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EVOLUTIONARY ROAD

In the first of a two-part article, ROGER HARGRAVE traces the development of the violin from the Baroque era to modern times and refutes some long-held beliefs in the process

If We Examine Both New And Antique Violins that have been setup in the modern style, we see a variety of bridge designs, each one finished in its own unique way. We see different fingerboards, some narrow, some wide, some rounder, some flatter. We see many different tail-pieces and bass-bars. We see different neck angles. We see necks set at different heights and depths in relation to the belly edge. We see a large variety of strings. We see all these things and many more. The truth is that at a time when international violin making schools, international conferences and the internet are arguably creating a greater degree of conformity, our ideas about such details still differ considerably.

This raises the question: if we cannot agree about how a modern violin should be set up, why do we suppose that there was ever a specific set up for Baroque violins?

Let us begin by looking at the subject of repertoire. On both new instruments and antique ones that have been set up in the modern style, musicians play anything from Monteverdi to Philip Glass. They also play pop, rock, jazz and blues. However, if there is a valid reason to build 'authentic' Baroque instruments, then surely it is to play period music on period instruments. This notion poses several problems.

Because we know when most composers lived and

worked and even when certain compositions were first published and performed, the development of musical styles can be traced with some certainty. Unfortunately, the same cannot be said of instruments of the violin family. For example, a piece written by Antonio Vivaldi in Venice in the 1720s may have been performed on contemporary Venetian instruments, but, it may also have been performed on instruments that were not only made in another city, but were already 150 years old when Vivaldi arrived on the scene. Such instruments can hardly be considered contemporary with Vivaldi. In modern terms 150 years would take us back to a time before rock and roll, before jazz and blues, even before Gershwin, Strauss, Puccini, or Tchaikovsky.

To complicate the issue further, by Vivaldi's time most workaday 16th and 17th century instruments would have already been seriously modified. Over a period of one and a half centuries fingerboards in particular are likely to have been replaced possibly several times. Moreover, numerous variations of the violin family were being developed in towns and cities across Europe.

INITIALLY, CREMONA AND BRESCIA had monopolised the manufacture of the violin and its family. However, by the second half of the 17th century, as the violin became the most popular European instru-

ment, this monopoly began to disappear rapidly. Instrument makers everywhere simply copied its basic design. Across Europe the tradition of musical instrument making was already hundreds of years old. It was not difficult for skilled makers to copy the violin's basic design.

However, even instruments being manufactured in neighbouring cities were often very different in terms of construction set up and playability. As each new school copied the violin they employed their own idiosyncratic methods of constructing the sides or ribs, attaching and aligning the neck, and making the fingerboard. Eventually, many of these idiosyncratic methods would play a part in the long term evolution of the violin, simply because whenever successful changes or developments occurred in one place, they were adapted and adopted elsewhere, often with surprising speed.

Musicians of the day travelled extensively, taking the latest developments with them and picking up new ideas on the way. For example, when the Florentine Catherine de' Medici married Henry II of France, she took many performing artists with her. One such was the Italian Baltazarini di Belgioioso, her director of court festivals, who was reputed to have been a violinist. Such native Italian artists may have been responsible for processing the order for Andrea Amati's innovative instruments known as the 'Charles IX' set, which were probably made and delivered between 1563 and 1574. Around 150 years later in London, Daniel Parker was copying a Stradivari violin while Antonio Stradivari was still creating his 'golden period' instruments (see *In Focus*, page 70). And Francesco Geminiani, born in Lucca in 1687, also lived and worked in Milan, Rome, Naples, London, Paris, the Netherlands and Dublin, where he died in 1762.

Because of this interaction between musicians and makers, there were no obvious evolutionary jumps, and for this reason there are also no easily identifiable so called 'transitional instruments'. Even when seemingly rapid and radical changes were being introduced around the turn of the 19th century, these

changes were not as abrupt as is often believed: they were simply part of a gradual evolutionary process. In the late 19th century, Enrico Ceruti in Cremona was still using a variation of the Cremonese system, albeit screwing rather than nailing the neck through the neck-block.

In fact, the development of the modern violin family from its first Baroque ancestors has always been a continuous process of modification. Of course, the changes that occurred in the 19th century stand out, not only because they were visually and physically more obvious, but because, as I will demonstrate, our ideas about what constituted the Baroque violin and its family are often misguided.

