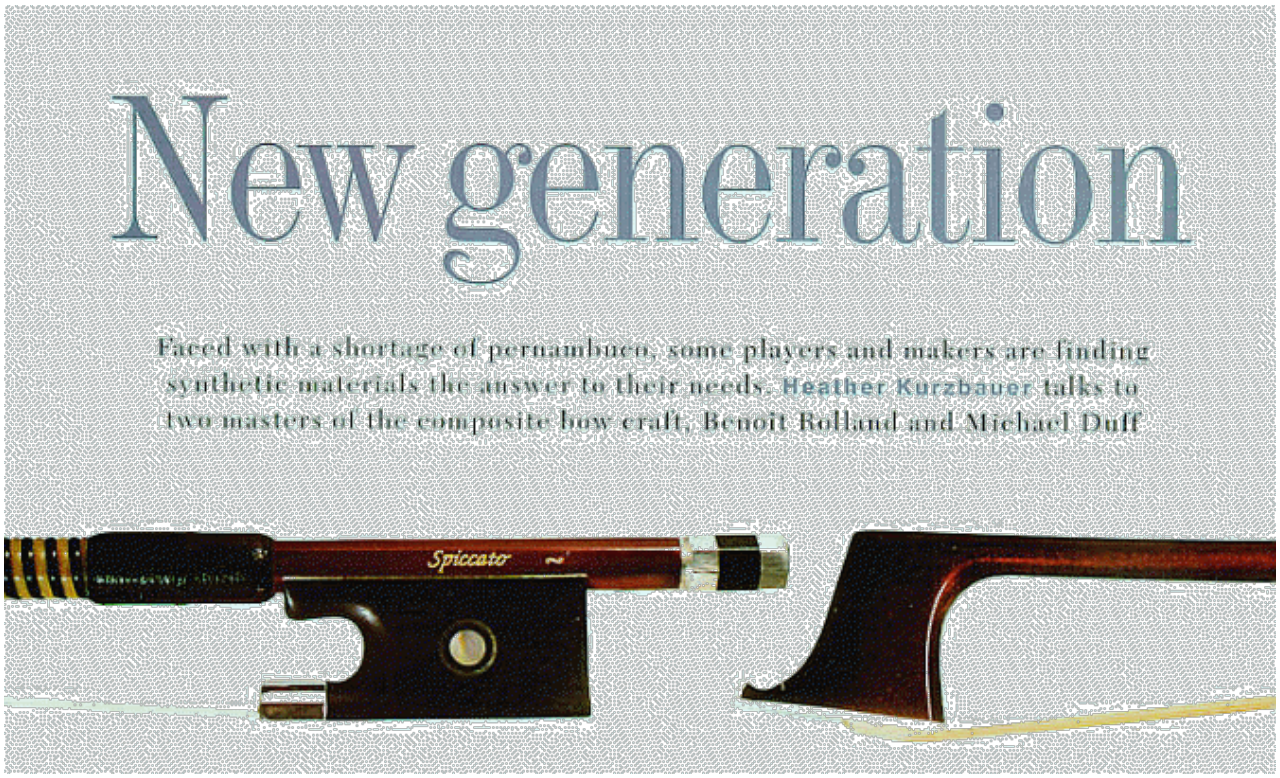
The following article appeared in THE STRAD October, 1997 issue: It is reproduced here (scanned and reconstructed by Caere Omnipage OCR software) as an informational service to string players.



Above:Benoit Rolland's Spiccato bow, based on a Peccatte model.

Once upon a time not so very long ago, an orchestral violinist opened a special delivery package with great anticipation. A gold-mounted tortoiseshell Hill bow had arrived 'home' after re-adjustments. The bow, alas, was hardly a sight for sore eyes: although the package was more or less intact, its contents were pulverised due to an in-transit accident at the local airport. All that was left of a fine bow was its distinctive frog. Such tales of woe, multiplied in the thousands by careless students and unmanageable orchestra pits, are one reason why many players, both professional and amateur, are seeking an alternative to pricey bows. Two masters of the synthetic or, to be technically correct, the composite bow craft, Benoit Rolland and Michael Duff, elucidate other cogent reasons to support what might seem to some a radical alternative to the traditional wooden bow.

The soft-spoken New Zealander Michael Duff waxes eloquent on his passion, the Berg Bow, choosing his words carefully. 'First and foremost there are the string players who are forced to pay exorbitant sums for a decent bow because the top-of-the-line 19th-century French and British bows have become collector's items. Taking a look at things from the bow maker's side, the real dilemma is how can we honestly say that the bow an instrumentalist orders will be the best bow we could possibly make if the supply of Pernambuco wood is shrinking. Also, the quality of the wood is unpredictable due to a complex network of conditions relating to Brazilian ecology. If you analyse the situation carefully, you discover that a synthetic bow, crafted with as much care and greater background research than its Pernambuco prototype, is a much sounder, fairer investment.'

