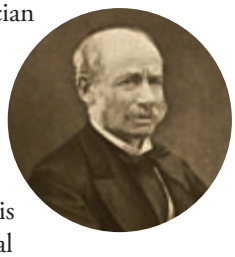
UNSPOILED

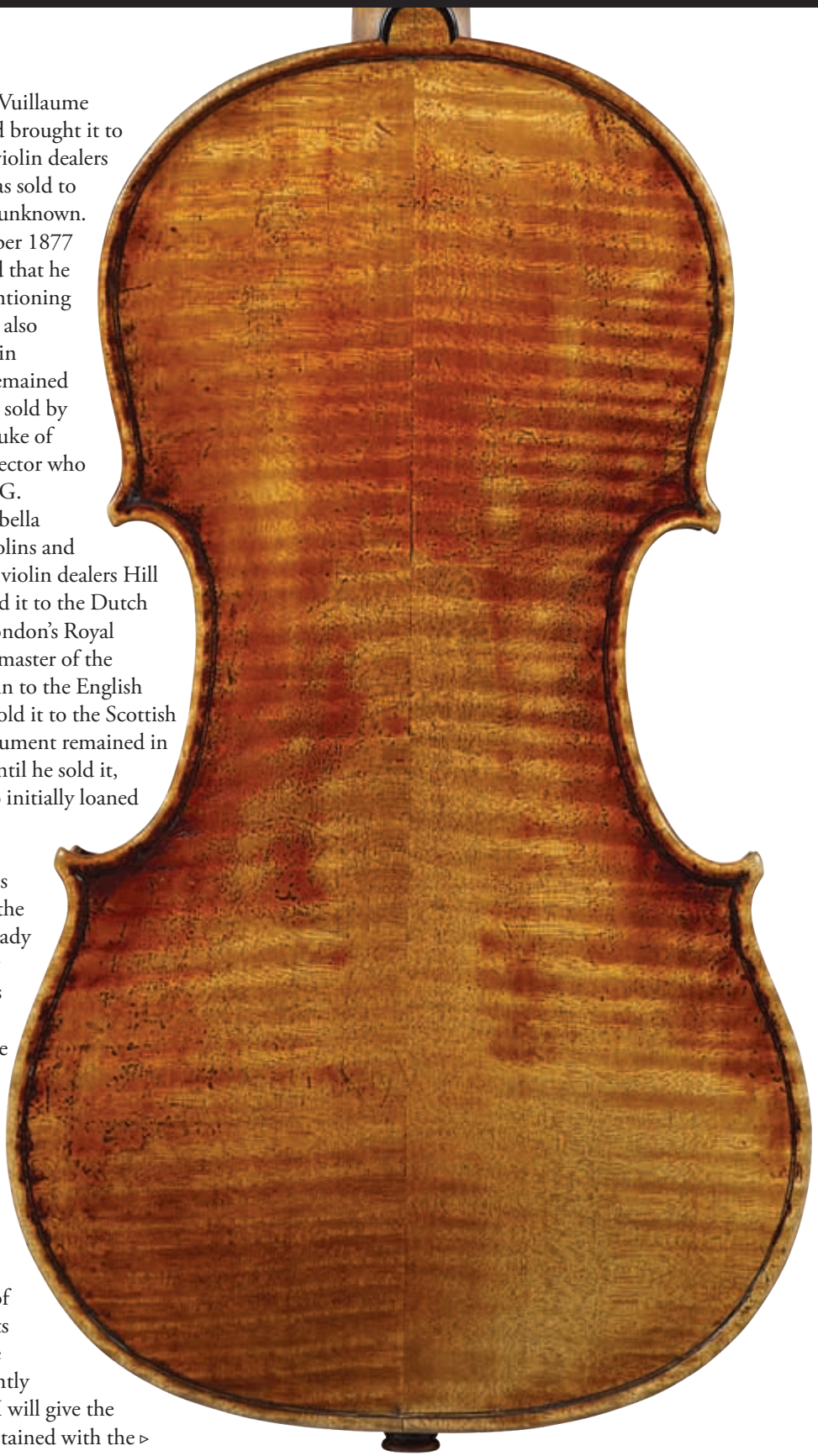
Currently the world's most expensive violin, the 1741 'Vieuxtemps' Guarneri 'del Gesù' is in a remarkable state of preservation, considering it has been in use for most of its life. In the first of a two-part article, **Terry Borman** examines the instrument to discover what it reveals about its maker

