

## Finishes for Wood, Antler and Ivory

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(by Samuel Rediske) Finally, something that I know a little about, or at least I know what not to do with what I use.

Finishes sort of depend on the project, if its out-door furniture that my kids will climb all over then I wouldn't use the same thing as I would use on a wood netsuke, or a lacquered box.

Here is an outline of the finishes that I most commonly use with some of their good and bad points, other traits etc etc.

I avoid most modern lacquers/finishes, I don't mix different finishes or solvents on the same projects, because the solvents in one paint can lift and destroy the previous coats of finish, its called paint reaction and it can ruin your day, if you have ever used paint stripper with Methelene Chloride it looks like that when it happens.

I personally use kashew, urushi, shellac, and rosin. "Kashew" is a good lacquer that I order from Japan, its base is an organic oil, and catalyses to a hard finish, it goes through a chemical reaction that makes it less prone to damage from acids, solvents, heat, and moisture, and is easy to thin with lacquer thinner and turpentine (among others). It can be bought in colors or you can purchase pigments and mix your own. It keeps well, when cared for properly

Urushi is pretty well known, it is made from the sap of a tree related to the poison sumac, Rhus vernificera, can cause rashes (rather nasty ones sometimes) can be thinned with a couple of different oils depending on what you are going to do with it. The lacquer only cures when exposed to high humidity( it fully catalyses) and is not U.V. light tolerant. This is hands down the most expensive lacquer, but it can also be worked with WITHOUT SOLVENTS, since there is no solvents to gas off, the lacquer (for the most part) retains its original film thickness after it has cured. But the first few coats can take weeks to cure, and the lacquer is naturally as dark as soy sauce when cured. Also it doesn't store well.

Shellac is a wonderful finish, one of my most favorite for stuff that doesn't require a glass like lacquered finish, although you can achieve a great glass like film if you choose to. It can be bought easily, it can be

hand rubbed, sprayed, padded, and brushed on, it will stick to even the most oily of the exotic hard woods, is cheap relatively, you can use a solvent, that when mixed with some home made ginger raspberry soda and a lime makes a great drink, ( food grade grain alcohol), the down side /up side is that the finish is soft, and prone to water/beer/wine damage, but it can be repaired and touched up as this finish never catalyzes, just use a bit of solvent on a cloth and you can blend blemishes away. Also if you don't like the finish its relatively easy to remove. It can be bought pre mixed or you can buy it in flake, chip or chunk form, in all varying grades and colors. It keeps well.

Rosin, simply, it pine pitch without the solvents or oils, basically it looks like amber. I buy it in chunk form, it is the softest of the "finishes" you can mix it with turpentine and apply it as you would shellac, it keeps darn near forever, if you heat it and mix it with a small amount of oil, oil tar, and or wax you will make an old fashioned glue that has been used around the world, but in Japan its called Kusune, use it kind of like you would hot glue, but the things to be joined need to be heated just a bit to get good adhesion, there are two mixes, one for the hot summer, that is "hard" (more rosin, less additives) and one for winter that is "soft" ( slight bit more additives). A similar formula is ( or used to be, I quit watching years ago) used in professional baseball on the handles of wood bats for added grip.

**Question:** (by Doug Sanders) I've thought about purchasing a can of cashew lacquer... When you use it, have you done any polishing after application, as with some urushi finishes?

**Answer:** (by Samuel Rediske) In a perfect world, you could skip the final polish, that is, painting area without any dust, but there is always some spot somewhere that is not perfect, so I suppose that for high gloss finishes I do rub them out and polish them. But for quick thin finishes on ( i.e. thinned down with solvent or rubbed on to the work with some sort of cloth intentionally thin) it doesn't need much polishing as the first couple of coats soak in.

Question: (by Janel) How do these finishes work for sculpted surfaces? My sort of work, small sculptures, or carvings. Here are a few that may have benefited from an alternative finish. Here's a sampling:





The two frogs on the left are from boxwood. The left one was stained. Both were buffed with a small cotton wheel and oiled, and buffed again when the oil had dried after many days. I know that the middle one was old boiled linseed oil. The other may have been a lighter weight oil, can't remember. The one on the right was buffed, and perhaps used a different linseed oil for painters. Again, I cannot remember.

