewer nodes means less node preparation for making a rod.

Fig. 6 Forest with Tonkin in Bac Giang province, Vietnam.

From Vietnam, I travelled to the Chinese province of Guangdong. Andy Royer, who was the only broker of Tonkin for rod makers at the time, invited me to join his final trip to China. There I could watch how the people harvest Tonkin and how much preparation by hand is necessary until it is ready for export.

With Andy, I travelled to Huaiji, the same area McClure (he named the species in 1931) visited ninety years ago, who stated then that these are bamboo plantations and not a forest. We still do not know if Tonkin originated in this area.

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Huaiji is situated in a very hilly landscape where almost exclusively Tonkin grows or, respectively, is cultivated. Primarily women harvest the culms from the hill slopes with hatchets (Fig. 7), cut off the branches, and pull them down steep tracks using two-wheeled carriers for further processing in the valley.

Fig. 7 Harvest in a Tonkin plantation near Huaiji, Guangdong province, China.

I assisted my friend and business partner David Serafin in selecting, by hand, mostly for export to the USA, the best out of a few thousand culms. Our selection criteria included culm straightness and an exterior as flawless as possible (especially insect damage). In addition, the culms needed to be heavy, of large diameter, and with long internodes.

Myth 4: The larger the culm's diameter, the better it is

When I walked through the plantations in China, initially I was surprised by the culm diameters. There were areas where only thumb-thick culms grew. These were not young culms, but just thin specimens.

(Continued on page 30)

I found that culm weight is a good indicator for fiber density. The heavier the culm, the greater the breaking strength of the cane. The culm diameter is very variable, and many rod makers prefer large diameter culms. However, smaller diameter culms can be heavier relative to their diameter and therefore possess a higher breaking strength than a larger diameter culm. Diameter alone reveals nothing about the mechanical properties of a culm for rodmaking.

The internode length is important for rod making. The internodes are longest in the mid-section of a culm, and are shorter in the upper and the lower ends in most species (Fig. 9). A Tonkin culm grows up to about thirteen meters (43 feet) in length (Fig. 8). Only the so-called butt cut, the lower twelve feet have been imported to date for rod making because the lower end of the culm is largest in diameter. The mid cut, the section above the butt cut, that contains the longest internodes and is well suited for making single-handed rods. Many rod makers may be unaware of this, probably because that part of a culm is often considered to be too small in diameter. However, the amount of fiber bundles is sufficient for single-handed rods.

Fig. 8 Freshly harvested Tonkin culms in entire length.

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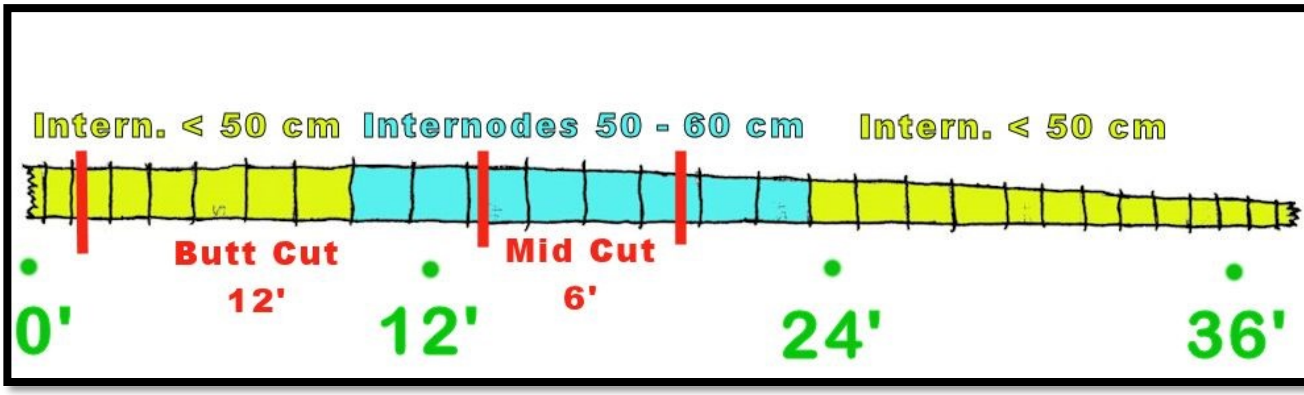

Fig. 9 Tonkin culm drawn to scale, butt and mid cut section, internodes shorter and longer than 50 cm (20”) in terms of color separated.