At 3pm on 28 August 1881 the small town of Verviers in Belgium became the centre of European attention, when the funeral procession of the late Henri Vieuxtemps began. From early that morning, according to local reports, the railway station had been overwhelmed by thousands of mourners coming to witness the burial of the Verviers-born musician who had had a seismic effect on European musical life – first as a child prodigy, then as a composer, and finally as the reigning violin soloist of the period. There is a photograph of the funeral taken from high up, showing the street overwhelmed with people while the horse-drawn hearse bears the ashes of the recently deceased Vieuxtemps (who had died on 6 June in Algiers). What is not discernible is that just behind the hearse, the eminent violinist Eugène Ysaÿe walked bearing a pillow on which was lying the 1741 Guarneri 'del Gesù' (hereinafter GdG) violin that Vieuxtemps had played for much of his career. Such was the esteem held by Vieuxtemps for this instrument that at one point there were rumours he wanted the violin buried with him!



Nothing is currently known of the instrument's history for the first 117 years of its existence, but we

CHARM



do know that in 1858 the violin dealer J.B. Vuillaume acquired it from a doctor in Switzerland and brought it to Paris. At some point it made its way to the violin dealers Hart & Son in London through which it was sold to Vieuxtemps; the date of this sale is currently unknown. We know of this sale because on 22 December 1877 the dealer wrote to Vieuxtemps having heard that he might be interested in selling his violin, mentioning that he'd bought it from them. Although he also owned a violin by Stradivari this was his main instrument for the rest of his career and it remained in his possession until his death. It was then sold by his brother on 22 November 1882 to the Duke of Camposelice, a well-known instrument collector who also had seven Stradivaris and one other GdG.

After the Duke died in 1887, his wife Isabella began selling his prodigious collection of violins and by 1891 it had found its way to the English violin dealers Hill & Sons who, on or about 27 June 1891, sold it to the Dutch violinist and pedagogue Maurice Sons of London's Royal College of Music. Sons was also the concertmaster of the Scottish Orchestra. In 1927 he sold his violin to the English violinist Robert Bower, who after 15 years sold it to the Scottish real estate magnate Isaac Wolfson. The instrument remained in Wolfson's possession for the next 24 years until he sold it, through Hill & Sons, to Ian Stoutzker (who initially loaned it to the violinist Philip Newman) in 1966. In 2012 it was sold by J.&A. Beare, in collaboration with Reed Yeboah Fine Violins and Alberghini Fine Violins; the sale broke the record for a violin, previously held by the 'Lady Blunt' which went for £9.8m ($16m) a year earlier. The 'Vieuxtemps' was bought, and is currently owned by, an anonymous owner who has loaned the instrument for life to the musician Anne Akiko Meyers.

BACK

The back of this instrument is quite long for the opus of GdG, at 356mm measured with ruler over the arch. This is interesting because, of all the GdG instruments I have measured, or been privy to measurements acquired by others, this is the longest back of his that I have seen. Note that measurements obtained by others and amalgamated can be problematic, as each person may have a slightly different technique or ruler; for this reason I will give the most weight to measurements personally obtained with the ▹

INSTRUMENT PHOTOS J.&A. BEARE LTD

same technique and ruler. I have measured this instrument on multiple occasions, physically and by CT scan, and obtained the same results.

For most of his working life GdG built instruments with back lengths ranging from 350mm to 353mm; it was only during the approximate period 1740–3 that he pushed his norm. The 'Heifetz' of c.1740 has a back length of 354mm; the 'Bazzini' of 1742 is 354mm; and the 'Dushkin' of 1742, currently played by Pinchas Zukerman, is 355mm. This is by no means saying that bigger is necessarily better: the 'Lord Wilton' of 1742 has a back length of 352mm and the tonal characteristics are stunning. The slightly longer-than-usual back contributes to the largest volume of air within the soundbox of all GdG instruments that I have measured – 1.91 litres. Internal volume plays a significant role in the resonance of an instrument.

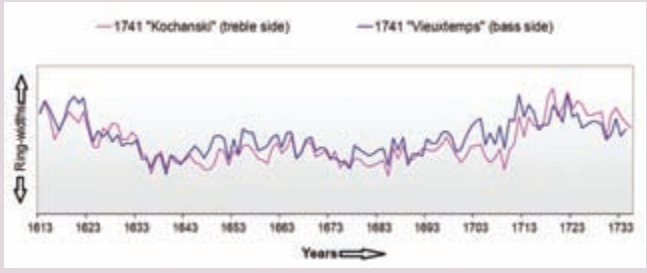
Although the maple of the two-piece back is not the finest I have seen used by GdG, the wood is interesting in that the flames are almost perpendicular to the centre seam. There are around 14 flames per 10cm. If one assumes that the majority of GdG's instruments were not made on commission but rather on speculation (contrary to Stradivari, whose opus seems to have been almost entirely commissioned) it would make sense that he would save his spectacular wood specimens for confirmed commissions; although I can't say for sure that this is true in ▹

DENDROCHRONOLOGY OF THE 'VIEUXTEMPS' GUARNERI

Peter Ratcliff presents the results of an analysis of the tree-ring data from this violin

Although the two halves of the belly share many ring characteristics, the latter parts of the ring sequences diverge significantly from each other. This dissimilarity in ring widths is observable on both sides of the centre joint, and is likely attributable to pieces from different trees.