Some woods seem to continue to be sensitive to hand moisture even when the oils dry. A coating that would penetrate slightly and seal the wood has some intrigue, such as the potential for the cashew or cashew with a thin application. I only want the surface protected, not a buildup of material. (I got away from that look when I left porcelain carvings that were glazed, uuphfff and shudder.) The look and feel of the wood is still desired.

Is cashew from the nut called cashew? Or is the name of a totally Japanese origin? Where might one acquire it, I have just taken my first Google look and have enjoyed this passage: "Cashew's natural paints create new dwelling spaces in pursuit of cozy and salubrious living environments." and "We have inherited the technique of traditional Japanese lacquer paint of staid texture and eternal splendor." With backtracking on that site, the products come from the shell of the cashew nut. Cashew Lacquer will get you into that site. I think that it does not hold all of the answers to my questions, but does present a wide range of applications possible with the product.

I would like to read about how an artist uses it, and an opinion about whether or not the above carvings/small sculptures would be good pieces for such a product application.

Would the complex surfaces present a problem with the application, resulting in uneven build up. Would the application of the lacquer give one time to apply and wipe off the excess without causing stickiness problems?

**Answer:** (by firewoodstudio) From my box building and wood turning and some carvings, I have used oils, some times thinned with mineral spirits. I have used Danish oil, some linseed oil, and like you said some lightweight oil for finish work and then a lot of the time I will finish with Bri-Wax. Bri-wax has bees wax and carnauba wax. It will polish out with a good shine and good protection. I coat the item with the wax and rub as much off as I can. Then I keep a polishing cloth

that has some wax that is starting to get hard, and shiny, I take this cloth with the wax part and rub as fast and as hard, with the grain, as I can, to burnish the wax on the surface. The wax gets hard and holds up for a long time.

**Answer:** (by Doug Sanders) I'm brainstorming rather than offering solid advice, but it sounds like you need to work with very dilute applications and build the finish up in thin layers, in order not to cause pooling in the crevices of your carvings.

Maybe even application by dipping?, And then allowing to drip dry while turning the piece in several directions?

I agree buildup is a problem with waxes...

What is your intention of finishing? To saturate and highlight the grain? Preservation? Gloss?

(by Dixie Biggs) I've been very curious about this topic, too, and would like to hear more about the Kashew lacquer.

I've also spent many hours on pieces trying to wipe out excess oil finish in "nooks and crannies" and keep hoping for an easier answer.

Janel, something I've tried on some bleached pieces I've done is Krylon Matte Finish.....the same stuff they use to protect charcoal drawings and paintings. I wanted something that wouldn't change the color of the piece, but would give more protection than an oil finish, without the shiny buildup of lacquer and be easy to apply. Is that too much to ask of a finish?

The first few coats seem to soak right into the wood. You do get buildup with subsequent coats though. If you do want a sheen it can be buffed up with a soft wheel or rag.

**Janel:** Hmmmm. For the monochrome stained or natural wood pieces, I want the look and feel of the wood to be present in most cases, but to be protected from the moisture and grime from the caresses of human hands. Touch is important when looking at the pieces and feeling their surfaces. I want the fingers to glide along the surface, not stick and stutter on a rough or gummy surface. I want the feel to be warm and not crispy hard like plastic coating.

**Samuel Rediske:** (At this point it would make sense to differentiate between film thickness and the hardness of the film, one thin coat of nitro cellulose lacquer will feel and look like plastic, it will be soft, and easily damaged., it may be that what you are looking for is a finishing material that actually is "hard", but can be applied in such a way that there is minimal film build up, hiding the wood less. )

**Janel:** If the material offers a shine or a surface coating, as with a few smooth unsculpted pieces

used as background or support for another part that is carved, it must be durable, resistant to the inevitable fingernail marks or dings and feel good at the same time.

Oils that penetrate the surface alter the color of the woods in different ways. Some darken and stay dark, some darken then become lighter, some offer a hardened surface that resists water, some leave an open surface that is altered immediately with water. Those vagaries are compounded between different sorts of wood.

I like the use of oils that would penetrate, highlight the chatoyance and deepen the color of the wood, though some woods it would be good to have not such a darkening.

**Samuel Rediske:** Another aspect I consider for finishes, is the contrast between the outer parts of the carved elements and the recesses. Contrast between surfaces is another aspect of my finished pieces, shiny to dull, worn shiny smooth to shadow softness(?).

