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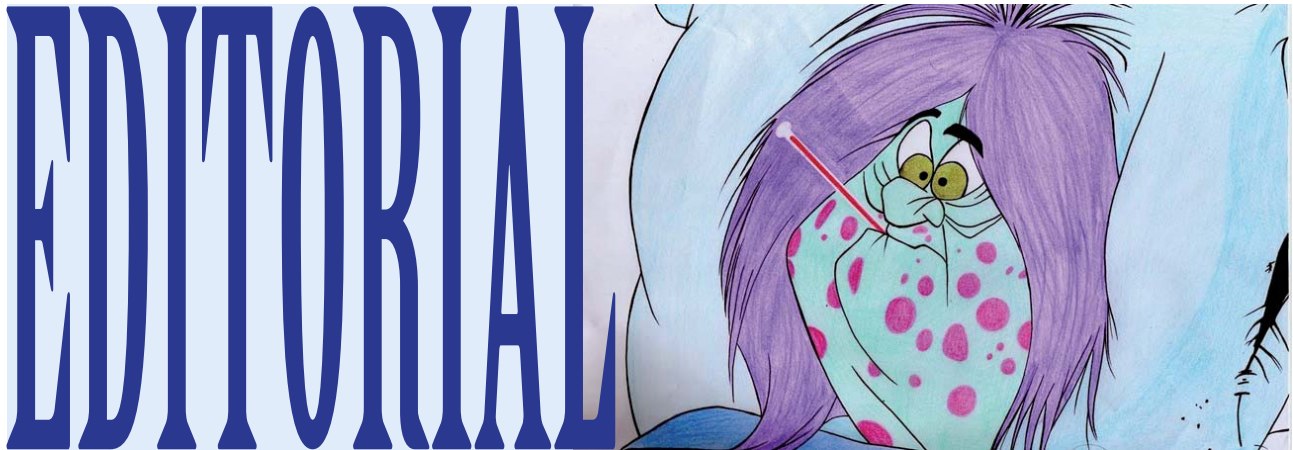
ITALIAN BAMBOO RODMAKERS ASSOCIATION

In this number:

- page 3 Editorial
by Maurizio Cardamone
- page 6 The colour of the blanks
by Angelo Arnoldi
- page 15 A dangerous metamorphosis ...
by Giorgio Grondona
- page 22 Thoughts of angles during the days of
angels
by Anders Hedin
- page 26 Bamboo and forging
by Marco Orlando Giardina (MOG)
- page 32 It's broken! ...
by Giovanni Nese
- page 50 Olivia Elia
by Marco Orlando Giardina (MOG)
- page 64 The restoration corner
by Romano Godi
- page 75 A simple modification of the Garrison
binder for quadrate rods
by Marzio Giglio

**Bamboo Journal issue 22 - april 2021**

Editor:	Maurizio Cardamone
Pictures by:	Alberto Poratelli, Angelo Arnoldi, Anders Hedin, Giovanni Nese, Romano Godi, Olivia Elia, Marzio Giglio,
Graphic Art Work and creative director :	Alberto Poratelli
Translation:	Moreno e Doria Borriero (info@damlin.com)
Front cover:	Detail of Marco Boretti's rod
Photo on page 2:	Mauro Moretti e Daniele Forner all'opera
Photo on page 80:	Tribute to the IBRA Wags



I really didn't want to talk about the pandemic (again ... I neither ...), but it really seems impossible to avoid it (sic!). However, we have reached the third issue of the BJ in the Covid era. The virus has now reached all countries of the world, and almost all regions within each country, with devastating effects on health and the economy. Very few countries seem to have truly overcome the crisis and are now covid-free. The images that come to us these days from New Zealand, where we are racing for the America's Sailing Cup and we see festive crowds no longer forced to wear masks, seem surreal. In Italy we are now facing the "variants": English, Brazilian, South African, but the real problem is still the limited availability of vaccines and above all the lack of an efficient organization to administer them quickly to the population. And then here is the whole country plunged back into an almost total lock down, more and more badly tolerated by the people.

However, compared to a year ago, we have the vaccine, indeed many vaccines, and the speed with which the scientific community and the pharmaceutical industry in various parts of the world have faced and won this challenge would have been unthinkable only a few years ago. I believe we must be pleased with this. So, let's hurry up ... mass vaccination seems the only light at the end of this very long tunnel.

What was the impact of a pandemic year on IBRA's activities? Certainly, the sorest point was the cancellation of the 2020 meeting. This was really suffered by all the regular visitors, since the annual meeting is not only an irreplaceable opportunity to exchange information and experiences on rodmaking, but it is also a chance to meet distant friends. After being deluded for a while, unfortunately, the winter rodmaking course, no less important for IBRA's social life, was also cancelled. It is true that several videoconferences and webinars have been organized for the members, and also a very active Whats App group has been created. These initiatives have been very successful ... but obviously it is not the same thing compared to a nice convivial meeting, maybe topped off with good food and adequate wine!

The other side of the coin is that rodmaking (like all manual activities, psychologists tell us) may have helped us mitigate the stress caused by protracted restrictions, and concerns about our health and that of our loved ones. I am very curious and I would like to be able to estimate how much a year of lock-down has affected the number of bamboo rods produced in the world by enthusiasts! If anyone has any figures please send them to me!

In each editorial I also always briefly mention how fly fishing went in Italy, based on my personal experiences, on what friends tell me, and on what I learn from social networks. In a nutshell, I would say that the end of last season did not live up to expectations, or perhaps hopes. Hopes that are now placed in the 2021 opening, which at the time of writing is still in doubt due to the now inevitable strengthening of Covid restrictions throughout Italy.

Let's talk about this issue of the Bamboo Journal, no. 22. You can see the articles, both the purely technical and the more "philosophical" ones of this issue, in the index, but I want to say a few special words on Olivia Elia's self-interview and on the first of what will become a series of articles dedicated to restoration, signed by Romano Godi. I was positively surprised by Olivia's great determination in pursuing the goal of becoming a rodmaker (and not only).

And she is a girl (I say this without sexist implications, but only as a statistical consideration) and she is also very young.

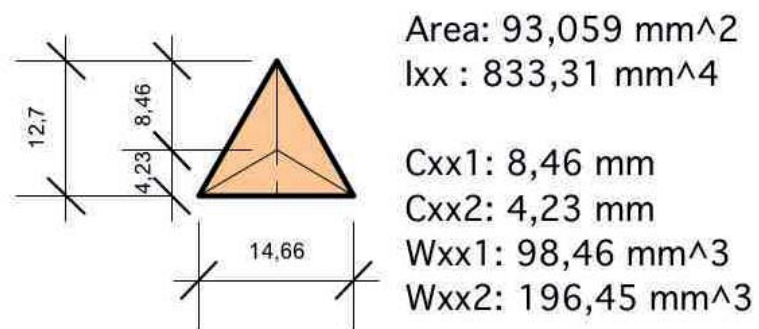
I sincerely wish you to continue like this in your life and to go a long way!

Romano, on the other hand, starts from this issue on the topic of the restoration of bamboo rods, and this is the first time for our magazine, at least in a structured way. This represents a very specific topic of rodmaking since restoration involves techniques, materials and the acquisition of knowledge that are different from the construction of the rod from scratch.

Only the greetings and best wishes remain, which I do to the members of IBRA, to all the loyal readers of the Bamboo Journal in Italy and in the world, and to myself, that this may be the last issue in the Covid era and that our lives can soon return to the normalcy to which we aspire.



solid triangular section



from "sezioni a confronto"
by Gabriele Gori

THE COLOUR OF THE BLANKS

by Angelo Arnoldi



Bamboo, graphite or conolon fishing rods must carry out some functions for which they were designed: they cast the line, catch a fish, better if it is a generous size, without problems or breakages.

However, there is another aspect that has to be considered: they must be beautiful.

Or rather, considering that beauty is not an absolute value, they must look beautiful and precious in the eyes of who owns or handles them.

For this reason, many rodmakers dedicate a lot of attention to this aspect, choosing particular wrappings, silk or nylon in contrasting or matching colours, with agates that are truly works of art, worthy of a jeweller or finely engraved ferrules.

Nonetheless the colour of the blank has a noteworthy importance in the vision of the whole too. For example, the recent success of the fibreglass rods is due mainly to the colours they have, bringing them back into fashion.

And bamboo? Here too can the colour of a blank make us appreciate a rod more or not? I think so and I'm exploring a road to achieve variations of it.

Let's see which routes we can take.

Many anglers prefer blondes, the blonde colour of bamboo is often not homogeneous, a very seasoned bamboo has an intense yellow colour, almost orange, warm, pleasant to the eye. Vice versa, a less seasoned bamboo has a light-yellow colour, more like grey. There are differences in the culm too caused by the different exposure to sunlight, but all in all those who appreciate blonde rods do not have problems with the colour. If we start with a nice culm, we will achieve a nice colour. At the most we can try to slightly lighten or uniform the colour of the strips, for example, with hydrogen peroxide at 130 volume, about 35%, obviously being very careful because a concentration greater than 10% must be handled with great caution.

The world is a lot more varied for those who prefer the dark rods, where the natural colour is altered in various ways, from light or dark brown to a reddish-brown colour, similar to the antique rods or a true red.



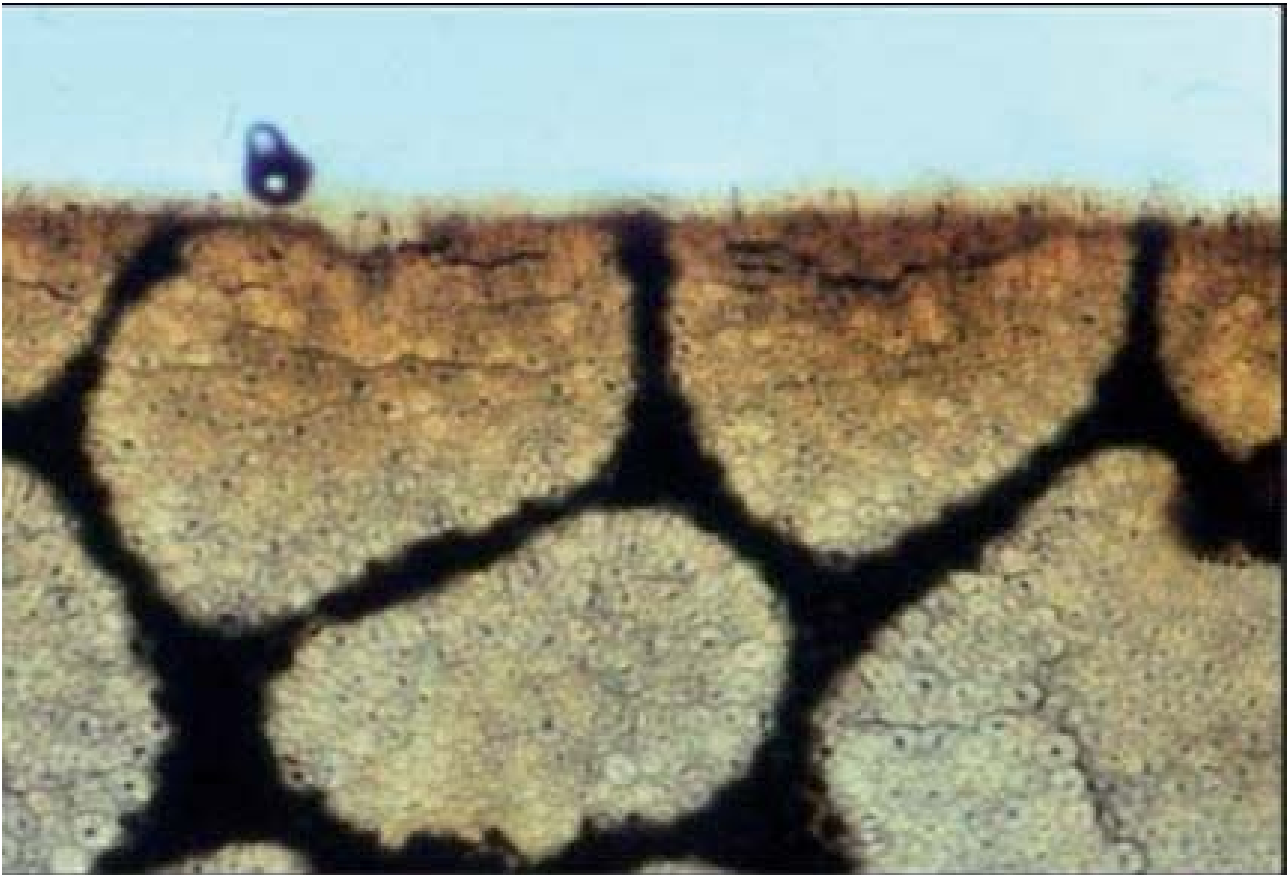
There are several ways to achieve this result, the simplest being heat. Many rodmakers use a flame to burn the external part of the culm to reach a more or less dark colour, flaming uniformly or with variations of light and dark if the culm is flamed in stripes or points.

Another effective result can be reached with a heat gun and wrappings that mitigate the heat; the tortoise shell-stripes is a remarkable example.



These measures undoubtedly result in a sort of brown and are obviously carried out on the culm and the strips before planing. However, according to some, I included, they can slightly alter the cell structure of the rod. A maximum temperature of 180 degrees for a few minutes is more than sufficient to induce another polymerisation of the hemicellulose, carbohydrates of the amylose, the amylopectin, the lignin and to expel the so-called intracellular free water of our bamboo. This process, called tempering, further hardens our strip, without altering the structure of the plant too much. Unfortunately, it is insufficient for a dark colour.

If we read Wolfram Schott's literature carefully, in particular "Bamboo under the microscope" and "Bamboo in the laboratory", both available on the IBRA website, we will find out that an oven temperature above 200 degrees for about 13 minutes is barely enough to turn the colour to beige and this temperature is already too high to temper the bamboo...flaming with a gas blowtorch easily reaches 800 or 900 degrees, and even if it's on the enamel, it can seriously damage the cell structure of the plant in general and the vesicular fascies in particular (so-called PF). Thus, we risk to have yes, a nice dark beige colour but alas, a loss of elasticity.



Apart from this, the problem from a purely cosmetic point of view is that in the unfortunate event that the nodes need to be filed, which unfortunately happens often, we will have a blank of a nice amber brown colour, interspersed by lighter stains where the filed nodes are ...

This limitation has led to the search for alternative methods to work on the planed or already glued blank.

Yet here we have another problem. Bamboo, like many other Poaceae contains high amounts of silicon. Silicon is the second element present in nature after carbon, in the soil it is present as orthosilicic acid and plants, mainly the Monocotyledons like bamboo, absorb a lot of it through the roots. When the orthosilicic acid absorbed in the plant cell increases in concentration due to loss of water or increased accumulation, it precipitates as silicon dioxide forming a mineralised film on the cell membrane.

This mineral film, which has the main function of strengthening the support of the plant, a structural function, also has other two effects, sadly unfavourable to us.

The first is that it makes the bamboo “vitreous”. The silicon dioxide, commonly called silica is the main component of glass. This is one of the reasons bamboo cuts our fingers so easily and ruins the blade of the plane at the speed of lightning. The fact that a plant has a “vitreous” characteristic must not be such a surprise, the most common food in the world, rice is far more “vitreous” than bamboo...

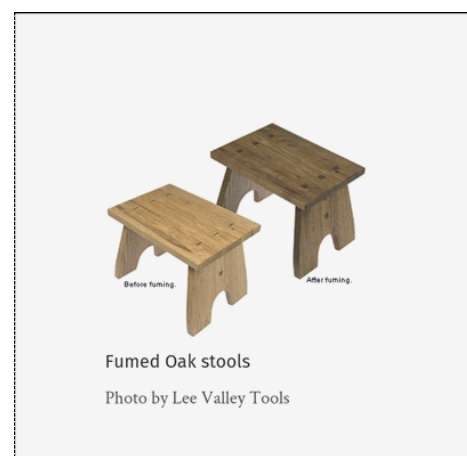
The second effect of this mineralised film of silicon dioxide makes the external part of the culm a lot more resistant and very waterproof.

Practically, it absorbs very little and thus, going back to our colour problem, all the arsenal of stains and non-drying primers, aniline, water or alcohol-based or also other colourings like tea, turmeric, saffron or walnut husk, products which are very common in woodworking, are very rarely used with bamboo because although they colour quite well, they do not penetrate, leaving a superficial patina which can easily be removed by simply handling the blank.

Even the treatment with potassium permanganate, a strong oxidant, unfortunately not easy to find, which gives a beautiful brown colour and which in many forums is given as the simplest treatment to darken a blank, does not seem to penetrate it. It was estimated approximately 0.001 inch (* 1). Unfortunately, it is now not easy to find and moreover its sale is subject to control because it is considered a precursor of explosives.

I then moved on to another treatment, staining with a substance that reacts with the tannins and polysaccharides of wood, darkening them, and which also gives quite good results with bamboo, ammonia..

The staining of wood with ammonia is a process discovered by chance in England in the late 1800s. In fact, it had been noticed that the woods of a stable exposed to ammonia released by horse urine darkened. Exported to America, it had its golden moment in the so-called Arts & Crafts movement, at the beginning of the 1900s, with the production of a lot of furniture in which the colour of the wood was altered by exposing it to gas, this furniture was called smoked (fumed in the original language). However, this process has not been abandoned, obviously with different characteristics from the past, even for purely hobby use, it still continues today.



Why wood darkens in contact with ammonia is not very clear. Certainly, it reacts with the carboxylate groups resulting in ammonium salts, and with the aldehydes and ketones giving amino groups. These groups are found in those substances known by the generic name of tannins.

Tannins are high molecular weight polyphenolic substances, linked to the polysaccharides present in the cell, common in vascular plants, with antioxidant properties to defend against fungal attacks. The complexity of these molecules makes it difficult to understand the interaction between them and ammonia. A very complete and interesting study by the University of Zagreb (* 2) has shown that the amount of tannin in a wood sample drops considerably when subjected to a current of gaseous ammonia, and both the residual amount of tannin and the resulting colour change can be controlled, also managing to establish which type of wood reacts better and faster to the process, and which colour variations can be observed depending on the type of wood. This study, complete and thorough, was undertaken since wood staining still has an industrial and commercial interest, unfortunately bamboo staining has none and therefore among all the essences taken into consideration in the aforementioned study, bamboo did not find a place, too bad.

Nonetheless, I tried this path.

In some forums (* 3) the focus is on how the simple soaking of the strips in an aqueous solution of ammonium hydroxide at 5%, the one commonly sold in supermarkets for household cleaning, or even better at 10%, used in some photographic processes (whiteprint) and in some printing processes (called blue ammonia), can in a short time lead to a colour change of the blank towards a dark brown colour. (* 1)

Unfortunately, I have not had any noteworthy results, after two days of soaking in a 5% solution, my blank was still a beautiful blond colour ...



We therefore need ammonia.

To get the gas, in a hobby context like ours, you can start from ammonium carbonate or even better from ammonium bicarbonate, much easier to obtain ... Both of these salts, if heated, release ammonia by sublimation. So, if we put the ammonium carbonate or bicarbonate together with the strips or the blank in the oven and heat them starting from about 60 degrees to rise, slowly the gas begins to release, one mole of ammonium salt gives me 4 moles of gaseous ammonia, which will darken the bamboo.

Experience will then tell us how long the strips must remain in the oven, exposed to the gas to obtain the desired shade. All in all, it is a fairly simple system which, however, has the defect of having to take place outdoors in order not to suffocate the neighbours and which takes a very long time. My blank began to turn brown only after almost three hours in the oven at an (excessive) temperature of 100 degrees together with 50 grams of ammonium bicarbonate. In the United States, on the other hand, it is fashionable to put ammonium carbonate and strips together in a black tube in the sun, leaving it there for several days. The summer sun provides the necessary heat. (* 1)

A method used above all by more professional rodmakers overseas, is instead the gasifier, that is a chamber, basically a large tube, in which the strips are suspended, positioned above a container in which the ammonium hydroxide boils, blue ammonia at 10% or more. Boiling, the released ammonia rises, coating the strips and darkening them. This system gives much more homogeneous colour results than heating in the oven, and above all in a more acceptable time...

A way that does not involve the use of heat, if you do not have a suitable oven or a scorching sun, could be achieved by using a strong alkaline base, which with the ammonium salt displaces the reaction with the release of ammonia. The strong base could be sodium hydroxide, the common caustic soda, easily obtainable, however be very careful because it has an exothermic reaction. But now we are dealing with operations that are already more complex, added to a somewhat problematic substance.





But if someone does not want to play with the chemistry set, or does not have ample space to use ammonia, must they necessarily give up having a rod with a nice dark shade?

No, fortunately not ... and the means to reach the goal is provided by a nice insect ... it's called *Kerria lacca*.

The female of this cute insect lays a resinous secretion on the plants to be able to attack and protect. This secretion, after harvesting and some purification processes by melting it in jute bags, is crystallized and sold under the name of shellac.

With an alkaline solution, a bright red dye known as laddia is extracted, used to dye wool.

Shellac is composed of large quantities of polycarboxylic acid esters, of which the most abundant is trioxyphalmitic acid.

This chemical composition greatly differentiates it from all the dyes used in the world of woodworking based mainly on aminobenzene, aniline, aromatic acids or essential oils of vegetable origin, it does not contain any of these compounds.