A total of 122 rings were measured on the bass side, and 134 on the treble. Exceedingly high correlations were found against our database, pointing to latest visible ring dates of 1734 and 1732 on bass and treble sides respectively. The most significant result for the bass half was identified against the wood from the 'Kochanski', also from 1741 (see graph), followed by a further GdG from 1739. Statistical results and graphical comparisons against both these violins point to a same-tree relationship with the bass of the 'Vieuxtemps'. The listings below include several more violins by GdG, especially those made in the last five years of his life. The wood on another of his violins, from 1740, also suggests a same-tree match although its tree-ring series, ending in 1708, is somewhat offset from the bass side of the 'Vieuxtemps'. This indicates that GdG used the outermost part of a larger tree for the 'Vieuxtemps'. Of the best results obtained from instruments other than those by GdG, we note



the presence of violins by Stradivari from the mid-1730s, and further Stradivaris from previous decades, to name a few.

The treble side also attracted hundreds of direct correlations with other Italian instruments, although no strong contender for a same-tree match was identified. Against regional, or Master references, both sides responded significantly to Alpine chronologies, and in particular those from Switzerland.

As is often the case for his instruments, the dendrochronological dates on the 'Vieuxtemps' are very close to the manufacturing date, demonstrating the use of fresh wood, certainly in the case of spruce.

In the listings, T-values and GLK% are statistical methodologies used to judge reliability of likelihood of same tree matches.

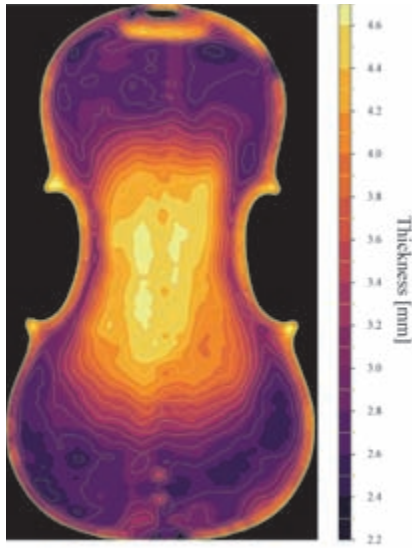
Cross-matches with the bass side of the 'Vieuxtemps' at 1612–1734	T-value	overlap	Glk%
1741 'Kochanski' Guarneri 'del Gesù' violin	13.43	122	76.4
1739 Guarneri 'del Gesù'	12.32	114	78.3
1733 'Prince de Khevenhüller' Antonio Stradivari violin	9.86	85	71.4
1710 Antonio Stradivari violin	9.46	87	65.1
1709 Antonio Stradivari violin	9.05	84	70.5
1744 Guarneri 'del Gesù' violin	8.77	104	69.9
1730 Guarneri 'del Gesù' violin	8.55	102	72.3
1708 'Marchesa Guasco' Stradivari violin	8.53	87	70.3
1741 Guarneri 'del Gesù' violin	8.52	77	80.9
1732 Antonio Stradivari violin	8.48	109	67.6
1734 Antonio Stradivari violin	8.47	87	70.3
1711 Antonio Stradivari violin	8.39	86	70.6

Cross-matches with the treble side of the 'Vieuxtemps' at 1598–1732	T-value	overlap	Glk%
1714 Antonio Stradivari violin	9.43	77	68.4
c.1732 'Stuart' Antonio Stradivari cello	9.15	102	68.8
1735 Carlo Bergonzi violin	8.9	63	74.2
c.1718 Antonio Stradivari	8.39	87	69.8
1712 'Hrimaly' Antonio Stradivari violin	8.34	74	66.4
1716 Antonio Stradivari violin	8.33	82	63.6
1734 Antonio Stradivari violin	8.27	86	69.4
1708 Antonio Stradivari violin	8.26	83	65.9
1734 Antonio Stradivari violin	8.25	68	76.9
1710 Antonio Stradivari violin	7.92	95	60.6
1732 Antonio Stradivari violin	7.9	84	65.1
1735 'King' Guarneri 'del Gesù' violin	7.64	78	64.9

