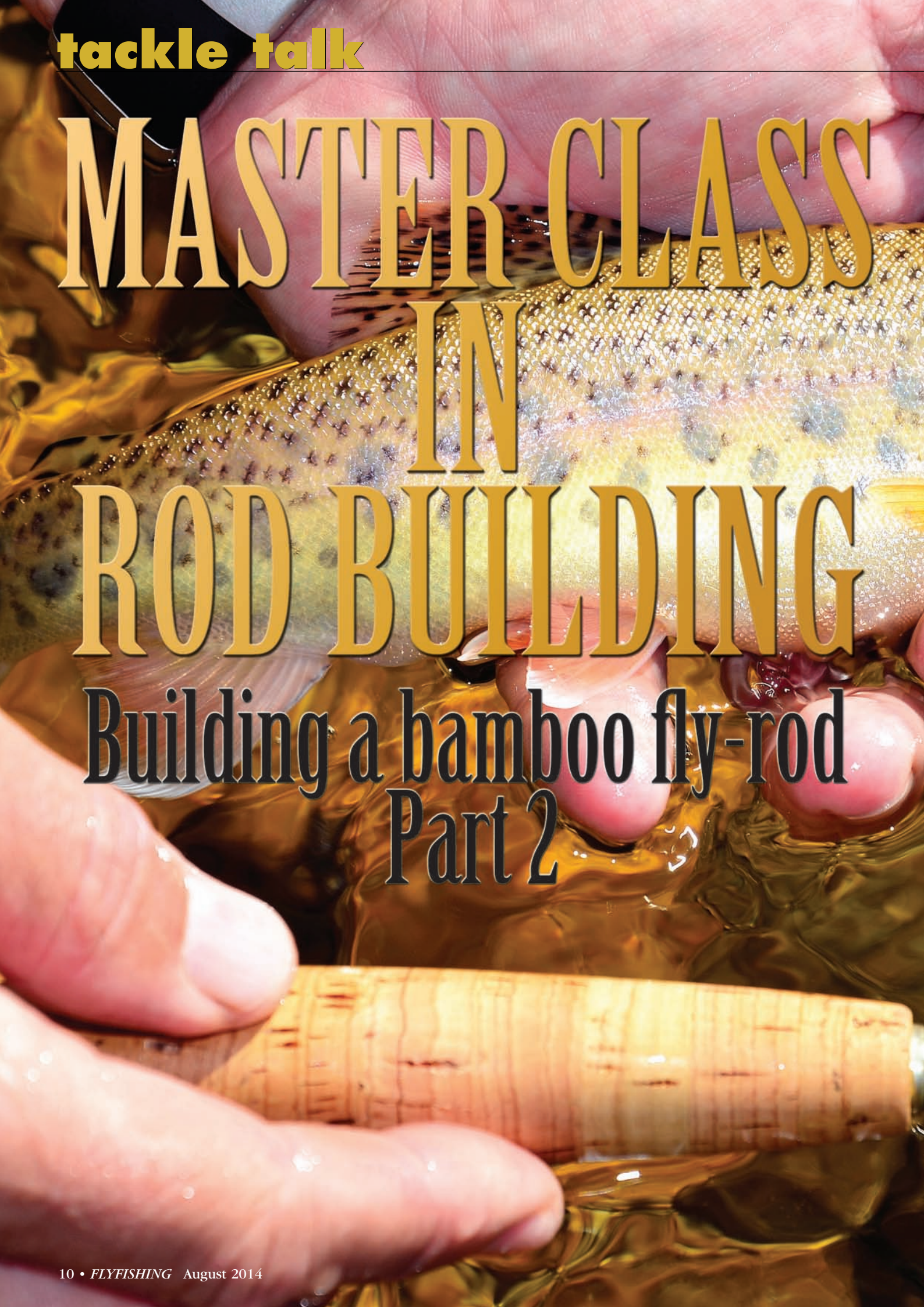
MASTER CLASS IN ROD BUILDING

Building a bamboo fly-rod Part 2



by Dirk de Villiers

AS I mentioned in the previous article, the best bamboo for fly-rods is Tonkin Cane. Tonkin Cane is used because of its abundance of powerful fibres (known as power fibres) which give the rod its strength and flexibility. A further advantage of Tonkin Cane is the convenient inter-nodal spacing.

It is interesting to note that bamboo is actually a member of the grass family and not a wood.