However, it is a very common product, widely used in the world of woodworking and in the restoration of fine furniture, harmless and edible (it is also used to polish apples), sold in all colour factories in various shades, ranging from straw yellow to amber, to dark red. These crystals are dissolved in denatured alcohol, in a proportion of 1 to 5, forming the so-called mother solution which is then passed on the rod with a buffer. Its use in bamboo rodmaking worldwide is not very common, but not too unknown. In this article (* 4), for example, the author explains its use as a primer before varnishing and to give a nice background colour.

In fact, shellac gives a deep amber colour to the blank, and even if it cannot darken much with a reasonable number of coats, it has the great advantage, being dissolved in a polar solvent, of being able to slide and fix the non-drying impregnating agents commonly used to colour wood, which I mentioned earlier, on our bamboo.

It is sufficient to dilute the chosen impregnating agent in shellac, I used a ratio of 3 to 1, and passed it on the blank with a swab.

In the photo below, you can see a natural blank, coloured with a light coat of walnut stain in shellac. If you want a darker colour, you can apply more coats until the desired result is achieved.



The last photo instead shows a blank that has been treated with mahogany stain, the reddish hue typical of this wood, stands out clearly.

This treatment with impregnating agents mixed with shellac, gives a result that is certainly superior to that of simple wood impregnating agents, and, even if not structural, such as treatments with ammonia, it is very persistent, I think it can represent a good simple system to achieve a warm colour and uniform in dark tones.

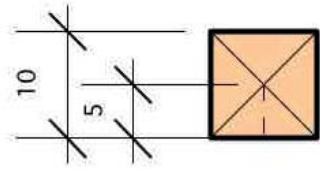
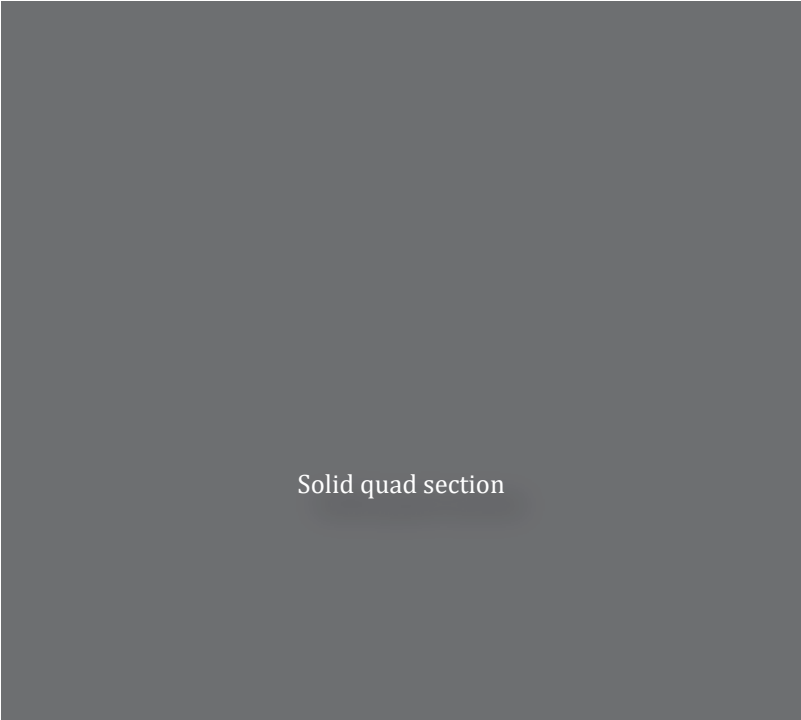
So, if someone loves blondes but marries brunettes*, they can use a similar treatment ...

** an Italian saying (translator's note)*

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- (1) [https:// www.bamboorodmaking.com/Tips-files/Toning.html](https://www.bamboorodmaking.com/Tips-files/Toning.html)
- (2) [http://www.researchgate.net/publication/265946152_ Wood_color_changes_by_ ammonia_ fuming](http://www.researchgate.net/publication/265946152_Wood_color_changes_by_ammonia_fuming), Josip Miclecic, Nikola Spanic, Vlatka Jirous Raikovic, University of Zagreb, august 2012
- (3) [tps://tapatalk.com/group/thebambooroom/ammonia-toning-experiments-t803.html](https://tapatalk.com/group/thebambooroom/ammonia-toning-experiments-t803.html)
- (4) <http://moscaclubpiacenza.blogspot.com/2015/01/1capitolo-come-costruire-una-canna-di.html>
Marco Schiavi 16/01/2015





Area: 100.00 mm²
Ixx: 833.33 mm⁴
Cxx: 5.00 mm
Wxx: 166.67 mm³





A dangerous metamorphosis...: "from paradigm to ...para-dogma"

by Giorgio Grondona

Late, I am terribly late, two months, we are in the first ten days of May 2020; this year will be remembered in the history of the planet that hosts us as the year of the Covid 19 pandemic ... we are living it (the pandemic) so it is no need to tell you about it. On these pages we talk about Bamboo rods, how they are built, a little less (I think) what they are built for and then, as I said, I'm terribly late.

On Sunday morning, before dawn, the winter "programme" included the first fishing trip in mid-March, when the peaks of the mountains that are slowly coming towards me are still covered with snow. I am on the border between four regions: Lombardy to the north, Emilia-Romagna to the east, Liguria to the south, Piedmont where I live to the west. The vein of water where I will fish flows from East to West, initially divided into minor streams that spring in secondary valleys and at different altitudes; at an altitude of 600 a.s.l. they flow into a single bed and descend towards the valley.

As I travel the light begins to overcome the dark, I will arrive at the end of the day, I take it easy; I am late with the season not with the timetable, nobody on the street, I remember the inventory: the bag with the boots is in the boot, the vest with "what you need" hangs behind the seat, the bag with "what you need less" is in the trunk too, I drive past a pharmacy with the illuminated sign, date, time, temperature ... 7°,

I look in the rear-view mirror and in the dim light of the passenger compartment I see the woollen pullover on the back seat, it has always been the same one for years, the right size, the right weight, when I wear it, it gives me a feeling of "soft well-being". Well, everything is there ... and the rod?!!!

The rod is there, not the "Sir Darryl" 7'0 "# 4 built at the 2009 Course which was the" rod for the Opening "until last season; this year is different, different period, different climate, in March there is often (almost always) still snow, you can fish at the hottest time (less cold, around noon). In the undergrowth you can see the yellow spots of the Primroses, but we are in Spring. The flowers of the Laburnum have substituted the Primroses, the first storms have given "new" water to the springs, you can alternate the "dry" or the "nymph" and then you "need" a suitable rod...

I think back to the "Sir Darryl"; the course then was divided into two weekends, the friendly atmosphere that was created immediately, the affable and helpful people who only a few years earlier had established I.B.R.A. with the primary objective of spreading the construction of Bamboo rods, each name of my Masters is linked to teachings ("Rules" and "Tricks") which I have always considered the paradigm to follow to make a bamboo "fly rod".

The Paradigm has represented and still represents the reference, a set of "steps" that leads to the final result, but over time, of course, we try to optimize each phase, each step. To do this some enrich their equipment, who by buying what they find on the market, who by building what they need with passion and satisfaction. Both "categories" try to increase their knowledge by drawing from all possible sources of information: books, magazines, the internet or, the most precious, the "colleagues" with more experience

All this, from the foundation of I.B.R.A. to nowadays, has originated a lively, growing community of enthusiasts, which has / had / would have (who knows?) as its highest institutional moment the Annual Gathering which at times has had international resonance. At the meeting, Italian and / or foreign guests with proven experience are invited and, together with some members, alternate interventions of high technical value.

The Gathering is not only "Analysis and discussion" of topics related to rodmaking, it is also exchanging and comparing. A showroom is set up where the rods of the various rodmakers are exhibited and an outdoor space is reserved for casting tests.

I remember that the first Gathering I attended I was entranced by the rods exhibited, I admired the works of the various builders ... Maybe the term entranced is incorrect, inebriated is perhaps more appropriate, on the tables covered with green cloth there were dozens of rods, most in two sections, a few in three, of various lengths. Let's say that many were between 6'6" and 7' or a little more, there were very few longer ones; almost all, if not all, suitable to cast lines from 3 to 5. It took me a few hours to go through the various tables, every now and then I went out and moved to the space where the rods were tested, some groups had formed far enough to cast multiple rods at the same time without hindering one another.

I spent a lot of time "analysing" the rods in the showroom and I believe as much to observe the casters alternating outside; I met several people, I listened to opinion after opinion and I learned something from everyone. During the return trip I began to take stock of those days spent in good company, I tried to merge the words I had heard with what I had seen and tried to imagine what the goal could be, but ... it took much longer to clarify my ideas (how many times have I written: "I'm a donkey not a racehorse!!!", I need time, I'm not quick).



However, from that first gathering (for me), the 2009 course, I have participated in others (as a repeater), then fairs, themed meetings, simple, but very important exchanges of experiences and opinions with other Bamboo enthusiasts and finally the goal is clear:

- 1) Rods "designed" for a specific use
- 2) Well-built
- 3) Beautiful

In the n° 4 Bamboo Journal dated April 2010 on page 5 there is an article written by the late Tom Morgan entitled: "Some concepts on Bamboo Rodmaking", I have read it and I read it often, with passion, I consider it Tom's gift, he became part of the paradigm learned at the Rodmaking Course!

I mentioned the encounters between passionate builders of "wooden rods", whether it was the Gathering, a Fair, or a Bamboo day, the Course, being able to meet was an opportunity to explore topics only mentioned on the phone, resume discussions that were interrupted "the time before" due to lack of time, exchanging opinions on materials and tools, someone proposed "new ideas", they tried the rods, all this cannot be done now. We must (rightly) limit travel and therefore meetings. Fortunately, I.B.R.A. had the idea of organizing a chat for its Members in order to maintain contact from a distance; I was initially sceptical, my being a donkey does not go along with the evolution of technology, it takes me time to accept changes. Now, I appreciate this further effort of the Association to keep the interest in our hobby alive, but, of course, a chat cannot replace all those face-to-face meetings.

Being around a table and evaluating the exposed rods, gives way to dialogue peacefully and you can exchange opinions without being misunderstood, proposing an example among those present helps to express a point of view that from a distance would be difficult to explain and interpret, a smile or a joke, they pave the way for even the most controversial and debated of topics.

We are not all the same, some have excellent communication skills, others not, some have the gift of summarising that helps them, with a few words, to satisfy their curiosity about some aspects dealt with, others have, in addition to the two qualities mentioned above, a preparation and culture such as to make every intervention pleasantly important.

Even the topics are not all the same, they should be, being all included in the same paradigm but some lend themselves more than others to examples and clarifications, others are easier to understand, with an image and a few words they become clear, images are not even needed.

Question) How do you plane if you are left-handed?

Answer) The orientation of the "cradle" of the planing form is reversed!

Q) How is a blank bonded after applying the glue?

A) You can do it "free hand", you can use Garrison's binder or you can use an "electrified" binder!

Q) In order not to look / wait for a collectors' auction where I can win the binder that belonged to Garrison, what can I do?

A) Find the diagram on the Bible (A Master's Guide to Building a Bamboo Fly Rod) which practically contains the Genesis of the paradigm that is proposed in the Course!



So, after satisfying questions and curiosities, even the less experienced come to have the raw material in their hands. It was probably easier and faster than if they had expected to meet someone "informed", but now the best part comes, indeed:

BEAUTY!!!!!!!!!!!!

If the realization of the blank provides for some venial "freedom", the final "dressing" has become, during the period of "Covid chat" (if you prefer, you may call it Chat during Covid) a strict discipline that does not allow "fun".

While cleaning up the surplus of adhesive, it was thought that the moment of truth had come, having cleaned the blank, the measures should be checked which, if they correspond to those established, constitute the springboard for satisfaction, the reward for many hours of work!

The "intended" rod is in two sections, if it is fitted with a metal ferrule or if the coupling is in Bamboo, we will see that it does not really matter ...



Q) The blank is "perfect" then we choose the "guides", they will be adequate to the length of the rod both in terms of number and size, okay but how many and where?

A) You can follow Peter's or Paul's scheme ... (omitted) without specifying that, for the same length, the number of "guides" may be different depending on the action of the rod

Q) Single foot or snake?

A) As you prefer but beware... a rod cannot be BEAUTIFUL if it does not mount the guides, at the most it will be ... pleasant (?) ...

In ... no man's land, in the "ferrule zone", as mentioned, there seems to be a sort of "tacit agreement" between supporters of the "junction" in Bamboo and admirers of metal ferrules whereby metal we mean Nickel Silver which actually has more virtues and advantages than others ... so let's move on.

Q) What stripping guide do you recommend? I saw the one of "X" company what do you think?

A) It's not bad, but beware that they are identical in shape but with the agate insert ...

Q) So, can I mount the one I like?

R) You don't understand!!! The one you like ... is not bad ... but the one with agate is BEAUTIFUL!!!!

Q) Sorry, I forgot, what diameter must it have?

R) Enough!!! IT MUST HAVE THE AGATE INSERT!!!!

With a little courage (to ask new questions) it is time for the grip, the cork discs arrived a few days ago but do not have a hole, it is 9.00 am on a working day:

Q) I have to drill the cork discs. How do you do it?

...silence...

2.00 pm

Q) Sorry, I should drill the cork discs, how do you do it?

A) ... a barrage of answers. Images of various tools with relative explanations on how to answer the question.

Q) Thanks. I'm taking advantage of your availability: "Among the many shapes that a handle can have, which one do you prefer?"

A) The handle is a "hallmark", as well as made with the best cork you can find, you have to shape it in a personal way.

Q) I like the double tulip handle, what do you think?

A) No, forget it, it is an obsolete design, today we prefer the "bird's leg" one!

Q) A "bird's thigh"? Why?

A) Because poultry meat, whether wild or farmed, must be accompanied by a vegetable side dish, in our case the side dish consists of the handle that will house the reel which, precisely, is made of a vegetable essence!

Q) While selecting the cork for the handle, I thought that I could make it with the same material as I have seen on Garrison, Young rods or Hardy's "All Cork" handles.

Which would you choose?

A) ... silence ...

8.00 pm

On the chat there is a shooting of photographs of mannequins of excellent workmanship and made (many on their own) with the most sought-after essences, all that is missing is the legendary Susd'A root (a secular old Annapurna celery)!

STOP!!!!

Do not rush to the travel agency to book a flight to Nepal and do not look for a Sherpa to accompany you, you would never be able to find the precious Susd'A shrubs, they do not exist!

They do not exist in nature; they are only found in my imagination!!!

All the vegetable representations suitable for the purpose have already been shown ... all except the cork!

Q) Why do you think cork is not good?

A) You don't understand!!! Cork could be fine but it is better to avoid it, it could provoke the desire in you to mount an aluminium mechanism ...

Q) I had really thought about aluminium, isn't it okay?

A) Nobody said that Aluminium is not good, but a BEAUTIFUL rod cannot be BEAUTIFUL without the Nickel Silver mechanism ...



That's enough, I hope I was able to give an albeit rough and incomplete idea of the discomfort that can be generated when, in a legitimate and unconscious way, we affirm our concept of beauty. Beauty is not an absolute value and therefore should not be sentenced in a dogmatic way (para-dogma); everything can be more or less beautiful depending on personal taste, personal taste subject to change, you want the context and you want the mood, in our specific case a rod can be made very well, by the best rodmaker "master" of each production phase from the design of the taper to the refined final set-up, but some will certainly not like it at first sight, others will change their mind, perhaps after having seen and appreciated it in a closed environment. When brought outdoors, they will see it different, the impeccably executed finishes stand out even more in natural light, everything is so perfect that it cannot blend with the surrounding environment.

Allow me to make an example, let's take as reference two famous paintings by two even more famous artists: "La Gioconda" by Leonardo da Vinci and "The sunflowers" by Vincent Van Gogh. The first, in my opinion, must be admired in an appropriate context, an art gallery, a museum. The second is more "immediate", less "demanding" both within the walls of an art gallery or hanging from a tree in the courtyard of a kindergarten.

I pointed my finger to the aesthetic aspect of a Bamboo rod; I deliberately took the shape to extremes; I could have brought examples that involve other aspects of our passion for construction. I consider myself a beginner and I try to cultivate curiosity as a beginner; I just wanted manifest the disorientation that can be experienced by those approaching rodmaking or those who simply would like to try fishing with a "wooden" rod. If you are too convinced / categorical in expressing your thoughts ... they are fishing rods and we are not all the same ...

I have almost reached my destination, soon I will be fishing, I look at the date on the car display, I think that next week we would have met at the Gathering, the appointment is cancelled and who knows how soon we will be able to meet, at this moment "long live the chat, at least we can keep in touch even if it's not easy. Someone manages to be concise and exhaustive, sharing their experience and knowledge in a natural way, others try but are not as capable or prepared as the former and suffer in this status ... then they "wave" the idea of the former, it is no one's fault, we are not all the same, but we should all recognize that if we have united in an association, dividing within it makes little sense ... this is beyond doubt ...

It is raining outside. I slowly park the car and when I open the door, I feel the raindrops settling on my cheeks, I look up but I do not see the tops of the mountains, shrouded in clouds, beyond the hidden ridge there is the Val Trebbia, Ernest Hemingway was there during the Second World War while, as a journalist, he was following an American military column: It is said that he defined it: "The most beautiful valley in the world", a ridge of mountains not too high divides it from where I am now ... so this could also be ... I won't say it.

I'm ready, I take the path and go down to the stream ...

Are you curious to know how it will go? Did I catch some fish or just rain? I will tell you next time, perhaps, but another quote attributed to Hemingway comes to mind:

"A bad day fishing is better than a good day at work!"

... questionable, just like ... BEAUTY!!!

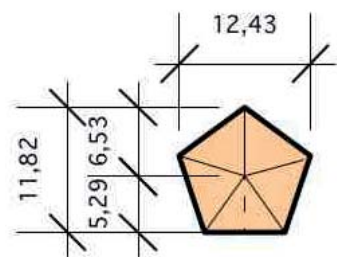
I do not know how many have had the patience to read this article, without pictures, deliberately.

If someone has read it but does not agree, I am not offended because as always:

"The braying of a donkey does not go to heaven"



Solid penta section



Area: 101,48 mm²

I_{xx}: 833,39 mm⁴

C_{xx1}: 6,53 mm

C_{xx2}: 5,29 mm

W_{xx1}: 127,57 mm³

W_{xx2}: 157,54 mm³

from "sezioni a confronto"
by Gabriele Gori

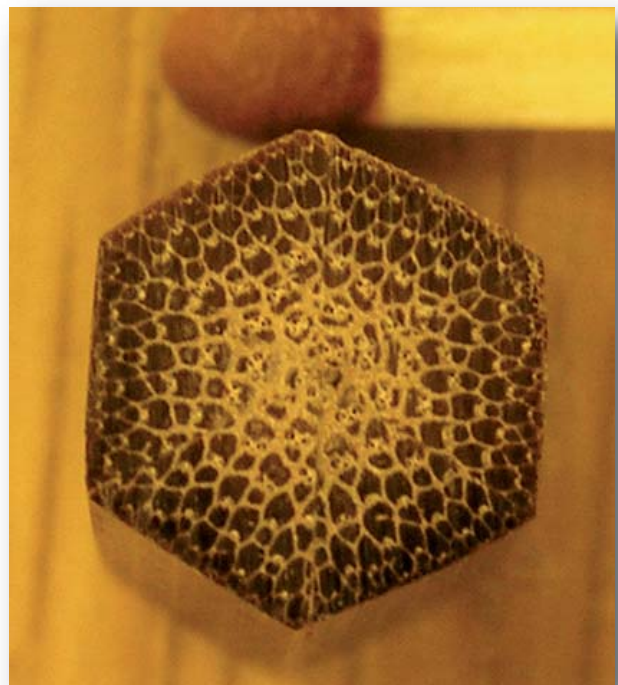
Thoughts of angles during the days of angels

by Anders Hedin (cahedin73@gmail.com)

During the Christmas holidays 2020 and all those corona-days, when lives are spoiled due to vague hygiene advices or non-compliance to follow the good ones, there is time to make something genuine to be remembered in the future. Now and then the thinking goes to nurses and doctors who in exhausted work save lives during these strange days. Let these thoughts be buried down in the bamboo you are working on, when they repeatedly turn up in the mind. Making a bamboo fly rod may be a way to honour them.

However, a normal year I only make one or two cane rods. As a beginner I do not have the necessary minute feeling in my hands, as those of you who hand-plane one rod a month, but I am happy, work slowly and get the strips tight enough not to show any glue space. This is the result after studying all good advices in the IBRA journal during the years, helping us beginners to simplify rod making and also to get higher quality. In 2009 Harry Boyd (1) wrote a very detailed paper showing which side of the strip to be planed, in order to get perfect 60 degrees angles.

When I had read his paper and used it during my planing, it improved. However, it was too elaborately written to be possible to remember or to read during the actual planing work.