LET ME BEGIN MY ANALYSIS of these changes by saying that in spite of the obvious differences between the modern and Baroque set up, the basic violin has not changed as much as is often supposed. If necks, fingerboards and fittings are taken out of the equation, in all their essential geometry those violins created by Andrea Amati in the 16th century are virtually indistinguishable from violins being made by most makers today. And the similarities do not stop there. The factors that govern the successful construction and set-up of any violin apply equally to both Baroque and modern instruments. In order to be playable, all violins must conform to certain fixed, but fortunately slightly flexible, parameters.

Instruments made at the same time but in different cities were almost certainly very different in construction

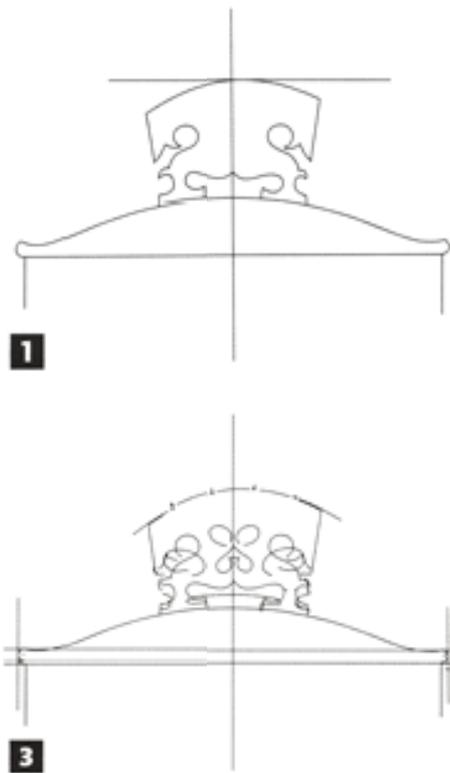


FIGURE 1 Diagram of a standard Baroque violin bridge

FIGURE 2 A standard modern bridge

FIGURE 3 Superimposing on bridge on the other shows their basic similarity in height and curve

Violins such as the c.1566 'Charles IX' Andrea Amati are geometrically almost identical to those being made today

BRIDGE AND FINGERBOARD CURVES

The height and curve of the Baroque bridge is governed by the same factors that control the height and curve of the modern bridge (**figure 1**). Although bridge designs may vary considerably, in concept Baroque bridges are similar to modern bridges (**figures 2 and 3**). Their primary purpose is to elevate the strings high enough so that the bow can pass freely across the centre bouts without contacting the belly's edge. In addition, the bridge curve and string spacings must allow each string to be bowed separately. Consequently, although the height of the strings above the fingerboard, the distance between each string, and the curve of the bridge can all be modified slightly, any instrument not conforming to these basic rules will simply be unplayable.

Just as bridge curves might vary, the curves of both modern and surviving Baroque fingerboards vary considerably. Some are flatter, some are tighter. Some keep the same radius along the board, and on others, the radius gradually becomes tighter towards the top nut. But here again, fingerboard curves must harmonise with string heights and spacing, and bridge heights and curves.

NECK AND FINGERBOARD WEDGE ANGLES

It has long been believed that the necks of modern instruments were angled back to increase their sound. This assumption is simply not true.

In the Hills' 1902 publication *Antonio Stradivari: His Life and Work*, it was suggested that Stradivari employed a shallower neck angle:

The neck and fingerboard as left by Stradivari, side by side with those of today, clearly shows the very different angle at which we now set the head. observe that instead of canting backwards... as seen in the case of the modern one, Stradivari rather inclined it forwards so that the face of the neck came level with the edge, and a small groove was cut in the neck to allow of the edge passing over. We obtain our height at the bridge by means of a more acute angle of the neck, whereas Stradivari effected the same result by using a wedge shaped fingerboard.

In spite of this statement, we can see from the Hills' own illustration (figure 4) that the Baroque neck does tilt back: it is not 'level with the [belly] edge'. (Also in this illustration, the buttons tilt back something that is absolutely incorrect.) And although the idea that neck angles were originally much shallower may have applied to the earliest Baroque violins, there is little or no evidence to support even this assumption either way. This theory is linked to the idea that changes were mainly introduced to improve sound. In particular, it is often said that Baroque necks were replaced to increase their angle, thus increasing pressure on the bridge, which in turn increases sound production.

