The Working Methods of Guarneri del Gesù and their Influence upon his Stylistic Development

Text and Illustrations by Roger Graham Hargrave

Please take time to read this warning!

Although the greatest care has been taken while compiling this site it almost certainly contains many mistakes. As such its contents should be treated with extreme caution. Neither I nor my fellow contributors can accept responsibility for any losses resulting from information or opinions, new or old, which are reproduced here. Some of the ideas and information have already been superseded by subsequent research and development. (I have attempted to included a bibliography for further information on such pieces) In spite of this I believe that these articles are still of considerable use. For copyright or other practical reasons it has not been possible to reproduce all the illustrations. I have included the text for the series of posters that I created for the Strad magazine. While these posters are all still available, with one exception, they have been reproduced without the original accompanying text.

The Preparation of the Head and Neck Blocks

The classification of Del Gesù's violins has created problems for generations of connoisseurs – so much so that the Hill brothers concluded that any attempt to categorise them on a chronological basis was futile: 'We cannot subscribe to the correctness of the method of dividing the master's work into periods, for we find no dividing line that is at all perceptible, no decided changes of form or type which we are able to point to as the production of given years.'38 There can be little doubt that the heads of Del Gesù's instruments have contributed much to this confusion. Although the scrolls usually reXect the manner of the rest of the instrument, suggesting that some kind of artistic integrity was sought, they are perhaps his most extravagant and idiosyncratic feature. They range through many forms and ideas, seeming to defy rational analysis and seldom following the same course for more than a couple of years before doubling back or lurching further into extremes.

The violin scroll may well have had some practical use, as yet undiscovered, but the likelihood is that it was purely a baroque adornment. In spite of the opportunity for personal expression which from a modern perspective scroll carving would seem to have

provided, in classical Cremona it was handled with some conservatism. What appear to be major variations in design, or examples of artistic Xair, usually turn out to be the result of different tool-handling techniques. Although their work transcended simple craftsmanship, classical makers were not so much artists as artisans. Their instruments were the product of a systematic and businesslike approach to a relatively simple and repetitive craft, more akin to pottery than to sculpture.39 It is thus highly likely that they practised a rudimentary division of labour, and that various parts of the violin were prepared in batches. This may have been done by the masters themselves or by their colleagues or apprentices. It would certainly have made perfect sense in terms of workshop management. Unlike soundholes and purfling, heads could have been completed separately, perhaps even away from the main workshop by some unknown outworker. This was a common enough practice among instrument makers elsewhere.40

The development of Del Gesù's scrolls is difficult to make sense of, and even the Hills made little attempt to unravel the complexities.41 However, once the notion of another hand has been accepted, a series of tenuous threads leads us from one period of his work to the next. The most obvious and logical involvement would have been that of his father,

Giuseppe Filius Andreæ, one of the most distinctive head carvers in the Cremonese tradition. He produced pleasingly sculpted heads, well poised and weighted, and with a distinctive heavy "comma" form to the eye. They were finished with a broad and deftly cut chamfer, which after 1710 he frequently picked out in black in the manner of Stradivari. We know that in 1730, Giuseppe Filius Andreæ was admitted to hospital with what must have been a serious illness. Possibly as a result of this, he seems to have retired in 1731, the date of his last label.42 But he lived on until 1740 and apparently continued to work, if only on a part-time basis. All the stylistic signs suggest that it was the elder Giuseppe who made the majority of scrolls for Del Gesù's instruments in the period 1732-40, with the increasing frailty of the older man's hand becoming clearly evident by 1738. Because of the nature of Del Gesù's heads it is often hard to establish boundaries between the work of father and son.

The ten years or so before the retirement of Giuseppe Filius Andreæ are something of an enigma.43 Probably fewer than twenty instruments by either father or son have survived. Nevertheless, among the elder Guarneri's scrolls during this period are those where the earliest evidence of Del Gesù's hand is apparent. They are identifiable by a particular delicacy in the execution and style: From the front, the volutes are narrower, the second turn especially so, leaving the eyes projecting widely (rather in the manner of Carlo Bergonzi). From the side, the final turn into the eye produces an extended cut behind the eye, avoiding the heavy "comma tail" that is so characteristic of the elder Giuseppe's work. The undercutting around the volute is generally deeper, and the eye smaller, with the last turn of the volute falling quickly and steeply away when viewed from the back. The whole appears to have been finished with abrasives which obscure much of the workings. The chamfer is also delicate, and this is probably the most telling feature in distinguishing Del Gesù's scrolls from those of his father (figure 18). On these scrolls, the slender chamfer was evidently the final task in the carving process. The Xuting and undercutting had already been taken right out to the edge, and the subsequent cutting of the chamfer dropped this edge slightly below the level of the central spine running between the Xutings (figure 19). Because of the shallowness of some of Del Gesù's Xutings, this feature is often obscured by wear. Moreover, in many places on these scrolls, the chamfer overruns the gouge cuts which form the undercutting of the volute.

