FOCUS ON CONTEMPORARY INSTRUMENT & BOW MAKING

Innovation has been slow to catch on in the violin-making trade, but that hasn't discouraged modern-day innovators

Subject to Change

by Joseph Curtin

THE VIOLIN IS OFTEN HAILED as a perfect design—though more often by makers and dealers than by working violinists, who must cope on a daily basis with the imperfections of their particular instruments. Violins—along with violas, cellos, and basses—are easily damaged, expensive to maintain, tricky to adjust, uncomfortable to play in the upper registers, unstable in the face of changing humidity, prone to wolf notes, and if they happen to be new, not expected to sound their best for the next 200 years.

Do these characteristics stem from the very nature of the instrument, or can they be sidestepped by using alternative designs and materials? Can the traditional violin be improved?

Makers have been trying for a very long time. True, the trapezoidal violin never caught on, nor did the octo-bass, but these innovations solved no problems for the working musician. Those that did solve problems—cello endpins, violin chinrests, modern necks, fingerboards, bass bars and bridges, synthetic strings, fine tuners, and, of course, the modern bow—have been widely adopted. Together, they have profoundly changed both the sound of the instrument and the way it is played. If this were not the case, there would be no divide between the modern and Baroque violin.

Frustrated innovators tend to blame the supposed conservatism of string players—unfairly, I think. Players may not be clamoring for cubist violins or green violas, but hand them a violin that is unaffected by humidity or a viola that won't give them tendonitis or a cello with an electronic wolf-note eliminator and they are more than willing to give it a try.

Today, a growing number of makers are realizing this and taking a common-sense, technically informed approach to innovation. Here are some of the areas we are exploring:

AESTHETICS

The popular young Czech violinist Pavel Šporcl recently commissioned Prague maker Jan Spidlen to build a blue violin. Šporcl believes the shock value of such an instrument, far from being a liability, will help attract young audiences.

Unabashed showmanship? Well, it worked for Paganini. In an era of diminishing audiences, why not use all available means to create a fresh interest in classical performances?

Creative artists in most fields search relentlessly for new looks, new sounds, and new ways of thinking. The violin world, on the other hand, has for centuries been engaged in a kind of backward scramble toward the old Italians—violinists to play them, makers to copy them, dealers to sell them. Classical violin making ended in the late 1700s, but no one knew what to do next, so we kept doing the same designs, over and over, while 200 years passed us by.

But this seems to be shifting at last. A number of highly qualified makers are rethinking the appearance of their instruments in sometimes radical ways. Will players follow Šporcl's initiative and commission instruments that look as though they could have been built in no other time than our own?

DURABILITY

To play a violin is to put it in harm's way. Most of the resulting damage is entirely predictable; it is also mostly preventable with relatively modest changes to the instrument's design and construction.

Consider the corners.

The maker spends hours getting them right. The player knocks them off. The maker glues them on. The player knocks them off again. At what point do we ask if they should be there in the first place, at least in their classical, elongated form? The simple, gamba-like corners on the violin pictured in figure 1 stay well out of the player's way, while the hardwood edges provide additional durability.

Chinrests became popular roughly 200 years ago and have been damaging violin tops ever since. Figure 2 shows one solution: a protective hardwood veneer glued to the top in the chinrest area. The chinrest itself (figure 3) is held in place with a single screw, which attaches to a rod fixed into the upper block, thus dispensing with the typically cumbersome metal clamps.

The soundpost may be the "soul" of the instrument, but it has a way of denting and eventually cracking the top. Meanwhile, the bridge slowly digs in from the other side. The veneers shown in figure 5 put a stop to this. They are easily removed and seem to have no affect on the sound.

FIG. 1: The simple, gamba-like corners on this Joseph Curtin ultralight violin stay well out of the player's way, while the hardwood edges provide an added measure of durability.

FIG. 2: On this Curtin ultralight, a hardwood veneer glued to the top protects it from damage by the chinrest.

Figure 4 shows an experimental bridge that will not warp; the wood is cross-laminated. Its "feet" register with a cutout in an ebony veneer glued to the top, preventing accidental changes in bridge position.

ERGONOMICS

If the violin's pleasing symmetry belies the asymmetry of its acoustics, it is downright at odds with the asymmetry of the playing process. The treble upper bout is the main offender. In the late '70s, Otto Erdesz introduced his "virtuoso" viola, featuring a cutaway treble shoulder. Despite initial resistance, the 30-odd cutaways he built are now in continuous use, according to his former wife, violist Rivka Golani, herself an enthusiastic proponent of the design.

Ergonomically designed violas are now commonplace, and those by such makers as Izuka, John Newton, Bernard Sabatier, and me barely raise an eyebrow at rehearsals. The same is true for Canadian luthier James Ham's ergonomic basses, with their steeply sloping shoulders and tapering upper-bout ribs.

