



MAKER'S BENCH

Great Materials for Great Bows

by Matt Wehling

In the last issue of *String Notes*, violinmaker David Folland wrote a great article about the woods that go into making a violin. His article got me thinking about all the different materials that make up a bow. One of the things I find interesting about bows is the range of areas that the materials come from, from the coldest areas on earth to the bottom of the deep blue sea.

Many people assume that since the wood used in a bow is from Brazil it is an Amazonian tropical hardwood. In fact, the wood typically comes from areas near the Atlantic Ocean, not near a rainforest at all. The name of the wood is pernambuco, which is the name of a state in Brazil. Pernambuco is located at the easternmost tip of Brazil, and is about 400 miles long and 100 miles wide. While some of the wood grew in that state, I think it got that name because the main port the wood was shipped from, Recife, is the capital of Pernambuco. When I show a raw board to people and let them feel it, their first reaction is often, "Wow, this is heavy!" And it is. Wood that is of suitable density to make a bow will be heavier than water, and a good quick test to see if a piece is dense enough to make a fine bow is to throw it in water and see if it sinks. However, don't leave the wood in the water too long, as this wood will turn the water a deep red: the original use of this wood for Europeans was as a source of red dye, and for a few hundred years it was the principal source of red dye for all of the textile industries in Europe. Most of the deforestation of this wood was due to this usage, and not to the relatively small amount that has been used to make bows over the years.

Recently pernambuco was classified as an endangered species by the Convention on International Trade of Endangered Species (CITES), which is the body that governs all international shipping of rare exotic species of flora and fauna. It is now illegal to transfer raw pernambuco materials (as opposed to finished bows) across international boundaries. Had it not been for the efforts of an organized group of bowmakers, violinmakers and musicians known as the

International Pernambuco Conservation Initiative (IPCI), the CITES board would have made it illegal to transport pernambuco of any kind into a different country without a permit from the country you were leaving and a permit from the country you were entering, for every individual bow. You can imagine the amount of paperwork for an organization such as the Minnesota Orchestra to go on tour, with every musician needing two permits for each bow they owned every time the orchestra crossed a border. (The IPCI was originally formed by bowmakers in 1999 to study and initiate conservation and potential replantation of pernambuco species. You can find out more about the IPCI, join it or make a tax deductible contribution to this group who is working to protect music lovers' interests, at www.ipci-usa.org.)

From the stick let's move on to the frog, which is most often made of ebony. The ebony used in the frogs can come from a few different parts of the globe. For centuries the best ebony came from the island of Mauritius off the coast of western Africa. However, export of wood from there has been banned for a number of years, and the best ebony we can find at the moment is from the jungles of Cambodia. Very good ebony is extremely hard to find, and is noted by a complete absence of pores on the side of the frog. However, the quality of the ebony actually has little effect on how the bow plays or sounds, as long as the wood is sufficiently dense (unlike the wood used in the stick...if it's not of great quality you simply can't make a top quality bow). For years, fancier frogs were made of laminated pieces of tortoise shell, which can be quite beautiful but is much more fragile than ebony. Nowadays, if anyone offers you a new bow made of tortoise shell it most likely has been illegally imported into the U.S. or made of plastic, either of which are good reasons to avoid the bow.

Ivory and horns from a variety of animals are occasionally used to make frogs. I personally don't care much for horn, but find ivory (from a mammoth, not an elephant, for a new bow, which I'll go into

later) can be quite beautiful.

At the moment, the most common shell used in the frogs of handmade bows is awabi shell, harvested in the Orient from the Pacific Ocean. Before about 1870 the shell in better French bows was most often from ormeau shells from the channel islands of Jersey and Guernsey; in English bows one more often finds mother of pearl, in German bows abalone is quite common. However, as the East became more open to the West and trade increased, the lower prices of materials from the Orient meant that the suppliers from the Channel Islands were put out of business. Experts looking trying to determine the authenticity of an older bow will often look at the shell in the bow to give a clue to when the bow was made.

The most common metals used on the frogs and buttons are nickel silver, silver, or gold. Nickel silver is mainly used on cheaper bows. Nickel silver isn't actually silver but is a combination of copper, nickel and zinc. When nickel silver was invented around 1810 it was initially thought to be an improvement on silver as it is stronger. However, it is prone to tarnishing into a very ugly dark green color. Silver is the most common metal found on a high quality bow. It has a simple elegance that can be very subtle and beautiful, especially as it ages. Gold used to be used only on wood of the highest quality. Sadly, in many of today's factory bows cheap 9-karat gold is put onto fairly ordinary sticks. Many people see a gold bow and think how rare it must be if there's gold on it. In fact, a beautiful piece of pernambuco truly worthy of gold mounting is much, much rarer than the gold. Heck, you can buy gold at K-Mart! It's much better to look for a bow with an outstanding piece of wood and not be swayed by the metal used.

When people who aren't musicians find out I make bows for a living, the majority ask, "Are the strings still made of, what is it, horse hair?" Quickly followed by, "Where do you get it?" I get the hair (*they are not strings!*) from a distributor in Massachusetts, but they got it from Mongolia or from

China. Hair is also available from Argentina or Canada. The horses that grow hair that is fine enough and white enough for use in a bow tend to be from very cold climates. People assume it must be hard for me to get hair, but in fact I probably get 2 or 3 emails a week with offers for hair. While my source is quite expensive (I pay almost \$400 per pound for my best hair), they are quite consistent and will give me a new pound of hair if I don't like the one they sent me, which I doubt many of the people sending email offers would be willing to do. And since I want all my clients to love the way I rehair, and to tell all their friends, it's very important to use the best quality hair possible.

The glues used to hold everything together can be as mundane as Elmer's or Krazy glue, to high tech versions of Krazy glue, to glues made from animal hides, or one of my current favorites, a glue made

from some part (or parts) of a fish. I didn't ask for specifics about what part when I ordered it, but it has some qualities that I like quite a bit and can't find in other glues. With all these animal products used in making a bow it's a good thing I'm not a vegan!

The final exotic piece on the bow is the white tip that is at the extreme end of the bow, which is made of mammoth ivory from dead woolly mammoths that are excavated from the Siberian tundra. (I am not making this up; evidently there are quite a few of them.) Historically these were made from elephant ivory, but, obviously, that's not an item we can use any more. I actually have a source for legal elephant ivory here in the U.S., a person who buys ivory that was imported into our country before transportation of the ivory was outlawed (see him at www.ivorybuyer.com). But most modern

makers would only use elephant ivory on a restoration of a historically significant bow. Ironically, the tips made of the mammoth are more expensive than the tips made from elephant ivory.

As I got more interested in making the highest quality bow possible I found the search for great materials to be one of the most interesting and challenging, aspects of the work. I hope I have given you an idea of the different materials that went into your bow.

Matt Wehling's experience includes studying bow making in France for five years with modern French master makers. In 2002 and 2006 he was awarded Gold Medals for his violin and cello bows from the Violin Society of America, and he has contributed to Strings and The Strad magazines. His shop is in Northfield, MN. ♪