

The trade in elephant ivory has been banned since 1990



SHUTTERSTOCK

WHAT'S THE ALTERNATIVE?

With customs officials swooping on any items containing ivory, bow makers are scrambling to find different materials to make their tips. **PETER SOMERFORD** looks into the potential substitutes

WHEN THE INTERNATIONAL TRADE in elephant ivory was banned in 1990, bow makers readily switched to mammoth and mastodon ivory for their tips. Now, with the US imposing strict rules on international travel with musical instruments and bows containing ivory – and proposing restrictions on the domestic sale and resale of such items – the bow making community is facing the need to switch again. The fundamental problem is that bow tips made from fossil ivory are extremely difficult to distinguish from those of elephant ivory, and this has already led to incidents of bows being seized by customs officials – and to understandable fear and paranoia among travelling musicians.

There is still a chance that some US government regulations may change, and musicians and industry groups are campaigning for an exemption for musical instruments and bows. For now, many leading bow makers and restorers are urging their customers not to travel with their fine bows, nor rush to replace their ivory tips. Maine-based bow maker Lynn Armour Hannings says: 'My recommendation to players is for them to leave their good bows alone and not make any rash changes. Many tips of antique bows are original, and we don't want to do anything that could endanger the head.'

Musicians still have to travel, though, and bow makers still need to make a living, so what are the options? Players might choose to travel with a carbon-fibre bow, or a pernambuco bow with a different tip. Plenty of tip materials are already available, ranging from cheap white plastic to gold, but nearly all have issues, usually with durability, long-term adhesive stability, or ease of use as a bow making material. There is the additional question of whether players will embrace them as substitutes. So several makers in the US are now experimenting with industrial polymer materials that they hope will prove as durable as ivory. One of these makers, New Jersey-based John Aniano, sums up the requirements: 'The material has to have enough strength. It has to be able to bond well using adhesive. It has to be easy to shape and polish with the usual knives, chisels, sandpaper and polishing techniques that we use when we replace an ivory tip, or install one on a new bow. And it has to look pleasing to a player.'

The need for a viable alternative to mammoth has been made even more pressing after the states of New York and New Jersey signed laws earlier this year banning the sale of products containing any kind of ivory – not just elephant. As Hannings says, 'We need to find another material immediately, and the challenge will be to make it easily and widely available to the whole industry.'

HANNINGS, WHO TEACHES BOW making and also sells supplies to others in the trade, has been advocating **casein** tips. A plastic derived from milk protein, casein has been in production since the early 20th century. 'Casein carves nicely, doesn't chip easily and has good strength,' she says. 'I like it a lot, but it's white. I would love to see a type of casein that is a slightly different colour – not garish or weird but something that would be different enough from creamy white to make it easy for customs officials to identify.' Aniano, while not giving casein's strength and handling qualities quite as much praise as Hannings, agrees that the material's

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LYNN ARMOUR HANNINGS

appearance is a big problem. 'It looks too much like ivory. If there were a way for the manufacturer to add in some kind of colour tag – perhaps green or blue flecks that could be seen under a magnifying glass – that could make it more viable.'

To avoid the colour issue completely, Hannings has started to experiment with **ebony**. Tip liners are routinely made from ebony, so why not just have one thicker piece as a combined tip and liner? 'Ebony is used as the liner for its strength and durability,' says

Hannings. 'It also polishes up beautifully. It shouldn't have an adverse effect on the weight and balance of a bow. And it's not white.' Other makers are thinking along similar lines, according to David Warther, whose Ohio-based lutherie supplies business is increasingly shifting its focus from pre-ban and mammoth ivory – in light of the US trade ban – and over to alternative materials. 'We've seen a growing demand for ebony bow tips,' he says. 'One bass bow maker whom we supply puts an ebony tip on an ebony liner. He likes the added strength.'

Others are not so convinced. 'The problem with ebony is that while it is a very hard and durable wood, it is fairly weak across the grain,' says Rodney Mohr, an Ohio-based bow maker who has done several experiments with alternative tip materials. 'You can snap a thin piece of ebony across its width very easily,' he explains, 'so it doesn't help very much with protecting the head from splitting.' >



▲ Bow tips made from (L-R): mammoth ivory; bone; plastic composite; silver and gold



▲ A viola bow by US maker John Aniano with a linen-polymer composite tip



Zdzislaw Prochownik has used cow bone for almost 30 years

ZDZISLAW PROCHOWNIK

'If there were a way for the manufacturer to add in some kind of colour tag, it could make casein more viable'

JOHN ANIANO

Zdzislaw Prochownik, a bass bow maker in Winnipeg, Canada, also dismisses ebony and other hardwoods as tip possibilities, arguing that they would lack the necessary strength. Instead of mammoth ivory, he has been using **cow bone** for nearly 30 years, as part of a wider strategy to eliminate wildlife products from his bows. Bone has long been a fixture on the inventories of bow parts suppliers, and is much cheaper than mammoth ivory, but some makers, including Hannings, complain that it is difficult to bend well. Prochownik says his experience has been more positive: 'It's a good material, if a bit brittle, and I can do everything I need to do with it just the same as I could with ivory.' However, he is now abandoning bone simply because it is a white-coloured material, and he wants to nullify the risk of bows being confiscated at customs. His solution is to switch to **silver**.