The exuberantly designed violas of David Rivinus, on the other hand, make no attempt to camouflage their unique ergonomic design.

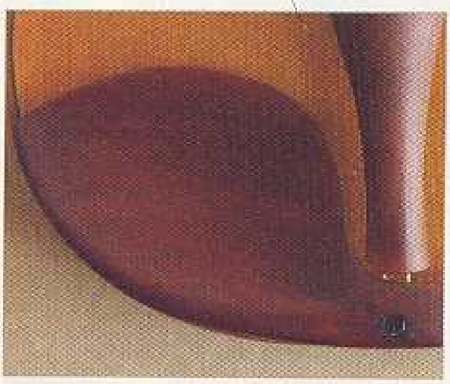

FIG. 3: This chinrest is held in place with a single screw, thus dispensing with the usual metal clamps.

FIG. 4: Joseph Curtin's experimental bridge will not warp or slip out of place.

Their success at helping musicians with such playing disorders as carpal tunnel syndrome keeps Rivinus' waiting list longer than that of many a traditional maker.

It may be that the pressure toward conformity in orchestras is slackening; it may be that violists would rather play an unusual viola than not play a viola at all.

RESPONSE

We love things that respond to us. From video games to high-performance cars, humans are fascinated by tools that both extend our capabilities and challenge our reactions. Playing instruments that have effortless, crack-of-the-whip articulation is addictive. Response time is dependent on many factors, from string design to set-up, but the weight and material properties of the instrument body are primary determinants. Optimizing these through the use of new designs and new combinations of materials will allow makers to offer routinely the kind of response that has until now been found only on the very best instruments. More on this later.

PROJECTION

A musician must first and foremost be heard—but only when the music calls for it. Projection is essential, and the more the better, so long as the ability to blend into an ensemble is not lost. This is especially tricky with the lower instruments, which are inherently less adept at radiating the high overtones needed for projection. It is not a question of new versus old. A fine old Italian viola that fits perfectly into a particular quartet may not be effective in the Bartók Viola Concerto.

FIG. 5: Hardwood veneers under the bridge feet and on the inside of the top beneath the soundpost prevent damage in these two highly vulnerable areas.

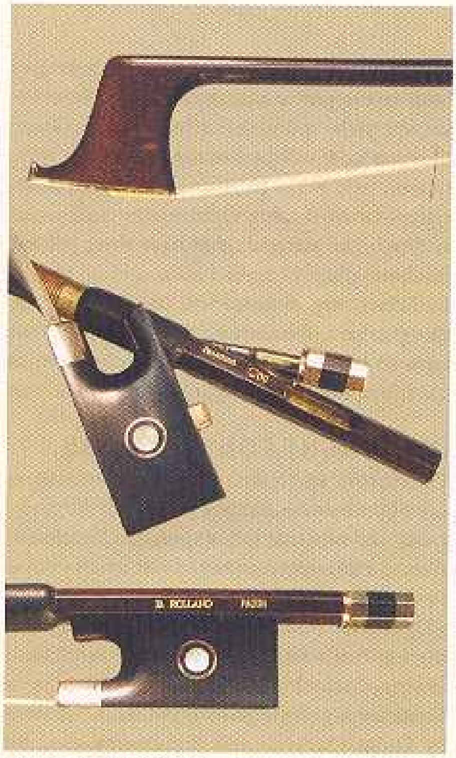

FIG. 6: Benoît Rolland's Spicatto Bow has a player-adjustable camber.

I believe that the violin family could usefully divide into two separate lines of instruments: one designed to blend into ensembles, the other to carry over them. Few players can afford even one old Italian, but two specialized contemporary instruments might provide greater musical flexibility with less strain on the budget.

Creative artists in most fields are characterized by their relentless search for new looks, new sounds, and new ways of thinking about things.

ADJUSTABILITY

The traditional violin does not have enough knobs on it. Four pegs and a fine tuner take care of the strings, but virtually all other adjustments require a trip to the violin shop and the often-frustrating process of translating subjective perceptions of sound and playability into terms a violin maker can work with. There is no reason why instruments and bows cannot be designed to allow players to undertake a number of adjustments themselves. Benoît Rolland's Spicatto Bow (figure 6), with its player-adjustable camber, is a brilliant move in this direction. The adjustable neck on Ham's basses (figure 7) allows the player to adjust string height between movements without so much as throwing the instrument out of tune. His adjustable tailpiece (figure 8) makes it easy to tune the string length behind the bridge for each string individually.

I am experimenting with configurations that let players quickly, safely, and repeatedly adjust sound-post length, bass-bar tension, and even the frequency of the main air resonance—thus offering an enormous range of tonal options.