This is far from the truth. It is more likely that these changes were introduced largely because of advances in string technology, the introduction of new materials and the need to repair or refurbish older instruments. Any sound improvements that occurred were largely a secondary benefit. Preliminary studies also suggest that pure gut base strings in particular generate considerably more load than modern strings.

Our ideas about what constituted the Baroque violin and its family are often misguided

They also require more pressure from the bow to set them in motion.

It has always been assumed that the apparently low angled Baroque neck required a fat wedge shaped fingerboard to provide the necessary angle for the strings to pass over the bridge. However, most surviving fingerboards have a relatively shallow angle. This indicates that Baroque necks must have been angled back quite considerably if the strings were to pass over the bridge at the appropriate height. Indeed, some instruments suggest the neck was angled back at least as much, if not more than most modern instruments. These include the 1690 tenor viola by Antonio Stradivari known as the 'Medici', housed at the Institute

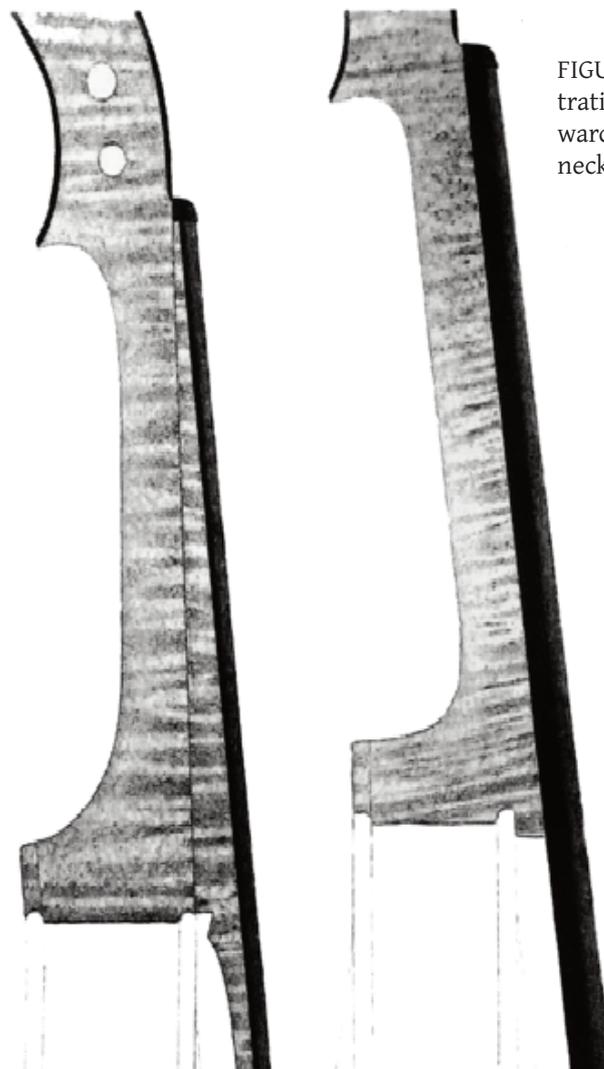


FIGURE 4 The Hills' illustration shows the backwards tilt of the Baroque neck (left)

Cherubini in Florence, and a fingerboard from the "Trechmann" Guadagnini violin, made in Milan in 1757.

The elevation of any necks, whether Baroque or modern, will eventually become lower if the instrument is kept under tension for many decades. This lowering of the elevation is a result of several factors. However, although these factors may include flex in the neck and the neck root, it is mainly movement in the ribs and above all the back and belly plates that create this problems.