Thousands of miles across the sea, Berg's counterpart, the Parisian Benoit Rolland, shares Duff's views. 'I spent most of my adult life crafting wooden bows in the finest French tradition and I still make such bows.

Nevertheless, I strongly feel that the future of the bow maker's craft lies within the realm of the synthetic bow, By workng to perfect the synthetic bow, I use the knowledge and solicitude toward the craft learned as a traditional bow maker to help meet the future.'

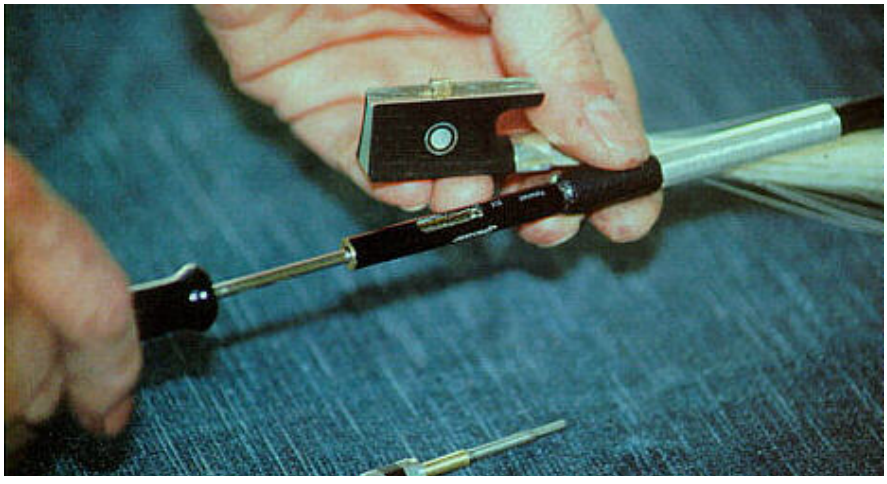
Duff and Rolland came to their comparable conclusions in favour of composite bows from entirely different backgrounds. Rolland initially trained as a violinist at the Paris Conservatory and still keeps up his playing. The rigidity of the conservatory system in France with its emphasis on solf'ege discouraged the young violinist from his first calling. 'We had to study eight different clefs in great detail while in fact only five clefs are used! As a 15 year old, I had four hours of violin, four hours of solf'ege and then general studies each day. Believe me, there was no time to enjoy music-making.'

Rolland's metamorphosis to bow maker came from the realisation that 'the musician within had never died. I wanted to be a part of the music world but independent from its limitations.' After spending a year at a furniture-making institute to learn about woodwork, his next stop was Mirecourt. There Rolland spent four intense years under the watchful eye of Bernard Ouchard, becoming the first student of the now esteemed School of Bow Making. Even at this time, Rolland attempted to move in the direction of synthetic bows. 'Tradition imposes so much on bow makers that it can weigh too heavily upon us. I thought to myself that if musical interpretation evolves and goes through changes, why shouldn't the bow-maker's craft be able to withstand change as well? I made what I would call my first dissident bow in 1973, which I never dared show to Ouchard.'

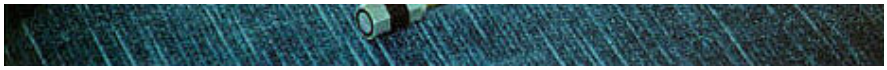
In 1977, Rolland struck out on his own with a small but coveted Paris atelier. He soon discovered that his attentive work as a bow repairer led to a steady increase in customers interested in purchasing bows. The late Mark Reindorf, a specialist in the field of French violin bows, sang his praise of Rolland's work in a STRAD article (September 1989) that still makes the modest bow maker blush. Although it would have been easy to rest on his laurels and continue a career as an archetier of repute, Rolland was compelled to search futher.

'Perhaps my change had something to do with tradition; after all, Tourte imagined the bows of today, but the work of that genius had no consistency. It was Peccatte who was able to rationalise Tourte.' Rolland made the first prototype for what was to become the Spiccato bow in 1985. 'Any new approach is part of a long process of maturity. In my case, the more synergy I had with the musicians who surrounded me, the more I realised that the inconsistency inherent in wooden bows was a great source of frustration.'

Rolland also spent a great deal of time at sea, enjoying the solitude. 'It might sound a bit crazy, but elements of the wind and the waves influenced my design. The sea also led me to discover the materials needed to make mv experimentation with that dissident bow come to fruition. I saw how incredible sailboats, better than the marvellous old wooden models, were now made from composite materials and thought, why not try it with bows?'