TONE QUALITY

Old instruments tend to have at least one acoustical advantage over new ones: they are better able to suppress the very high-frequency overtones (above about 5,000 Hz) that contribute to a harsh sound.

The harshness is far more apparent to players than to audiences, who in blind listening tests time and again have proven incapable of telling the difference between old and new.

Still, it is the player who must live with the instrument and many are willing to spend large amounts for the mellowness most easily found on old instruments. Is it possible to build new instruments with this kind of sound? It seems to come down to a question of materials—and of what happens to wood over time.

Preliminary investigations suggest that old tops are more highly damped (have a shorter "ring") than new ones, contributing to both fast response and mellow tone. Research should yield more definitive answers. Once they are in, it will be a matter of finding ways to treat new wood to give it the desired properties—or of finding combinations of wood and/or other materials that have these properties naturally.

Either way, makers will be able to offer, straight from the bench, tonal qualities that have so far cost players dearly in the form of old instruments.

FIG. 7: The string height of Jim Ham's bass can be changed in seconds with a small key—without so much as throwing the instrument out of tune.

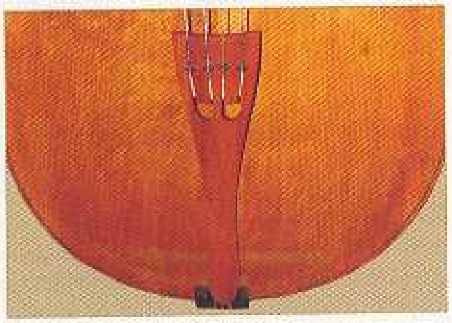

FIG. 8: A Jim Ham bass tailpiece with individually adjustable after-bridge string lengths.

ULTRALIGHT CONSTRUCTION

This brings us to one of the most exciting developments in acoustics research in many years, and one that is beginning to turn heads among a growing number of luthiers.

The best old violins are typically lighter in weight than new ones. The average weight of the top (without bass bar) of nine old Italian violins—including the Strads used by Maxim Vengerov and Iona Brown, the del Gesù used by Elmar Oliveira, and the Testore used by Vladimir Spivakov—is just under 60 grams. The lightest among them (the Booth and the

Kreutzer) are below 55 grams. Reducing mass while retaining appropriate stiffness allows faster response and increased power.

It also makes an instrument less tiring to play—and to carry around.

Creating lightweight instruments is not simply a question of thinning down the top and back. It is a matter of finding materials or combinations of materials that yield the stiffness-to-mass ratios found in the best old instruments. Wood of this quality, though rare, is still available. But why stop there?

Why not go lighter?

In July 2005, a boat designer and amateur violin maker named Doug Martin showed up at the Violin Society of America's Oberlin Acoustics Workshop with a number of violins made almost entirely with balsa. They looked as though they were built on his knee and held together with bits of electrical tape; still, their responsiveness and fullness of sound were exceptional, and they created a good deal of excitement among the professional violin makers there.

Fan Tao, head of research at D'Addario Strings and a fine amateur violinist, played one of Martin's balsa violins for the duration of a chamber-music session. Players, he says, were fascinated—and most were very open to trying other such instruments.

Five months later at the annual VSA convention, cellist Roman Borys of the Gryphon Trio demonstrated a balsa cello made by bass maker Ham and Ted White. Borys pronounced the instrument remarkable for its tone and responsiveness. Hearing how well it compared with the cellist's vintage Vuillaume was for me one of the high points of the convention.

About ten years ago, I began experimenting with ultralight instruments, using both laminated woods and new materials such as graphite fiber. The tonal possibilities—in particular, the astonishingly rapid response—have kept me in a state of more or less constant excitement ever since. Thanks in good part to Martin, this excitement is now shared by enough makers that something like an ultra light movement has been born.

Ultralight instruments should begin coming to market in the next few years.

Will players make the switch? I believe this will ultimately depend not on how much or how little these new instruments resemble traditional ones, but on how well they do in the highly competitive world of auditions, competitions, and solo performances.

In the past 50 years, inventors, designers, and engineers have stretched the concepts of everything from tennis rackets to racing yachts to their limits and beyond. When fiberglass boats began winning races, there was a move to exclude them from competition on the grounds that they were not exactly sailboats. Well, wooden boats have not been competitive for decades, and neither have wooden tennis rackets.

The traditional violin will long be treasured for its extraordinary role in music history, and for the sheer visual and tonal beauty of its best examples. Still, when performance is at stake, what tends to get left behind—both figuratively and literally—is the traditional design.

Functionally successful innovation has a way of quickly appearing normal, while what was replaced, though it may ultimately achieve great value as an antique or a classic, most often becomes obsolete. □