



WOOD FORUM

Newsletter of the Sonoma County Woodworkers Association

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May 2019

Arts and Crafts

Our guest speaker this month is Michael Wallace, who has been a sometimes member of the SCWA over the last 12 years. After having a 30 year background in IT, with jobs at Oracle, Apple, Symantec and RCA, plus contracting gigs with several startups that went nowhere, Michael moved to Sonoma County in 2002 and soon joined the SCWA. He received some woodworking training at the Woodworker Academy located in Alameda. While he learned a lot there, he acknowledges that his skills still need some refinement. However, over the years Michael developed a strong interest in woodworking history. In 2017, he gave a presentation to the SCWA on Mid-Century Modern Furniture. This time he promises to deliver an equally great presentation on the acknowledged masters of Arts and Crafts - Gustav Stickley and the Greene brothers.



The presentation traces the development of these men through their training, businesses, and accomplishments. When the Arts and Crafts movement came to the US, these men quickly came to epitomize the movement. The presentation will look at the ways in which they shaped what we know as Arts and Crafts design. We will delve into their personal lives, see how they worked, and what happened to them when the Arts and Crafts movement ended in 1920. There will be a discussion about the furniture that they created, and it might be surprising to learn that perhaps it wasn't all designed by them.

When: 7pm, May 7, 2019

Where: 180 Studios in Santa Rosa



SPALTING

by Joe Scannell

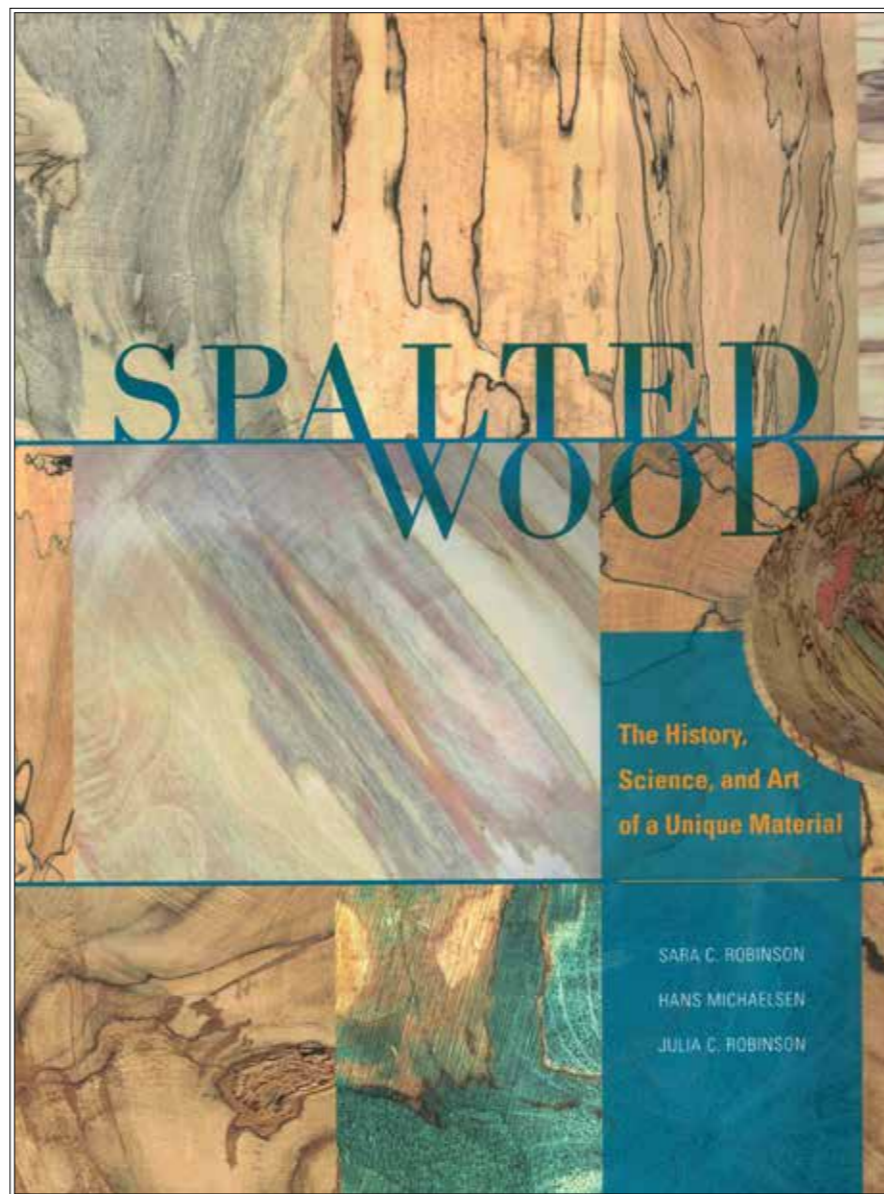
Our Tuesday evening monthly membership meeting began with Show Chair Don Jereb calling attention to a recent article in the *Press Democrat* about our member and renowned luthier Andrew Carruthers. (The article may be viewed online at <https://www.pressdemocrat.com/entertainment/9280615-181/why-this-santa-rosa-violin?sba=AAS>).