In Rolland'sSpiccato model, an internal Kevlar thread is attached inside the stick at the head and adjusted by a special key at the frog. This allows the player to adjsut the bow's camber and flexibility.



The demands of Paris life, a busy atelier and constant commitments were not conducive to thoughtful progress. Rolland moved to Brittany in search of quietude and 'the space to dreamn my next step. Realisation was one thing, but the culmination of his project took seven tough years of trial and error. 'To translate the musicians' language into the technicians' language was excruciating at times. I had to rework the bow makers' language into that of the scientists time and time again,' he recalls. The result of Rolland's work is the Spiccato bow, originally only for violin but now also in viola and cello models. They closely resemble classic French bows in their aesthetics, but what differentiates them from traditional bows is their composite material, life-long durability and, most importantly, a patented system of internal adjustment that enables the player to change the tension, camber and flexibility of the stick to suit his or her specific demands.

Rolland's revolutionary creation, heralded by musicians the world over, led to his exclusion from the elitist world of French lutherie. 'Mv colleagues reacted by avoiding me; these were the nice colleagues,' he says. Others within the establisment were not as polite. When the violinst Pierre Amoyal presented a Pecccatte and a Spiccato bow for rehairing to a noted Rue de Rome dealer, he was told: 'We, do not rehair composite bows.' However, some years on, with enthusiastic reviews the world over, increasing orders and plans for manufacture in the US, Benoit Rolland's achievements seem unshakable.

Aside from his father's experimental nature, there was no specific factor in Michael Duff 's youth that pointed the way to his present successful career as the promulgator of the Berg Bow. 'My first introduction to the world of music came through the piano. I started with lessons at eight and continued on through high school. Yet, although I loved the repertoire, I really hadn't found my musical voice.' Like many momentous changes in life, Duff's remarkable career turnabout came by chance. 'I remember the vear precisely, 1963, when I completed my medical studies with a double major in microbiology and biochemistry.

left: Michael Duff of Berg bows, who hand-moulds each Berg stick In a process he describes as 'creating a wood to be crafted'.

right: Berg gold fleur-de-lys cello bow

That same year I discovered Sam McLean's violin shop in Wellington, New Zealand. If I close my eyes I call still see Sam, an accomplished cellist as well as Iuthier, standing in front of me spinning tales about the great bow makers of the past. Somehow, at Sam's, I knew I had come home.'

To tell the complete story of Duff"s vovage from the time of his epiphany at the violin maker's shop to the realisation of his own ideas in the form of the Berg Bow could easily fill volumes. 'That same vear I began violin lessons and decided that my expanding career as a professor of microbiology could serve musical goals if I found a position at university with a fine music programme,' he says. Duff's fantasy became a reality after he was offered a faculty position at Indiana University, a school famed for its music department. 'Before I knew it I had befriended Ole Dahl, the Danish luthier who did all the restoration work on campus. Like Sam back in New Zealand, Ole loved his craft and imparted his particular fondness for

bows to me.' Dahl's respect for Duff was reciprocal. Duff became Dahl's assistant f'or a popular course on string-instrument technology at the universitv. Duff soon struck out on his own and opened a stringed-instrument repair shop, The String Consort. 'My obsession for music in general and bows in particular led me to retire as a microbiologist forever. Yet all those years of looking through a microscope encouraged me, to search for something new.'

The arrival of Franco Gulli, Rostislav Dubinsky and Mimi Zweig at the faculty of Indiana University brought Michael Duff closer to his reincarnation as the purveyor of Berg Bows, 'It was Mimi Zweig who suggested that I look up Bob Berg, the New Zealand-based musician who had taken over the research and development of what came to be known as the Berg Bow.'

The bow marketed today as the Berg bow already has a considerable history. It was invented by Irving Fink, a former assistant concertmaster of the Cleveland Orchestra during the late 1950s. Serving his country as a pilot cost Fink the use of his left arm, but, a man of multiple talents, he retrained as an engineer. The synthetic bow he developed with the help of another Cleveland Orchestra violinist, Stephane Dalschaert, laid the foundation for today's Berg Bow. As far back as 1962, Arnold Steinhard used an early model in performances of the Bartok Violin Concerto no.2 with the Cleveland Orchestra.

The next step in the process involved a US bass player, Bob Berg, who met the then-retired Fink in California. Berg agreed to take over the research and development of Fink's prototype in the mid-1960s and brought the plans with him to New Zealand, where be bad won a position in the bass section of the New Zealand Symphony. Aided by mathematicians, physicists, computer scientists, engineers and his musician's instincts, Berg perfected the Fink model. At this juncture, ready to develop the original bow into a series of different models, Michael Duff came on to the scene. The production of the original Fink bow, which bore the Berg name, was moved back to the US with Duff as its motivating force.