Myth 5: The culm must be dry

Some clients ask me if the culms are dry so they can start using them immediately. Only dry culms are imported.

To improve mechanical properties, the splices for rod making are treated with heat, so-called tempering. That alone dries the bamboo. After a rod is finished, the moisture in the cane equilibrates

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with the moisture in the environment, no matter how dry the rod was during building. The culm's state of dryness is therefore unimportant during the building process. Many soak their strips in water before planing because the plane blade then cuts more easily.

A freshly harvested culm may weigh twice as much as when dry. Shipping costs would increase enormously because they are based on weight. Obviously, no merchant wishes to import heavy, wet bamboo. To facilitate drying, the culms are hand washed with sand and water to remove the natural, outer wax layer (Fig. 10).

Fig. 10 Removal of the natural wax layer with sand and water.

(Continued on page 33)

Afterwards the culms are stacked in tent form for several weeks (Fig. 11). Experience is required to estimate the correct amount of time. The culms may not be exposed to the sun too long otherwise, they crack lengthwise. They then are stored in warehouses until they are shipped (Fig. 12 — next page).

Fig. 11 Culms stacked for drying. Glenn Bracket demonstrates their enormous elasticity.

(Continued on page 34)

Fig. 12 Warehouse for Tonkin (© Chad Okrusch).

I asked rod makers how they carry out tempering (Fig. 13) and many gave exact replies. They use temperatures from 120° to 190° C respectively 248° to 374° F and durations from 5 to 120 minutes. The variations in the process lead to the question: Are all variants good or is there an optimum?

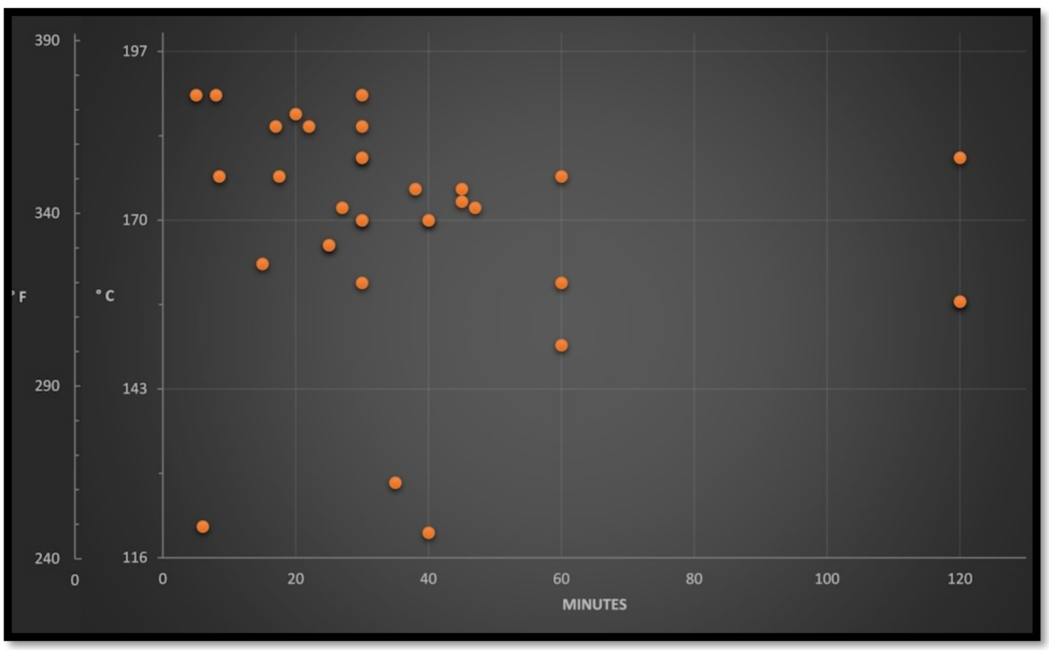

Fig. 13 Each dot indicates tempering procedure of one rod maker.

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There are many opinions about tempering, but there is not a lot of data describing the effect on breaking strength and stiffness of Tonkin. The only rod makers who conducted such experiments are Wolfram Schott (2006) and Robert Milward (2010). We conducted our own experiments in the Center for Wood Sciences of the Universität Hamburg.