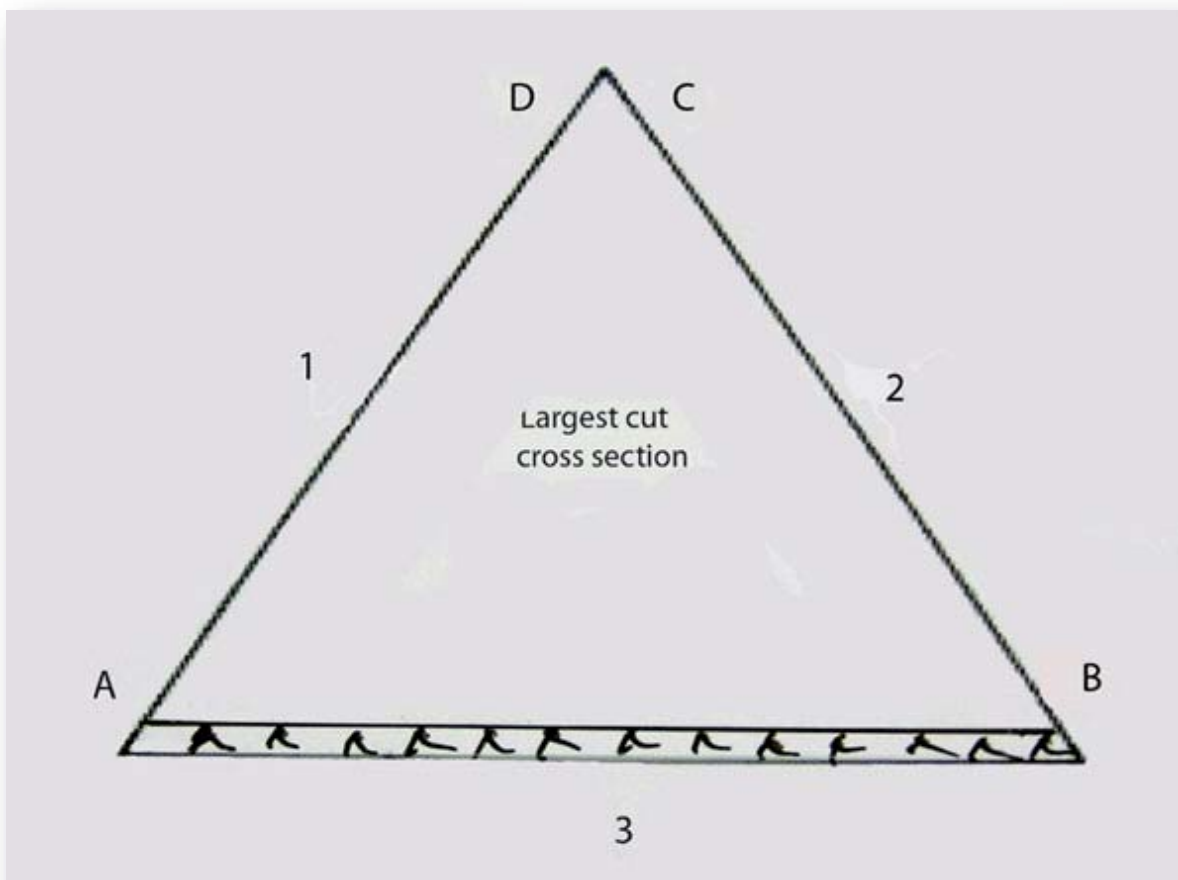


*Good gluing lines in area without hollowing,
thanks to Harry Boyd!*

When I got a little tired working, but still wanted to go on hand-planing, I now and then planed the wrong side! I understood that I needed a simple drawing to look at, in order to be sure that I have chosen the right side or corner to plane. I therefore took Harry Boyd's paper, and synthesized it into one drawing, which I now have hanging above the planing table just in front of my eyes.

The drawing is self-explaining and you can be quite sure, that when you plane according to it, you will have the right result. It is most valuable when you are doing the last part of the planing of your strips. Do not hesitate if you do not get the desired result after the first planing stroke. Probably you got too little wood in the shave. Take another stroke, and you will see that the measurement goes in the direction you want.

On each station of the strip draw a small lead-pencil stroke on side 1 after each planing on that side, exactly at the measuring point. My advice is always to start measuring from this pencil mark and in the order of side 1,2 and 3 as in the following text. This makes the measuring always in the same order, also when you have turned the strip upside down. If you mix up the measuring sides, you will have wrong advices!



Measuring order on the strip:

1. Measure side 1 to corner B
2. Measure side 2 to corner A
3. Measure side 3 to corner DC

Rules for the plane:

- If measure 1. is less than measure 2: Plane corner A if 1. is higher than 3.
- If measure 3. is highest: Plane corner C.
- If measure 1 is higher than measure 2: Plane corner B if 1. is higher than measure 3.
- If measure 3. is highest: Plane corner D.

The differences between the measures are only 0,0010 - 0,0005", i.e. 0,025 – 0,013 mm, so the planer must therefore be adjusted to very thin shavings.

Here is an example showing how I reach the right last measuring during planing when I follow the drawing. In general, if I do not make a large mistake, for example to have the planer adjusted to take too thick shavings or to angle the planer wrong, I reach within + - 0,0005", and not seldom exactly on the wanted figures. A small mirror attached to the planer eliminates tilting the planer in wrong direction (2).

Goal to reach is 0,0910":

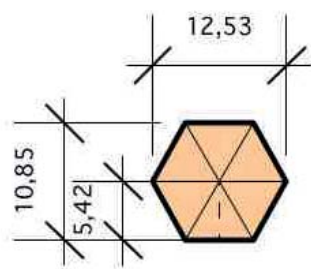
	1	2	3	Side of strip
Start with:	0,1080	0,1070	0,1095	Plane corner C
	0,1065	0,1060	0,1035	Plane side 1
	0,1045	0,1045	0,1025	Plane side 2
	0,1010	0,1020	0,1015	Plane corner A
	0,0990	0,0985	0,0980	Plane side 1
	0,0970	0,0975	0,0970	Plane side 2
	0,0955	0,0955	0,0955	Plane side 1
	0,0935	0,0940	0,0940	Plane corner C
	0,0920	0,0920	0,0930	Plane side 2
	0,0920	0,0910	0,0910	Sickle corner B with 2-3 strokes
	0,0910	0,0910	0,0910	Goal!

And, later this spring 2021, when you have been vaccinated, the rod is complete and you are standing on the bank of your favourite river, rise your rod-tip up to the skies and thank the angels for a new fishing season with good health!

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1. Boyd, Harry: *Obtaining and keeping perfect 60 degrees angles (adaptation from Harry's blog and from his posts on Rodmakers). "The Bamboo Journal" IBRA no 2, March 2009, page 24-29.*
2. Hedin, Anders: *The Pathfinder. "The Bamboo Journal" IBRA no 15, October 2015, page 68-71.*

Solid hexa section



Area: 101,94 mm²
I_{xx}: 833,27 mm⁴

C_{xx}: 5,42 mm
W_{xx}: 153,61 mm³

from "sezioni a confronto"
by Gabriele Gori

BAMBOO AND FORGING

by Marco Orlando Giardina (MOG)



The release of the Bamboo Journal is always a pleasure. Sometimes a little delayed, but it can be said that the wait also adds to the final pleasure.

The first article of issue 21, October 2020, is authored by Frederic Leroy.

I have read it very carefully and attention, but I must admit I disagree with the setting of the article and a series of statements contained therein.

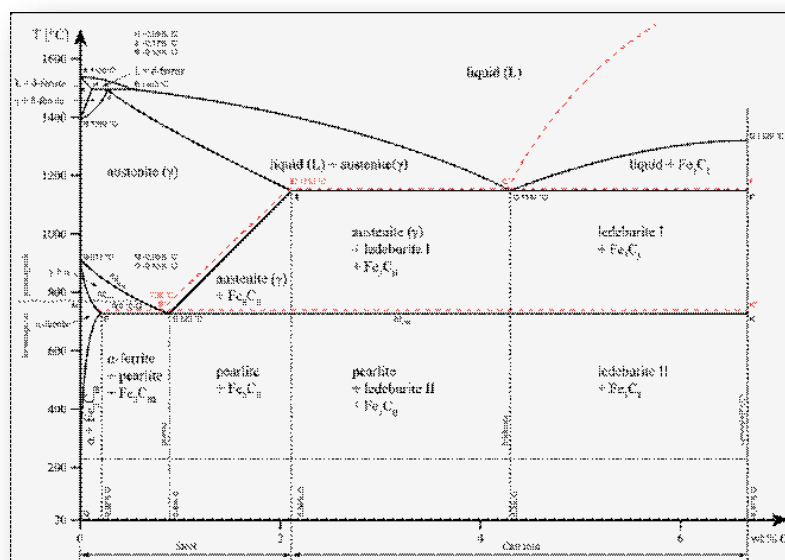
The main theme of the article is that of Bamboo Forging.

The misleading connection between bamboo and metallurgy is ancient.

More than a hundred years have passed since we started talking about the tempering of bamboo. It started with E.D. Edwards, in circa 1917.

Actually, there is no relationship between the two elements, bamboo and tempering in the proper sense. These are practices that pertain to areas belonging to different kingdoms. Probably the misuse of this term was caused by a mistranslation giving "tempered" the sense of "quenching". Perhaps it would be useful to use the term "hardening" for bamboo.

Anyway, in elementary school, a long time ago, I was taught that the world was divided into three kingdoms, the animal, the vegetable, and finally the mineral.



Of course, it was a wholesale approach, nonetheless not without its truth and reasonability.

Back to tempering.

The tempering treatment - the real one, of iron for example - consists in the sudden cooling of the metal material, after having brought it to a temperature at which the material assumes a crystalline structure defined as Austenitic.

The sudden cooling will allow a further restructuring in the crystallization from the Austenitic phase to the Martensitic phase. At this point we have an iron-carbon alloy commonly called steel!

Evidently all this has nothing to do with bamboo!

Vice versa, the Author introduces another element from the mineral world and from the field of metallurgy into bamboo rodmaking: forging.

Frederic Leroy quotes in the opening words of his article the writings of Robert E. Milward (Bamboo: Fact, Fiction and Flyrods) and Wolfram Schott with his two articles Bamboo under the Microscope and Bamboo in the Laboratory.

Well, Bamboo under the Microscope is an interesting piece about collecting thin sections - widely used in research related to mineralogy - applied to the internal structure of bamboo rods.

Let's say that it is a collection of horrors: a handbook of what not to do in the construction of bamboo rods. From this point of view extremely instructive. Considering, however, that it is unthinkable that someone could offer slices of rods of great names. In fact, in Schott's work there are no Garrison rods, or Leonard, or Payne or any of the big names of the golden years of rodmaking.

The discourse developed in Bamboo in Laboratory is different.

The key point of the work is linked to the heating of the bamboo strips to increase their resistance and modify their MOE by extracting water from the bamboo structure.

In reality, a fundamental element is not taken into consideration in the research, namely the action of heat that leads to changes in the chemical structure of the components of bamboo and in particular of lignin.

At temperatures in the order of 212-220 degrees Celsius, lignin passes from a single-bonded molecular state to a double-bonded state which significantly increases its MOE.

A point strongly urged by the author of the article on BJ is the reference to the absolute and indispensable maintenance of the conservation of the fibrous layer just below the enamel.

A practice greatly supported and considered fundamental by Milward in his writings. On the other hand, Milward's writings are decidedly assertive and the numerical examples reported are rather "light" from a statistical point of view.

This involves maintaining a certain level of roundness of the strip on the outer side taken from the culm.

This is a method not practiced by professional builders at all.



Maybe they were wrong? And how much?

The strip cutting technique was (and still is today) carried out through the use of mechanical milling machines that needed a stable and flat base for the cutting action.

Not dissimilar from the need to have a stable positioning even for those who work with a planing form.

Hence an almost generalized use of equilateral strips.

In fact, even Tom Morgan, quoted by the author, had long ago abandoned the use of rounding / concaving the strip support anvil and one of his latest creations was a tool called Enamel Scraper and Flattening tool. In other words, a "strip flattener"!

But let's go back to the article, we were saying how Leroy introduces the term Forging into his work.

Forging is a metallurgical process of transformation by plastic deformation of metallic materials.

In the case of ferrous materials, forging consolidates the transition from ferrite to austenite.

But surely it doesn't produce fibres and has no relevance to bamboo?

The Author talks about fibres that are produced in the forged material imagining a similarity with the small fibres of bamboo.

Just as a reminder, I would like to mention that the length of the fibres in bamboo is positioned on a length of around 2.5 / 4.5 mm.

Establishing this similarity, the Author decides to compress the bamboo sections through a process of heating and mechanical pressure.



In support of this practice, the experiences of building tiles for floors and bamboo plates through the combination of structural bonding in the presence of significant compressive pressures are reported.

The point is that the function of these materials is profoundly different from what may interest us. A floor tile does not have to cast delicate feathers into a festive and fishy stream, like a bamboo fishing rod is not suitable for tableware.

According to the author, the compression process increases the MOE.

The tests carried out indicate that the sample subjected to the test changes its state passing from a thickness of 3mm to a thickness of 2.5mm, simultaneously producing a collapse of the structural voids like the lymphatic channels.

Leroy carries out a series of tests to evaluate the improvement of the material in terms of MOE, declaring an improvement of 10% compared to the uncompressed material.

In addition to a theoretical analysis using Hexrod's algorithms, Leroy builds two identical test rods to carry out a series of practical tests.

By applying a weight of 500g it is possible to notice the different flexion of the two rods, with a clear improvement in the MOE of the "compression" on the "natural" rod.

A second test is performed with the Common Cents System method. The method reports the compressed rod as a rod for line 3 and the "natural" rod for line 2.5.

However, the Author does not indicate any tests regarding the behaviour of the "new" material subjected to breaking tests.

A methodological question arises here. The two rods are defined in the article as identical, but it is clear that the compressed bamboo material must have a higher specific weight than the rod made of "natural" material. Therefore, the compressed rod must be, if volumetrically identical, heavier than the second one.

I think it would therefore seem more correct to compare the two rods with the same weight and not with the same volume / size.

I have the distinct feeling that for the same weight the differences would be minimal! Reasoning in the terms of Everett Garrison's work, in fact, a difference in quality status induced in the construction material - bamboo - should also have led to a recalculation of the Impact Factor value for the calculation of the Stress Curve.

Design algorithms and procedural paradigms described by Garrison in the construction of bamboo rods, as reported in his book by Hoagy B. Carmichael, describe a modelling of the project that is simple in its structure and linked to the limitation of the calculation tools available to Garrison. The use of a slide rule, be it a Faber Castell or a Pickett in use at NASA, is not comparable with a computer today. But despite these limitations, the proposed model - even if static and not descriptive of the dynamic action of the rod itself - is able to identify the basic elements referable to the design of a rod and to analytically describe its functional characteristics.

The analysis of the action of a rod is certainly better described by the stress values - however static - than the drawing on a blackboard of the curve assumed by the rod under load. The first method produces punctual analytical data, the second is a subjectively interpretable analogue graphism. The same method of detecting the tail weight that can be used by a rod as defined through "The Common Cents System (CCS)", honestly seems to me unscientific.

And this would lead me to consider the author's attempt at innovation to be in vain, inconsistent with its own purpose.

On the other hand, it is worth remembering that several attempts have been developed over time to improve the physical / structural characteristics of bamboo as a rodmaking material. Certainly, the best known and most successful is thanks to Wes Jordan.

Jordan is certainly one of the most relevant and important figures in the history of rodmaking. Wesley D. Jordan was born in the state of Massachusetts in 1894,

After World War I, he began his professional involvement in rod making. First at the Cross, then with South Bend, and finally in the 40s becoming Master Rodmaker at Orvis.

The desire to improve the performance of bamboo for the construction of rods led him to patent an impregnation technique on behalf of Orvis - Patent Application No. 2,532,814, Serial No. 662,086, dated April 13, 1946 hot and under pressure with Bakelite phenolic resin.

From 1954 all Orvis rods were produced with this method.

These rods were successful. Less maintenance, greater rigidity. On the other hand, the rods were heavier than non-impregnated ones. Furthermore, their combination with plastic made purists turn up their noses. The impregnation was entrusted to Sharp's of Aberdeen, which in the following years collaborated with Leonard for the Duracane series rods and with T&T for the Classic series. Still produced today.

Again, on the theme of improving bamboo performance, one cannot fail to mention the ingenious and heterodox work of Wayne Meka and his Beaverhead rods: Meka has a long collaboration with Master Rod Builder Glenn Brackett at Winston.

Meka has started producing a series of very fast and light rods that constructively use thin bamboo walls encapsulated in an epoxy matrix. If you are interested you can get more news on the Rick D. Sorensen West Slope Fly Tackle website (<http://westslopefly.com/rods/beaverhead.cfm>).

At this point, I think it would be worth opening a parenthesis, let's say, of meaning, semantics. IBRA now has a long history and, without doubt, has essentially moved in the wake of tradition, let's say the Classical, trying above all to safeguard the idea of quality in the construction of bamboo rods. Over the past few years, perhaps the past five years, innovative, advanced and sometimes defined as heretical tendencies have developed in Bamboo Rodmaking which tend to depart from the traditional line, sometimes moved not by rational processes, but rather aimed at surprising and arousing wonder. It makes me think of wine with bubbles.

Many of you are certainly lovers of sparkling wine and you certainly know that the production methods are different: the classic or Champenoise method with refermentation in the bottle is certainly the most valuable.

The Charmat method with fermentation in an autoclave follows this closely.

Then the sparkling wines, the wine route to Coca Cola!

I think it would not be utopian to talk about Bamboo Rodmaking today by classifying its development lines and methodological tendencies and philosophical implications.

We could speak of Classic or Traditional Bamboo Rodmaking, of Advanced Bamboo Rodmaking, or Experimental, or Heretic, or as you prefer, to highlight two different operational and ideological ways of today's rod construction.

We would avoid the ideological clashes between two ways of conceiving the construction of rods, between tradition and "everything is allowed in the search for novelty and something new".

In many cases, thanks to the experience of recent years, it seems to me that there is a full-blown Dunning-Kruger Effect

I would add Bamboo Rodmaking "in the manner of the ancients" where even the rounders of hexagonal rods and those who put the external fibres inside the blank can find peace, so everyone will be satisfied and happy and we could all live together passionately!

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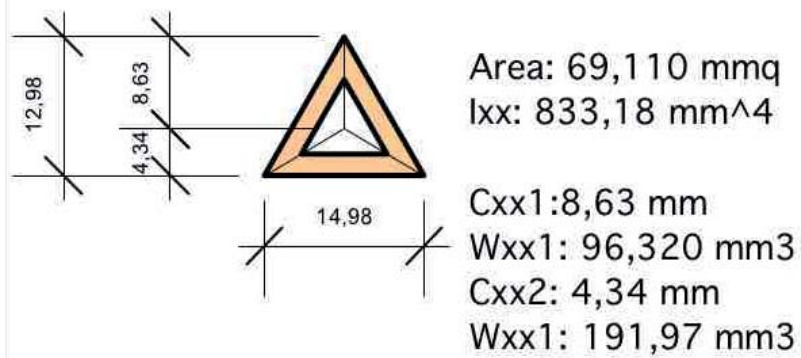
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Bamboo rod taper design with RodDNA Designer, Larry D. Tusoni 2011

Playing with fire: the life and fly rods of E.W. Edwards, Patrik C. Garner 2008

Hollow triangular section



from "sezioni a confronto"
by Gabriele Gori



It's broken! Why right there? Why like that?

by Giovanni Nese

From the breakage of a rod under the ferrule position, a discussion arose on FB as to why and how it developed there and in that way.

There are reasons; I'll try to illustrate some of them. There is everything: physics, mechanics, theory of constructions, metal techniques and technology. Even a little bit of mystery ... in fact there are no numbers!

Let's discover another of the many reasons building with bamboo keeps us active and vital.

To explain it in colour and make it "easily" intelligible, I used two software, one structural, the other is a 3D CAD package that has the ability to do FEM (finite element method) studies. The first, about ten years old but well known, the other found, free, on the WEB a short time ago.

The procedure in both cases was:

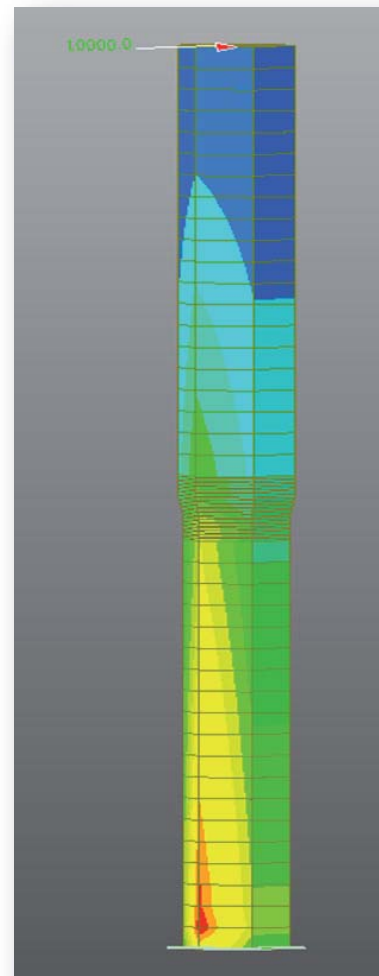
- 1) Identify a functional scheme of the coupled ferrule / bamboo;
- 2) Develop the 3d model;
- 3) Apply a realistic load condition and materials;
- 4) See the result of the tensions and compare it with the things studied 40 years ago.