Duff's goal is to produce the finest possible synthetic bow. In order to meet his exacting standards, Duff hand moulds each of the stick blanks. 'Although injected moulding would speed up the process considerably, my goal is not to mass produce incredible numbers of' bows, but to deliver superb quality,' he says. 'hand moulding brings vou close to the traditional craftsmanship involved in making a wooden bow. When I mould each stick I feel as though I am creating a "wood" to be crafted. 'With the encouragement of several faculty members at Indiana University, Duff developed different models for the Berg bows. he too has expanded from the original violin bows to create a now well-established cello bow, with plans for viola and bass ones well in hand.

Berg gold fleur-de-lys violin bow. Michael Duff prides himself on the wood-like appearance he has achieved with composite materials

To include the extensive endorsements of both Spiccato and Berg bows by a considerable number of famous string players, some of whom use these bows to the exclusion of priceless 19th-century specimens, would take up several pages. The reports concentrate on the clean articulation, richness in sonority, even spiccato, powerful 'in the string' tracking and consistency in changing climatic conditions.

The proof, they say, however, is in the playing. Stepping out of the role of interviewer and into the role of

orchestral violinist, I can happilv report that I was recentlv fooled by a composite bow. When a colleague asked me to test yet another bow from his considerabe collection, I wasn't sure which of the great 19th-century makers had crafted the bow. Needless to say, it was synthetic. Vive la difference!

COMPOSITE BOWS: SOME QUESTIONS AND ANSWERS

What is a composite bow made of?
Most composite bows, although often described as being 'carbon fibre', are made of different fibres – not necessarily carbon – bound together with resins. The key to their success lies in the sound conduction of the fibres, in much the same way as a wooden bow works. According to the makers, the quality of the stick – in density and camber – is far more controllable than when using wood.

How is it made?
The fibre/resin composition is moulded into shape, usually by hand. However, individual manufacturing techniques are a closely guarded secret.
The frog and other fittings are made of the same materials and in the same way as for wooden bows. This allows maintenance and rehairs to be carried out by traditional bow makers.

So are all bows by one maker exactly the same?
Michael Duff of Berg states that, because of the handcrafted element, no two bows can be identical. CodaBow, on the other hand, make a point of the consistency between their bows.
All manufacturers allow for some degree of customisation, such as weight, fittings and finishings and, in some cases, colour. Most do more than one standard model to take some of these factors into consideration, but they can also meet additional requirements on individual bows.

What bows are available?
Violin bows are the most popular, with every company making them. Most also produce, or plan to produce, viola and cello bows. Bassists currently have less choice, with bows available from Durro and Berg planning a future model. All these come only in 4/4 size, with the exception of Durro's 3/4 and 4/4 bass bows.

What does a composite bow look like?
Berg bows have a remarkable similarity to wood, in colour and grain. Others choose not to imitate wood in this way, producing bows in black or, in the case of Benoît Rolland, five off-the-peg colours. In every other way a composite bow looks just like a traditional one.

What does it cost?
Composite bows vary greatly in price depending on the maker and additional specifications, such as gold-mounting. For violins, the Durro bow begins at $300, going up to the Berg Gold Fleur-de-Lys at $3,750. Violists have slightly less choice, with Durro at $375, CodaBow at $885 or a Spiccato for $2,200-plus; Cellos go from Durro's $500 to Berg's $4,000, with bassists needing $600 for a Durro. ☛

COMPOSITE BOWS: SOME QUESTIONS AND ANSWERS

How long will it last?
Properly cared for, composite bows should theoretically retain their shape and their performance, as they are immune to many of the dangers facing wood – such as warping or climate – and highly resistant to others – damage by dropping, tapping, even, allegedly, being caught in doors. Guarantees vary, with Berg and Spiccato bows coming with a guarantee for as long as the bow remains with the original owner, CodaBow restricting workmanship coverage to a decade and Durro to one year. Of course, despite optimistic sounds from the individual manufacturers, no one truly knows if and how they'll still be performing in 150 years time.

Will it finance my old age?
It's too early to predict the long-term financial prospect for composite bows. Makers agree, though, that their bows are at least maintaining their value in real terms and that re-sale is not a problem.

How do I try one?
Individual manufacturers vary as to their policy on distribution and trials. CodaBow, for example, offers a no-commitment two-week trial, inviting feedback from players, while Benoît Rolland distributes his Spiccato bow through the Shar catalogue and directly.

Information has been supplied by the following composite bow makers and has been used in good faith. Inclusion does not constitute a recommendation.

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