For tempering, I built an oven capable of maintaining a desired temperature. A sensor placed in a strip provides the core temperature of the bamboo (Fig. 14).

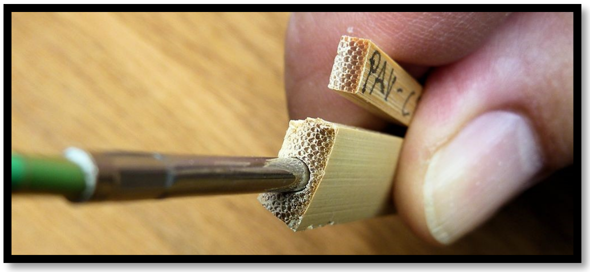

Fig. 14 Temperature sensor inside Tonkin. The upper sample is 3 millimeters (0.118") thick.

Results reveal that a rod maker must decide between greater breaking strength or greater stiffness (Fig. 15). There is no optimal core temperature for both factors. Core temperatures above 150° C (302° F) lead to chemical reactions, which permanently reduce the capacity to absorb water. The core temperature has a larger impact on mechanical properties than the duration of heating. For short processing times one must bear in mind that bamboo insulates very well. It takes about fifteen minutes until the core temperature is the same as the temperature of the outside of a bamboo strip.

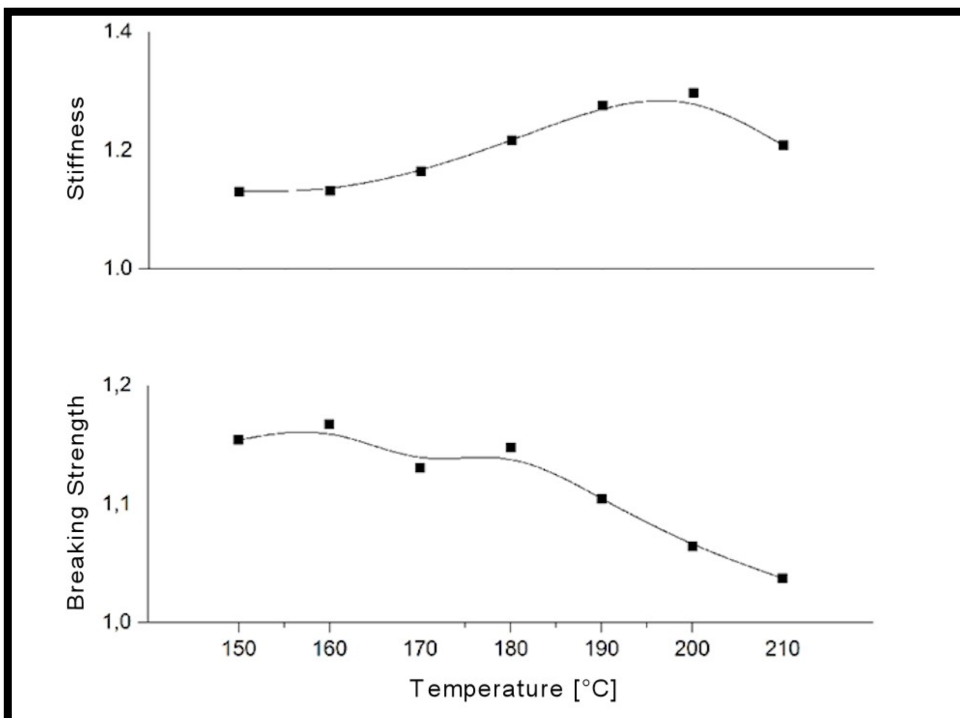

Fig. 15 Relative values of the 3-point-bending tests for breaking strength and stiffness (1 on the vertical scale = untreated samples) at various temperatures. Duration of heating always 2 hours.

(Continued on page 36)

I investigated several factors: comparison of different bamboo species, tempering of the Tonkin at various temperatures, and comparison of different sectors of the culm. I found that breaking strength and stiffness are greatest in the outermost millimeters in the lower sector of the culm and decrease slightly towards the top. In comparison with other species (*Guadua angustifolia, Phyllostachys pubescens, Thyrostachys siamensis*), also versus the Tonkin from Vietnam, Tonkin from Huaiji is best with respect to breaking strength (Fig. 16). The Vietnamese Tonkin is, in contrast, stiffer (Fig. 17).