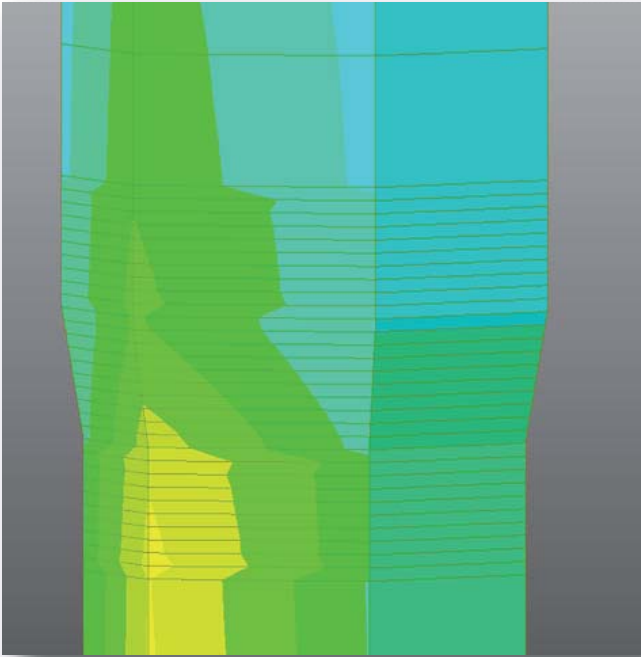
First study with MIDAS, structural software

This is the first attempt to make a studio rod segment to see if the program is able to detect localized stress variations around the section and material variation. The software I own does not have a rich library of meshing functions so I felt that the ferrule could be simulated by a hexagonal section tube. What I am interested in seeing is the transition zone between bamboo and metal, the area of the crowns and there the simplification adopted is reasonable.

The section is approximately 4mm in diameter.

The first attempt at a solution does not meet my expectations and the distribution of tensions is approximate and unsatisfactory.



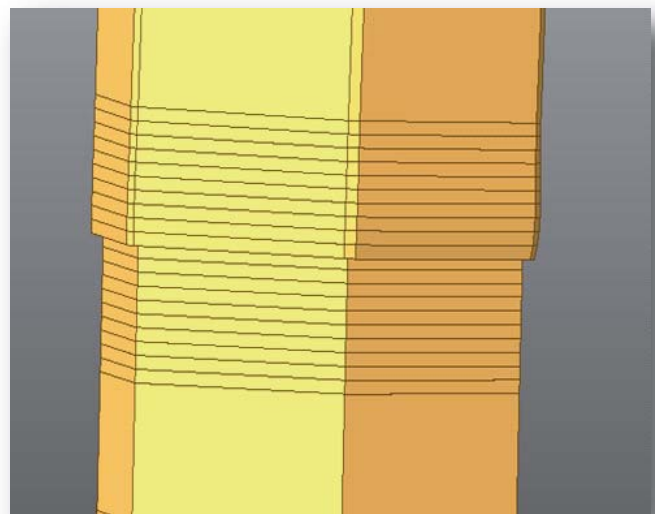


The local thickening of the elements did not improve the definition.

This model and the applied force were not very consistent with the real ones used in fishing.

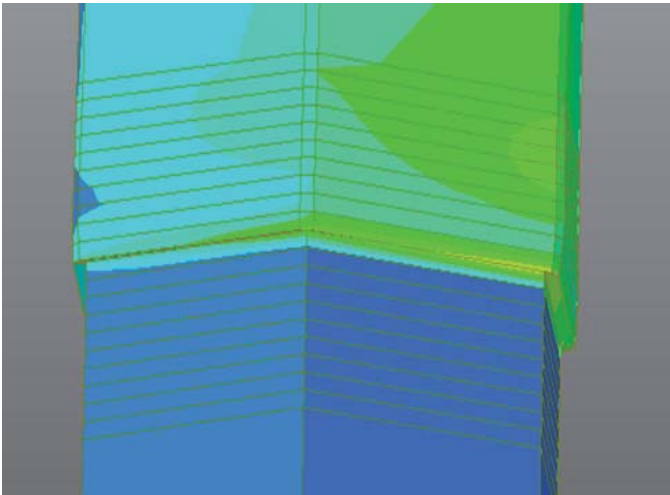
If we compare the expectations with the result, this shows us some inconsistency in the flow of stresses. The shape of the coloured bands is of too little significance to be taken into consideration. (We are working with an accuracy of 13 decimal points).

Let's refine the model and see what happens. We divide the model with a smaller mesh and differentiate the materials of the tube and the internal stem.



Here we see that using a pipe connected to the solid section, "strange" deformations begin to be appear at the point of contact between the pipe and the wood, but consistent with our expectation.

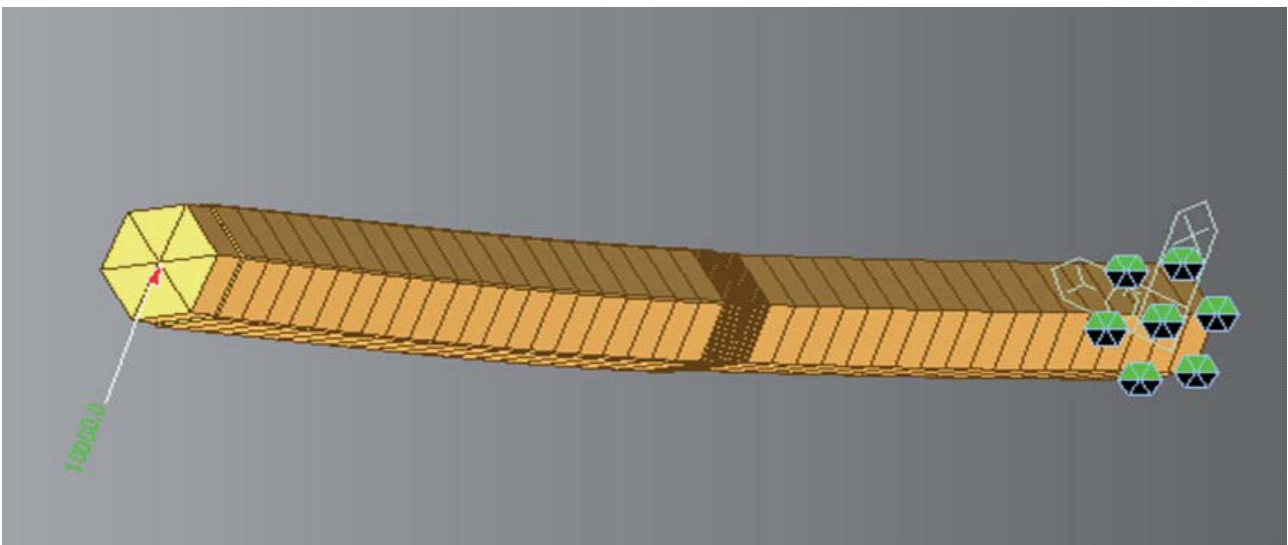
What is remarkable is the fact that the tensions practically disappear as soon as they leave the first support element on the wood, it seems that they immediately go inside. (The blue colour indicates a low voltage value, green and yellow higher values).



There is a strong disproportion of resistance between the two sections: metal, wood. All stresses from the metal pipe are transferred to the solid wood section. It should be noted that the line in which this happens is very thin. Just 1 mm more under the stress is so evenly distributed and no differences in tension / colour can be detected.

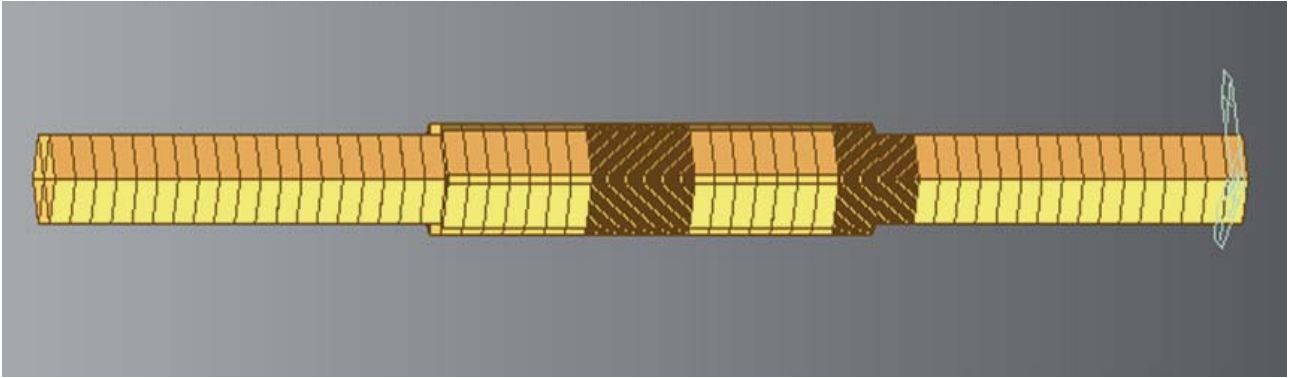
And this begins to be consistent with the breakage under examination, that is, the distribution of the tensions from the metal, passing through the wood is extremely concentrated.

Incidentally, the deformation of the tube / ferrule / bamboo with the applied force is as follows:

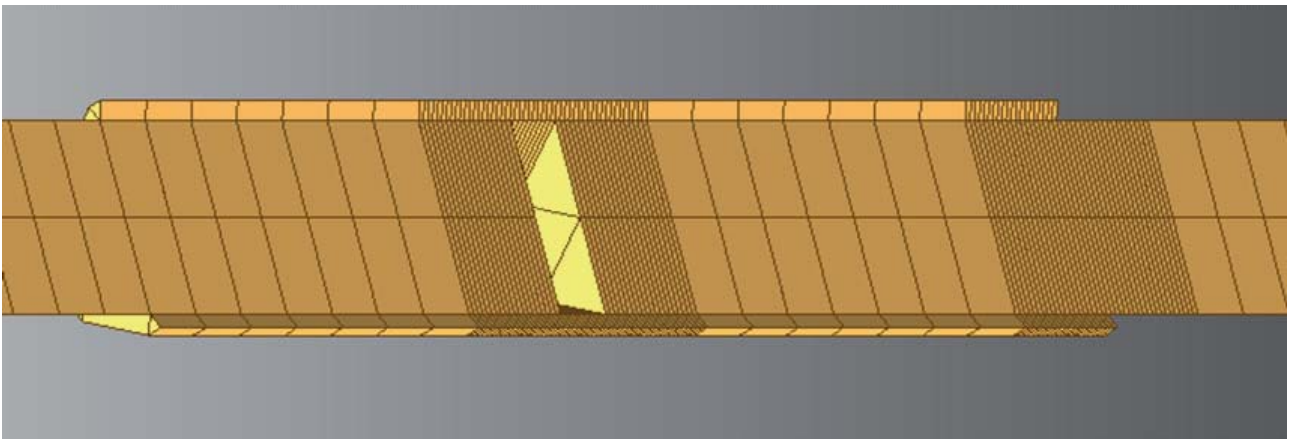


This is a model; a case study and the values are not consistent with real fishing. But the proportions and materials are realistic. To “spin” the model I placed a diaphragm at the point of application of the force. Otherwise, the hexagonal section becomes an egg.

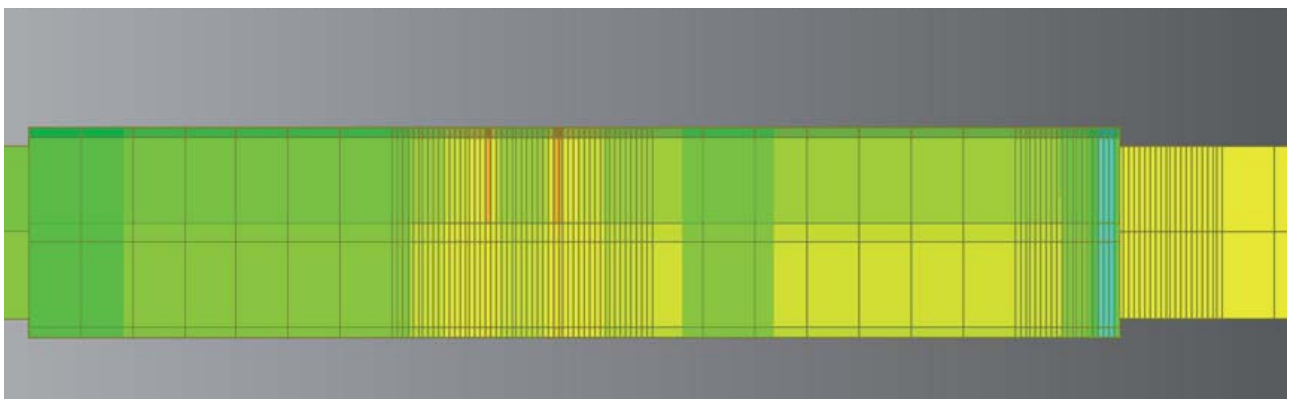
We gradually try to refine the model to make it more likely. We still improve the mechanical characteristics of the materials and dimensions and also the proportion between the resistances is almost exact. Here the ferrule is assimilated to a sleeve that fits the two stems. There is a gap between the upper and lower shaft where you see an increase in the elements, about in the middle of the sleeve and also in the point where the sleeve ends there is a densification.



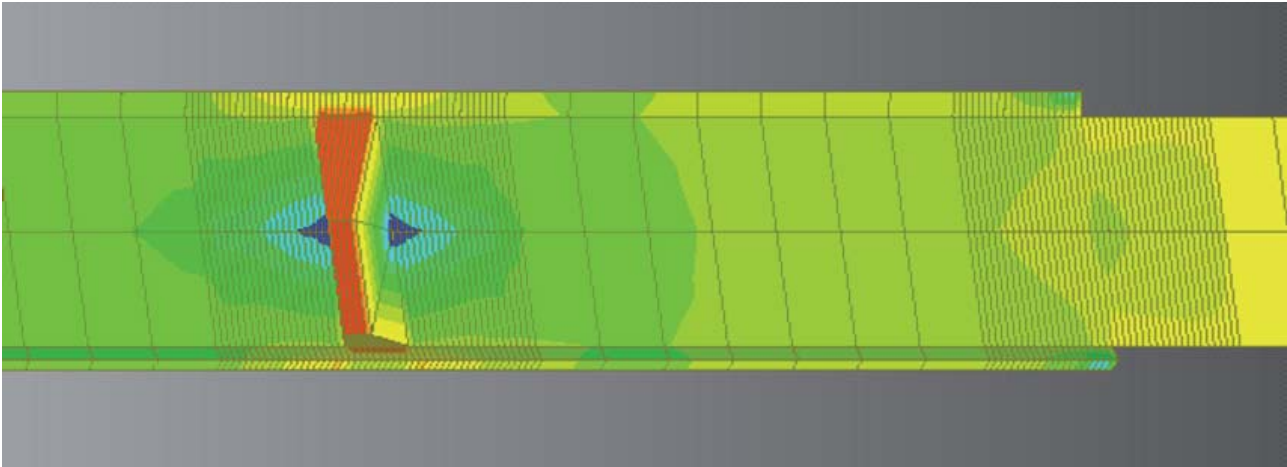
In section:



It is important to note that here too there is an increase in the stresses on the edge and on the wood that is on the edge (in orange and yellow, the blue on the edge below is unloaded, but it represents the external surface of the sleeve, it is correct that it is so).

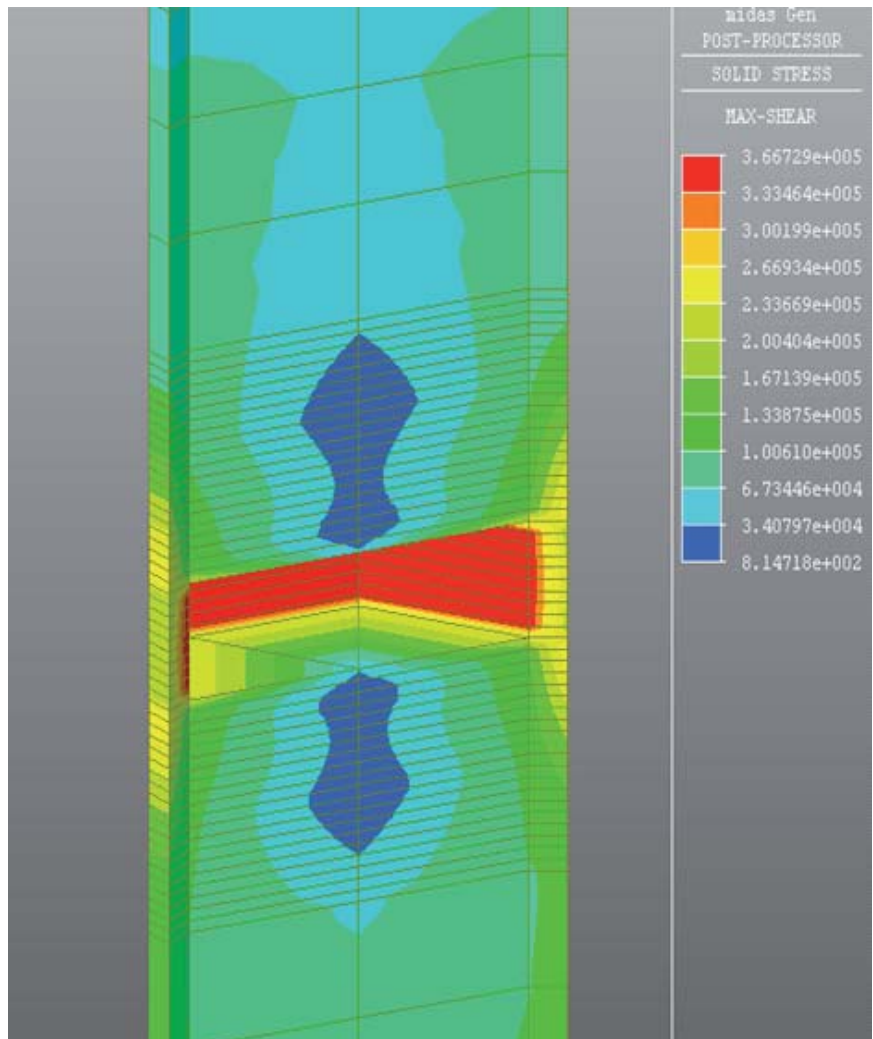


Seen from inside, in longitudinal section.

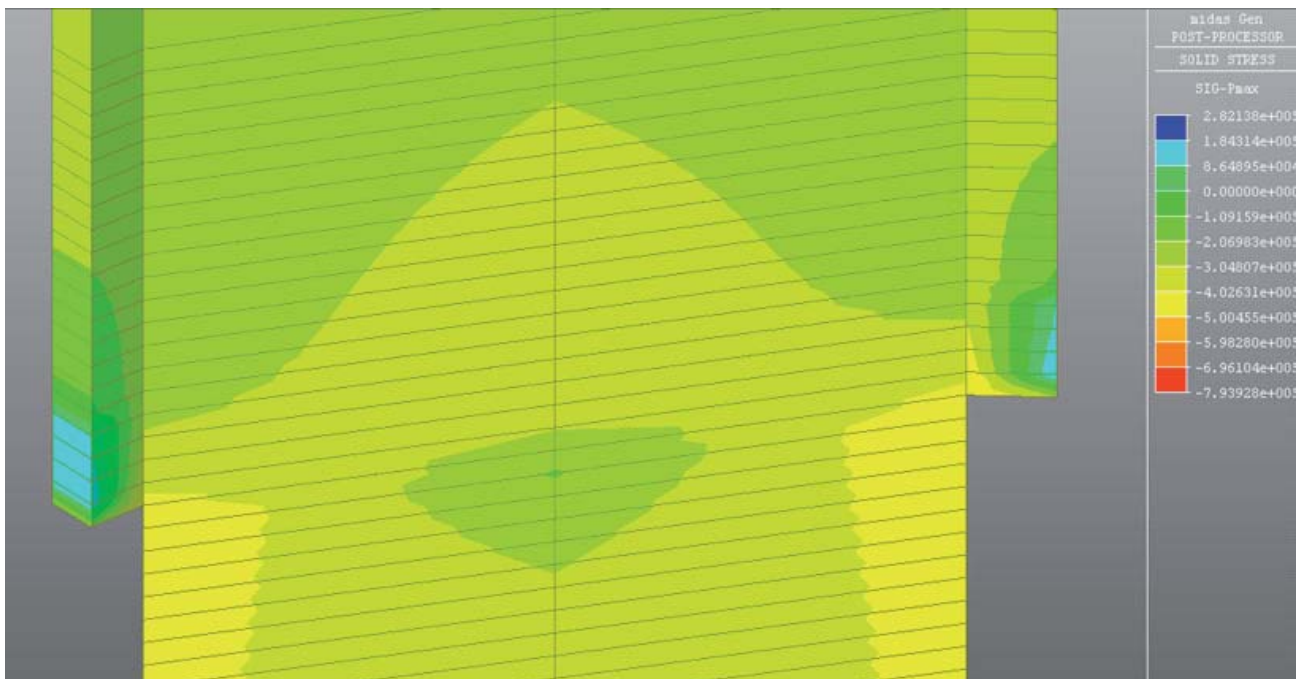
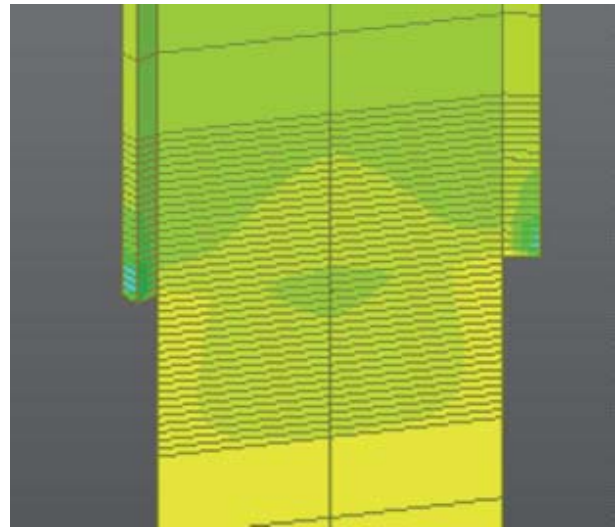


The blue dot in the centre of the rod is due to the cut! In the real flange that peak is even more limited by the flange bottom which redistributes the tension. The blue indicates the state of tension which is very small compared to the sleeve in the same point (in red). However, this shear stress works on wood and glue. We will have to ask ourselves questions about the usefulness and shape to give to the pads.