One or all of these characteristics had started to appear on the scrolls of the elder Guarneri as early as 1715. On the "Dancla", "Stretton" and "Baltic", dating roughly from 1727 to 1731, they are dominant. The scrolls have a very dainty aspect, with an upright oval shape to the spiral, in total contrast to authentic heads by Giuseppe Filius Andreæ. It is reasonable to assume that they represent the unaided work of Del Gesù, whose more feminine style of scroll appeared intermittently until 1734, the "Rode" and "StauVer"44 of that year being among the last pure examples from this period. Significantly, after the death of his father in 1740, this style reappeared.

Perplexingly, the heads of one or two other instruments from the same period as the "Dancla" and "Stretton" show a markedly different approach. The overall effect is stronger and even at times ungainly. The "Kreisler" (1730) is a good example of this type. The scroll has a deep undercut on the vertical walls of the volutes, giving a Xared appearance to the front view of the eyes, an effect which is not found in the earlier work of Del Gesù's father. Marks of the toothed plane used to shape the pegbox sides are also visible, as they are on the cello of 1731. These scrolls are Xawed in execution in ways which those of the elder Giuseppe are not, but in weight and proportion they are comparable with Giuseppe Filius Andreæ heads. This type of scroll reappears with tantalising consistency in Del Gesù's work after 1740.

From 1732 to 1740, most of the known heads are of a different type. Among the finest examples are those of the 1734 "Diable" and the 1737 "King Joseph" which perfectly match recognised earlier productions of Giuseppe Filius Andreæ, evidence of whose workmanship can be clearly seen: The whole scroll is left fresh from the gouge, and much of the character and charm of his work derives from this. The Xuting at the top of the scroll is broad and deep, and occasionally shaped with transverse knife cuts (as on the "Haddock" and "King") rather than the round rasp usually employed, which left its own distinctive marks, most clearly seen on the "Kreisler" scroll. The sideways gouge strokes in the Xuting at the back of the pegbox seem to shimmer beneath the varnish, and slightly spiralling cuts cover the turns of the volutes, while on the best examples (such as the "Plowden"), the vertical walls of the turns are cut with even and regular strokes of a flat gouge. The front face of the scroll is cut with slanting knife strokes. The pegbox is hacked out roughly, the interior being finished with a small radius gouge, the end of the mortise likewise, with no concern for the straight, neat lines

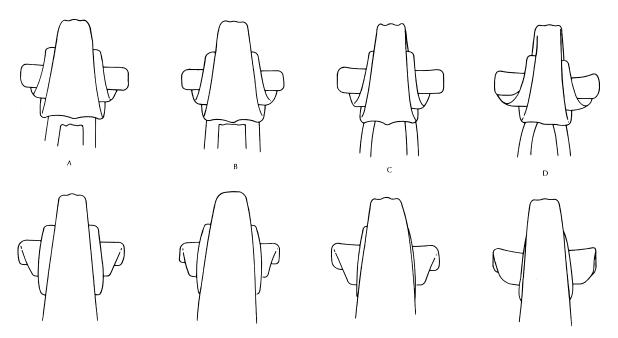


Figure 18. The development of the type of head attributed to del Gesù himself: a) circa 1727; b) circa 1731; c) circa 1742; d) circa 1744.

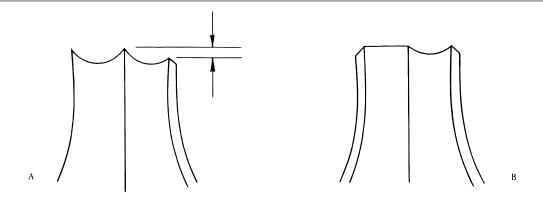


Figure 19. a) The method of applying the chamfer as used by del Gesù himself. b) The method of applying the chamfer as used by Giuseppe 'Filius Andreæ' Guarneri.