Mike Center reiterated his announcement of last month that **180 Studios** is seeking two volunteers to help out in the evenings in the shop space, in exchange for complete free membership. Contact Mike for more information.

Guild Chair Mark Tindley introduced our evening's guest speaker, Seri Robinson, aka Dr. Spalting. Seri is an assistant professor of wood anatomy at Oregon State University and a recognized authority on mycology and how fungi affect wood in tantalizingly beautiful ways. Seri has co-authored a magnificent book on the subject, which includes enormous historical research into the usage of spalted wood, especially in marquetry, going back hundreds of years. The tome is filled with gorgeous photographs of modern work as well, and in Mark's opinion deserves a place on every woodworker's bookshelf.

Seri has been a woodturner for 25 years, and produced many of the pieces seen in the book.

Seri began the presentation by establishing a definition of spalting. It is decay of wood caused by fungi. In the process, one or more colors are



imparted into the wood. Seri emphasized the distinction of *into* vs. *onto* the wood. There are molds that can make color changes on the surface only, but these are also often airborne health hazards, and the colors are not stable.

Spalting fungi are decay fungi that excrete enzymes that can break down wood and release pigment *into* the wood. Spalting is also distinct from the well known phenomenon of the boxelder tree that imparts red streaks into its wood. That occurs in the living tree, does not involve decay, and the color is not light stable.

There are three types of spalting. *White rot* is often overlooked when discussing spalting, because no flashy color is generated, but on a dark piece of wood, walnut for example, the effect can be quite spectacular.

The second type of spalting Seri calls *zone lines*. Seri emphasized they should not be called black lines, for often they are not black, but can be brown, orange, purple, green, yellow, or another color. Zone lines are areas of interaction between two fungi, where they seem to erect this “barrier” between themselves instead of constantly fighting with each other. The lines are melanin, the same substance that produces hair and skin color in humans. Most zone line producing fungi are white rot, which is why the wood next to those spectacular zone lines is frequently also quite punky.

The third type of spalting is *pigmentation*. Seri describes the various fungi defense strategies as “eat and go,” put up lines and stay awhile, and third, to make the wood so toxic no other fungi can live in it. A common example of this latter is blue stain, but there are others, in a rainbow of colors. Another example of pigmentation is seen

in English brown oak. This is not a species of oak, but simply oak that has been infected with a specific fungus that turns the wood a medium brown, but at the same time causing only minor decay.



Shoe Storage Bench by Larry Stroud, 2017; English brown oak, spalted maple

Seri projected a series of slides showing how long spalted wood has been used by artisans, starting with a marquetry panel dating from 1478-82. In those days chemical dyes were nearly non-existent, but woods could be found that provided most colors in the spectrum, with the exception of blue-green. Fungi to the rescue! The *chlorociboria* fungus provided the blue-green wood the marquetierians were after. Interestingly, after more than 500 years, these panels have all resolved to mid-range browns, except for the chlorociboria-affected woods, which remain green.