**Janel:** Oils seem to take precedence with this. Except that some oils with some woods equal gummy exudate and hours of correction, and is not always predictable. Application on humid or rainy days is undesirable in retrospect. High dry and fair weather has been a better time for the oils. Now, is there a trick or an additive that will make the oils do their thing but faster and more reliably? Does it change the way the oil works?

Before I apply finish to a piece I try a variety of oils (and an oil urethane (I think) for the smooth wood choices), to see what happens to a test piece of wood. There are so many possibilities and outcomes, and they don't always work the same on the finished piece! I have on hand: Watco, Tung, (uh cannot remember another one), Minwax rubbing oil finish, an oil & urethane finish, and I apologize that I do not have all the names on hand. I did use a semi gloss lacquer spray on one piece. Not my favorite, but the only choice to consider at the time.

**Samuel Rediske:** lets get down to it, basically all finishes are oils, or some derivative there of. There is always exceptions but for the most part. It all comes from "oil" where do many plastics come from? some kind of oil. What is it in urushi that makes it a good lacquer? Urushiol, an oil what is it in spar varnish that makes it harden, usually linseed oil and a metallic salt catalyst. So the trick is to find a finish or group of finishes that work together, that are flexible enough to achieve most of the finishing results that you would want.

**Janel:** Dixie, thanks. Is the Krylon a spray? Does the surface remain smooth, tactile and wood-like? Do you do anything to the Krylon surface after application?

**Samuel Rediske:** Krylon is a brand name, it works good, but it doesn't resist solvents, it never catalyses, and is a bit soft

**Janel:** Best case scenario for my small sculptures would be a single application of a liquid that wipes off nicely, does not soak into the end grain too deeply (with resultant exudate and clean up problem after a week or two). This application would protect the piece from moisture and lotions from hands, but would feel smooth and wood-like. It would enhance the character in the wood, it would be OK to darken the wood a bit as enhancement but let the character of the darkest woods still show through. The application would not take forever to cure to the stage where I work the surface for shine contrasts.

**Samuel Rediske:** Some woods like Teak is just not very “finishable”. It should not be used with the intent of using some sort of sealing finish, its just to damn oily. Period. Know your wood, and before you invest a great amount of time in a new wood run a test to see what it will finish like with your proposed finish... I am not sure what your ceramics history is, but when I was required to make new glazes we had to make test tiles, that had a variety of different textures and thicknesses to the glaze, I recommend some sort of test “tile” for your wood and finish. A little time here will possibly save you down the road, or at least make you feel more comfortable when finishing a carving. Get a notebook only use it for finishing info and record your finish mixes, times, weather, wood etc, don’t trust your memory, if you finish a few hundred things, Murphy says the one finish that you thought you would never forget, and really really want to use is the one that you cant quite remember.

**Samuel Rediske:** This application would protect the piece from moisture and lotions from hands, but would feel smooth and wood-like. It would enhance the character in the wood, it would be OK to darken the wood a bit as enhancement but let the character of the darkest woods still show through. The application would not take forever to cure to the stage where I work the surface for shine contrasts.

**Janel:** Best case scenario for the smooth surface pieces would allow the wood to feel like wood, but glow and be protected from moisture and scratches.

**Samuel Rediske:** One of the balance acts of the finishing stage is to do just that, to protect but not hide the wood. My best advise is to find a base finish and then to work it to your full advantage

I use basically the same lacquer, as a wood stain/sealer/stabilizer/ as a putty/ armor coat/ for middle coats as well as for flat finish and high gloss finish final coats, it just depends on how you apply it, and what you add to the lacquer base.

For me kashew can do most of what I want it to do, performance wise there are “modern” finishes that are harder, more durable, more U.V. resistant... but they look “dead” to me., also many of these are toxic to the point of not really being usable in the small shop situation. Some of these can cause severe asthma in one exposure. Or worse.

For the very top end work there is urushi and it does the rest.

For you, you may find that a wipe on flat polyurethane works great, after you fill the grain with something, but remember to KEEP IT SIMPLE what ever you do.

Don't take it too seriously, manufacturers web sights are full of hype, and many web sights are filled with arm chair experts, and on occasion company reps. The facts are the facts. One book in my library is this book, <http://tinyurl.com/rzrdp> I recommend this book for a couple of reasons, they use the scientific method in the research of the finishes for the most part, its short and does away with page after page of dull chemists information, it just doesn't get any cheaper for the amount of info that you get. Of course it doesn't cover kashew but it covers many finishes. The down side is that its main orientation is geared towards finishing large objects and furniture. This book will probably be able to help you more than I can, have a look.