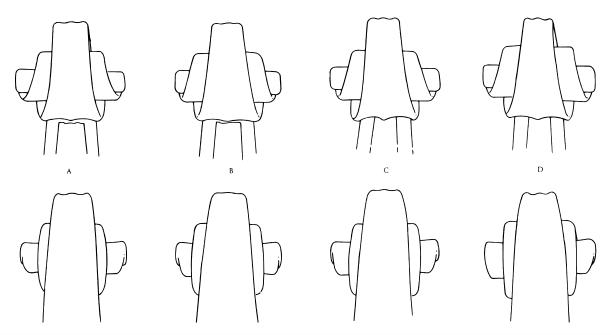


Figure 20. The development of the type of head attributed to Giuseppe 'Filius Andreæ' Guarneri: a) Giuseppe 'Filius Andreæ' Guarneri head on a violin circa 1720; b) circa 1734; c) circa 1735; d) circa 1738.

which Stradivari invariably cut. The end result gives a powerful impression of weight and good, solid proportion (figure 20). In contrast to the "Dancla" type of scroll described earlier, the style favoured by the elder Giuseppe Guarneri shows his adherence to the classical Cremonese practice of cutting the chamfer at an earlier stage, before the Xuting. This produces greater strength and regularity without altering the final profile of the head (figure 19). The strong chamfer matches the strong curve of the pegbox, which is broad and spacious, a practical arrangement for the player threading strings onto the pegs.

The failing powers of Giuseppe Filius Andreæ can be traced through the workmanship of his scrolls during this period. If the scroll of the "Plowden"(1735) is the grandest and most dynamic piece of carving, that of the "Heifetz" (1740), which was worked from the same template, shows a hand and eye unable to follow a Xowing line. That is not to say that this decline was continuous and irreversible: The scroll of the "Kortschak" (1739) shows a relative strength and Xuency for its date, while the scroll of the earlier "Diable" (1734), though undeniably charming, is remarkably asymmetrical and distorted. Whether such inconsistencies are due to the elder man's Xuctuating state of health, it is impossible to say. Another explanation might be that he carved these scrolls in batches, creating a surplus which was used in later years. Del Gesù may well have selected and even modified the various scrolls made by his father to suit particular instruments. There are several examples throughout the middle period which seem to show the heavy, and increasingly crude work of the elder Giuseppe, touched here and there by a more delicate hand - the most obvious case being the "Ysaÿe" of 1740. It is no coincidence that when Giuseppe Filius Andreæ died, this type of head quickly disappeared.

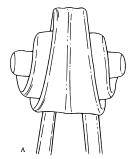
After the death of his father in 1740, Del Gesù's scrolls clearly revert to his earliest type: Separated though they may be by ten years or more, careful reference to stylistic features and working methods leave no doubt that the scrolls of the early and late periods were cut by the same hand. Curiously, Del Gesù's scrolls in the 1740s undergo a similar process of change – some might say, degeneration – to those of his father in the previous decade. His first attempts reveal that he was having difficulty in reacquainting himself with the techniques of scroll carving, something he had apparently not regularly practised for many years. Gradually the workmanship becomes more intrepid, until in his final year, the heads have

every appearance of being the product of impulse, referring back to his earliest style but exaggerating it to the very limit. On instruments of the late period the front face of the volutes becomes steadily narrower, with the second turn almost disappearing behind it. The chamfers are small and fragile. The undercutting of the volutes is deeper and cruder, commencing suddenly behind the A peg in the manner of the Brescians (a characteristic of all the later scrolls). The volutes are cut with a deep concavity rather than the Flat cut of Giuseppe Filius Andreæ. Under the front of the head, the Xutings stop well short of the throat. The eyes become even more prominent, and generally Xy upwards when viewed from both back, front and end - a parody of the elegant style of Carlo Bergonzi. These characteristics finally culminate in the barely controlled eccentricity of the "Leduc". 45

Identifying patterns in the stylistic evolution of Del Gesù's violin bodies is difficult enough, so many are the variations which occur, even within the more obvious trends. It is harder still, however, to chart the parallel development of the heads, especially as any stylistic changes which occur are often inconsistent with those affecting the body. It is virtually impossible to match head groups to body groups. The obvious inference is that Del Gesù's heads were prepared in batches and used as required; at the beginning and end of each batch some overlapping would have inevitably occurred.