If you examine bamboo you will find a hard, shiny outer surface called enamel, followed by the densest power fibres. As rod builders we must take great care to not remove any power fibres during the rod building process. As you move towards the inner surface the power fibres become less dense and a soft white material, called pith, becomes more abundant.

Density of power fibres is of paramount importance to rod builders. The densest power fibres are found towards the bottom of the culm and are therefore most suited to butt sections and more powerful rod actions. The top part of the culm is mostly used for building tip sections or butt sections on lighter rods.

Side view of a bamboo culm showing the dense power fibres just below the enamel.

A second very important consideration when selecting bamboo is the condition of the enamel and underlying power fibres. Exterior imperfections could be purely cosmetic, such as water marks, or could indicate more serious damage, such as growers' marks, cut marks, worm holes and leaf nodes. Try to avoid areas with such

All bamboo culms should have a drying split that runs the entire length of the culm.

major imperfections as the integrity of the finished rod could be compromised.

Sometimes the bamboo culm will not be age-cured correctly and will still be a light-green colour. Such culms need to be stored until they are properly dry and are a straw colour. Some bamboo culms may have been straightened by the growers in China and may have surface burn marks. Such sections are not suitable for rod building and should be discarded.

Bamboo culms come in 12 foot lengths and you should ask your supplier to cut these lengths in half to provide you with two 6 foot lengths that are easier to transport and work with. Usually when you buy a bamboo culm, a drying split that runs the length of the culm will be present. If such a drying split is not present, one should be made as soon as possible to prevent random splits occurring during the drying process.

FLAMING BAMBOO

Bamboo in a natural state contains a significant amount of moisture and is not resilient enough to resist taking a set. Heat treatment is required in order to remove excess moisture and improve the rod building qualities of the bamboo.

Heat treatment can become a very technical issue beyond the scope of this article. In my opinion, the best way for the hobbyist to heat-treat bamboo is to flame the culm of bamboo. If you want to end up with a darker toned rod it is best to flame the exterior of the culm. It is also possible to build a light-coloured (also called blonde) rod by splitting the culm in half and flaming the inside surfaces.

Flaming the bamboo culm with a propane torch.

Quite simply, flaming involves burning the culm to an almost black colour using a propane torch. It is quite hard to damage the bamboo by applying too much heat, but I would still advise one to practise on an off-cut to get a feel for the technique before flaming your precious culms.

There are two ways of flaming the exterior surface of the culm. You could move the flame in perfectly overlapping lines to produce an even colour, or you could purposely move the flame erratically to produce a more mottled appearance. I quite like an uneven colour as I feel that it adds to the character of a rod.

Start flaming in the middle of the culm and move the flame towards one end, turning the culm as you go to cover the full circumference. You will see the enamel becoming black and crusty and steam and water should escape from the side of the culm as you move closer to the edge. Now start from the centre again and move the flame towards the opposite side until the whole culm has been treated. If correctly flamed, no further heat treatment of the bamboo is required.

The burnt enamel will be removed later to expose the lovely honey and caramel tones that the flaming process has created.

SPLITTING THE CULM

After flaming, the bamboo culm has to be split into strips. Start by splitting the culm in half using a large, blunt knife and rubber mallet. Hold the knife opposite the drying split and start the new split with a tap from the mallet. Twist the knife sideways to open up the split. You should find that the culm splits in half quite easily, the only resistance occurring at the nodal dams.

Nodal dams are visible after splitting the bamboo culm.

You will now have two half-round bamboo sections. Before we can split the half-round sections further we need to remove the bulk of the nodal dams with a chisel or wood gauge, using the rubber mallet once again to apply some force.

Once the nodal dams have been removed, the section has to be split into thirds if the culm had a diameter of 2½ inches or more and halved if it was less than 2½ inches, using the knife and mallet once again. These sections will be halved and halved again until you end up with between 18 and 24 strips, each approximately 6mm wide. Splitting the sections into these smaller strips is a tricky operation that requires some skill. If the bamboo is not manipulated correctly the split will tend to run to one side, resulting in strips that start out okay

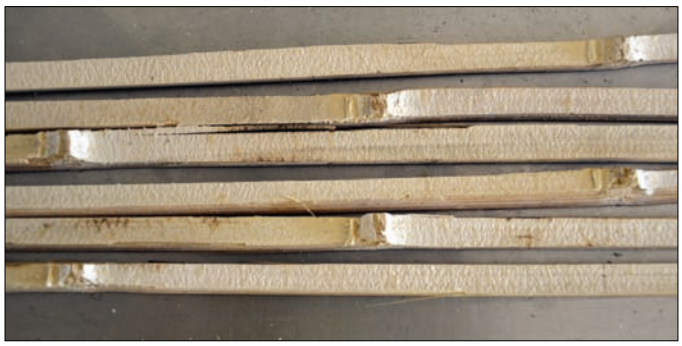
but eventually taper to almost nothing towards the end.