(by Jon Shaw) I've just been reading this exchange (3 months on I know, but I'm new!) and think I can offer some help if you're still experimenting.

I am in total sympathy with the look and feel that you're after. In my view, a high gloss finish tends to look cheap and unsophisticated, which rules out most, but not all, waxes. As you rightly point out, there can also be nasty build up problems in nooks and crannies with some waxes. All contemporary furniture lacquers are also completely out of the question.

I would consider a sheen of around 7 on a 1-10 scale, with 10 a high gloss, to be about right. My question to you would therefore be, what didn't you like about the finish on the examples you showed us? They look just great.

Raw linseed oil is an excellent finish for this type of work and you seem to have buffed it up a treat. It can be thinned for even greater penetration if necessary, with white spirit, and you could experiment with a final finish of Vaseline petroleum jelly as a very low build up, lower sheen top coat. Boiled linseed is made to dry faster, but is prone to nasty build up residues if too much is applied, and unless you have an extremely pressing deadline, I would stick to raw (1-5 days drying time).

Tung oil is another alternative, and it tends not to darken as much as linseed. Rustin's Danish oil is another possibility, though you would need to avoid build up by applying it sparingly with a fine brush to avoid build up in inaccessible areas. It has the advantage of additional protective varnishes in its composition.

Basically, this type of work doesn't need a heavy duty type of finish. Their owners find them very hard to resist handling, and they will therefore acquire an additional polish and patina on the high spots from natural oils on the skin over time, just like an old netsuke. This in itself can be very at-

tractive (though admittedly it is not there at the point of sale).

Sue Wraight (I presume you are familiar with her work) uses neutral colored shoe polish (the tin of wax type, not the cream), which is a much lower build up wax based product, and if applied sparingly with, say, a soft tooth brush, will give you no build up problems at all, (I used it years ago in colored form for mahogany antiques) and a degree of sheen that can be controlled by the amount of friction you apply to it, not to mention the material e.g. soft cotton cloth or say 6000 - 12000 micro-mesh.

I have no experience of any Kashew based finishes, but it is easy to believe from the literature that there are universal do-it-all finishes when in fact no such thing exists. Personally I would stick to the tried and tested products I've suggested, and perfect a technique with them. Having seen some of your latest work, you seem to have mastered coloring and finishing pretty well, but I hope this has been of use nevertheless.

**Janel:** I do know about the shoe polish/wax from the tin, and used it early on for some things. One tends to learn and want to keep learning, and the more one learns the more questions there are.

A sampler box of a variety of wood scraps came to me, (raw material size in my eyes), and I have tried some finish treatments on them to see what results.

The woods I use which are plain grained like boxwood, are often chosen to be colored by various means, which then lends the finish to certain choices. The very colored pieces of mine have the oil medium right in the color, so when dry, that is the surface treatment. When dried as long as it needs to and thoroughly, it is buffable and a controlled sheen can be developed for feel and looks. The figured woods, ones with rich color and patterns, would not lend themselves to coloration. They are the candidates for a variety of outcomes with finishes. Some woods are a little open, some are quite closed. Some darken and lose their great character, some repel the finish and continue to exude the finish rather than it hardening. Some are perfect with the first finish application experiment, but that is rare. Because there are so many choices, and so many types of wood which could use different approaches for finishes, I am feeling pre-confused when facing the group of woods, or facing the wall of products in the wood finish/treatment area in the stores.

I have been forced away from work by things this summer, so there has been no forward movement with the search in this topic. There is hope that in September I will be able to resume my explorations with the woods and finishes. In my studio nothing ever moves quickly, except for the power tools and quick hardening glue!

There are some tests on the bench and I will review them, after having had a couple of months to cure. Those are treatments to the colorful and lively pieces of wood which hope for boasting of

their good looks. Then when I have that figured out, I will carve more simply composed ideas from those woods, and show off the character of the wood. I had not considered the raw versus boiled linseed oil.

How are any of the finished you mentioned for holding up to a spot of water if that should occur? I keep thinking that the surface should not be affected by moisture, or if a moist or sweaty hand meets the carving for a length of time. Maybe I worry too much.

In the end, I hope for the wood to look good and to feel good. There seem to be many ways to get to that point.