There exists a small but significant number of heads which stylistically do not Wt comfortably into any of the of the preceding groups. Among them are the "Carrodus", the "Cannon" and the "Wieniawski". These heads belong to the period c.1741-3 and are characterised by their heavy, almost bulbous form (figure 21). They are obviously different from the Giuseppe Filius Andreæ heads, not only in style but also in workmanship. However, in spite of initial appearances, there are similarities between this "Cannon" group and those of the "Lord Wilton" group. In particular, the volutes are concave, and at the base of the turns lies a coarse cross-hatching where the downward cut of the gouge has not reached the inward stroke of the undercutting, resulting in shavings being ripped and torn out rather than sliced cleanly. When viewed from the side, the spiralling of the volutes has a splendidly wild and open swing - a feature which the "Lord Wilton" and "Carrodus" scrolls noticeably have in common. As with the earliest "Dancla" group, but unlike the Giuseppe Filius Andreæ heads, the "Cannon" and "Lord Wilton" groups both appear to have been rubbed down with

a fine abrasive material.



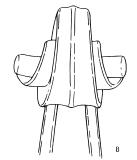


Figure 21. Left, the bulbous form of a del Gesù head in the period 1741-43, contrasted with the narrower form of head, right, from the same period.

In spite of the similarities, the "Cannon" and "Lord Wilton" type of heads appear quite distinct. The "Cannon" cannot remotely be described as dainty, unlike the "Dancla" and even the "Leduc" with its more extreme eccentricities. The second turns of the "Cannon" are more prominent when viewed from the front, whereas the eye is considerably less so. From the back, the final turns of the volute do not fall away as steeply. The chamfers are more heavily applied and the throat is more constricted. Nevertheless, although the possibility of the "Cannon" type heads being wholly or partially worked by yet another hand cannot be ruled out entirely, the general consensus is that these heads are solely the work of Del Gesù.

There are several other heads which Wt neither the Giuseppe Filius Andreæ nor Del Gesù categories conclusively. Although having much in common with the "Filius" heads, the heads of the "King" and the "Haddock" are very wide at both the chin and the nut, and the Xuting over the top of these heads has been formed with a knife rather than a rasp. As already mentioned, the magnificent "Kreisler" of c.1730 is also a problem: Such heads may prove to be the work of more than one hand. In particular, the "D'Egville" head has details which imply that it may have been made by the elder Giuseppe and finished off by Del Gesù himself. Most notably, the bass side of the scroll has a much narrower chamfer and a smaller eye, characteristic of Del Gesù's work. The limited number of the more bulbous "Cannon" type of heads also suggests that they came from a single batch; it is possible that they were the final sorry efforts of Giuseppe Filius Andreæ, rescued from a spares box and finished by a stressed (or slowly deteriorating) Del Gesù. Faced with a heavy pre-cut blank, Del Gesù may have had little choice but to produce a "Cannon" type head, with all the finishing details of the "Lord Wilton". The head of the "Heifetz" (c.1740), clearly the work of the aging Giuseppe Filius Andreæ, is more heavily finished than his previous works and may well be a precursor to the "Cannon" group.

Regardless of authorship, all but the very earliest of Del Gesù's heads were marked out and cut from the same outline template. One such early exception is the "Dancla". However, as can be seen from the diagram (figure 22), if the chin end of the slightly shorter pegbox is disregarded, even the "Dancla" head outline is closely related to the others. This shorter outline was also used by Del Gesù's father, supporting the contention that the "Dancla" head was made before Del Gesù had established his own workshop and label. Given that the "Dancla" pegbox is only marginally shorter, it would be logical to suppose that Del Gesù's later head outlines were developed from his father's model, and this may well be true. But it may be relevant that approximately a quarter of a century earlier, Stradivari was cutting heads using an outline identical to that used by Del Gesù for the rest of his working life: This is revealed when the head outline of the "Kreisler" is superimposed upon that of the "Betts" Stradivari (figure 23). If Del Gesù resorted to an existing Cremonese design, he was not alone in doing so; the Hill brothers made many passing references to such links.46

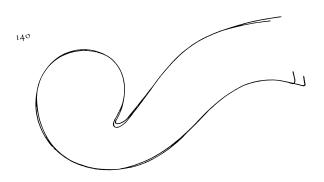


Figure 22. The outline of the "Dancla" head superimposed upon that of the "Sauret".



Figure 23. Outline of the "Kreisler" head superimposed upon that of the "Betts" Stradivari.

