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“VIOLIN BOWS GO HIGH TECH” by **Ellen Pfeifer**

“The complicated fate of a slender piece of wood.”

Violin bow maker Benoit Rolland sculpts a plank with a homemade knife. Supporting the wood under his left arm, he shapes the subtly tapering “stick”, running the blade into a concave wooden backstop affixed to the edge of his workbench. Switching to a plane he also made, the French-born, and -trained bow maker shaves the wood. The scraping takes on an increasingly refined, almost musical sound, as the surface is smoothed. Burgundy curls of pernambuco shavings fall to the floor, but Mr. Rolland will quickly sweep them up. Like many bow makers, he is allergic to the attendant wood dust, which some believe is carcinogenic.

Bow making is a cottage craft, and Mr. Rolland works in a small room without power equipment. Like others of the French school, he eschews the use of a vise – insisting that the sensations of holding the bow guide his artistry. But this traditional art may someday be forced to yield to high-tech manufacture.

That is because pernambuco, the sine qua non of fine bows since the 18th century, is an endangered species. An exotic Brazilian wood of great strength, density and durability, pernambuco has always been rare. But now it is in even shorter supply because of exploitation and deforestation. Currently, only 5% of the original forest remains. Of that area, pernambuco occupies just a fraction. The Convention on international Trade In Endangered Species of Wild Fauna and Flora is currently reviewing pernambuco’s status, which could lead to export restrictions or a world-wide embargo.

“It grows among other trees. It’s not like the acres of pine forest you find, for example, in New England,” says New York maker Yung Chin, a conservation activist who will present the case for preserving the precious source of bow wood at the Violin Society of America’s conference this week in Ft. Mitchell, Ky. (near Cincinnati). “Pernambuco,” he says, “grows like the veins in a gold mine.”

Bow makers have become so concerned about pernambuco depletion that, in company of the Confederation of Craftsmen and Users of Natural Resources, they created the International Pernambuco Conservation Initiative three years ago. About 200 bow makers from Europe and America – about 95% of their number – have signed on, according to Mr. Chin, a founder. They hope, for example, to sign an agreement with a Brazilian governmental group that encourages cocoa cultivation. Because cacao and pernambuco live complementarily in the forest, a cooperative venture makes sense.

But since the early 1980s, bow makers have also been investigating alternative materials. A good synthetic bow could be used by advanced students or by professionals who need a reliable second or third bow, thus reducing overall demand for wood.

One of the hottest development to come out of this effort is the carbon-fiber composite bow. And among the pioneers was Mr. Rolland, the traditional French artisan. An amateur sailor, he wondered if bows could be made the way boat shells are fabricated, from pre-cast fiberglass.

Yes, they could. Indeed, since they were introduced in the early 1980s, carbon fiber bows have established a successful niche in the instrument market. Artisans from the United States and Europe are crafting models ranging in price from less than \$200 to as much as \$5,000 (for a viola bow). Despite their initial skepticism, numerous professional musicians, among them violinist Yehudi Menuhin and violist Rivka Golani, have publicly endorsed them. Students musicians are usually wowed by the superior performance of carbon fiber over inexpensive pernambuco bows.

The new bows are a mix of graphite and other fibers held together in a matrix with epoxy resin. Because “carbon fiber is a chemical process, the bow stick is molded rather than carved,” Mr. Rolland explained. Among the bows’ attributes are durability, resistance to climatic conditions like high humidity, responsiveness, and an ability to negotiate a range of musical articulation –from legato to spiccato.

One liability, though, is a fixed camber –the concave curve of the stick is permanently set in the molding process. In a wood bow, the camber can be adjusted and modified by heating and reshaping it. But if a musician wishes to modify the camber of a carbon-fiber bow or if an older model starts to lose its camber, changing the responsiveness of the bow and the relative brightness of the sound, the bow cannot be heated without damage to the composite. But Mr. Rolland counters this difficulty by inserting a Kevlar thread through the bow and attaching it to a screw mechanism at the frog (the end of the bow that players hold in their hand). By tightening or loosening the screw, a player can adjust the bow for strong, medium or light flex.

Another objection voiced by some musicians is that carbon-fiber bows don’t appreciate in value as other instruments do. But, says Christopher Reuning, a dealer in Boston, it is only the increasingly scarce antique bows that continue to go up in value, not modern pernambuco bows. Those, he says are “doubling in value every 10 years.”

It is undoubtedly the allure of the great antiques, the desire to someday be counted among the immortals that brought Mr. Rolland back to the traditional craft of handmade, pernambuco bows. That, plus a bruising experience with the rough and tumble of American mass-manufacturing. His trademark Spiccato bows are now produced by a Salt Lake City Company. After more than a decade devoted to carbon fiber, he has opened the shop in Boston where he makes and restores bows as his French progenitors have done for centuries.

In the end, it comes down to a philosophical question, he says. “Will our disposable world take over instrument making or will our love for authentic, long-lasting, beautiful things win out?” **Ellen Pfeifer, Boston**