Trivia: this is the only shear stress, it alone. In detail.
Absolutely not worrying!

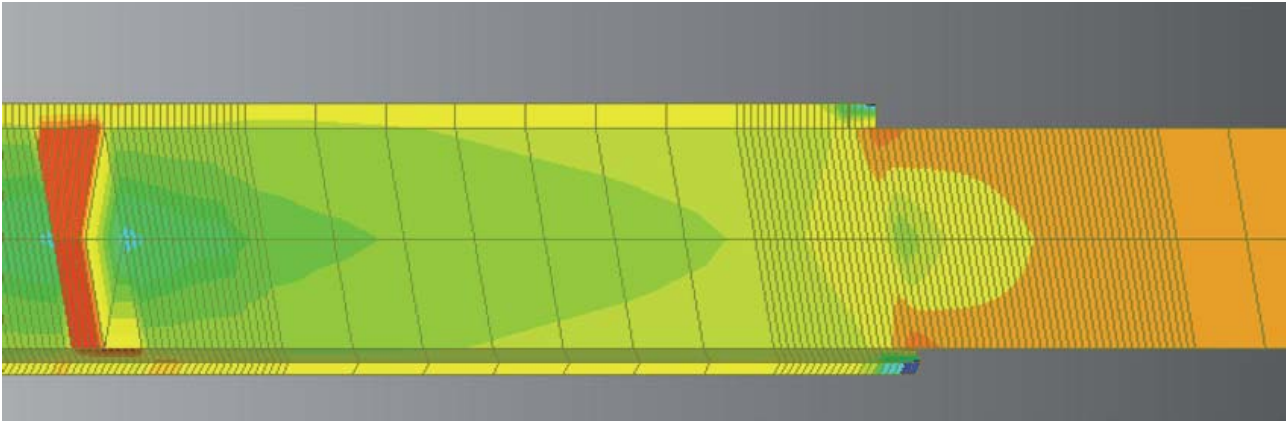


This image is important and even if not very precise, it shows the flows of the internal tensions.



The blue is light, the yellow darker, there is more force applied. And do you see how it goes inside? Transversely to the section! It enters from the edge of the sleeve and immediately spreads into the wood.

Below I have further refined the mechanical characteristics of the materials. We have a further endorsement of intuitions.

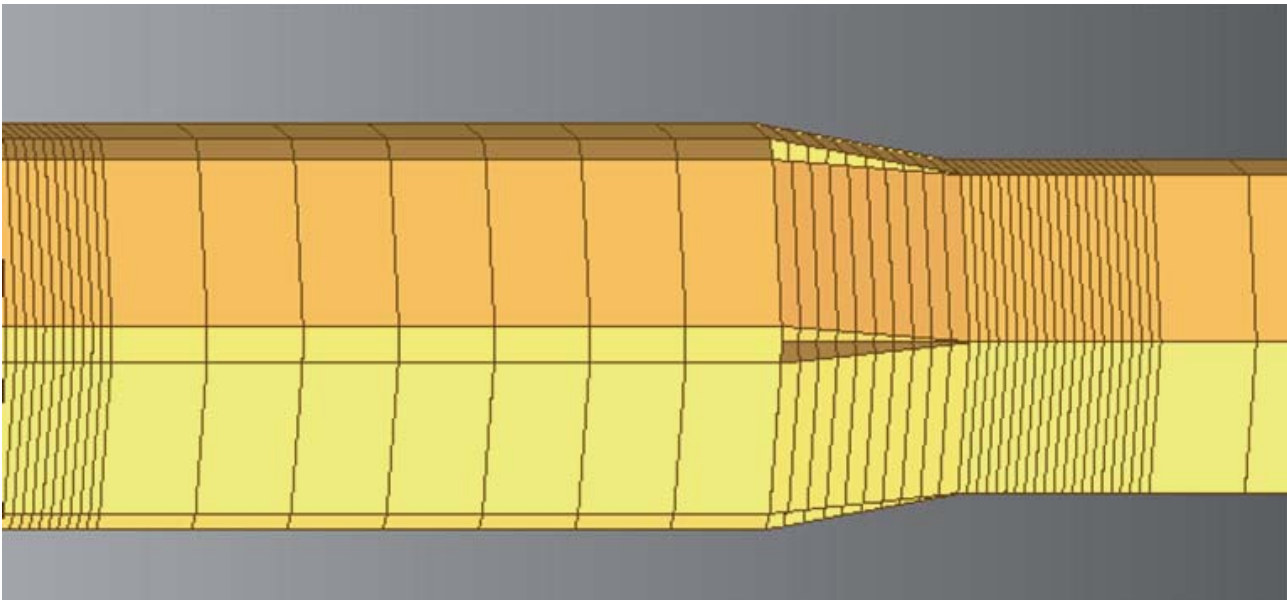


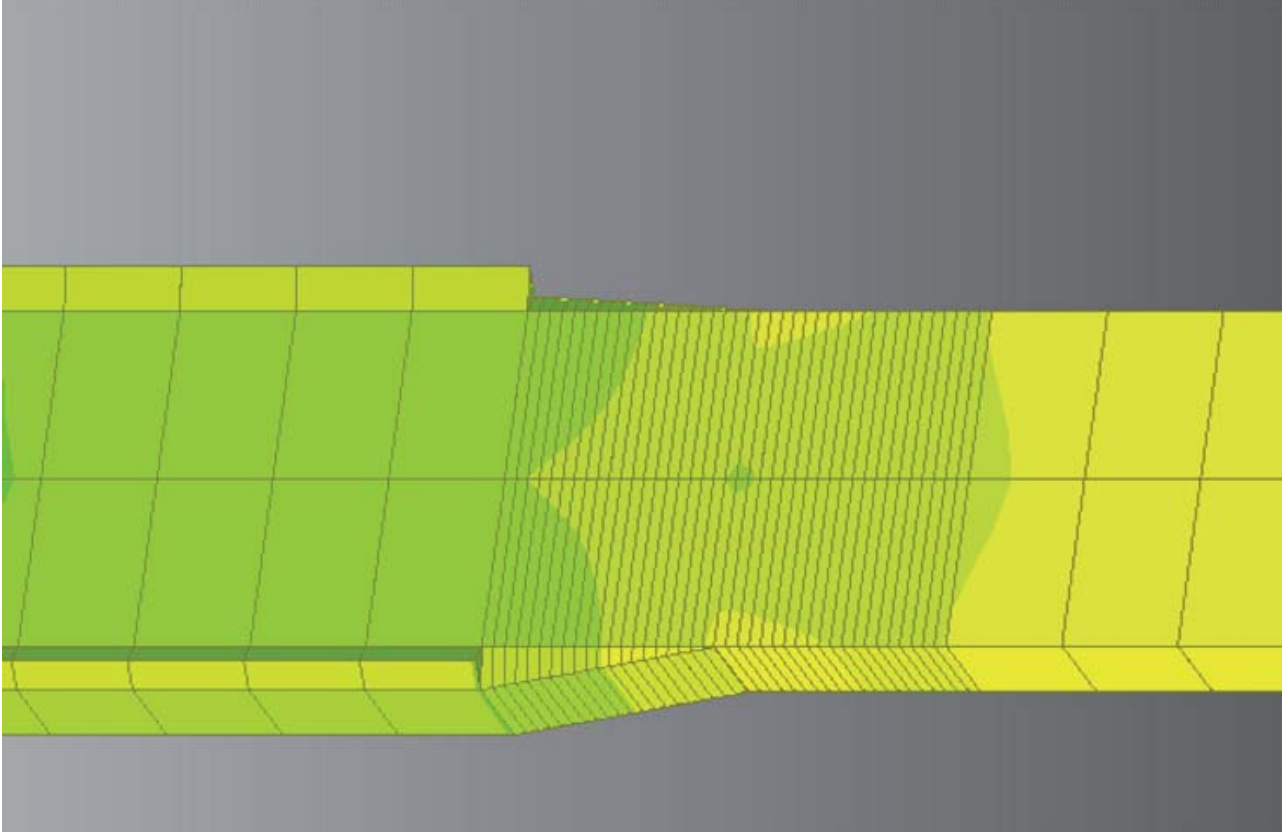
The shear stresses have decreased a lot along the central axis line.

Note how by increasing the difference in mechanical characteristics between wood and metal, **they are instead concentrated at the point of attachment between the edge of the ferrule and the bamboo.**

And you see that if the leading edge of the sleeve / ring nut is thick and rigid, a lot of tension goes through it. **And these can break the wood**

Same model, same load but with tapered crowns in thickness

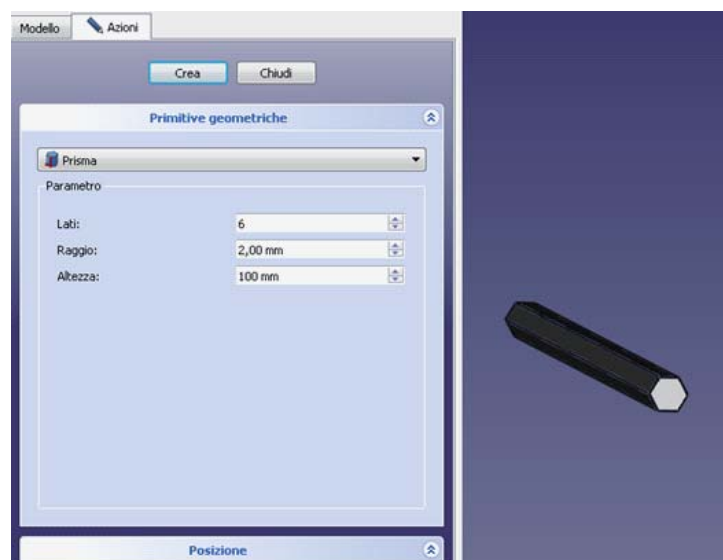




The tension peak is almost gone! Almost ... at least it spread over a greater area. This trend of internal tensions is much better than the previous one. (it is yellow at the point of contact, no longer brown!)

Here we use FREECAD. Three-dimensional CAD modeller. It does everything! From mechanics to architecture, to geotechnics, to anything that comes to mind and can be drawn in 3 dimensions.

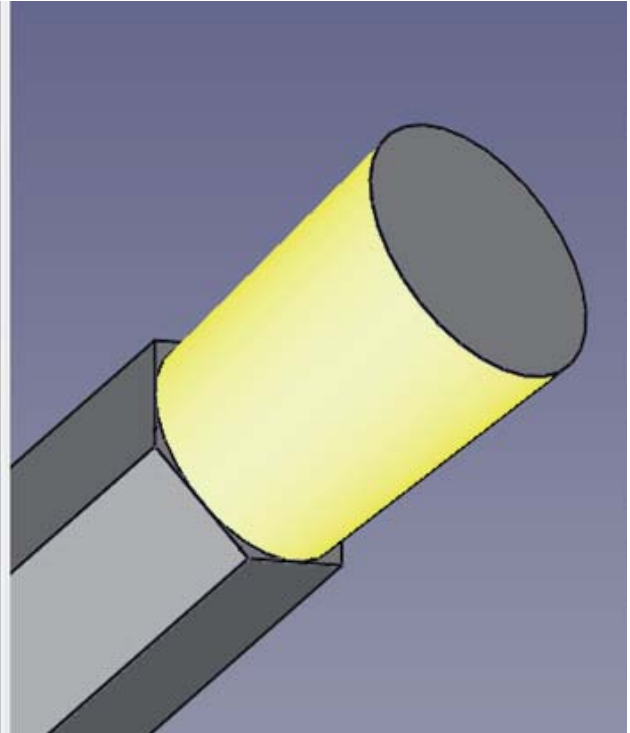
Almost the same construction as before but illustrated with greater precision because while with the previous package we generated vertex nodes and then built solids on them, here we do the opposite. From the solids we derive the model for the structural calculation.



The hex base is a 3d solid with 4mm outer radius, thickness = $1.732 * 2 = 3.464\text{mm}$

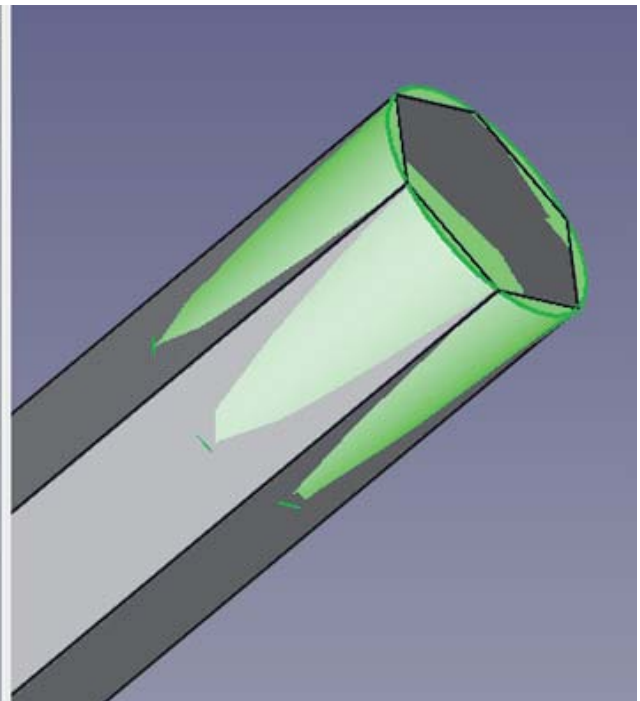
The cone of the ferrule placed above the end of the wood

Proprietà	Valore
Attachment	
Map Mode	Deactivated
Base	
▲ Placement	[(0,00 0,00 1,00); 0,00 °; (0,00 mm 0,00 mm 100,00 m...
Angolo	0,00 °
▷ Asse	[0,00 0,00 1,00]
▲ Posizione	[0,00 mm 0,00 mm 100,00 mm]
x	0,00 mm
y	0,00 mm
z	100,00 mm
Label	Cono
Cone	
Radius1	1,73 mm
Radius2	2,00 mm
Height	5,00 mm
Angolo	360,00 °

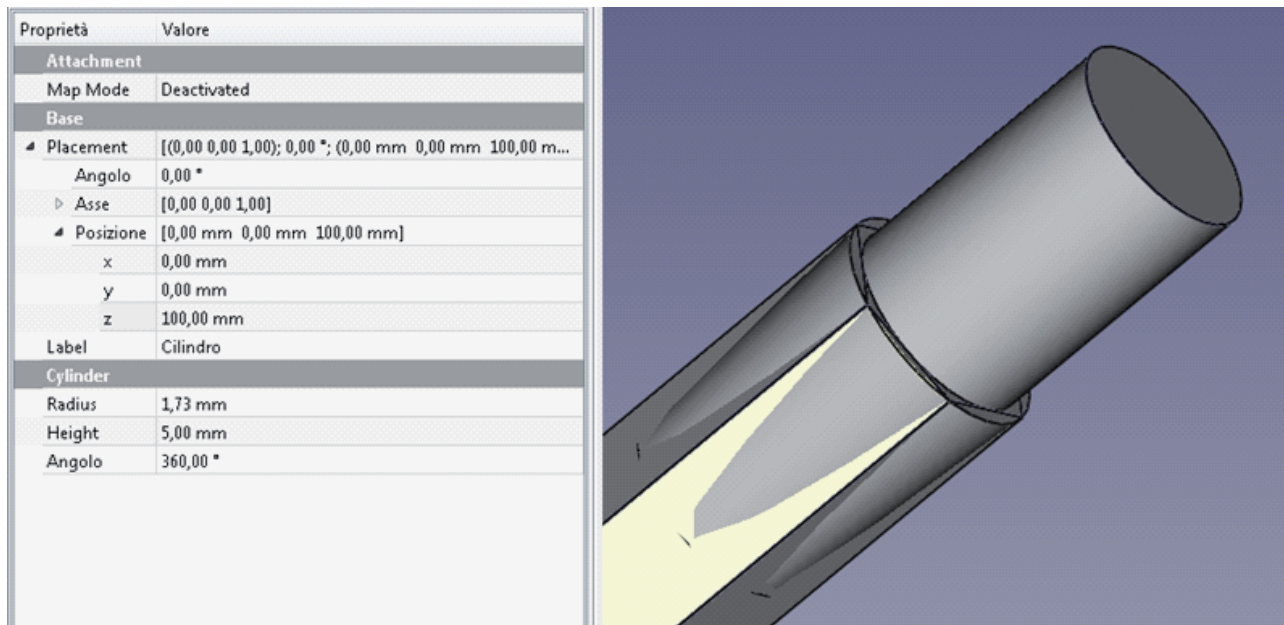


The cone in position

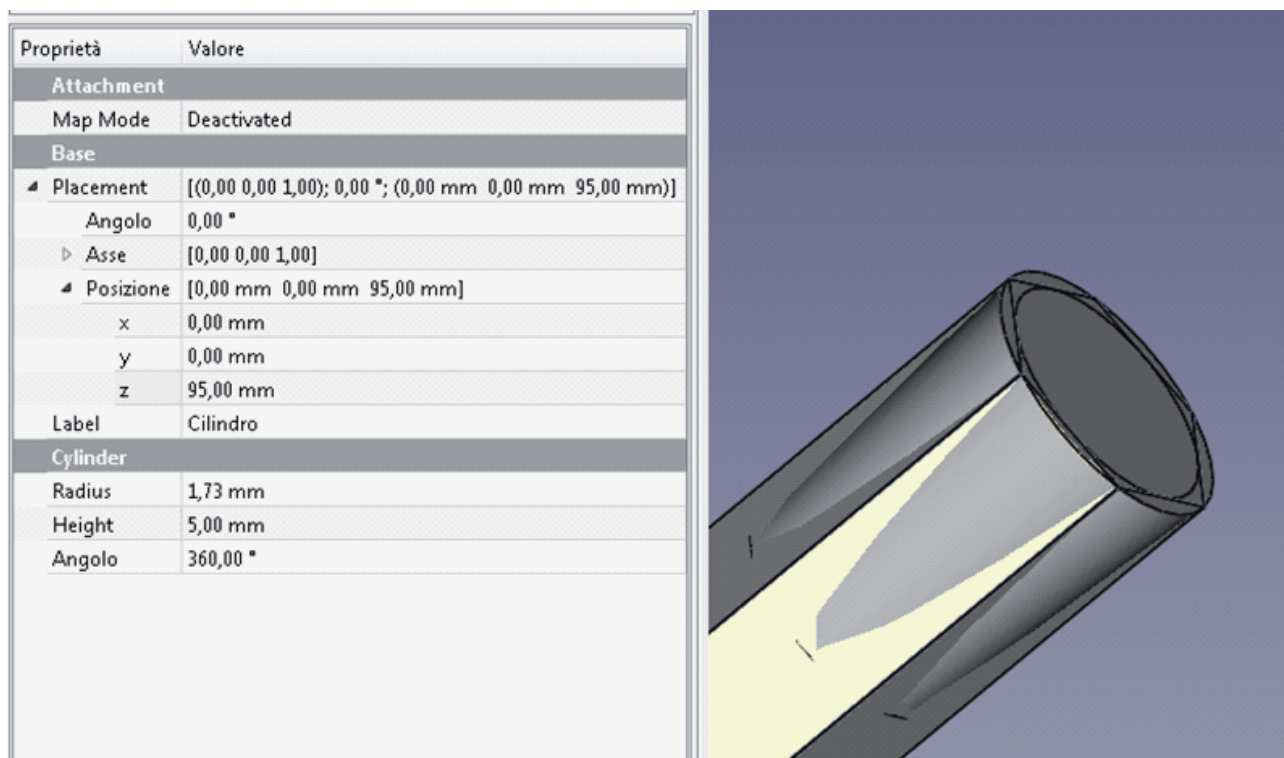
Proprietà	Valore
Attachment	
Map Mode	Deactivated
Base	
▲ Placement	[(0,00 0,00 1,00); 0,00 °; (0,00 mm 0,00 mm 95,00 mm)]
Angolo	0,00 °
▷ Asse	[0,00 0,00 1,00]
▲ Posizione	[0,00 mm 0,00 mm 95,00 mm]
x	0,00 mm
y	0,00 mm
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Label	Cono esterno
Cone	
Radius1	1,73 mm
Radius2	2,00 mm
Height	5,00 mm
Angolo	360,00 °



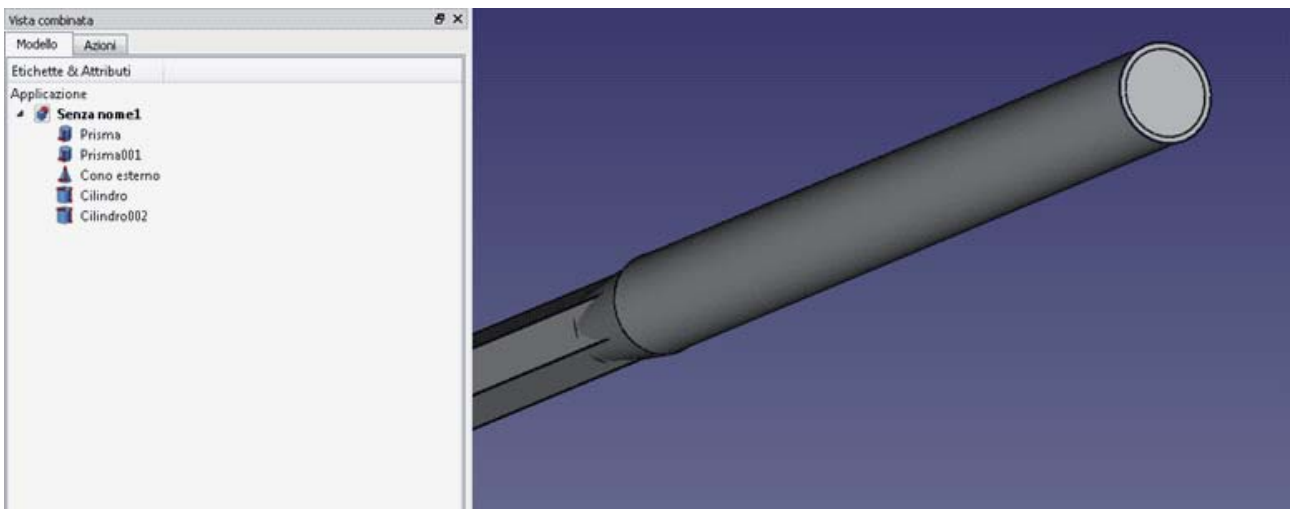
Cylinder for hollowing the cone...