On the face of it, silver seems like a simple choice. It's a proven tip material: the Tubbs and Hills routinely used silver, and silver and gold are also found on some Tourte bows, the original tips attesting to the materials' strength and durability. Contemporary makers also occasionally use silver and gold. However, not all makers believe silver is the best option for new bows, and especially when replacing an ivory or mammoth tip on an existing bow. Mohr points to a long-term durability issue with the adhesive bond between a silver tip and its ebony liner. 'There are very few glues that will adhere metal to a material such as wood, which constantly shrinks and expands with

changes in humidity,' he says. 'Eventually a silver tip is going to come off. One of my customers has a very nice French cello bow with a silver tip, and I have to glue the tip back on every three or four rehairs because it comes loose. You have to resign yourself to the fact that if you glue on a metal tip, it's not on for the long term.'

Historically, silver tips were attached using metal pins, which leads to another problem, as Aniano explains: 'Over the years the wood shrinks but the metal doesn't, which can result in what we call "pin cracks". This cracking can be repaired but it devalues the bow to some extent.' Metal pins should absolutely be avoided by anyone considering switching their original ivory tips to silver or gold, says Mohr. 'If someone is putting a metal tip on a bow that didn't originally have a metal tip, I would beg them not to put pins in it. To my mind that's almost vandalism because they would be altering the head in a way that it should never be altered.'

BECAUSE SILVER WEIGHS more than ivory, makers are also concerned that switching to a silver tip will change the balance of a bow and affect its playability. Some players may not find the additional weight a problem, but if a bow is already tip-heavy, even a very thin piece of metal could adversely affect the balance. 'Violists and many orchestral players often like a little more weight in the tip,' says Aniano, 'but a lot of soloists would rather have a more tip-agile bow. As for using lighter metals, the trouble is that there aren't many lightweight, non-reactive metals. If there were a metal that polished up beautifully, could be held in place with no problems whatsoever, had the same density as ivory, and was accepted by makers and musicians, then perhaps we'd have our solution.' ▶



Silver has been used on bows by Tourte and Tubbs among others

ZDZISLAW PROCHOWNIK

'Although this fibreglass and resin tip came out nicely, it ruined most of my tools and I would not recommend it': Rodney Mohr



PHOTOS: RODNEY MOHR

Prochownik remains adamant that silver is currently the best option. 'When you use a thin piece of silver it doesn't have that much effect on the balance, and a good epoxy glue will keep the metal in place for ever,' he argues. 'I hope that someone will develop a good ivory substitute. It shouldn't be difficult, but the market for it will be relatively small.'

A larger industry that has been exploring alternatives to elephant ivory for years is the billiards trade, which needed to find effective substitutes for the ivory parts of billiards and pool cues after the elephant ivory ban came into force in 1990. When Aniano and Mohr, along with bow makers Matt Wehling in Minnesota, Eric Swanson in Chicago, Thomas Goering in Kansas, and Yung Chin in New York, started looking at

alternative materials earlier this year, they discovered that suppliers to the billiards industry were offering an array of ivory-coloured polymer materials. Some of these are **polymer composites**, with glass fibres or linen woven into the polymer, acting as a matrix to hold it together. Aniano and Mohr have both experimented with fibreglass materials, and their conclusion is that although these are extremely strong and look very different from ivory when viewed up close, they are also frustratingly difficult to work with. In June, Mohr made a replacement bass bow tip out of fibreglass and resin, an experiment that took him six hours as opposed to the two and a half hours he would usually spend on a bass bow tip. 'And I destroyed around \$75 worth of saw blades and files in the process,' he says.

THE LINEN-BASED POLYMER shows more promise, however. Strong but relatively easy to form, it has the colour of ivory but not its characteristic grain. It is Aniano's favourite among

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RODNEY MOHR



Rodney Mohr has also experimented with a silk and epoxy composite

the materials he has looked at so far, but Mohr points out that it is supplied to pool cue manufacturers in tube form: 'Someone is going to have to take that tube and do a lot of machining to reduce it down to a usable tip.' Warther, however, is already working with the linen material, and he is not perturbed by the machining challenge. Indeed, when we spoke in mid-August, he said that he hoped to have a line of linen-based tips available within a matter of months.

Mohr is taking a slightly different route by experimenting with a composite of epoxy and silk. 'My thinking behind using silk is that it's the strongest natural fibre we have,' he says. 'I'm also hoping that the material will look like ivory at arm's length but could not possibly be confused with ivory when inspected up close. With any of

these composites, though, there is still the issue that no one has any long-term experience of them as tip materials. We know how well elephant and mammoth ivory work, but we can't say for sure whether any of these other materials are going to be as durable.'

Makers are also unsure as to how well players will accept new materials. Bows would start to look a little different if they all had ebony or metal tips, and how would a player feel about a piece of plastic on their expensive pernambuco bow, even if it was hard-wearing and had a familiar cream colour? Hannings doesn't believe that aesthetics will be a problem for most players. 'I think the majority of musicians would be more concerned about a bow's playability than with its look,' she says. But Mohr acknowledges that tradition in the string world can be difficult to break. 'Players want something that looks and feels like the material they're accustomed to,' he says. 'But they have to understand that the natural resources are under attack. As an industry, we will have to get used to different materials.' ■