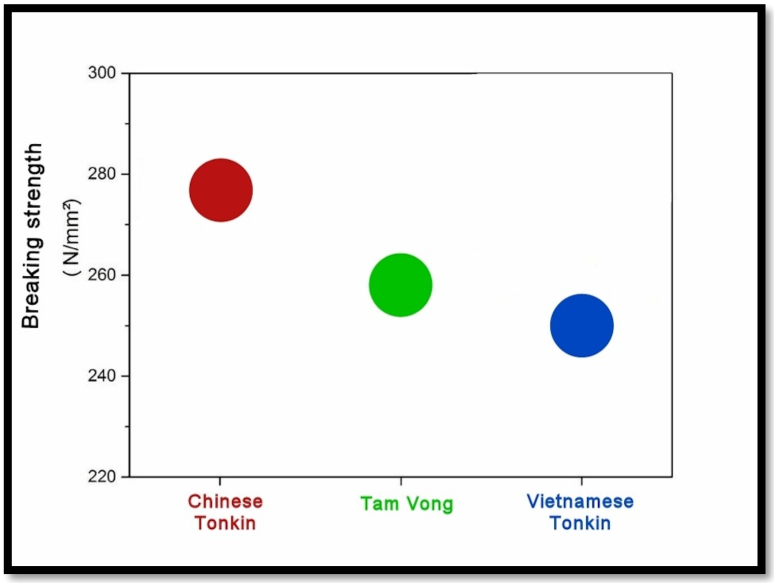

Fig. 16 Breaking strength after two hours tempering at 180 °C (356 °F) of Chinese and Vietnamese Tonkin and Tam Vong.

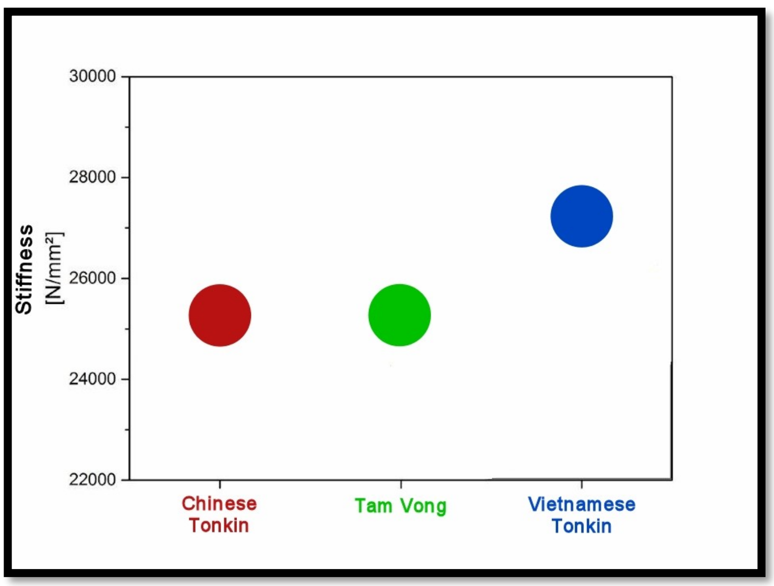

Fig. 17 Stiffness after two hours tempering at 180 °C (356 °F) of Chinese and Vietnamese Tonkin and Tam Vong.

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The project "Tonkin for Europe"

The intensive engagement with bamboo led to my importing Tonkin culms of very high quality for rod makers in Europe to provide the best raw material available. There were prerequisites for doing so. They included the scientific testing at the Center for Wood Sciences of the Universität Hamburg to provide a previously unavailable assessment of quality. The basis for export from China is personal contact with a bamboo broker in China who has more than twenty years of experience with Tonkin, especially for rod makers. Quality control in China entails co-operation with David Serafin (www.anglersbambooco.com), who was trained for several years in hand selecting culms on-site. In Berlin, I perform a further quality control before the culms leave Springforelle's warehouse.

I measured entire culms in Vietnam and China and found that internodes are relatively short at the butt, become longer towards the middle, and again shorten towards the top. The mid cut contains most of the longer internodes. Tonkin of very high quality was hard to obtain in Europe and my investigations confirmed that the Tonkin from the province of Guangdong is excellently suited for rod making. In the spring of 2017, the first container for my project "Tonkin for Europe" arrived in Berlin from China with four and a half tons of butt and mid cuts of Tonkin cane.