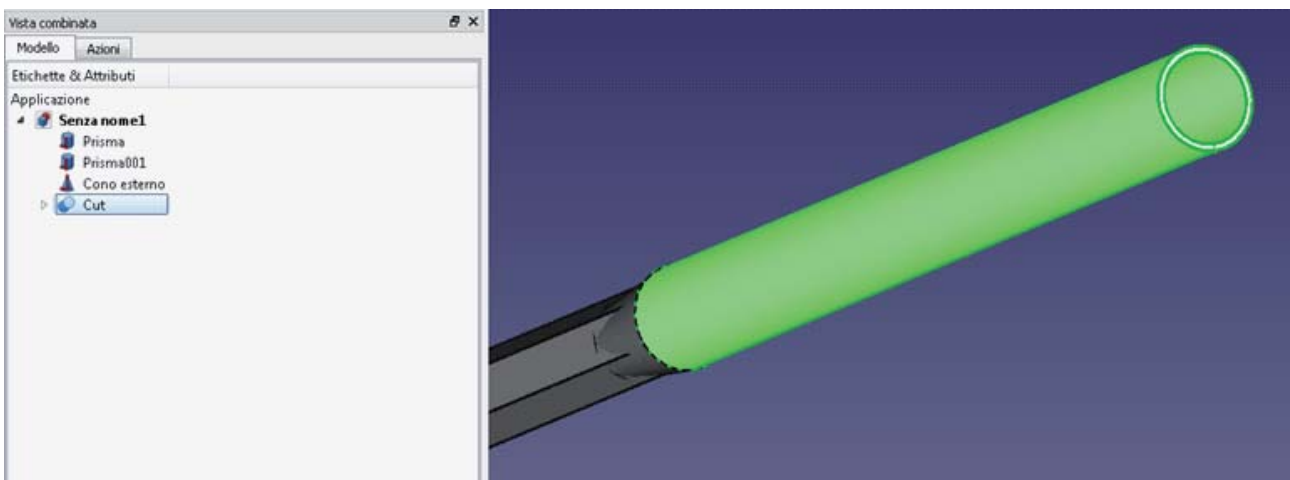
And positioned correctly



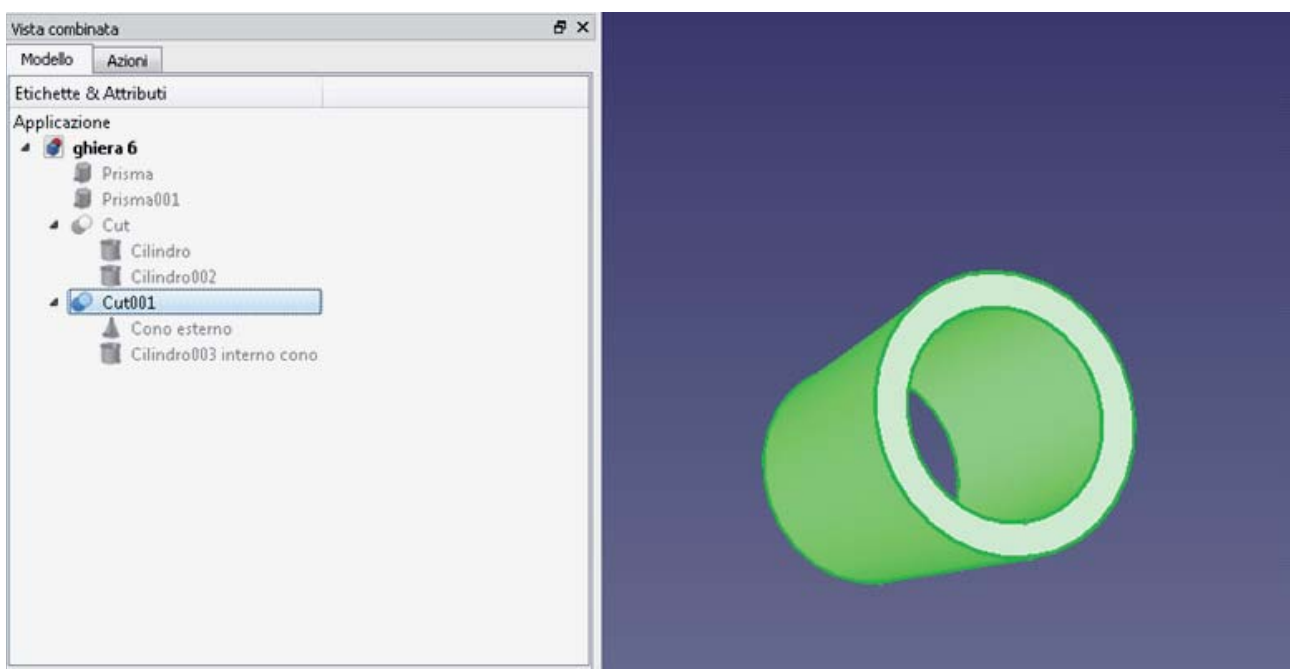
All the elements that make up the model



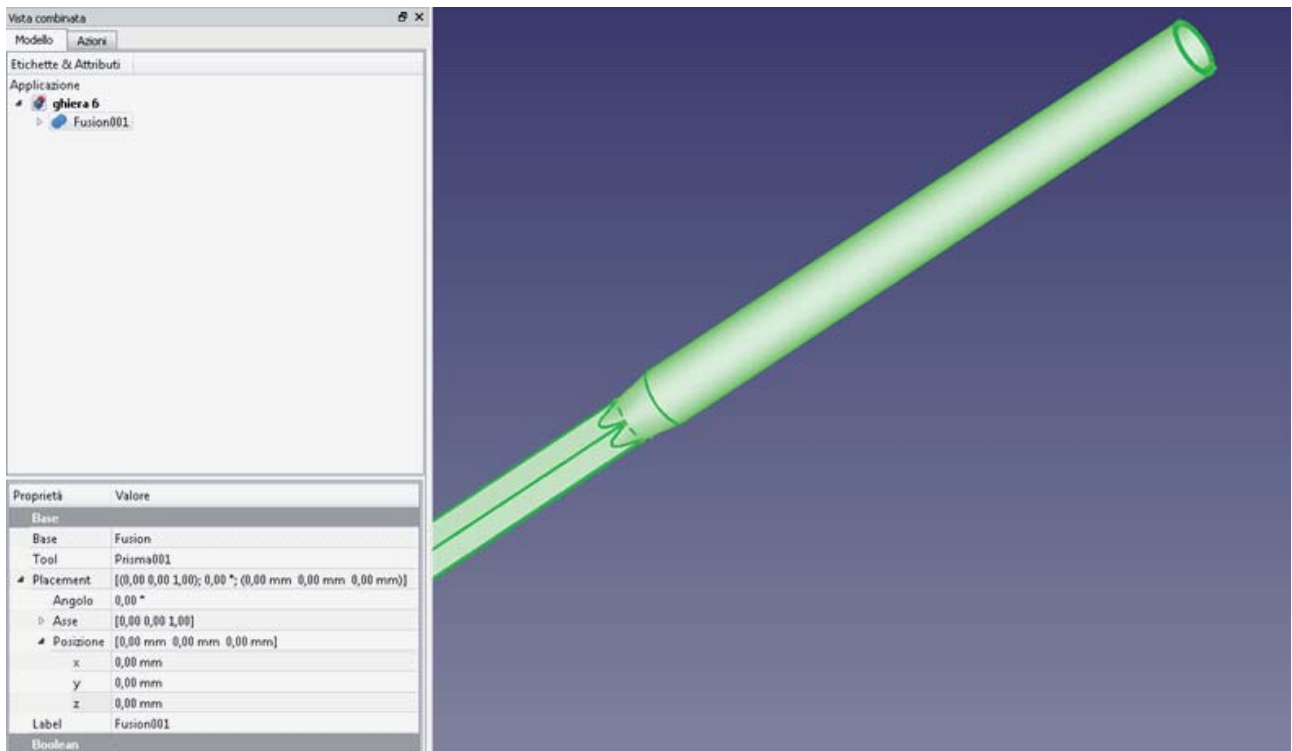
The hollowed ferrule tube



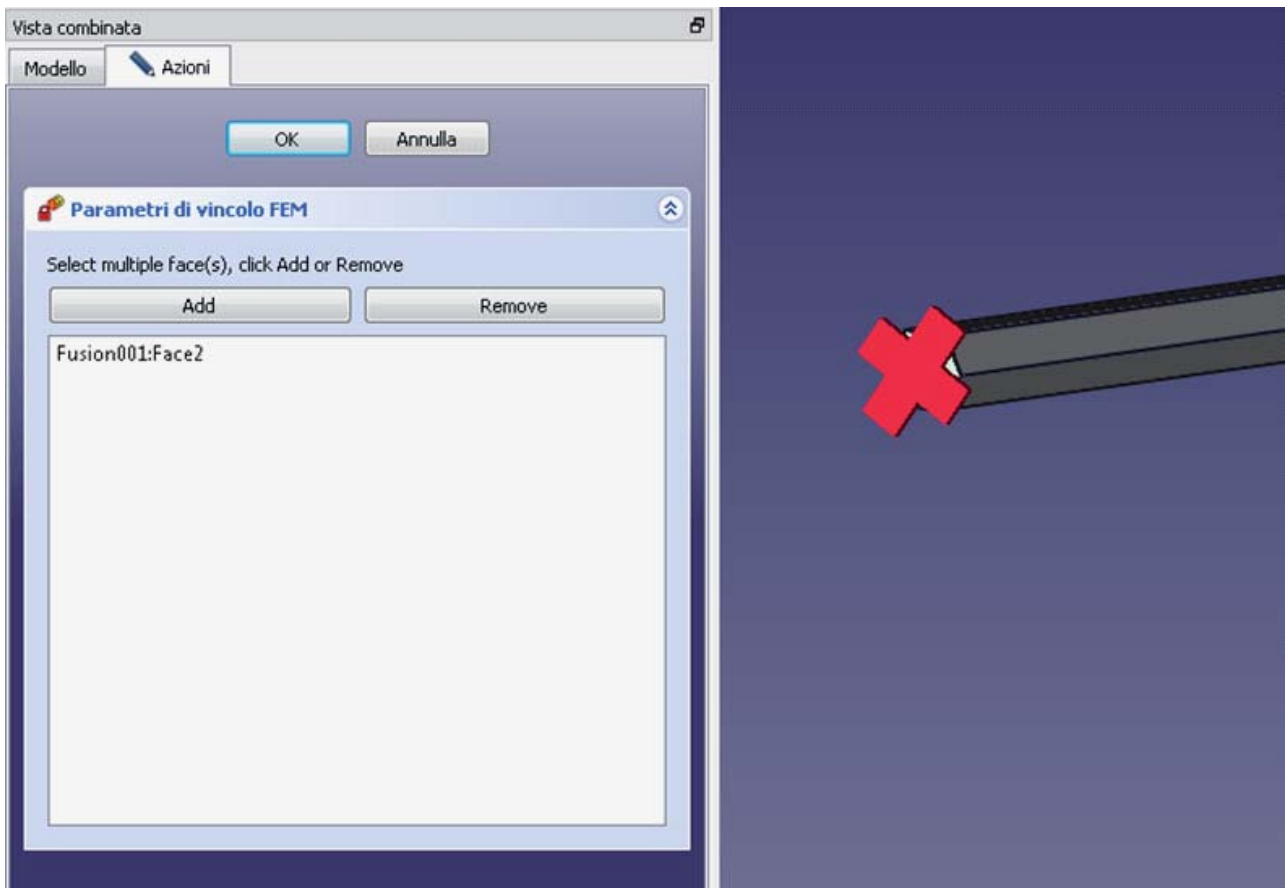
The hollowed cone



The joining of all the pieces

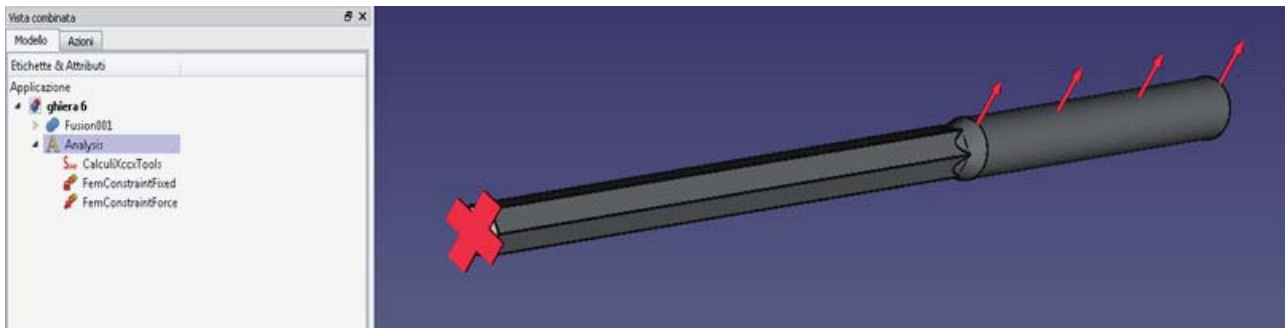


The constraint condition of the foot joint



Foot constraint and applied forces. The software is not very rich in load conditions in the free distribution.

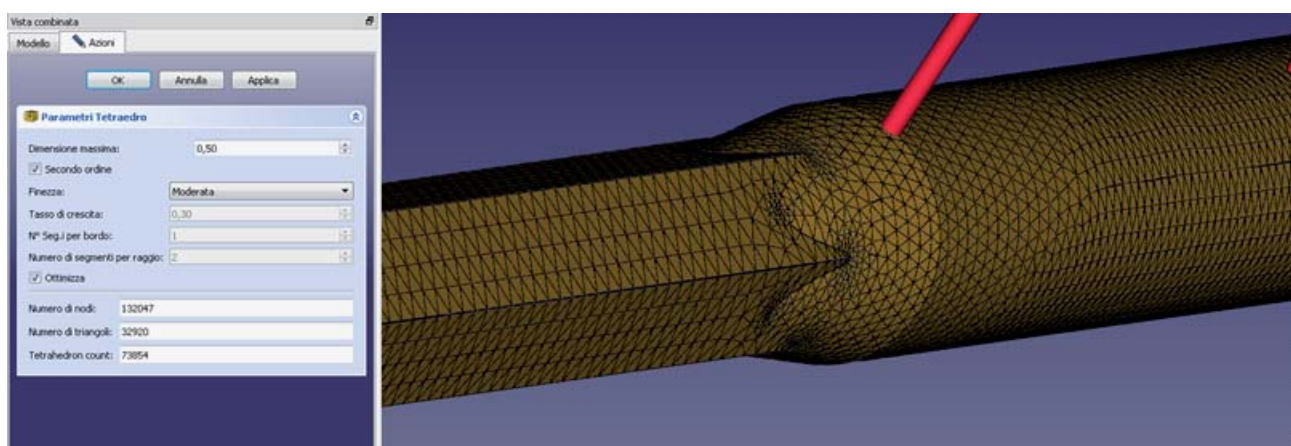
With the PYTHON programme you can do smart things: macros and load combinations.



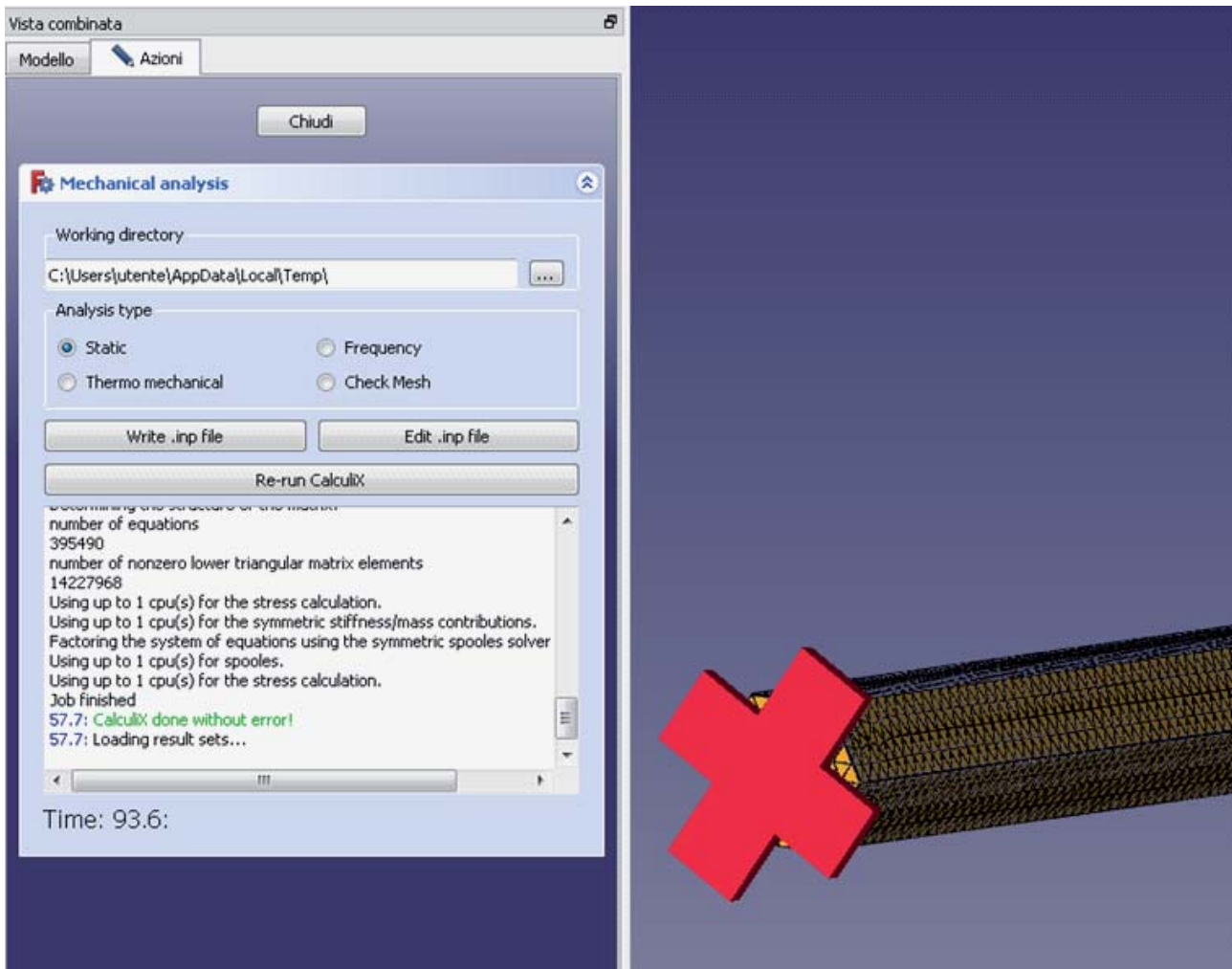
Mesh; this one is great!

For those like me who are used to doing them the old way, that is: first the positions of the nodes are generated: X, Y, Z coordinates and then they build the 3d solids on them, this mesh would be impossible!

132047 knots!