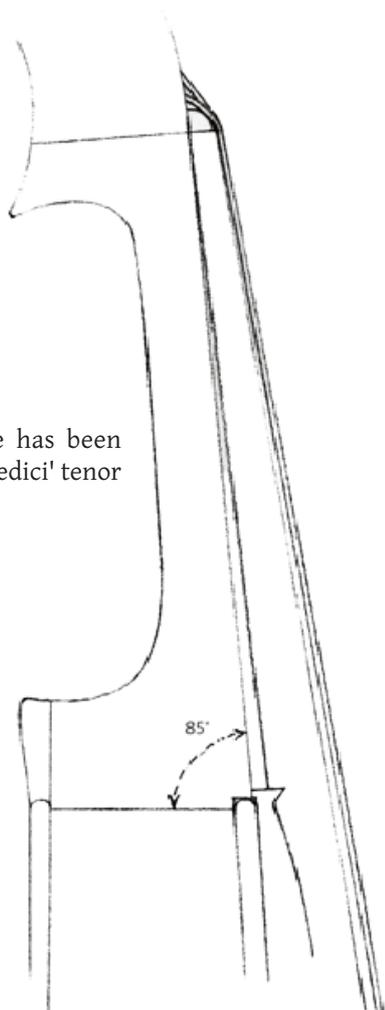
IN THOSE EXTREMELY RARE INSTANCES where an original neck is still attached, the fingerboard has usually been modified or replaced to compensate for this lower angle. The 'Medici' tenor viola provides an excellent example of this phenomenon (**figure 5**). An additional wedge has been placed under the original fingerboard, raising the elevation by several millimetres in order to fit its original bridge. This viola actually has an original bridge that is just as high as a modern one would be. This bridge has been lowered

slightly, but the fact that it was decorated proves that its original height was entirely similar to that of a modern bridge.

If the additional wedge is disregarded, it becomes quite clear that this neck was originally tilted back a long way. The neck's cut off angle is approximately 85 degrees. This is also the angle of an original violin neck by Stradivari, and several viola and cello neck templates in the Stradivari museum.

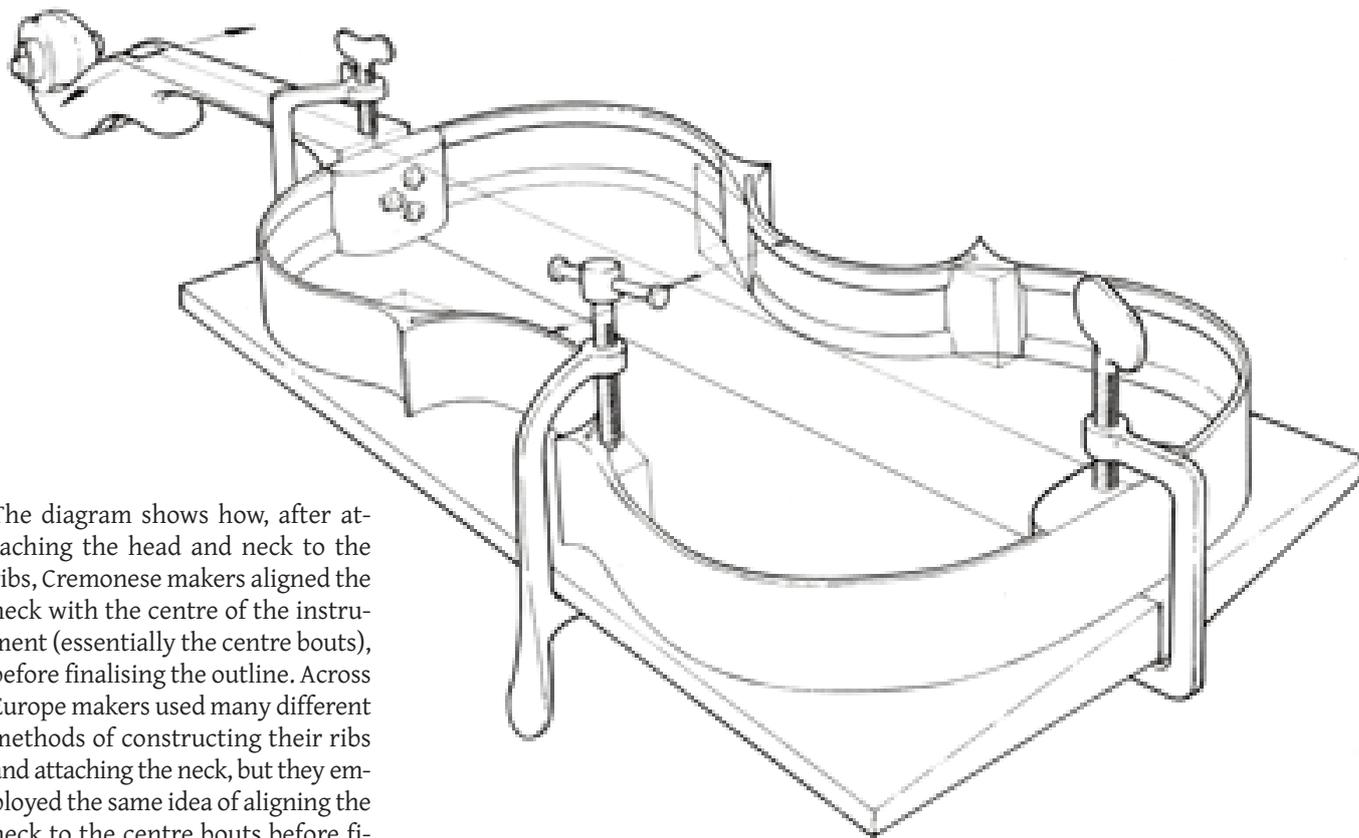
In fact, the cut off angle is an interesting feature in itself. When mortising a modern neck into the neck block, traditionally most shops prepare the neck block end at an angle of about 85 degrees. The question is: why this angle, and not simply 90 degrees? In fact, for fitting the modern neck, this angle could be 80 degrees or even 95 degrees because we simply chop the mortise to fit the neck root. However, for the Baroque neck (depending on the way that the neck is attached to the top rib, an 85 degree angle creates a neck angle that matches the modern set up almost exactly. Could it be that this traditional angle is simply a rem-