While I haven't been able to carve, I've been mulling over how to proceed with the finishing of the current piece I have in progress, a piece of old boxwood with some spalted gray streaks in part of it. It could generate a topic of discussion on it's own. To color a piece, as others of my pieces have been, or to use a monochromatic approach, with oil or slightly colored oil to give a bit of relief to the light wood.

(by musket ) I'm not sure how much of an advantage it would really be to use any type of spirit varnish for this kind of work, rather than a penetrating oil of some kind.

That being said-- I never use hardware store pre-mixed shellac. It's very easy to make your own solution. Failing that, the best stuff to use is a pre-mixed shellac polish from a specialist wood finishing supplier like Liberon.

A shellac film can be made considerably harder and tougher by the addition of seedlac to the mix. This is a cruder form of the same stuff, looks like little seeds, as the name implies, rather than flakes. It's available (or used to be anyway) in three different grades, Kusmi, Bysaki, and Siam. All have a definite orange tone, with Kusmi-- the most commonly available these days-- being the lightest.

I used a mixed shellac-seedlac solution for finishing guitar tops for many years until I gave up building instruments, via the process called French polishing. I still do so for some of the wood bases for my carvings if the wood is suitable for the process-- plane, mahogany, satinwood, cherry, pear and so on. The whole process is much easier on closed pore woods like boxwood and pear, unless you want to emphasize the open pores of woods like mahogany or rosewood, which must otherwise be filled (a major pain in the butt).

It's done by applying the finish with a pad made of an inner core called a fad, made of high grade cheesecloth or whatever. Some people prefer cotton batting, others have had good luck with old socks! And an outer cover made of linen. Some people use old cotton shirts or sheets for this but I

have no idea why-- linen rules, since it has no lint at all. Shellac applied in this way goes on almost dry, so ambient dust is not a problem, but lint on the cloth itself can be.

The traditional way of obtaining a high gloss on a French polished surface is by burnishing it with alcohol, rather than by abrading. This is called spiriting off, and would work nicely for giving the highs a good gloss while leaving the valleys matte.

Build up in crevices shouldn't be a problem. Even boxwood is thirsty enough to simply absorb several coats of a properly made shellac solution applied by brush or dipping, and it actually takes quite awhile to build up enough shellac to allow for spiriting off, though this would probably happen fairly quickly with a wood as close grained and poreless as box. Since no abrasives are used, the film where spirited will have no scratches whatsoever.

But the degree of gloss can be controlled pretty handily with powdered abrasives, 4F pumice being the most common. In traditional French polishing, the abrasive is never applied direct to the surface... a small amount of it is placed between the pad and the linen cover. So no build up of abrasive powder in nooks and crannies, or on the glossy areas.

Color can easily enough be added to shellac solutions with proprietary stains.

It does take time and practice to get good at French polishing, and especially at spiriting off. Injudicious use of too much alcohol will burn the surface rather than burnish it.

Many guitarmakers today are adding a drying oil to their shellac solutions, usually walnut oil. This allegedly increases film toughness as well-- some people are using it with very good results on necks, which obviously get handled a lot more than any netsuke ever will. I've never tried this myself.

A good French polished finish has a very fine appearance, completely free of the plastic look of so many modern lacquers. Even cellulose nitrate looks cheap by comparison. It is also of minimal thickness, one of the primary reasons it's considered the best finish for tone on a guitar top. And it has a pleasing tactile quality as well. Think rich and warm.

(by Jon Shaw) You raise some interesting points here, though I think perhaps you do worry too much!

I have used a wide variety of timbers over the years, including many exotic species, yet have never had the experience of a timber "repelling" a finish and it never drying. It is true that some of the more oily species, e.g. rosewood, teak etc. can be problematic when the incorrect basecoat is applied, and of course there is a huge and complex world of finishing techniques, materials and

compatibilities of differing materials to be learnt. However, this is all mostly relevant to large scale woodwork e.g. furniture, and not, in my view, to the miniature world that concerns us here. In order to obtain what I would consider to be a first class professional finish on a detailed miniature, I wouldn't go anywhere near a lacquer or varnish of any type, because I feel oils and thin waxes produce a more satisfactory uniform finish across all manner of surfaces.

Yes, all the oils I mentioned are what a watch manufacturer would describe as "water resistant" rather than "waterproof", and are certainly protection against handling, as well as compatible with a wide variety of species. They also have the advantage of being easily re-oiled in the event of an accident with the carving.

Needless to say, all the above applies predominantly to the finishing of raw or stained wood. The oil based polychrome finishes you sometimes use, or indeed any opaque colored medium are of course another topic altogether, and as you say, one that could open a discussion on its own. So here goes.