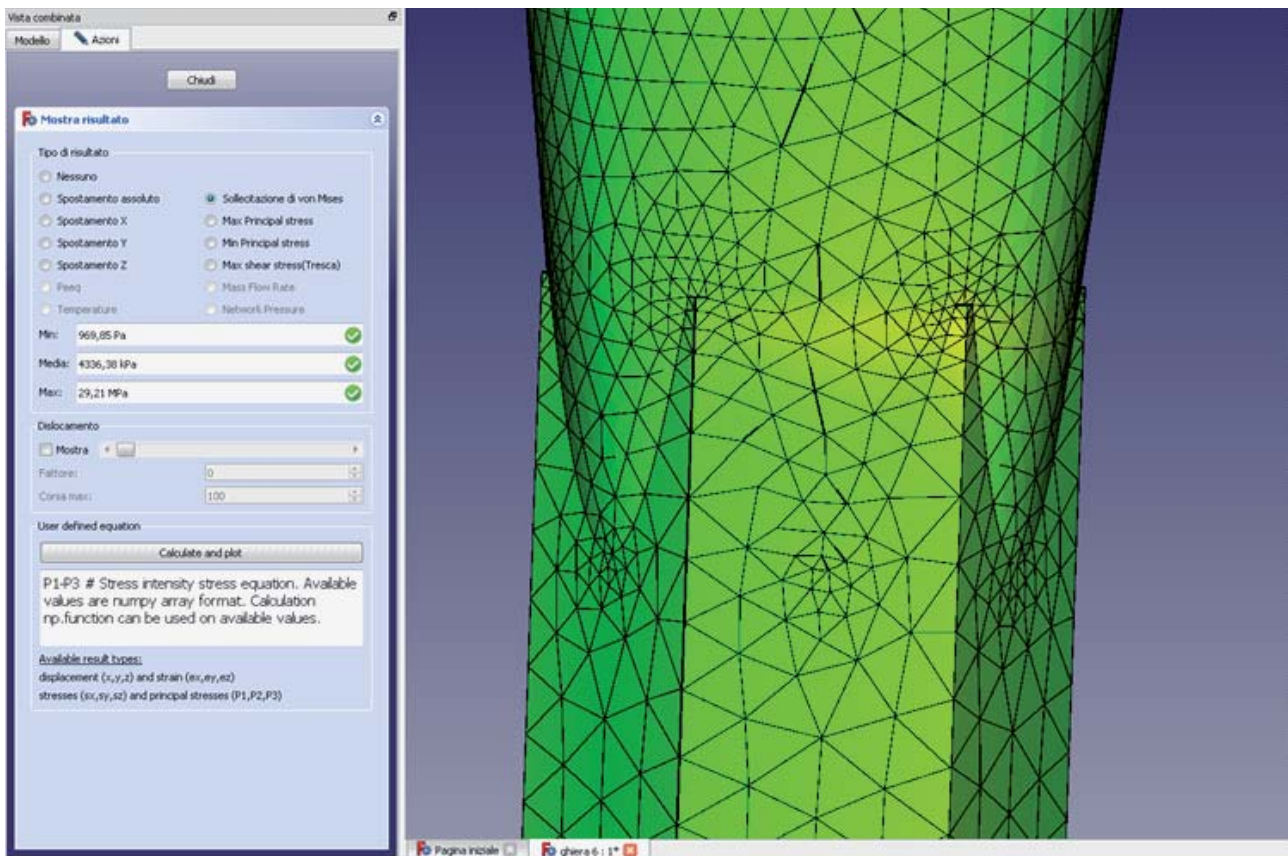
The calculation



(almost 94 seconds for an i7 computer, that's a lot of time and calculations)

The chromatic scale that identifies the tensions confirms the concentration of tensions at the edges. There is no explosion of colours that I would have liked to see but there is some stuff. The change of colour in the position at the base of the scallops is appreciated. That is, with this type of shaping we have AVOIDED the concentration of tensions in the support point between metal and wood at the end of the ferrule, we have further increased the surface of distribution of tensions.

(Remember that all this stuff is free, but it does a crazy job.)



Once the software has been mastered and the dimensions and stresses rationally identified, the design and calculation are completed in half an hour.

With this tool you can design the reels and then send them to the "3D" copy shop to print.

PERSONALLY ...

I put the Gothic-type crowns in the centre of the face. Always.

You have always known that all the stuff illustrated works this way. Construction science and technique teach these things. Those involved in mechanics know how cracks and fatigue breakages work, they know how to avoid stress concentrations and have a tabulation of the ways of making fillets, chamfers and holes to remove the danger of crack initiation.

"Loaded sharp edge = crack initiation => certain breakage"

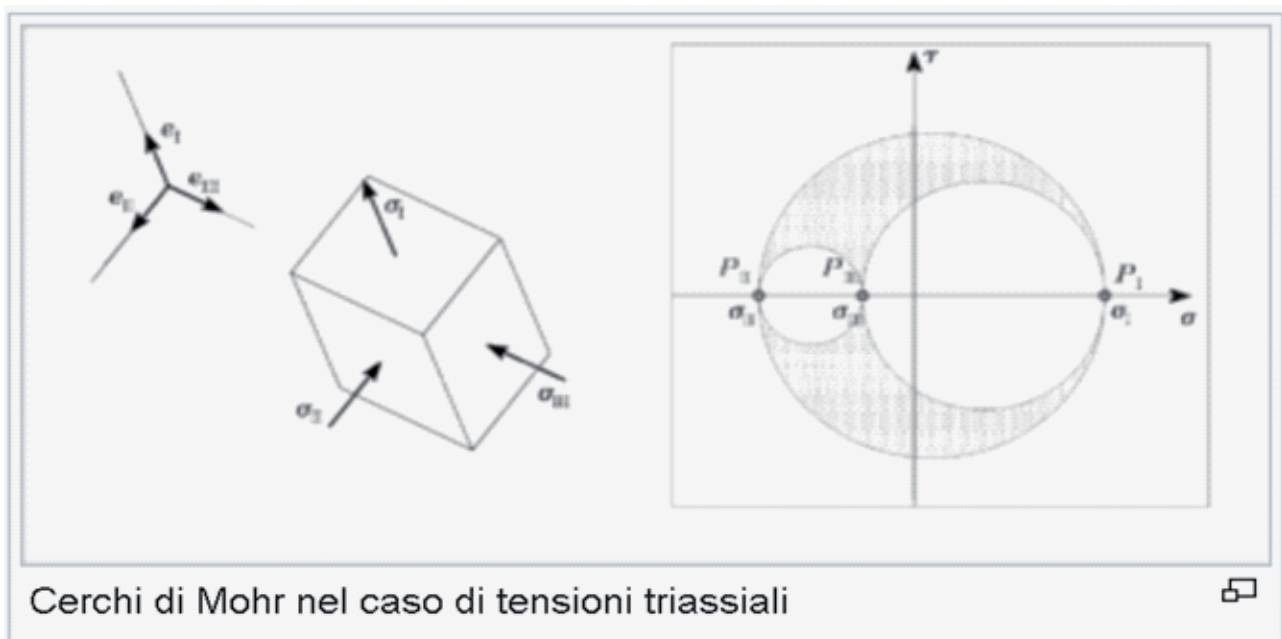
The idea of placing the crowns in the centre of the edges is not unusual. But I cannot identify a reason for the final choice.

I make nylon bindings. Quite big and pulled tightly. Then I coat with epoxy. If I am in a hurry, the first impregnation of the ligatures is made with cyanacrylic, Attak or similar, fluids, which penetrate well. Even under the crowns if they are not glued well.

I had already written about historical ferrules in PIPAM or in one of the old fly-fishing sites.

Conclusions

- 1) the tip of the crowns must be very thin or pointed so as not to concentrate the stress on the point of support on the bamboo.
- 2) It is an excellent strategy to extend the binding under the ferrule position. A smart solution is to place the coil there, which stiffens the section and creates the wrapping / hoop effect (this operation alters the shear strength and for the rods, for large deformations, the cut is a very important tension). The Mohr circles explain why well, practically you introduce a state of triaxial tension which in fact increases the mechanical characteristics of the wood (and transform a breakage due to the fraying of the fibres into a brittle breakage due to the limit of the tensile strength being reached, which is higher than the shear strength)



3) The effect of the ligature induces the presence of sigma 2 and sigma 3 tensions which enlarge the final circle and increase the strength capacity of the material. Have you ever tried to tie a rubber band around your finger? Same thing for bamboo. This Mohr's circles theory is an engineering and geotechnical fact that needs to be studied and pondered. In my university days it was not illustrated very clearly and many colleagues do not know how to use them. Without it, you can still live... If in the past they made countless bindings as well as compensating for the poor quality of the glue, it was also for this reason. And they did it even before the circles!

4) And what about: the glue, I use quick-setting epoxy for metal. In 5 minutes, the ferrules are fixed, permanently.

5) A good read about cracks:

<http://www1.unipa.it/giovanni.petrucchi/Disp/Meccanica%20Frattura.pdf> with the benefit of skipping the formulas and understanding the concept of concentration of tensions on the edges of the crack.

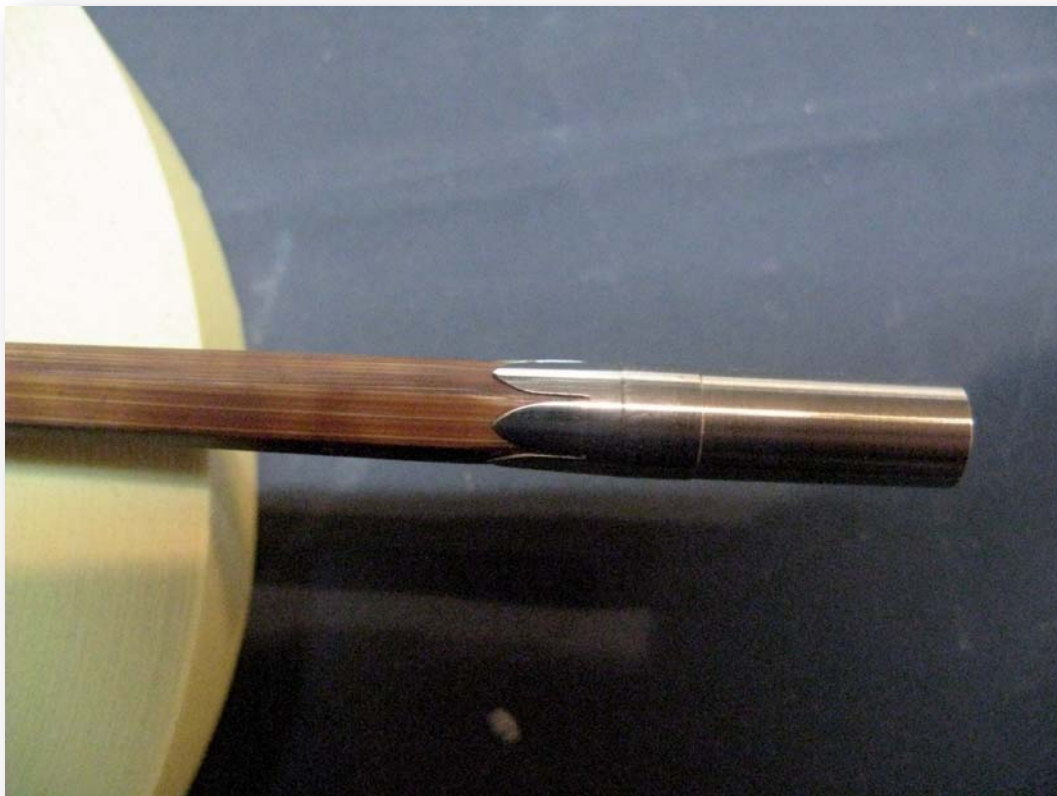
That is, even the cutter's mark can trigger a crack and start the breakage from there. Ah, even the badly cut foot of a serpentine! Refine these too. There was a beautiful story at the time of Fleishmann-Pons and the proponents of cold fusion who said that the hydrogen that is free inside the cracks derives from the very high pressures that are generated there and that in this specific case can detach and release protons from metal. This is not a very strange theory either.

P.S. In free cracks or in extremely bent stems, large deformations, the tension that stresses bamboo is the cut, the sliding between bundles of fibres, the cracking of the long needle section is a clear indication, otherwise if it were a breakage due to failure of the material in traction / compression, it would be a clean, compound fracture orthopaedic surgeons would say.

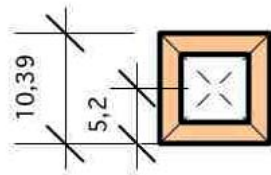
If the section is confined: wrapped by a sleeve, ferrule, tightened by a ligature, the easier breakage becomes "compound" because the ringing, encircling, prevents the fibres from sliding (the triaxial state seen above) and subjects them to breakage due to traction / compression, examples are the breakages on the cork, thanks to the metal ring, or under the ferrule.

In this case too mechanics and structural engineers try to avoid the rapid change of a resistant section. There tensions are concentrated, cracks and disasters are born!

The next topic will be the great deformations ...



Hollow quad section



Area: 67,13 mm²
I_{xx}: 833,40 mm⁴
C_{xx}: 5,20 mm
W_{xx}: 160,35mm³

from "sezioni a confronto"
by Gabriele Gori

*I for sure can be classified among the Web surfers, though of medium intensity.
I love browsing with no goal and recently I came across an unexpected encounter.
While looking on Google Images at several types of planning form - I use the Morgan Mill, but first love is never forgotten - I run into an unusual photo: a young girl who was very seriously planing a bamboo strip. This was unusual for two reasons. First, women who are involved in rodmaking can be counted on the fingers of one hand; perhaps on two hands if we take into account women busy in secondary activities. Secondly, even more unusual she is a "young" person!
Frankly, rodmaking is the domain of graying and white hair, the game field for lively retirees. A young girl? I carried on surfing the web searching for her. I found a well made web page with really good content. I also found a Facebook page very nice and well conceived.
In reading about her rodmaking I found very interesting, exciting elements and a very strong cultural aptitude for manual skills and a pragmatic spirit.
Then I thought, why not to ask her to write an article concerning her world and her "making"?
I got in touch with her and this is the outcome*

MOG

OLIVIA ELIA

RODMAKER



Hello I'm Olivia, and by the time you read this, I'll probably be twenty five. I'm a rod builder, and I'd like to share a little bit about myself and my journey into the world of bamboo so far. I grew up in South Dakota. If you're less familiar with the United States, that's the one below North Dakota. It's in the northern center of the country. The town I grew up in, Rapid City, has about 65,000 people, and it's the only town of that size within a five hour drive in any direction. If you should happen to drive in any direction from Rapid City, you'll quickly run into the flat American prairie, but the city itself is nestled among the foothills of a modest bump in the map: the Black Hills. The hills are home to bison, ponderosa pine, granite peaks, and some of the best trout fishing in the country. These hills are sacred to the Native American Sioux Indians. Unfortunately, I wouldn't fish those hills until some years later, after I'd moved away.

After my Sophomore year of high school, my family moved to Santa Rosa California, which is about an hour north of San Francisco. My family is my mom, dad, sister, cat, and me.

*My cat Luna laying
next to my first
bamboo fly rod,
2018*



My dad is Italian American, and originally from Philadelphia, Pennsylvania. He's raised us to hold on to the Italian traditions that he was raised with, like making ricotta gnocchi together. He's also a journeyman carpenter, and is always doing woodwork around the house. When my sister and I were 3 and 5 years old, he gave us a large block of wood, two hammers, and a box of nails for Christmas. I think his passion for woodworking is part of what led me to it. My mom has her own artistic streak. She loves to sew and craft, and she works as a librarian in the schools. When we moved to Santa Rosa, my sister left home to study math and physics in college.

I went to an arts-focused high school, and decided to study art in university as well. I received my Bachelor's in Arts from the University of California at Los Angeles (UCLA). Although I thought I'd be heavily focused on photography, which I loved and studied throughout high school, I ended up taking all sorts of classes and gravitating towards those that were more hands on. Some of my classes were Photography, Ceramics, Painting, Printmaking, Sculpture, Drawing, Bluegrass Ensemble (playing double bass), Cognitive Neuroscience and Psychology, Astronomy, and Italian 1-3.

In my second year at UCLA, I met my boyfriend Cory. He's the one who introduced me to fly fishing. Cory has been fishing all of his life, but at the time I'd never been. On my 21st birthday, he gave me a little backpacking rod; it was about a foot long and looked like a pointer that you pull out. When he gave it to me, he said, "Catch a fish on this, then I'll upgrade you." That night, we snuck onto a golf course by the school lake and went fishing, and ... I didn't catch anything. I ended up catching my first fish a couple of days later when Cory and I went fishing at a lake in Los Angeles, Lake Piru. I caught the fish on the small conventional rod, but with a fly. In order to throw the fly out, I had to put little weights in front of the fly. It was a bass; it might actually be the largest bass I've ever caught.



My bedroom in college at UCLA, 2017

I experienced a lot of emotion when catching this first fish. I'm not sure how I felt (and still feel) about putting a hook into a fish's mouth and then fighting it until I could reel it in. It was amazing to get to hold the fish, and to release it. I felt sort of in harmony with the fish, and grateful that I could catch it and release it back into the lake. It felt weird to me... but rewarding.

Cory kept his word. After I caught the bass, he gave me a fly rod. It wasn't anything fancy: a beginners St. Croix 5-6 wt rod that probably cost thirty dollars. There was also a low end reel. The next fish I caught was a surf perch at Santa Cruz Island. Then Cory upgraded me again to a nice reel. He didn't hold my hand as we went along (at least as far as fishing was concerned). He gave me the tools and said go. It was up to me to figure out how to tie flies, tie on the fly, build a leader, cast a rod, catch the fish, and to fall for fishing or not. And I did. That challenge got me hooked.



Lake Isabella, California, 2017



Los Vaqueros Reservoir, California, 2017



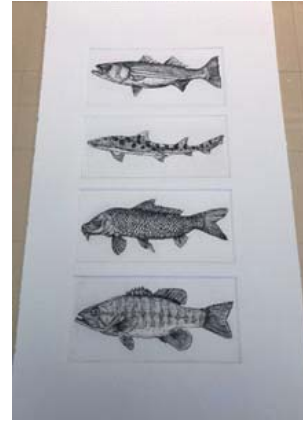
*Fishing the Trinity River in California,
2017*

Over the next year or so, Cory and I sought out all of the blue spots on the map of Los Angeles and tried to fish them (if there was actual water). At least once a week we'd try a new blue spot and see if we could fish it. It involved a lot of exploring, which is one of the things I love about fishing.



*Fishing at Will Rogers State Beach in
California / 2018*

I wanted to get better at fly fishing, so I started driving to the ocean before class to fish. Fly fishing started seeping into every part of my life, especially my art. In my senior year at university, almost all of the art I made was related to fishing. I made a series of fish inspired mugs, each one painted and modeled after the skin of a particular fish like striped bass, leopard shark, and brown trout.



*My Trout Mug
and Fish Prints,
2018*

I shot a session of abstract photos of my fly fishing rods suspended from the ceiling with fishing line. Most of my favorite documentary photos from that year were taken on fishing trips with Cory and my friends. I started connecting to other fishers, and read some great books featuring fishing like Trout Fishing in America.



Two galleries I was featured in, 2018 and 2019

After graduating, I began looking for jobs where I could combine fly fishing and art. The local fly shop in LA was having an expo, and I found a job as a female counselor for a fly fishing camp near Mount Shasta in California, called "Fish Camp".

This meant that the first time I'd be trout fishing, I'd also be teaching it. I headed up to Northern California a couple of days before camp started, to fish the rivers before the campers arrived. It was incredibly easy because they'd stocked them so full.



Antelope Creek Ranch, 2018

Being in California, near Mount Shasta was an unreal experience. Mount Shasta is 14,179 feet high (4,322 meters), and I remember thinking “Holy shit, that’s what a mountain looks like” when I saw it. Location is one of those great things about fishing. One day a bamboo rod builder named Russel Beck visited Fish Camp and gave a presentation to the campers about how he builds his rods.



I was amazed and whispered to my friend, “I’d love to do an apprenticeship with him.” My friend told me to ask; it worked. In November of that year, I was back behind Shasta to do an apprenticeship with Russel. Russ is mostly a hobbyist rod builder. He’s about 70 years old, he grew up in LA, and he’s a Vietnam vet. After the war, he worked as a machinist and built car engines, including the engine for the car with the land speed record.

The apprenticeship lasted two months, and I’d go almost every day for about four hours. Russ is a really humble, sweet, quiet guy. We’d listen to music while we worked in his freezing garage, especially Steely Dan. Over the course of the apprenticeship we talked more and more.



Russ working his Lathe, 2018



Russel's Pentagon, 2018

The first rod I made was something of a shock. I’d never really done any wood working before. There was so much potential, and so much behind the rod. Everything was brand new to me at that point, and all of the information hit me like a wall of water. I remember that first day, Russ told me about sharpening stones, and it was something I’d heard of, but never considered at that level of detail. Russ explained to me a lot of the physics behind the rods. He explained to me how to pick out the cane, and look closely at the power fibers. He had always built pentagon rods, but had me build a hexagon because it’s easier to plane initially.

We used no power tools, so he had me plane the strips from their initial rectangular shape. My favorite part was the planing. I remember how cold it was in this little garage shop. I would stand there with a space heater next to me, planing for hours and hours, trying to get the “zzzippp” sound of a perfectly fluid stroke across the bamboo.

Luckily, I kept notes from my lessons, because I was about to start earning some real woodworking bars and be able to put all of it to use. I had a job lined up at Kala Ukulele in the body building department after my apprenticeship with Russ. My experience with Russ had shown me how complex and fun the rod building world was, but as of yet, I had no way to keep going with it. I had no shop, no money for the expensive tools or materials, and a beginner's set of skills

Working at Kala was the right next step.

Kala Ukulele is the world's number one manufacturer of ukes. The company was started in Hawaii, but today nearly all of the ukuleles are made in China. Only the specialty and custom ukes are still made in the United States, in a small workshop in Petaluma, California. This is where I spent the next year and a half, working and learning about the process of building a musical instrument. I learned about how wood

reacts to different stresses: being glued, soaked, bent, and heated. I prepared the wood, I bent the wood, I created the sound bodies of the ukuleles. I routed the bodies and put binding on them. I did pretty much all the work up to the point of finishing the instrument with polyurethane.



*Custom Ukulele
I built for Emi Sunshine, 2019*

Lots of these were very delicate processes. It's not unlike building a fly rod. At the beginning, you have a task ahead of you that seems so large you aren't sure how you can ever manage it, but you just move straight ahead and do one thing after another, to the best of your ability, and you get there. Another way that it's like building a rod is that there is a lot of physics and mathematics behind it. That's something that I really enjoy about it. Over the space of a year and a half, I became one of Kala's top builders. I also

had the opportunity to do my second fly rod apprenticeship. While working at Kala Ukulele, I was continually searching for ways to get into the rod builders' community. I started cold emailing all of the local builders I could find out about, looking for advice on how to establish myself. Most of the replies were

disheartening. People would say things like "You won't be able to make a career out of building rods. Don't try, it's impossible to make it."