FIGURE 5 A wedge has been placed under the 'Medici' tenor viola's fingerboard



The fingerboard of the "Trechmann" Guadagnini violin





The diagram shows how, after attaching the head and neck to the ribs, Cremonese makers aligned the neck with the centre of the instrument (essentially the centre bouts), before finalising the outline. Across Europe makers used many different methods of constructing their ribs and attaching the neck, but they employed the same idea of aligning the neck to the centre bouts before finalising the outline

nant of the Baroque era? Although this may sound unlikely, many similar features have persisted when, other than tradition, there is no apparent reason for them to do so. When I worked at the Hills' shop, there were several early wooden neck templates in various boxes that appeared to support this idea. Unfortunately these templates seem to have been lost when the firm closed its shop in Great Missenden in 1991.

NECK LENGTHS

Because it relates to the overall string length, lengthening the neck to 130mm must have had some influence on the instruments' sound. The question is: how much? Before I address this question, it is important to remember that many modern soloists still happily play on smaller sized antique violins with shorter stop lengths, and correspondingly shorter string lengths. Such instruments with a modern set up may have string lengths reduced (from today's standard) by anything from 6mm to 9mm. These measurements compare favourably with Stradivari's longer Baroque

necks.

Although Stradivari was still using shorter necks, some of his European contemporaries were already

The elevation of any neck will eventually become lower if the instrument is kept under tension for decades

fitting 130mm necks, suggesting that Stradivari may have been somewhat behind the times. There are two violins by Jacob Stainer, from 1668 and 1679, that still retain their original necks. These necks measure 130mm, the same as most modern violins. Their accompanying wedged shaped fingerboards may also be original. They are certainly very early. As well as being considerably longer than those of Stradivari

these boards are also narrower. They are also veneered on their sides confirming that they were not reduced in width at some later date.

IN SPITE OF THESE DEVELOPMENTS, Europe's violin makers had not yet revised their basic method of construction. They continued fitting their necks to the rib structure before finalising the body outline. They also continued to employ wedge shaped fingerboards, but towards the end of the 18th century, circumstances conspired to force a change, and the basic method of construction that had lasted more than 250 years, was gradually phased out. It was followed by what now appears to have been the most abrupt period of change, although this period was also one of continual amendment.

The mid 19th century was a time when necks and fingerboards were being replaced on a regular basis. Firms such as Vuillaume in Paris and the Hills in London continued the work begun by the Mantegazza family in the late 18th century. Together they rebuilt virtually every instrument of merit that passed through their hands. They replaced necks and boards, neck blocks, bass bars and most free fittings.

Some people refer to this as the 'transitional period'. However, this term implies that there was a time where both music and musical instruments passed through a clearly identifiable epoch and for the violin family this was certainly not the case. In next month's issue, I will compare Baroque instruments with their modern day counterparts, particularly in relation to the development of the strings used, fingerboards and the Baroque neck root.

For a more complete description of the Cremonese system of making, see 'The Working Methods of Guarneri "del Gesu" and their Influence upon His Stylistic Development' at www.roger-hargrave.de