Many interesting questions about Tonkin and other bamboo species remain unanswered and I intend to continue my research on them in the future.

Fig. 18 Peer Doering-Arjes with Chinese Tonkin mid and butt cuts.

(Continued on page 38)

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Making a Basket Weave Rattan Handle

Text and photos by Phil Kosmas

The concept of making such a grip presented itself in the mid-2000's when I found myself with way too much idle time. Upon experimenting with three fly grip styles; Half Wells, Cigar, and Reverse Half Wells aka Western style, I concluded that a 6.5" to 7.5" inch RHW style with its shape, taper and contours was better suited for the basket weave design and just seemed to look better than the others. After making several recent basket weave fly grips, I've determined the elapsed time start to finish from gluing and turning the cork grip to end result final varnish coat varies somewhere between 12 to 15 hours.

The basket weave style lends a unique and appealing look to both fly and spinning rod grip applications.

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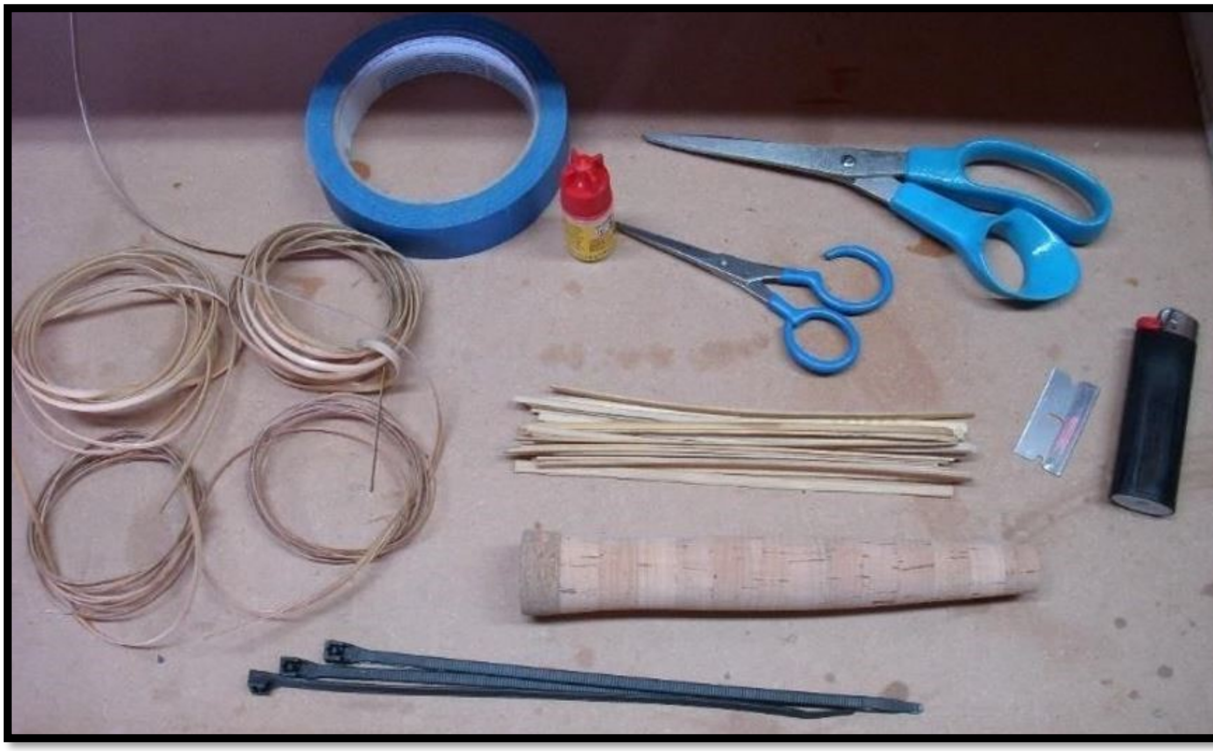
Getting Started



Things you will need:
Cork grip
Rattan cane hanks in three sizes: 3.5 or 4mm, 3mm & 2.5mm
Scissors
CA - Super glue (gel and/or liquid)
Sharp scissors
Razor blade
Painters tape
Mandrel (12" length of thread rod)
Lighter
10" zip ties

Step 1

Begin by sorting and prepping the rattan, using the larger (3.5-4mm) for the vertical/length-wise base strips. In this case I'm using 3.5mm. Utilizing the best part of the rattan; straight, undamaged

(Continued on page 42)

and clean with most enamel will afford the best results. It's discretionary to leave the growth nodes intact or cut them away although, as a preference I try to eliminate as many as possible.