There are many techniques for splitting bamboo, but they all involve bending the side towards which the split is running more to force the split in the opposite direction. This sounds counterintuitive and is much easier to demonstrate than trying to explain in words. I recommend that you view one of a number of Youtube videos on the subject to familiarise yourself with the procedure. Expect to end up with at least some wasted strips until you find a method that suits you.

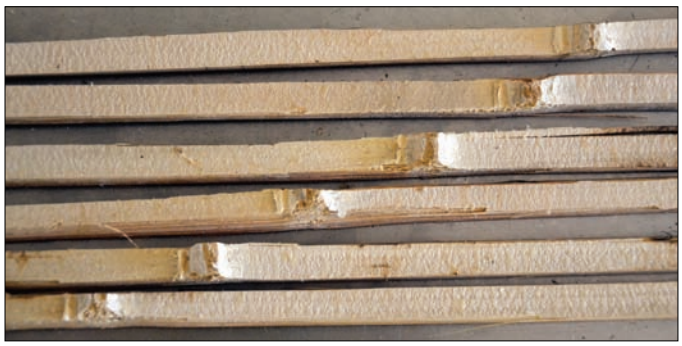
STAGGERING THE NODES

Once the bamboo strips have been split, the nodes have to be staggered. Care taken in the positioning of nodes is one of the hallmarks of a quality bamboo fly-rod. The objective is to distribute the effects of the weaker node areas so that the strength of the finished rod is not compromised.

Strips showing a 2x2x2 stagger.



Strips laid in a 3x3 stagger ...



... and strips in a spiral stagger.

There are three commonly recognised methods by which nodes can be staggered. The 2x2x2 stagger uses the least amount of bamboo while the spiral stagger uses the most. I have decided to use the 3x3 stagger method for the rod that I am building for these articles.

Once you have finalised the node spacing, you should cut the strips to length with a small hacksaw. Keep in mind that you do not want any nodes close to the tip guide or ferrule positions. Also add about five inches to the actual length needed for the finished rod section. This will allow you some leeway later on that may come in handy if you need to adjust the taper slightly. (I will explain this in greater detail in the next article.)

I colour the bottom of each strip with a marker as soon as I have cut it to length — red for tip strips and black for butt strips. This is so that I can remember which side is down and to make it easy to identify whether the strip belongs to the tip or butt section.

Mark the bottom ends of the strips as soon as they have been cut to length. Above, red for tip strips and black for butt strips.

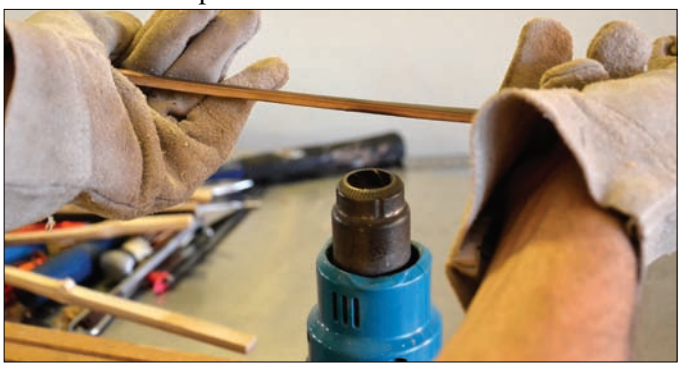
SMOOTHING THE NODES

Once you have staggered the nodes and cut the strips to length, you have to smooth both the pith and enamel sides of the strips to remove the remaining nodal bumps. I use a block plane to smooth the pith side, while a mill bastard file is used to remove the external ridges on the enamel side. Don't try to smooth the external areas too much at this stage as you could remove power fibres in the process.

Strips showing flattened nodes on both pith and enamel sides.