Indeed, to color or not to color, that is the question! Are we to assume that boxwood, with its figure free grain, is crying out to be fully polychrome colored in an attempt to somehow make it more interesting? If so, does coloring actually achieve this? Alternatively, does it possibly lose that intriguing and magical realization in the eyes of the beholder that the piece has actually been carved from wood; indeed that it could now almost be either ceramic or, dare I say it, a plastic injection moulding? Decisions, agonising decisions! Over to you.

(by Doug Sanders ) I think we had a discussion thread going a while back about people's choices in coloring their work. It hadn't occurred to me that that choice can directly relate to one's finishing options, until you mentioned it John. To carry your idea further for others, oil colors versus acrylic colors versus colored lacquers and enamels can dictate the chemistry of the finish needed.

I'm of your mindset that leaving wood as wood shows truth to its origins and so forth. Others add color and are quite successful with it; both visually and sales-wise. Impact is a big thing when it comes to miniature carving- we have to give our items some shelf presence, so to speak, and color is a good way to accomplish this.

(by Janel) Jon, you don't beat around the bush with your invitation to consider coloring vs not coloring! It certainly takes considerable thought process to determine the best course of action with some pieces. Not only do I have to sort out my own reactions to the wood and the subjects of the carvings, I must defend my decisions or modify them when hearing the reactions of my DH when he offers his opinion, which I value, but I must ultimately make the decision.

I am not able to tell anyone that only one way is the best way, but rather, I consider each piece with

it's finishing, individually.

You know, I've got to think off line here, and will post my response after a while. Since I am about to resume work after some personal time off, and am about to rejoin my consideration of the current complex boxwood piece on the bench (waiting for its future to be decided), this topic is timely and needs a fresh mind and careful thought. I'm hedging, also!

**Question:** Do You know a technique with which I can bleach boxwood? Is there a chemical-solution or something else to do it ? There is no problem to colour the wood in every direction, but to bleach it ? .....to give a more white touch?

**Answer:** (by DFogg) I bought some wood bleach a while ago. It comes dry and you mix it. I think it is used for old floors primarily and boy was it strong. It sucked the color right out of the wood. I can't remember where I found it, but it was local either a hardware store or feed store.

**Answer:** (by chuck bennett) We were a little late weather-proofing our deck. We bought bleach at the grocery store and used it straight. Did not mix it at all. It took all the weathering out (gray) out of the pine boards. It would probably work on boxwood. Try a small piece, by its self. Hope this helps.

Make sure you rinse the wood with water, after the bleach. I almost forgot that.

**Question:** (by Janel) Cornel wrote that he has used two liquid chemicals:

...two liquid chemical substances. The first is " Ammoniak 25% ", the second is " Wasserstoffperoxyd 30% ".

First, I make the wood wet with Ammoniak, then the same procedure with Wasserstoffperoxyd. I must repeat the procedure again and again, until the colour bleaches".

The chemicals are Ammonia and Peroxide

He wrote this morning that the procedure worked "...and the result is superb. Now, the piece of wood looks like a real bone. I am happy about the result."

I am curious about the piece he did this to! Has anyone else used these materials to bleach wood?

**Answer:** (by Doug Sanders) I'm always a little cautious when it comes to the subject of bleaching. I have the need to bleach paper now and again with the paper restoration I do to pay the mort-

gase. Bleaches can be very powerful. By this I mean that they can continue to be reactive after you think you've rinsed the item completely. Color reversion (back to the original pre-bleach color) can also occur. They can also 'burn' and cause material loss.

Bleaches can fall under the categories of being either oxidative or reductive. The difference is the route by which they do what they do.

Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) is an oxidative bleach. It will reach an end point in its bleaching and the by-products are water and oxygen so it seems like a good choice to use. Color reversion can be a problem at times. A bleach like Sodium borohydride (Na(BH<sub>4</sub>)<sub>2</sub>) is reductive. This may have some use in bleaching boxwood also. It would have to be ordered from a chemical supply house and needs refrigeration and some other safety precautions but I think it would be effective.

I'd stay away from anything with chlorine in it (laundry bleach, Chlorox, sodium hypochlorite, etc) for health reasons and the fact that it keeps on working (albeit with diminishing returns). A chemical called an anti-chlor is needed to stop the reaction.