The length of the grip being used in this project is 7". It's a good idea to turn your grip dimensions down slightly smaller than practical by .10 to .15 thousandths in diameter. Cut about thirty (30) or more 6" inch base rattan pieces one inch shorter than the grip at even lengths of 6" inches leaving ½" at the fore and aft ends of the grip.

Additionally, it should be noted that I shaped this grip with a disc of natural burl cork at the rear to help reinforce the area when boring a recessed inlet, thereby eliminating the possibility of tear out.

Step 2

Once the 3.5mm rattan has been cut into 6" lengths respectively and you've selected three to four hanks of the smaller 3.mm rattan for the fore and aft turns at the nose and butt of the grip, along with a couple of full length hanks of 2.5mm for the appropriate center weave, it's time to soak the rattan. Natural rattan is best worked soft, damp and pliable to eliminate the possibility of breakage. I generally heat water on a stovetop or in the microwave and then soak the rattan in a container of hot water for an hour or so.

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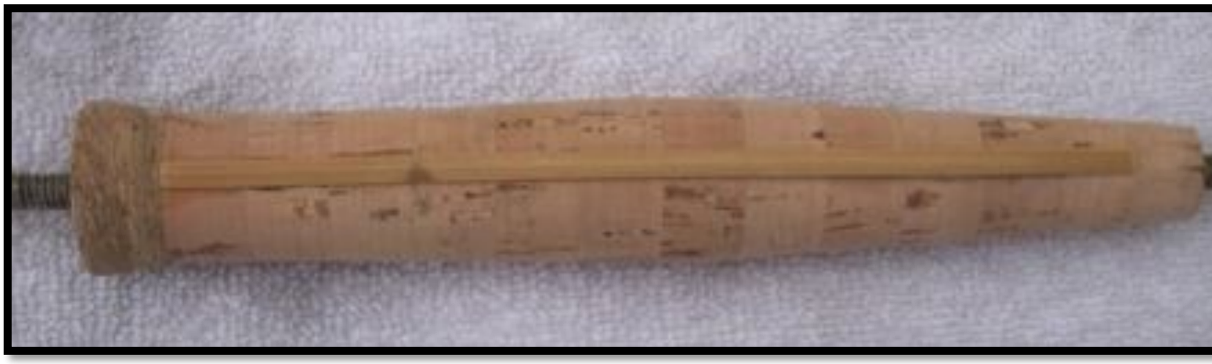

Next, take the thirty 6” inch vertical base pieces and remove about ¼” of material from the backside of the strips on both ends to create a sloped/tapered effect. Do so by carefully shaving at an angle a little at a time. Once completed it’s time to start gluing in the strips lengthwise as seen in the photo below.

Glue in the strips 1/2” from the rear/butt side **ONLY**, adding enough super glue to cover ONE inch of the strip. **DO NOT GLUE IN THE TOP** portion of the strip. This is important as gluing in more length of the strips will make it difficult to start the WEAVING process thereby defeating the purpose of a basket weave grip! Hold down tightly each strip for 20-30 seconds or longer to ensure full adherence to the cork.

(Continued on page 44)

Step 3

Upon gluing in all of the strips side by side it's now time to glue in a hank of 3.mm rattan. Shave down about ¼" of material on the backside of the 3.mm hank tag end, add glue, locate and lift a vertical strip at about 1-1/2 inches from the end of the grip and tack it in underneath. Hold for 30-45 seconds or longer then wind the 3.mm down towards the rear, adding a drop of CA every inch or so. Hold and repeat until you've managed to overlap the end of the cork by at least one full turn.

Cut off the remaining rattan hank being certain the overlapping tag end is tucked in and secured well with drops of CA. Do nothing at this juncture as the excess will be carefully trimmed away later.