Seri pointed out an example in one slide of some man-made “marble” used in a marquetry panel. The artist took some spalted wood shavings and glued them up with shavings from some sound wood, then sliced the package into veneer that looked remarkably like marble.

By the 1700s the use of wood colored by microorganisms began to wane as chemical dyeing became more common. Much of what was known about pigment spalted wood was carried to the grave by the guilds who “owned” it. In fact, it was only about 20 years ago that art restorers discovered that the green in those old marquetry panels was from a microorganism and not some dye.

In the 1960s, studio woodturning was coming into its own, with many craftsmen pursuing unusual avenues. In 1977 *Fine Woodworking* published an article by Mark Lindquist about the use of spalted wood on the lathe, and enthusiasm for the material really took off. However, most of the popularity was due to the eye-catching zone lines, and pigmentation spalting remained virtually unknown.



Desk of Claude Monet at Giverny

Photo by Jose Cuervo

The first requirement for DIY spalting is water. Without it, the fungi die. An interesting concept Seri mentioned is that if you have a dry piece of wood, and wet it only in certain areas, then it will only spalt in those areas. Spalting is all about controlling the variables; the fewer variables, the more reliable will be your outcome.

Similarly, fungi need oxygen. So putting your wood underwater will prevent spalting.

Wood to be spalted can be inoculated with “infected” wood plugs or sawdust or the like, but there are better ways. Zone lines usually require two or more species of fungi. But zone lines come in different thicknesses and colors. The trick is to know which species to combine to obtain the effect you are after. Seri devotes a chapter in the book to DIY spalting, with suggestions about which combinations of fungi will produce certain types of zone lines and other effects. One interesting idea Seri mentioned was circular zone lines, which are formed when the wood is inoculated with two fungi of slightly different vigor. The more powerful fungus

keeps attacking and encapsulating the other one each time it tries to establish itself, resulting in circular patterns.

Seri absolutely never recommends trying to spalt outdoors because of the difficulty in controlling the variables. Even if you could somehow control the moisture and temperature, you are still confronted with other foreign fungi that can upset the process in many ways, including killing your preferred fungus.

Spalting is a stress response. It is counter-productive to provide your fungi with excessive food resources (such as the malt agar Seri recommends using to cultivate your starter colony of fungi). As long as the fungi have the culture medium to feed on, they won't have any reason to feed on your wood. Remember, the goal here is

to produce pigment, not rotten wood. Stress the fungi with competition, and they will produce pigments to render the wood inhospitable to foreign fungi.



Photos by Jose Cuervo

Spalted madrone bowl by Alan Brickman, 2014

Seri relies on laboratory conditions to produce much of their spalted wood. Seri described the technique of extracting pigment from wood, which is then used almost like paint, applying it selectively to the project. Starting with white-rotted wood chips that have been sterilized, they are added to a malt agar medium. The wood chips contain no living fungus, but all the chemical signatures of the dead fungus are still present. This is inoculated with a fungus, such as *Chlorociboria aeruginascens* (elf cup). This fungus, sensing the far superior white rot invader, begins rapidly producing pigment to protect itself. Of course, a bunch of green rotten wood chips aren't very useful. But then Seri immerses the chips in a solvent such as dichloromethane (a paint stripper), which leaches the color from the wood. It is then poured into small bottles, from which it can be used immediately. Or the bottle can be left uncapped until the solvent evaporates. The pigment is left as a film on the interior glass, and since it is non-volatile and non-living, it can be

sent through the mail. This is what is done at www.northernspalting.com, which is associated with the Oregon State University lab. The customer has only to add her own solvent (dichloromethane or acetone) and she once again has liquid pigment, ready to use.

