

Martin Myths and Other Nonsense: *from the workbench of John Greven*

There are vast quantities of totally bogus information about Martin guitar construction details found all over the internet, particularly on the various guitar forums. Even builders who should know better promote inaccurate information either through lack of direct experience or perhaps as part of their marketing agenda. Whatever the root cause, the basics need to be discussed and better information provided.

I was fortunate enough to be the shop foreman at Gruhn Guitars from 1970 through 1976 during the very beginning of the vintage instrument renaissance. Nashville and Gruhn Guitars were the epicenter of this new movement for the country and the world.

It was a time when great old guitars came out of the woodwork daily and into our hands for repair and restoration. We took it for granted that on any given day we would be working on prewar Martins; 18's, herringbone D's, 42's or 45's as well as many one of a kind special models. It was during this time I restored Charlie Monroe's pre-war D-45 and Red Smiley's D-45 before they left for Japan. Both guitars were tonally awesome, iconic instruments, even by the best of pre-war Martin standards. (I will be posting a clip of one shortly on this site).

Many of the photos in the 1993 Carter/Gruhn, Acoustic Guitars and Other Fretted Instruments book are of instruments that returned to life from my workbench, like the insanely inlaid parlor guitar pictured on page 20 and 21. There was not a better place to be working on instruments then, or since. It was an unparalleled educational opportunity for which there is no modern equivalent.. From this perspective, along with fifty years of building instruments including 2100 acoustic guitars, I offer up these insights.

Structure:

Overview

Here is the thing to remember: Martin was a conservative, pragmatic small business. For them, warranty repairs were a major drag on their bottom line, and when guitars came in for service, someone from the line had to stop their work and attend to it as Martin had no dedicated repair department back then.

It is obvious to me after looking at hundreds upon hundreds of vintage Martin guitars, that every change in structure over the decades had everything to do with solving an engineering problem, and nothing to do with TONE.

Martin already felt that they had the best possible tone in the marketplace, but they could ill afford instruments coming back with similar structural problems and not address the issues proactively for the future. Martin was always thinking STRUCTURE, not TONE when changes were made.

The X Brace: The position of the crossing of the X relative to the bridge placement has two basic forms; the “**Advanced**” X which is closer to the soundhole and further from the bridge and the **Back Shifted X**, which moved the X much closer to the bridge. While this positioning of the X crossing is a tonal factor if one uses the same top material for both, the primary reason Martin altered the X position over time had everything to do with the changing structural qualities of their tops. The light, scalloped bracing of the 20's and 30's under stiff Adirondack tops gradually gave way to wider, taller less scalloped bracing as more top deformation issues arose. By the time Sitka replaced Adirondack, bracing was significantly heavier than before. Moving the X toward the bridge was just part of the solution for reducing excess top deflection. It was not a tonal consideration.

As a side note, the best sounding guitars from the 1930's represent a kind of perfect storm of great materials coming together with small shop production performed by highly skilled and dedicated craftsmen at a point where Martin's structural evolution hit a sweet spot of not too heavy, not too light.

The Tongue Brace: The tongue brace had but one function, to help prevent the top from cracking along the edges of the fingerboard, a very common problem. This upper bout region of the top is primarily structural, holding the rotational pressure of the neck at bay and preventing body collapse.

Between the heavy main cross brace by the upper soundhole and the dense, massive fingerboard-end glued firmly to the top, this is not a major tone generating part of the top. A 6 gram slip of quartered spruce is not going to have any measurable effect on the output of the instrument. **Think Structure, Not Tone.** Lloyd Loar was never on staff at Martin.

The T Bar: There is much ballyhoo about this little T shaped bar of high strength steel that Martin went to after the ebony neck support proved insufficient for heavy steel strings. Again, if it had worked so well, Martin would still be using it, but they don't. The same is true of all steel beams they changed to over the decades until they finally replaced all with adjustable truss rods. In this case, function is more important long term. The T bar is a relic to be noted and discarded. It is not a tonal factor in and of itself.