FIGURE 1 Back arching of the 'Vieuxtemps'

FIGURE 2 The belly arching is full to the purfling, with little to no recurve

FIGURE 3 Treble side f-hole



THIS IS SINGULARLY ATTRACTIVE SPRUCE, ALTHOUGH NOT BY THE STANDARD DEFINITION OF BEAUTIFUL

the case of the 1735 'Plowden' (see *The Strad*, July 2011), it does appear to be a wonderful example. It has both signature elements of what I consider to be a known commission: stunning wood choice, particularly for the back, and the rich red-coloured varnish, which was likely quite expensive at the time. In my estimation, the 'Vieuxtemps' was a speculation instrument until fairly late in the building process, at which point he possibly received a commission and then he deemed it economically reasonable to add the red varnish or colouration to the finished instrument.

From the graduation maps, we can see that the typical thickened part of the C-bout area is singularly large, reaching well into the upper and lower bouts. Of the many graduation maps I've seen over the years, the only GdG instruments with this trait, to this extent, are the 'Cannon' of 1743 and the 'Heifetz' of 1740. The condition of the back is quite good, as seen in the (Maximum Intensity Projection) CT images. The ventral pin is clearly visualised. Near the top-block is a small area that has been underlaid. **Figure 1** shows the very shallow 'channel' that is typical of this maker.

BELLY

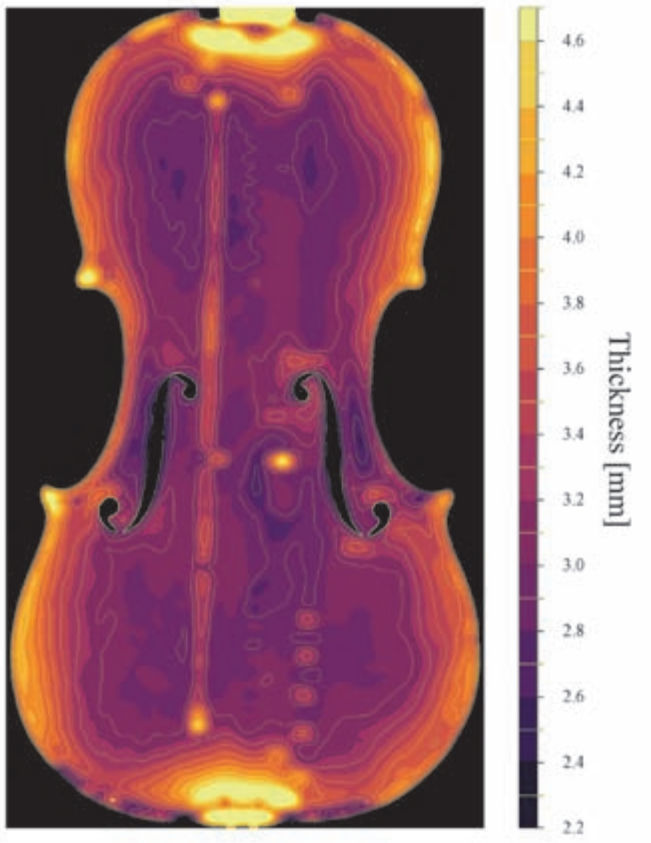
The belly of this instrument has a more typical length of 353.5mm. The wood is cut almost perfectly on the quarter, which gives it the most overall strength and makes for an ideal starting point to begin this aspect of the instrument. The dendrochronological report (see box, page 40) tells us that the treble and bass sides are not book-matched (nor were the vast majority of classical Cremonese instruments) and don't appear to be from the same tree. Ring spacing varies from 12 to 21 grains per centimentre, and for the most part it does not adhere to the 'narrow in the centre widening slightly towards the edges' mantra. Nonetheless this is singularly attractive spruce, although not by the standard definition of beautiful.

As is the case with most GdG instruments, the maker clearly felt that arching was of paramount importance and focused a great deal of attention on this aspect. The work on this particular instrument is singularly inspiring, as both the front and back archings are powerfully conceptualised and yet very delicately actualised. The arching is full to the purfling in the upper and lower bouts and gives the impression of the arch flowing off the belly, rather than what I refer to as 'puddling' prior to the purfling, as can be seen in most instruments. **Figure 2** shows this in detail. There is little to no recurve, nor channel. This is not because of a large amount of wear, as the edges are still quite thick (3.5mm to 4mm). In the C-bouts there is some recurve with the purfling slightly below the adjacent edge. Since the corners have so little wear, particularly the lower bass corner, we can see the original intent before what would normally be worn down through the years to often indiscernible nubs.