There are multiple advantages to this method. As you will recall, spalting is an excretion by the fungus into the wood. You can grow the fungus on the workpiece and let it do its own excreting, which can conceivably take years. Or you can follow the steps outlined in the previous paragraph, which speeds things up. Or you can buy the pigment from Northern Spalting, who have done all the work, and you can have color in a



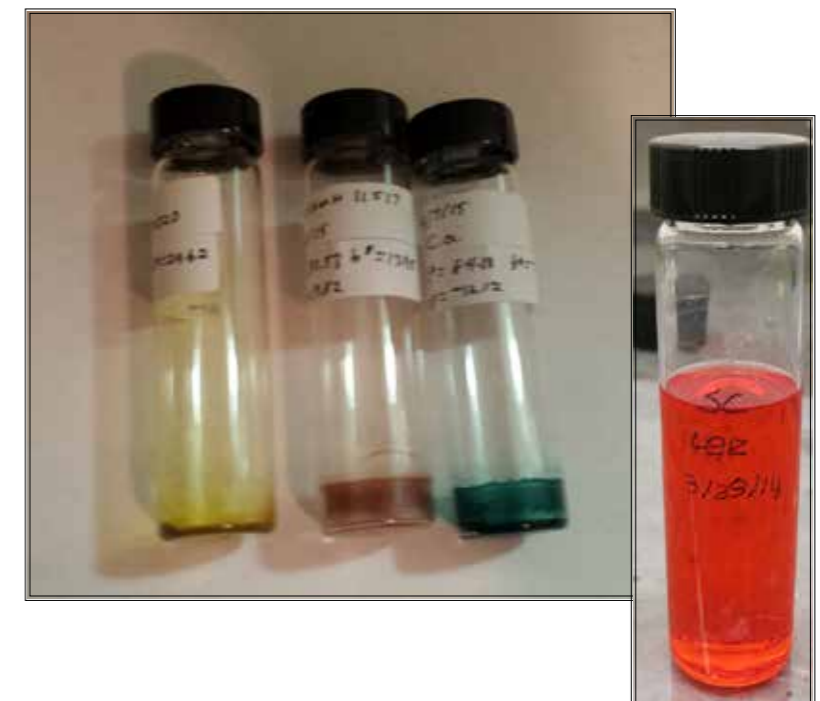
Dr. Seri Robinson

Photo by Jose Cuervo

These pigments have application far beyond woodworking. One of the first grants given to the lab where Seri works was from Walmart, who wanted to develop a dye-ink to be used in ink-jet printers to print on textiles. Other areas where the pigments have become useful include solar cells, bio-markers, batteries, decking protectors and paint.

few minutes. The results are visually the same, and the durability is the same barring water intervention. Another huge advantage is that there is no decay of your wood.

Seri's lab makes use of three primary pigmenting fungi to produce a range of colors. The three produce red, yellow, and blue-green pigments. The chlorociboria (elf cup) fungus produces the blue-green pigment. The red fungus starts excreting a somewhat orange pigment, which then becomes red, then blue, and finally purple, all based upon concentration. The yellow fungus starts off yellow, then goes to green, then to brown, then to purple.



Thinking of trying spalting from scratch? Turkey tail is a fan-shaped fungus that is found nearly everywhere. To collect it, look for fresh, fluffy growths; if they're dried out, keep looking. It is a white rotting fungus that pairs nicely with Winter Polypore, *Polyporus brumalis*, a "mushroomy" looking fungus, brown on top, white underneath, with pores (not gills) on the bottom. Together they produce nice medium width black zone lines, an easy project for a beginner.

Starter fungi can also be purchased from one of the many fungi banks around the world, but Seri cautions that you should inquire how the fungi have been stored. Pigmenting fungi that have been in cold storage for a long time may simply stop producing pigment. The Northern Spalting website offers plates of many different fungi for sale at reasonable cost.