Step 3

It's now time to start the weaving process. This is where patience and a bit of hand strength with glue-encrusted fingertips will be required. Please note that CA/super glue can be mostly removed by scrubbing with hot soapy water followed by acetone or nail polish remover.

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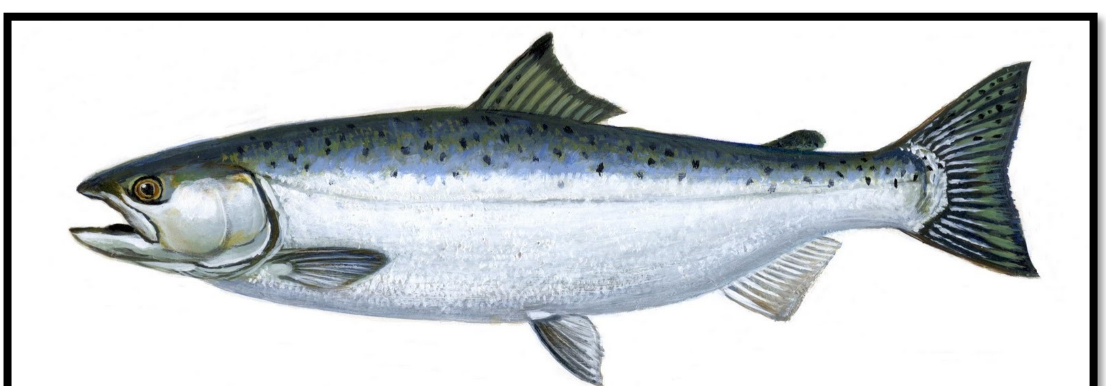

As in the above pictures, take a long hank of 2.5mm rattan you've selected, shave/slope ¼" of the backside, locate and lift **TWO** vertical strips and glue in the weaving hank underneath. Hold till secure then gradually work the hank in between the lengthwise strips, over and under through and through over and under each vertical strip while respectively "weaving" the grip. It will take a lot of manipulation to stagger and achieve the evenly spaced weave you desire. Although not necessary, you may glue in each full weave/turn as you work towards the nose of the grip to allow for better control. I've personally found it's easier to avoid gluing at this step, instead waiting to glue and secure when the weave has been completed to my satisfaction.

Step 5

Now that the weave is approximately where I want it to end (roughly 1-1/2 inches from the nose), I've used a zip tie to temporarily secure the strips snuggly to help avoid slippage so I can glue it in, trimming away the residual. Painters tape will also accomplish holding the strips in place.

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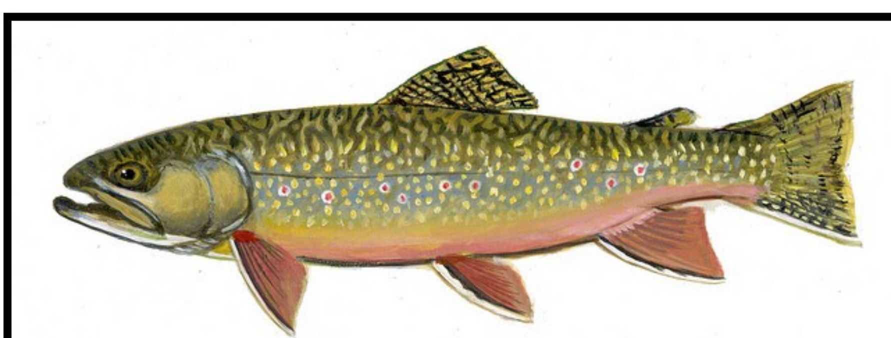
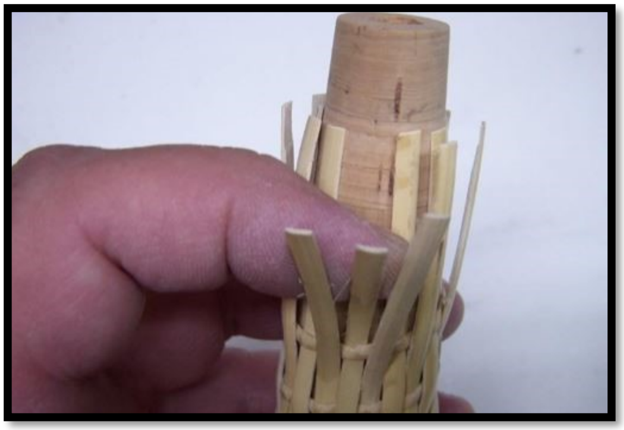
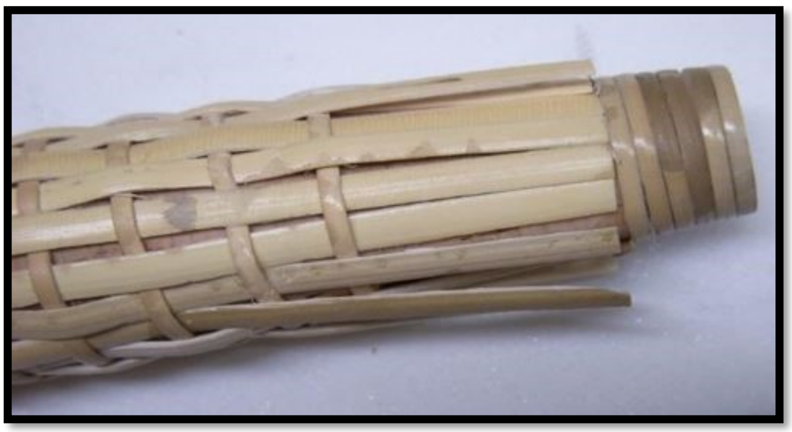