The f-holes (**figure 3**) are cut with a precision rarely seen in instruments of any period and were done by the maker at the peak of his skills. The wings have very little wear – so little that on the treble upper wing we can see what appears to be a residual guideline for bridge placement as the line points to the edge of the bridge and the same for a reconstructed line on the bass-side f-hole. The extrapolation of the upper wing tip angle appears to denote the location of the bridge notches. All in all, the condition of the f-holes allows researchers a lovely model to work from, to understand the underlying principles of GdG's f-hole placement.

The thickness map of the belly of this instrument is as unique as that of the back. It is readily apparent that the entire perimeter of the plate, with the exception of a small area near the treble f-hole, displays unusual thicknesses. The density of the wood is even a little on the high side for ▹

ALL PHOTOS TERRY BORMAN



THE ARCHINGS ARE POWERFULLY CONCEPTUALISED AND YET VERY DELICATELY ACTUALISED

GdG, which in 'normal' circumstances would have dictated thicknesses a few tenths of a millimetre smaller. In most GdG instruments, mapping is relatively even throughout. It appears that the lack of 'puddling' towards the edges, which would normally have reduced the thicknesses in the perimeter, accounts for this. The interesting question is whether this was intentional or an absent-minded oversight. For whatever reason this map is quite significant in that it gives clear guidance towards a very successful path to a very impressive acoustical result.

The condition of the belly is remarkable in that it is one of the few classical Cremonese instruments that have been used by musicians, as best we can tell, for most of its life and yet does not have a soundpost patch, or any other, in the top. CT analysis was verified by visual inspection. On the thickness map we can see an area below the bridge that seems quite thick. This is because CT has a hard time differentiating between wood on wood with only a very thin layer of glue; we see similar apparent misreadings at the ends of the bass-bar areas. The ends of the bass-bar often have glue sizing so there may as well be some kind of non-hygroscopic sizing in this area as well. It could also be caused by the CT program having difficulty differentiating the plate from strong contact points which also appear under the bass-bar. There are three small cleats near the top-block, five cleats reinforcing a crack emanating from the bass side of the bottom-block, and a couple of f-wing cleats.

PLATE THICKNESSES

We are providing thickness maps for the belly and back of this instrument. These maps were generated using hundreds of thousands of thickness measurements. Our tests, which compared calliper-derived measurements on test pieces of wood with those obtained from CT scans, show that accuracy is almost identical. The advantage of CT-derived measurements is that the potential for human error is completely removed. With a calliper any deviation from perfectly perpendicular to the measured point on a plate will give false readings, always thicker than real. Comparisons to Hacklinger gauge measurements are also virtually identical, although it's difficult to repeat measurements and get the same result with this method, and the gauge has to be calibrated (which most makers don't bother with). In the end, though, thickness measurements on their own don't provide as much information as we'd like to believe.

There are four parts to interpreting thickness maps: the thicknesses themselves; the density of the wood used; grain orientation (particularly for the belly); and the thickness distributions. The most important factor is the wood density, because variation from the density of the original will necessitate altering those thicknesses commensurately – denser wood will most likely need thinner values to achieve a somewhat similar effect. Recent research has shown that, contrary to the long-held opinion that the classical Cremonese makers had access to 'special' wood, this does not seem to be the case. The notion that they benefited from wood with unique properties derived from the Little Ice Age has long since been debunked, as this would have created wood with significantly higher densities than what has been accurately measured in multiple Stradivari and GdG instruments via non-invasive CT quantitative analysis.

Once the densities and thicknesses are known, the next factor is knowing where thickness distributions occur, as this will affect the underlying concept of how a violin functions: much of the violin sound is derived from modal vibrations. The plates (at lower frequencies) vibrate creating 'signature modes' and knowing where these changes occur one can attempt to sculpt the modes towards a particular goal. We provide density, thicknesses, and thickness distributions as well as an intuitive visual map to guide the maker.

In a letter dated 9 April 1881 to his friend, cellist Joseph Van der Heyden, Vieuxtemps wrote: 'cela coutera cher a l'acheteur, mais il en aura pour son argent, car ce violin est une perle unique' (this will cost the buyer a lot, but it will be well worth it, because this violin is a unique pearl). In the second part of this article we will see just how prescient his comment was, in addition to information about the rib structure, the scroll and varnish, as well as an acoustical analysis. ●

Subscribers to The Strad will receive a free poster of the 1741 'Vieuxtemps' Guarneri 'del Gesù' violin with the June 2018 issue of the magazine, with larger versions of the thickness maps