**Question:** (by Janel) Like the discussion of tagua nuts, I think it comes down to a choice we make as artists- are we concerned only about the appearance and chemical state of the item at the point when someone acquires it, or do we try to do as much as possible to prolong its life. I suppose it's somewhere in-between for most of us.

Do you have an additional comment on the use of ammonia alternating with peroxide (both higher than grocery store percentages), as Cornel used it?

**Answer:** (by Doug Sanders) Well, ammonia seems to have an effect when oxidatively bleaching of helping things along. I think it must have something to do with changing the pH of the bleaching to alkaline. I'll leave it at that. We do some light bleaching (leaving paper in the sun, or in water tanks with daylight fluorescents) and a few drops of ammonia to the bath gives better results. It's anecdotal in the conservation community. I don't recall reading any studies of the actual chemistry going on.

It may help also in washing out discolored byproducts of the bleaching reaction, cutting through wood oils, etc giving better results.

Hydrogen peroxide can be found in pharmacies at 3% but also 30%. Sometimes the concentration is listed in 'vols' but that gets a little tricky. What works at 30% will work at 3%, just more slowly.

25% ammoniak. I'm guessing that was ammonium hydroxide (NH<sub>3</sub>OH) which you can get full

strength (I'm not sure what concentration household ammonia is sold at). Even diluting it down to 25% with water will still wake you up out of the deepest hangover. I wouldn't think he even needs that much. Even 5% will do. Without rambling too much, but since you asked, it's all about pH. Cornel probably only needs the pH around 10 or so. 25% will still be off the scale at 14. He ought to be able to find some pH detection strips at a garden shop or a Chemists- they always seem to stock more fun stuff at European pharmacies!

**Answer:** (by Janel) Just in to my email from Peter Welsh: Just a quick note, re: bleaching wood. Feel free to pass it on to Cornel. You should be able to find a 2-part kit for bleaching wood. The usual components are: Part A, Sodium Hydroxide, Part B, strong Hydrogen Peroxide. Part A is applied first, and before it is dry, Use Part B. The reaction will 'fizz' and should be repeated (A followed by B as often as necessary. The reaction is stopped by flushing with water. (you should not mix the 2 chemicals together. The reaction time is fast and would render the mix ineffective) It is difficult to control accurately ( patchy). This mix is useful to bleach out a carving to allow a more even staining. As far as I recall, French Polishers use this mix, before restoring colour to furniture. There should be something on the 'net, but I don't have time to look at present. It may well be possible to use the ammonia as Part A, as Cornel suggests. I just can't recall that chemical being used with peroxide.

Some of the other chemicals used in bleaching wood are not effective for anything other than removing stains, etc.

**Answer:** (by Doug Sanders) Sodium hydroxide is of course lye, so it is very caustic. Please wear gloves. It's the active component in many drain cleaners.

It looks like then that alkalinity IS important with hydrogen peroxide bleaching. Both ammonia and NaOH are strongly alkaline.

**Answer:** (by firewoodstudio) I used Parks wood bleach. It is the same 2 part bleach talked about by others. I got mine at a home center like Lowes, Home Depot, and from a local paint store. I found that you need 2 throw away 1" brushes and 2 plastic cups, to put equal parts, A in one, B in the other. You take part A, and wet the piece completely, It flows like water so wet the piece so it looks the same all over. Then you let the piece set for I think it is about 10 min. instructions on package. This is when I washed out the brush for part A. With the brush for part B you do the same, With Basswood you will see it start to change. Make sure you cover the piece completely. Then set aside and let dry. For about 12 hrs. On basswood the bleach will leave it covered with like a fine salt or sandy feel. This will sand off easy I used 240 then 400 grit paper. Then I use Clear Briwax and burnish the wax with a good old used cotton rag. That has wax built up, I rub till I feel the heat. The piece comes out looking like bone or marble depending on the grain pattern. The bleach will discolor you skin Wear protection or like I do use scrape pieces of wood to move the piece.

**Answer:** (by Tom Sterling) I use the same kind of two part bleach and apply it just like firewood-studio describes. I find it takes 3 to 5 applications to bleach boxwood really white - probably because it is so dense, it takes a while to penetrate deep enough. Of course, the two bleach parts are in aqueous solution, so the wood grain gets raised. You shouldn't plan on carving after the bleach application since you'll carve through the white layer quickly and expose the raw, unbleached boxwood beneath.