STRAIGHTENING THE BAMBOO STRIPS

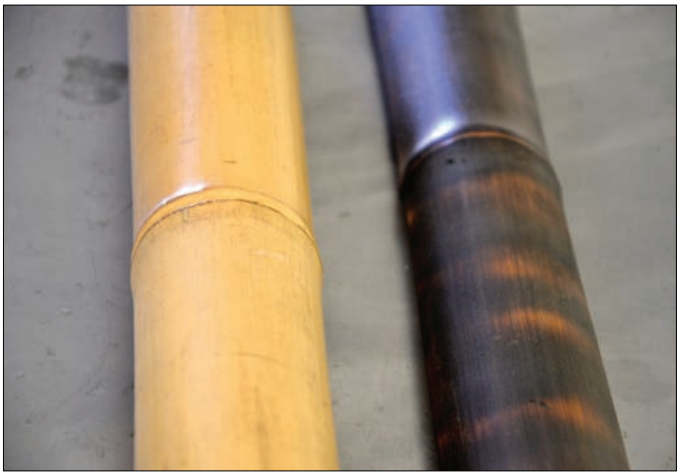
Before we can commence with rough planing of the bamboo strips, we have to straighten them so that they lie flat in the roughing form. Sight down a strip and you will notice all the twists and turns inherent in an untreated strip. In order to straighten the strips the bamboo has to be heated until it becomes soft and pliable.



Straightening a strip using a hot air gun.

Use a heat gun that is pointing upwards on a medium heat setting. Don your leather gloves and hold the area that you want to bend in the hot-air stream. Wait a minute or two, until you feel the bamboo becoming pliable, then bend the strip in the opposite direction to the bend that you want to correct. Remove from the hot-air stream and wait a few seconds for the strip to cool sufficiently for it to set in the straightened position. Continue until most of the major bends and twists have been removed from the strip.

Three typical flaws (below, from left to right): cuts through power fibres, scuff marks and worm hole; and (pictured right), the preference is yours — blond or flamed bamboo



BAMBOO ROD TAPERS

I would like to finish this article with a few words on selecting a taper for your new rod. Bamboo rod tapers are expressed as a dimension in thousandths of an inch at five-inch intervals. By adjusting the final planing form to half of these dimensions we can replicate any of a number of tapers by the classic rod makers such as Payne, Garisson, FE Thomas and Leonard.

My personal preference is for rods in the 6ft to 7½ft range for 2-, 3- and 4-weight lines. Numerous suitable tapers are available. I would suggest doing a bit of research on the internet before deciding on the rod that you are going to build.

For the purposes of these articles I have selected the Garisson 193 model which is a 6'9" 3-weight 2-piece rod with a medium action. The taper is as follows:

STATION	ROD DIMENSION	PLANING FORM SETTING
Point 0	.063	0.0315
Point 5	.070	0.0350
Point 10	.090	0.0450
Point 15	.106	0.0530
Point 20	.120	0.0600
Point 25	.132	0.0660
Point 30	.144	0.0720
Point 35	.156	0.0780
Point 40	.168	0.0840
Point 45	.181	0.0905
Point 50	.193	0.0965
Point 55	.206	0.1030
Point 60	.219	0.1095
Point 65	.233	0.1165
Point 70	.270	0.2350
Point 75	.274	0.2370
Point 81	.277	0.1385

COMING IN PART 3

In the next article I will cover rough and final planing. I will also look at gluing the splines to form the blank sections and finishing the blank with a wipe-on finish, as well as installing ferrules to the blank sections.

RESOURCES

- Dirk De Villiers Custom Fly Rods — Custom graphite and bamboo fly rods, REC reel seats and ferrules and Hopkins and Holloway guides. Web: <www.ddvflyrods.co.za> Email: <dirkav@gmail.com> Phone: 083 643 5897
- AMT Composites — Ampreg 21 epoxy: <www.amtcomposites.co.za>
- Hardware Centre — Stanley and Veritas planes, 0000 steel wool, Japanese water stones: Web: <www.hardwarecentre.co.za>
- Netbooks — Books and DVD's on bamboo rod building. Web: <www.netbooks.co.za>
- StreamX — Rod building components, planing forms, reels seats, guides and silk thread: <www.streamx.co.za>
- Bellinger — planing forms and depth gauges Web: <www.genuinebellinger.com>
- <www.bamboorodmaking.com> for lots of advice, hints and tips.
- <www.thomaspenrose.com> for lots of useful information.