Braces: Contrary to the ongoing mythology, Martin did not use Adirondack bracing, it was always Sitka. Again, it was a simple decision on their part. They were way ahead of their time developing very local wood sources. The Adirondack came from nearby New York state and upper New England. All other spruce came from the suppliers to the shipyards of New York, where wonderful perfectly quartered Sitka was plentiful and cheap.

Hide Glue: First let me state that hide glue does not sound any different than the LMI white glue despite many advocates to the contrary. The total amount of glue in a guitar is on the order of three tablespoons spread over very small surfaces. If two glues have virtually identical hardness and elasticity when cured, there will be no detectable difference in their structural behavior and no difference in the sound an instrument makes when constructed with them.

Martin had to discontinue using hot hide glue for general construction when their production numbers grew in the post folk-boom of the late 60's. The hot room glue-ups took time and space and slowed the whole production line down. Working with hot hide glue also required a great deal of skill and speed to do correctly, white glue did not; simple economics on their part. If Martin was thinking TONE over PROCESS and truly believed that hide glue sounded better, they would still be using hide glue over the Titebond they were using at the transition point or the white glue they use now.

Martin currently uses hide glue only for their most expensive guitar lines, allowing them good marketing copy and justification for higher prices for a "vintage" glue type. Many modern makers have returned to using it for a selling point as "more authentic" or for "better tone". While hot hide glue is quick and lots of fun to do, the use of it has far more to do with marketing and adding to the builder's bottom line than with building a better guitar. Wayne Henderson and I both use the LMI white glue for all construction and have for years. When we do use hide glue, there is no up-charge..

Pricing: If you were buying a new car, you would research the actual dealer cost as a negotiating point. It just makes financial sense. Guitar players could do this as well, but the information is scattered and requires considerable guitar making knowledge to understand. Here are some thoughts on the matter of material costs and up-charges.

Tops: There are many, many wood dealers around the world we use as sources for our top woods. One can get excellent tops directly from Europe or from any one of a number of U.S. suppliers. The dealers try to make their stock sound more exotic with "moon harvest" claims, or elevation data etc. Again, great way to make a distinction from a competitors offerings, but ultimately meaningless.

The bottom line is, all tops are very competitively priced from the lowest grades to the Master grade. Average prices for all species range from \$15-\$40 for the lower grades to \$50-\$75 for middle grades to \$80 to \$250 for the highest grades. There are a handful of wood dealers selling very special tops in the \$400+ range, but this is not the norm for most builders except for a special order instrument.

The other thing to remember is that top grading is essentially about cosmetics not structure. Clean, clear, fine grain, perfectly quartered, with no run-out makes a Master grade of AAA top (depending on the dealer). How it will sound in the end is entirely up to the skill and experience of the builder, not the quality of the top by itself. Lower grades of the same top material can be just as amazing tonally if the builder has the necessary skill and knowledge to work with it.

An up-charge of \$1000 for any top is excessive and is about making money at the customer's expense not a reflection of the actual cost plus reasonable mark-up for labor and overhead.

Brazilian rosewood: A great tonewood by any measure. Scarce, expensive, problematic in many ways for builders, but not nearly as scarce or expensive as the public is lead to believe. We all get our Brazilian from a very few reliable sources and we all pay about the same price for it.

The basic grade of decent but not perfect Brazilian runs \$350-500 a set. Some of these sets are quite lovely and very serviceable. These sets have less quarter sawn material, not so colorful, some knots or pin holes or other issues that make it less marketable. It can make a fine sounding guitar in capable hands, but may not be as stable over time and is simply not as desirable. By comparison, fine rosewoods other than Brazilian can be had for \$150-300 a set and do not have so many issues for the builder or owner to deal with. Better cosmetics for the price.

The middle Brazilian grades consists of good color, possibly some spider figure, better quartering but usually not totally quartered, and fewer flaws. These sets can be had for \$500-800 a set.

The highest grades of Brazilian come in two forms: dead quartered in a uniform brick red color and some spider figure AND/OR wildly figured sets with stunning color changes (also known as "stump wood" for obvious reasons). The best of either of these styles will command \$ 800 to \$2000 a set, but if you have good sources, \$1200-1500 a set.