I felt where they were coming from after I saw all of the expensive equipment and time that went into my first rod. However, I got one reply from my soon to be mentor, Dave Dozer, that was totally different. Dave replied with about three pages of good advice, and mentioned an upcoming fly show where we could meet up. We talked at the fly show, and Dave offered to do an apprenticeship with me. I was thrilled that I'd get another look at fly rod building. Dave and his wife Mary-Ann are keystones in the fly rod community on the West Coast. Dave has built hundreds of rods (he specializes in tapers inspired by H.L.Leonard) and has had many students before. Mary Ann (who is now like a second mother to me) is 1 of 300 master casting instructors. I felt very lucky that I got to do this apprenticeship. Dave and Mary Ann live up in Sisters, Oregon, so I went to stay up there for my two week apprenticeship. I was much more prepared this time around. I had my experience with Russ and a year and a half of woodworking to back me up. I was ready to absorb everything Dave had to teach me.



Having the privilege to learn from Dave Dozer was probably one of the most life changing experiences of my life. As a teacher, Dave is very attentive and caring. Because of his intensive knowledge of building, he is able to describe and demonstrate each step to a very precise level. He knows exactly what he is doing, and why he is doing it. He is a wonderful teacher. I was able to ask any question that came to my mind and know that a) I wouldn't be judged if it was a dumb question, and b) Dave would have the answer and immense background knowledge to explain the answer. This time, I finished two rods and got half way through a third in about a quarter of the time.

I'm still a beginner, and have lots to improve on, but I already feel miles ahead of where I started.



*Me and Dave Dozer,
2020*

During the apprenticeship, Dave suggested that we tour a guitar company in Sisters called Preston Thompson. I emailed them, and Dave and I dropped in for a tour, resume in hand. Preston Thompson is known for its traditional style of building and its focus on detailed skilled craftsmanship. Their guitars draw inspiration from some of the best American made guitars from the 1930's. I really clicked with everyone there. By the end of the apprenticeship, I had two great new friends, a job offer, and one of the hardest decisions to make of my life. Moving to Bend would mean that I could continue to make rods in Dave's shop (Hallelujah! Thank you Dave!) and could learn how to make guitars with Preston Thompson and bring my woodworking skills to the next level. On the other hand, it would mean moving away from Kala Ukulele, my family, my cat, and Cory. I talked it over with my family and did a lot of soul searching. In the end, I decided to go for it. I wanted to keep pushing towards my dream of building fly rods and mastering my craft.

Philosophy of Rod Building:

Finely crafted bamboo fly rods evoke a feeling of artistry, quality craftsmanship, and tradition. My goal in building bamboo rods is to create a rod that will move exactly as the caster desires, a rod that dances to it's maximum ability. I hand build all my bamboo fly rods one-at-a-time. I invest upwards of 80 hours building each rod, and I am intent on superior quality and precision in my building process.



Planing, 2020

My tapers are inspired and adopted from those of historic bamboo rod builder Jim Payne. One of the main things that I learned from Dave and Mary Ann Dozer is how important your casting style is when it comes to the taper of your rod. After videoing and analyzing my specific cast, we learned that because of my casting style, having rods with crisp, medium-fast action would be the appropriate fit. Thus, I began to develop tapers based off of Jim Payne's. As I progress as a rod builder, I tweak my tapers more and more based on the person for whom I'm building.

I want to achieve a specific level of quality. I use the finest quality components on all my rods, and I turn all wood reel seats on my rods from hand selected figured hardwoods. I never try to rush anything. I want to create a work of art just as much as an amazing fishing rod.



I am also a fan of tradition. Today, owning, casting, and fishing a bamboo fly rod takes an angler back to an era where rods were built by talented rod makers. That personal craftsmanship and old-time tradition appeals to many anglers including myself. I like the idea of being able to build everything you use. Build a guitar to make music. Develop film to view a photograph. Build a rod to catch a fish. This philosophy is something that is constantly inspiring me.

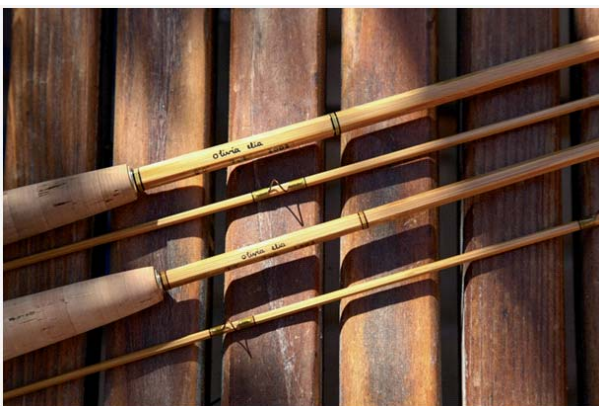
Moving forward, I want to learn as much as I can. I never want to feel like I have mastered rod building. I want to hear feedback and grow from each rod that I build.



Thank you for letting me share my story with you; I'm honored that I got the chance to tell it to some of the best rod builders in the world. I hope to become more and more a part of this supportive community, and maybe meet some of you one day in Italy, the USA, or somewhere else in the world.

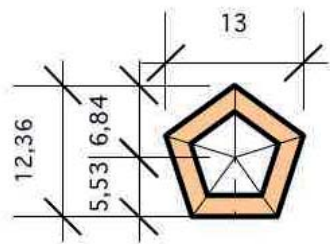
For now, this is where I am: building bamboo rods and guitars, playing some ping pong and some music, fishing when I can, and learning all the time.

My website is: www.oliviaelia.com and has images and videos of my work.





Hollow penta section



Area: 65,90 mm²
I_{xx}: 833,38 mm⁴

C_{xx1}: 6,83 mm
C_{yy2}: 5,53 mm
W_{xx1}: 121,93mm³
W_{yy2}: 150,69 mm³

from "sezioni a confronto"
by Gabriele Gori

THE RESTORATION CORNER

by Romano Godi

Vintage rods:

That is, ancient reeds; how many of us saw them when we were young, used by numerous fishermen on the banks of rivers or in large lakes, and maybe even tried them.

Rods often forgotten in the attic of some ancient building, they would have their own story to tell, and could still give us a lot of emotions if used why not? These tools are often considered as no longer usable and often end up decorating the walls of some tavern or room. Well; they are of considerable value, in my humble opinion, and could still be used for the function for which they were made in ancient times.

In this column I intend to illustrate my personal vision of the restoration of ancient rods, aimed at addressing numerous aspects with the intention of restoring their primary function of use.



Leonard-Mills 10'6" in 3 pieces, (circa 1908), a very slow action rod

Collecting ancient equipment since 1988, in particular for fly fishing, I have been able to examine many specimens, in the most varied conditions of conservation;

from those in perfect condition, since they never came into contact with water or with lines running through the rings, to those strongly compromised, both in the finishes and in their primary function.

This made me think, over the past years, how to best recover their original function, achieving with sufficient guarantee not to further compromise them during the fishing exercise, and adopting the general principle of maximum conservation of the various parts



Leonard 9'6" in 2 pieces, about 1930. 10' for 8-9 line

Types of rods and possible intervention categories:

In this specific section, I use as an example some rudimentary equipment from the past, not really made for fly fishing but for bait fishing: the Bolognese.

Designed and built in a relatively recent period, between the '50s and '60s, they brought several innovations; they were made with Nice cane for the first two sections, those of the butt and that of the middle, while the tip was made of bamboo.

In the photo below some examples of fully restored Bolognese rods by Macchi-Stomarchi.



"Bolognesi" by Macchi -Stomarchi 6m in 4 pieces and 5m in 3 pieces

I wanted to include the Bolognese because the materials with which they were made are the same that were also used for the "Valsesiane" rods, and although they were tools of a completely different conception, they have similar problems during the restoration.

Many restoration operations on this specific tool, such as the removal of the varnish with varnish strippers, are possible without compromising the structure of the blank.

In hexagonal rods, the use of varnish strippers can compromise the structural integrity of the blank, favouring a quick degradation of the adhesives used to glue the strips.



The example in the photo above shows a Bolognese rod by Vigarani-Paolucci, without rings and completely restored by removing the original varnish and replacing it with a spar varnish. This manufacturer, in fact, used a varnish particularly subject to aesthetic degradation, and also removable with denatured alcohol.

Categories of intervention according to the state of conservation:

Before the restoration of ancient equipment, we think about how it might have originally appeared when it left the factory or shop.

Often this investigation is very difficult due to the wear of time on the various materials, which inevitably causes a deterioration at least in the appearance of the rod and the difficulty, for example, of tracing the real shades of the wrappings.

A phenomenon of aesthetic degradation may be found on the handle and on the parts most exposed to wear, such as wrappings and rings.

Main degradation phenomena that occur:

- yellowing and cracking of the varnish
- loss of adhesion of the wrappings to the blank
- oxidation of the rings
- fractures of rings in agate and / or other materials
- dislocation and fractures of the joints and ferrules
- delamination phenomena of the strips
- non rectilinear course of the blank sections
- phenomena of bamboo rot due to previous infiltrations in correspondence with the wrappings or along the gluing lines of the strips

Often the choices that can be put in place in the restoration depend on the most varied factors, both on the final decisions of the user, and on the state of conservation which, if too compromised, determines the impossibility of adopting even minimal interventions.

In my personal opinion, I face these problems from the point of view of "conservative restoration", that is a type of intervention aimed at maximum conservation of all the original parts of the rod, maintaining in many cases even parts that are not optimal, but still able to fully perform their function.

It all depends on what function you intend to use the rod for. In this regard, many collectors tend to want to keep the original varnish, albeit degraded, as they believe that any posthumous restoration can be considered a falsification of the original appearance.

These represent choices of those who prefer collecting to a possible use of the rods.



a LEONARD MILLS 9'6" with rattan handle

There are some cases in which, to ensure sporadic use, it would be necessary to verify the integrity of the wrappings and rings also by means of non-invasive structural tests.

For example, it is possible to perform an empirical verification of the conservation status of the wrappings by subjecting the rod to a slight bending after inserting a nylon thread (e.g. 0.30 mm) through the rings. In this way it is also possible to verify any sections of the blank that flex more than others, therefore possible structural problems, even if not visible at a first analysis.

In this way, the structural criticalities of the raw material are highlighted, in most of its length, thus making it possible to make more informed choices to be adopted during the conservative restoration.



*A Hardy Phantom
(note the final part
of the tip with
structural problems)*

In the previous image, we see the final part of the tip, apparently in good condition, which, subjected to a slight bending, reveals a structural failure of the blank in adherence with the ring.

In this case of structural degradation, there is the danger of fracture, also considering that this specific part of the blank is normally subjected to greater bending during casting and fishing.

A possible intervention would be a joint with another part of another blank to restore its length (scarf joint).

In any case, this is an intervention that could the loss of a considerable part of the value of the rod, but in this specific case necessary for its use. This particular criticality is generally caused by an anomalous bending: when you have a fish on the rod and you force yourself to make an acute angle with a rat's tail at the upper end of the tip, a concentrated yield is thus exerted on a specific part of the blank.

Check the condition of the wrappings and rings:

As already mentioned, the wrappings and the rings remain among the most sensitive parts of a bamboo rod to deteriorate over time.

At the beginning of the twentieth century, materials were used that were frequently found in tailors, such as cotton and silk yarns whose warp was not always compatible with use in rodmaking. These yarns were wound on the raw material of the rod and initially fixed with glues of animal origin, before the final varnishing.

A first check of the state of these wrappings consists in exerting a slight lateral pressure on the rings. In this way any slack in it and the loosening of the coils of the wrappings become evident even if no criticality emerges from a visual analysis. A further check of the state of the wrappings at the feet of the rings is advisable: any water infiltration would be inevitable in both cases. Any cracks in the varnish at the feet of the rings indicate potential slackness on the blank.

Possible interventions:

- Stripping of the wrappings using a varnish remover and quickly exerting a slight mechanical action, taking care to make a movement in the direction of the coils, and not transversely
- disassembly and replacement of degraded wrappings
- if the state of the wrappings isn't an issue, we can intervene with a very fine-meshed steel wool, to opacify the varnish, and then revarnish the treated part.

Degradation of the handles:

The handles of ancient rods are very varied:

Unlike nowadays, at the end of the 19th century noble materials were used, such as woods and leathers that could be sewn onto a specially prepared base.

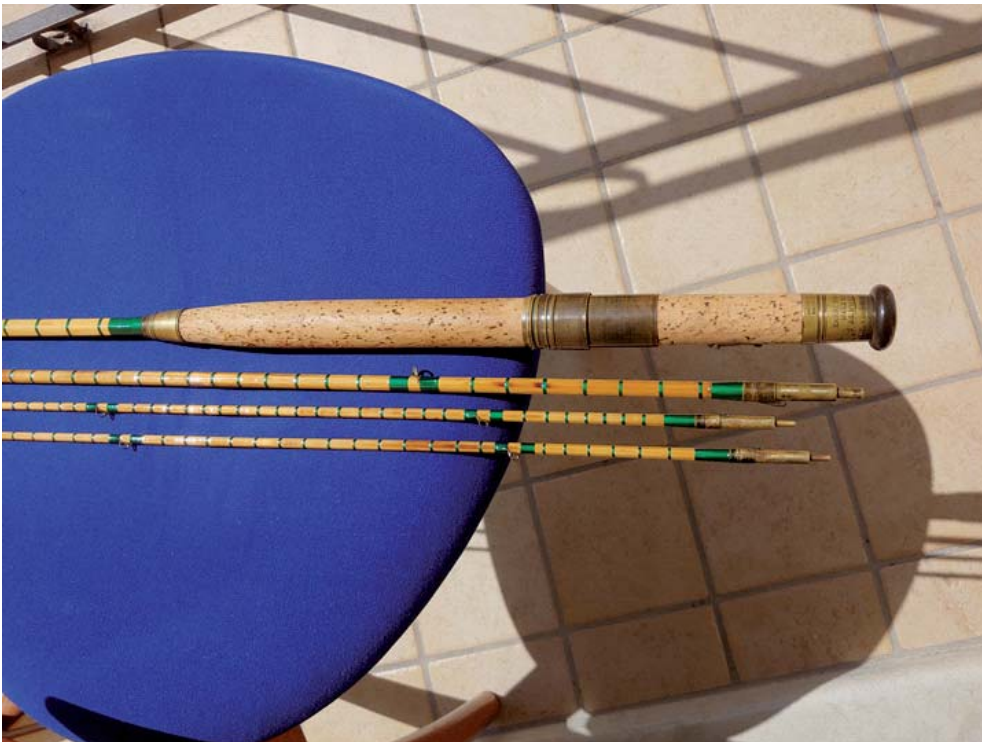


*A Leonard – Mills (about 1905)
9'6" with rattan handle and
bamboo tip holder*

In many Leonard-Mills rod handles, for example, Rattan was used, which was wound in tight coils and glued to a cork or wood base.

After the beginning of the 1900s, the use of cork as the optimal material for the handles became more widespread, as it allowed an easier construction than other materials.

The structure of these was very different from the present one; a specially prepared base was formed on which a whole top quality cork leaf was first wrapped and glued, and then moved on to the final turning and grouting. The result was a handle free from harmful defects and without any type of visible joint.



*A 1894 Hardy Tournament,
with one of the first handles in cork leaf, recently restored*

Subsequently, due to the scarce availability of quality cork leaves, it was decided to work the handles using previously drilled washers, which were glued together and the blank of the rod, to then move on to the final turning and grouting, thus obtaining the desired shape.

This method is still adopted, which allows to use many more raw parts of cork, with less waste during the manufacturing process.

Today's glues used in the assembly of handles, such as epoxy ones, allow performances that were previously unimaginable both at a structural level and for their resistance to humidity. In fact, glues of natural origin quickly lose their mechanical resistance characteristics in the presence of humidity, as well as quickly losing their elasticity.

Degradation of the handles and possible repairs:

Cork handles generally have residues of use that strongly alter their appearance;

These can mainly be treated in the following ways:

- expose the handle to a jet of water vapor, in order to soften the part to be treated and eliminate the presence of any depressions (e.g., marks left by the reel seat and / or sagging)
- subsequently use a degreasing detergent (such as anionic surfactants, detergents, etc.), having previously wet the surface to be treated, taking care to perfectly isolate any varnished parts of the blank and the reel seat
- quickly remove the degreaser using a non-abrasive cloth and passing the handle again in a light jet of water
- If necessary, work the handle with an abrasive paper from 800 to 1200, if necessary, to reduce abnormal depressions
- Following the previous point, fill those damaged parts with a mixture of cork, titanium dioxide and low viscosity epoxy glue.

Other forms of deterioration may be present in the form of fractures and missing parts, which involve its removal and / or remaking.



A 14' Leonard, from the '30s, before and after a partial restoration of the handle

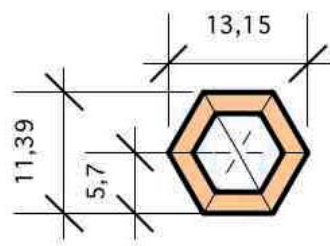
In the next article this aspect will be examined in depth, and some interventions to replace some heavily compromised parts.

Here ends this first part, with the hope that it will be useful to those who intend to recondition their ancient tools.



A 1914 Hardy Palakona, restored

Hollow hexa section



Area: 65,07 mm²
I_{xx}: 833,31 mm⁴

C_{xx}: 5,70 mm
W_{xx}: 146,24 mm³

from "sezioni a confronto"
by Gabriele Gori

A simple modification of the Garrison binder for quadrate rods

by Marzio Giglio



If you make quadrate rods and use a Garrison binder, it is likely that you will agree that quadrate and the Garrison binder do not get along well. The square geometry makes the rod “jump” on the cradle when each edge goes through, and if you crank on the wheel slowly, you feel that the tension on the driving cord increases at the passage of each edge. The worst problem however arises because the two adjoining 45 degrees edges of the bamboo strips are easily damaged because of the rubbing (under tension) against the cradle.

I have spent in the last few years an unreasonable amount of time and energy to generate a new method to produce tapered bamboo strips with a new all manual method somewhat along the old and forgotten method of the Former Beam. Strips are planed while resting on tapered grooves on one edges of a square wooden beam. Planing is done with an iron 90 degree fence plane with skew blade, and strips with immaculate edges are produced. Therefore I felt quite disappointed to see that the glued up sections invariably showed indentations and fiber damage along the edges. All this prevented from obtaining what I had in mind, that is a rod with small fine edges, and four well centered strips with bamboo natural curvature on the faces. This is why this small additional project did start!

The modification is very simple to implement. If you already have a Garrison binder, keep everything as it is and just replace the four arm cradle and substitute it with a ball bearing mounted perpendicular to the rod, so that the new cradle is the free rotating inner ring of the ball bearing.



Fig. 1 – My rendition of the classical Garrison binder with wheels, cord and crank.

I show in Fig. 1 my rendition of the Garrison binder, where the cradle has been replaced by the ball bearing. A clearer view of the ball bearing and how it is clamped at the proper height can be seen in Fig. 2.

Notice that the ball bearing is clamped in place by a screw that tightens the small crack on the wooden fixture. Fig. 3 shows the view from the back of the ball bearing. Both last photos show the multiple turns of the driving white cord resting against the bottom of the inner ring of the ball bearing.



Fig. 2 – Front view of the ball bearing.



Fig. 3 - Back view of the ball bearing.

The photos are self explanatory and require little more to be said. See the few points listed below:

The ball bearing dimensions I use are I.D. 20 mm, O.D. 47 mm and thickness 19 mm. But the choice is non critical.

The mounting for the ball bearing. You see some of the details of the piece that holds the ball bearing in place in Fig. 2 and 3. A hole has been cut with a hole cutter on a 20 mm thick strip of wood, the diameter being close to the ball bearing outside diameter. A cut is made along the side of the horizontal diameter, so that the clamping of the bearing O.D. is done via a 6 mm bolt that engages with a threaded insert glued below the cut. Removal the ball bearing and associated driving cord can be done by unscrewing and removing the fastening bolt, slipping out the ball bearing and slipping the cord through the saw cut.

The driving cord. I never mentioned before, but the method requires that the loop of the binding cord must be threaded across the inner ring. With the classical knotted loop, as usual, you want to make the knot as inconspicuous as possible to prevent jamming. I suggest to use a double Chinese cuff knot.

Binding can be an all in one shot disaster. Therefore I always bind having a spare ball bearing with a binding cord threaded and knotted through the inner ring. Just to be sure in case anything goes wrong and I can move fast.



Fig. 4 - Cranking brass wheel with multiple turns of the driving cord.

Initialization procedures. Maybe you do not need to read this. To get into the situation depicted in Fig. 1, I suggest the following. Have the binding cord straight more or less across the inner ring. Then place the glued up strips so that they protrude from the ball bearing by a couple of inches. Then place multiples turns onto the strips. Then pull on one side of the cord while keeping tension on the other while the cord is wrapped along the guiding wheels and the cranking wheel.

The weight at the bottom will take care of putting everything into tension and remove any slack.



Fig. 5- Final double wrappings with tying cord.

Placement of feed of the binding cord. Feed the binding cord under the last turn of the driving cord. I feed from above of the ball bearing. Adjust tension as usual.

Clean up procedures. I use thick epoxy glue, and rather sparingly. I hate to have excessive glue around. Still, some clean up is necessary. The use of a ball bearing with sealed races is fundamental. Wipe the ball bearing clean, and wipe the driving cord repeatedly. Usually it is not necessary to demount the ball bearing and associated driving cord. If you have to do it, it can be easily done. Be sure that the inner ring is absolutely clean after use.





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www.rodmakers.it
ibra@rodmakers.it

§

Editor Bamboo Journal
www.rodmakers.eu
editor@rodmakers.it