Most spalting fungi are adapted to hardwoods. The brown-rot fungi that grow on conifers are unsuitable for hardwood use because they will happily invade your hardwood pile and reduce it to a pile of brown rot. Do not use conifer fungi!

Whether collecting your own fungi or purchasing them, you need to grow them for awhile on a growing medium that provides enough nutrients to get a good sized colony going. If you've ever done any canning at home (jam, applesauce, etc.) you're already half way there. Seri has DIY instructions on the Northern Spalting website, so refer to that for the details, but the idea is to first mix a batch of unflavored gelatin with barley malt (beer-making supply house), put the

mixture in canning jars, and go through the canning process to sterilize your media. Then you carefully lift the lid on each jar and put a small amount of your starter fungus onto the media and reclose the jar. Put the jars in a warm dark place, and in a couple of weeks you will have some nice mayonnaise to smear on your wood.

Seri stresses the importance of maintaining sterile conditions during the process. Since fungi travel easily in the air, it can be difficult to avoid contamination. In

some fungi on it that you don't want in your inoculum. Consequently, this approach has a rather low success rate.

Instead, Seri pushes the scientific method, which means that you obtain a plate of a known fungus, reproduce it in your canning jars, and use that to inoculate your wood. If you want to use two or more fungi on your wood, start with plates of known fungi, grow them separately in their own jars, then smear them on your wood. The idea is to keep your combatants apart until they meet on the battlefield (your wood).

Seri suggests using plastic bins with covers to conduct your spalting. When making your jars, don't be tempted to fill them up. A thin layer in the bottom, like the petri dishes the fungi are sold in, is better because less food = more stress, leading to better spalting. Another temptation to be avoided is diluting the inoculum and spraying it on your wood. This dilutes the food so much that the fungi cannot compete with airborne molds. Results are better if more than one piece of wood is used, because the idea is to pack the wood tightly together, with a thin layer of inoculum in between. Moistened vermiculite can be packed around the wood to help maintain the moisture content.

The evening's presentation evolved into an extended Q&A session, with many thoughtful questions on spalting and using the prepared pigments. The members seemed filled with enthusiasm for trying the process, and Seri was thanked with a huge round of applause.



Aged to Perfection by John Cobb, 2017



Artistry in Wood 2013, maker unknown

using field-collected specimens, the problem is that you don't know if your specimen is the only species going into the jar. Parasitic fungi may be going along for the ride, which will get you nowhere. The same is true of using a piece of spalted wood as your starter. There are most likely



Lie-Nielsen HAND TOOL EVENT





Kevin Glen-Drake of Glen-Drake Tools in Fort Bragg was on hand, demonstrating his unusual and beautiful handsaws, hammers, and marking tools.

Ron Hock was there too, showing his legendary blades and stones.

There was more than tools on display at the Lie-Nielsen Tool Event. College of the Redwoods had some work on display.



Renowned wood finisher Joe Amaral also came over from Fort Bragg, not selling anything, just there to share his knowledge. We discussed lacquer and, of course, his amazing use of straw, which he imports from France, splits and flattens with an iron, and uses as veneer, as seen above.



Photos by Jose Cuervo



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Wood Forum is the monthly newsletter of the Sonoma County Woodworkers Association. Please feel free to submit articles and photographs for inclusion in the publication. You can send your submissions to the Wood Forum Editor at SCWAEditor@gmail.com. Advertisements are also accepted with a nominal cost for paid members.

Membership Application

I would like to join the SCWA to meet other people interested in the craft, the art and the business of fine wood-working. Enclosed is my check in the amount of \$35 for the annual dues. I understand that this fee entitles me to attend monthly meetings and to receive the Wood Forum newsletter by email or via the SCWA's website.

Name _____ Email _____

Address _____

City, Zip _____ Home Phone _____

Cell Phone _____ Work Phone _____

What can you do to help further the organizational goals of our volunteer-run association? Please tell us how you would like to help:

Please send check and completed application to:

Sonoma County Woodworkers Association, PO Box 4176, Santa Rosa, CA 95402