Having a Brazilian guitar built brings on all kinds of interesting stories as to when, where and how the wood was acquired, some of them quite inventive. There are a handful of older builders who stashed the "good stuff" back in the 60's and 70's when suppliers still had it on hand prior to the embargo. In this case, if the wood is really exceptional and old, the price is only limited by what the market will bear. Otherwise, the pricing listed above should be a guide as to what the player might pay the builder for this material. Give negotiating a try, it might just work.

Some other Nonsense:

Brazilian: (continued)

Lots of fun stories about this most famous of rosewoods. Here is some of what has popped up recently in an article. I paraphrase...

Rosewood logs were floated down rivers to the sawmills. The long periods in the water caused the oils in the wood to leach out and changed the colors of the wood.

First, Brazilian logs were not floated down rivers to sawmills, the wood does not float and the prime source for Brazilian was the coastal plain in southeastern Brazil, not the jungles of the Amazon (which is what comes to mind).

Second, the oils and waxes within the cell structure of Brazilian are not water soluble. A far more aggressive solvent is needed. Alcohol, acetone, or benzene derivatives are required to pull the color and wax out of the wood and even then, it is only a surficial reaction and that does not penetrate more than a few thousandths into the wood. I don't recall any rivers in Brazil running with acetone or benzene.

There has been much discussion about the superior tonal qualities of Brazilian over other rosewoods. This one is actually true, although it has taken me years of building to absolutely confirm it. Here is what I have found.

Rosewoods vary in hardness, density, and elasticity. The resulting tone effect on the voice of a guitar is approximately as follows (using the most common rosewoods):

Hardness:

<u>less hard</u>			<u>Hard</u>		<u>Very hard</u>
Indian RW	Palo Escrito	Brazilian	Honduran	Cocobolo	Blackwood

Density:

<u>less dense</u>			<u>Dense</u>		<u>Very dense</u>
Indian RW	Palo Escrito	Brazilian	Brazilian	Honduran	Cocobolo Blackwood

Elasticity:

<u>inelastic (rigid)</u>			<u>Moderately elastic</u>		<u>Very elastic</u>
Blackwood	Cocobolo	Honduran	Dark Brazilian	Indian Lighter Brazilian	Palo Escrito

So what does that all translate to tonally?

Hardness and density impart sustain and lots of audible high partials (referred to as “sparkle”). The high partials add a crystalline clarity to the voice, sometimes glass-like and brittle. The back that is very hard and dense reflects the sound energy rather than moving with it or absorbing it. The sustain is very long lasting, it “rings forever” kind of sound. This is where the Modern voice differs from the Vintage voice.

Elasticity is more interesting and less acknowledged among makers. It is this property that provides the power and punch to the voice of a guitar. Brazilian falls in-between rigid and too mobile. It moves easily to the motion of the top but not freely as the more elastic materials do. It is this quality of Brazilian which provides the voice with the warmth (the effect of the density being moderately high but not too high) and the punch (the elasticity allowing the plates to move quickly in response to the motion of the top). Brazilian also absorbs some of the energy of the top (true of any species that falls into the less hard, less dense category) and this produces the darkness to the voice, some call it smokeyness.

So for me, the bottom line is, Brazilian IS different and I think superior to other rosewoods for its power, depth and responsiveness. I feel it is essential to use it if you are building for a Vintage style voicing (but there are many other factors involved here and are addressed in the Voicing pages). Other rosewoods work better for the Modern voicing.

And one other side note:

Did you know that most of the Brazilian logged between 1850 and 1930 was shipped to France, shredded into tiny bits, soaked in solvent and made into perfume? The woodworking side of it was very small. Furniture took up less than 10% of the exported wood and the guitar trade was on the order of .01% . I find it very unsettling to think of how much of this amazing wood ended up as pulp.

I hope this generates some thought, discussion, even controversy and helps dispel some of the myths which have found a home on the internet. It is a start.