Step 6



The loose, errant fore strips can be distracting and a tad troublesome due to the sharp decrease in taper dimensions at the nose of the grip. Once the woven center strip is glued in place, I attempt to straighten and evenly space the vertical strips in an effort to keep from riding atop one another then gluing in flush as many as possible that are willing to cooperate, but not all will.

Step 7



To help retain the taper at the fore of the grip, at the ½" cork void located where the vertical base strips end, I've shimmed it with a length of 2.5mm rattan, glued and wound it in past the nose. The thinner dimension 2.5mm works well for this task to maintain the taper and help keep the proper slope transition.

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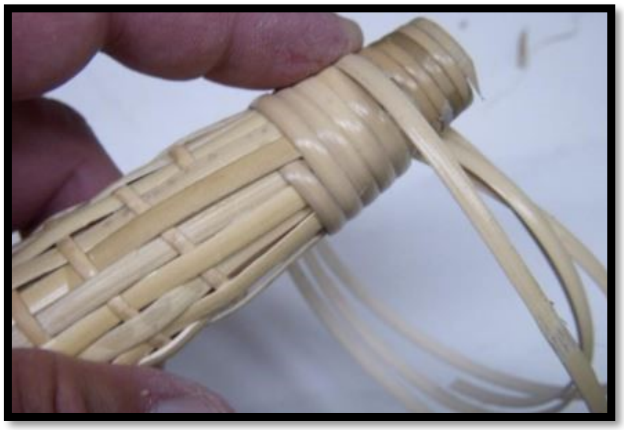
Step 8



As in **Step 3**, take a hank of 3.mm rattan, shave the backside, glue and tack under a vertical strip roughly 1-1/2 inches from the nose. Hold and secure then wind forward until you have at least one full turn past the cork. Trim off excess rattan and glue and tuck in the tag end with more drops of CA.

Step 9

The grip is starting to take on a basket weave effect. At this point, I squirt super glue underneath the vertical strips at the grip contours where they aren't sitting flush against the cork and secure them flat with zip ties. If done correctly, the center vertical base strips and woven section should be evenly spaced, nice and tight, not requiring glue or zip ties.

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Step 10

Take a razor blade, laying it level and perpendicular to the cork and carefully shave away the excess rattan at both ends of the grip. When done, lay a sheet of 220 grit paper on a clean surface of your workbench and carefully sand the ends flush. Follow up by taking a lighter and singe the frayed ends of rattan throughout the grip. At this point you can turn a thread winding between the gaps of the wound fore and aft portions if desired, then finish by applying 4-5 hand brushed coats of your varnish of choice to further seal and protect it from the elements.

Voila!

I've installed a few of these on rods and the first thing folks always ask is if they're rough on the hands. To the contrary they're smooth, very comfortable, super tactile and grippier than standard cork when wet, aside from the unique aesthetics they offer. No blisters, callouses or pain, even after a full day on the water. Enjoy and tight lines!

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