Here are a few images of a little sparrow netsuke I did a while back, from my old camera so I'll apologize for the quality (lack of). I've adjusted the colors as best I can to approximate the actual colors. On the left is raw boxwood (the actual piece for this carving), center is the carved and bleached sparrow, and on the right is the finished, with linseed oil finish. I used the white boxwood as a canvas for Procion dyes and woodburning. You can see the white wood uncolored and unburned on the head and throat of the finished sparrow.

**Question:** (by kwinn) In this forum and on a number of Netsuke carver's web sites, I've seen reference to the use of Sumi ink. From a little web research, I've found that Sumi ink is a traditional far-Eastern water-soluble ink made from pine or vegetable oil soot mixed with glue made from boiled animal skin & bone. It is most known as the agent used to produce those wonderful oriental pen & ink paintings.

Ok, so I know how its made, but now I'm interested to hear why people choose to use Sumi Ink. Are the reasons partially sentimental? Does Sumi ink have properties that are still hard to beat with modern inks? What applications is it best at? Which ones is it not-so-good at?

**Answer:** (by Doug Sanders) For me, I've got several reasons for using sumi. In my work, I like to keep things simple. It's easy to have a stick of sumi and a stone to grind it on to produce ink whenever I need it- without having to worry about spills or a bottle drying out. - that said, there is a liquid sumi on the market which is a very good product. I'm not sure what additives it may have over the dry stick type.

Sumi, as you stated is made up of very small particles of carbon, which can be classified as a pig-

ment. Most modern black writing inks are a cocktail of dyes- they have been developed to flow from pens with very little clogging, and are liquid through and through. It is my understanding that a black dye is very difficult to make, so most of these modern inks are a mixture of blues, purples and even reds. Before the modern petroleum-based dye and color industries, a black dye was achieved with an iron compound (the same chemical Japanese women blackened their teeth with) used in writing inks and dyeing leather. It is really a very dark brown though.

You can see this ‘cocktail’ by taking a black felt-tip pen, writing on a piece of paper, and then getting the spot wet with alcohol or acetone or some other solvent. As the paper soaks up the solvent, the ink bleeds into its composite colors. This process is utilized in the science of Chromatography- generally speaking.

Sumi also works well across a range of dilutions, so that intensity of black can be built up in layers- without going too far at the start.

Will modern inks give a different effect? I don’t know. They may bleed into the wood fibers, giving a more feathered appearance than with a pigment-based black.

Modern black watercolors will give a similar effect as sumi. India ink traditionally has shellac added to the mix to give a shiny appearance and make it water insoluble when dry. Dr Martens brand of writing inks are known to be very good quality. Black shoe polish will stain and create a wax finish in one application

Finally, with black pigments, there is a whole range available, from cool bluish blacks, to warm brown blacks. It all depends on the source- combustion of oil, various vegetable matter, and/or bone- and the particle size. For woodcarving, this is probably too fine a point to worry about, but next time you see a sumi painting, have a look at the range of colors ‘black’ can achieve

**Answer: (by Janel)** I use sumi at times for darkening the area behind an amber eye inlay. When I have tried to put the sumi right on the amber, it more often than not, will release from the amber during the glue stage. Consequently, I non longer use that technique with sumi.

Is there something else that I should be doing to help the sumi to remain where placed?

**Answer: (by Doug Sanders)** Well, if you’re not adverse to modern paints, acrylic will form a better film on the amber. Once dry, it should be resistant to the solvent action of the glue.

Maybe paint the inlay pocket with sumi, then inlay the amber. Of course the glue might distort the blackness.

There's also a technique where you could fix the sumi on to the amber by painting a layer of clear nail polish on top of the ink layer. This will be soluble in acetone, so probably won't withstand the cyanoacrylate glues (Super Glue), but should be fine with epoxies and maybe model cement. Kinda gets complicated and not a very purist approach.

I'm really interested in all sorts of artist materials and traditional techniques and methods of artists. In order to conserve artwork, we've got to know what things are made of and how to manipulate them. I've got a shelf at home of all sorts of artist tracts and kitchen chemistry handbooks. Consequently, there are so many things I want to attempt with carvings, but not enough time. My wife thinks I'm a mad scientist.

Oh- one more thing- Amber is soluble in alcohols- you may have noticed this. A quick brushing of alcohol (rubbing, isopropyl, methylated spirits, etc) on the back side of the inlay will frost it just enough to maybe give the sumi something to grip on to.