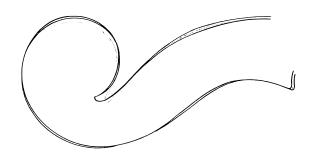


Figure 24. Three randomly selected del Gesù head outlines from circa 1732, 1738 and 1743.

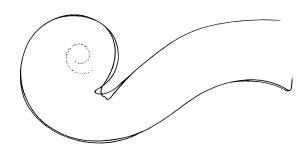


Figure 25. The heads of the "King Joseph" and the "Leduc", showing the position of the eye..

While it might be relatively easy to accept that the "Kreisler" and "Diable" heads were cut to the same template, it is harder to imagine that it was also used for the "Cannon" and the "Leduc". This was, however, almost certainly the case, and no matter how wild Del

Gesù's heads became, their outlines continued to conform. This can be illustrated by superimposing the side profiles of several heads selected at random (figure 24). Furthermore, in spite of the differences between the treatment of the volutes on, for example, the "Leduc" and the "King Joseph", superimposing the turns of the scrolls reveals that the eyes are generally located in the same position (figure 25). On the earlier heads of both father and son, the turns of the scroll also match remarkably well. As might be expected, on the later heads, as the turns unfurl from the eyes they relate to each other with less accuracy. There are a few exceptions, including the more bulbous "Carrodus" and "Cannon" style heads, in which even the eyes do not conform; however such exceptions are probably the result of an inaccurate use of tools rather than the application of a different template. In spite of these variations, the overall proportions indicate that from 1731 all Del Gesù's heads were marked out and cut from the same side template. Nevertheless, a large assortment of side profiles ensued. How these variations came about is at least in part easily explained.

The side outlines of the head and neck were probably marked out from a template similar in type to the paper viola templates which have survived from Stradivari's workshop (figure 4).47 The neck and head outlines were then sawn out. Even on Del Gesù's early instruments, traces of the saw are often found where the cut stopped at the throat: For example, the throat of the "Dancla" is finished directly from the saw. Over the years, Del Gesù's throats ranged from the almost Stradivarian form which characterises the heads made for him by his father, to the more roughly finished examples of his own from the 1740s, which by the time he reached the "Leduc" had become an abrupt rendezvous of saw cuts. At first, both Del Gesù and his father went to some pains to clean the sawn surface back to the marked line of the template. After about 1740 the template is relegated to a mere guide, and the final shape of the head is determined by the somewhat unpredictable course of the saw – and it is clear that the sawn surface was barely touched by the rasp.48 If the side profiles of the "Lord Wilton" and the "Leduc" are carefully examined, it quickly becomes evident that the saw often failed to make either the curve or the distance (figure 26). The subtle, complex lines of the original design were gradually simplified to a straightforward single downward curve from the nut to the throat. This type of treatment to the throat is more commonly a feature of those heads considered to have been cut by Del Gesù himself. In a more moderate form it is evident even

on the earliest heads, as the "Dancla" clearly shows.

Figure 26. Side proWles of a) the "Dancla", b) the "Lord Wilton", c) the "Leduc", showing how the saw cuts into the throat gradually became wider and straighter. The Giuseppe 'Filius Andreæ' style, "King Joseph" head, d) is illustrated for comparison.

As drastic as this operation might initially appear, finalising the side profile directly from the saw was relatively harmless. The resulting outline may have been heavier, lighter, or even somewhat irregular, but it was derived from the same template. Moreover, when the head was finished, the tops of the pegbox walls were all that remained of the outer surface, and on some of Del Gesù's later works these do show

traces of the rasp or saw.49

We know that on a Stradivari violin, the complete head and neck template was also responsible for determining the neck length, and ultimately the overall string length. This was probably also the case with Del Gesù, since it is unlikely that he cut the head and neck profiles at different times. Only two known violins by Del Gesù retain their original necks: The "Cannon" of 1743 and the "Alard" of 1742. To conform with changes in performance practice in the early nineteenth century, each neck was removed from its original position, lengthened at the root and remortised into the body. On both instruments, the neck root has also been remodelled; in the case of the "Alard", this work was probably carried out by Vuillaume. On each violin, the small rebate in the neck root which was originally made to accommodate the belly edge has been filled with a square strip of maple. Normally, by measuring the distance from the rebate to the nut, the neck length can be deduced. However, there seems to have been no Wrm convention in the eighteenth century as to where the top nut should be located. Modern practice is to Wt it in alignment with the chin of the scroll. Today the nut sits 3.5 mm behind the chin on the "Alard" and 1 mm behind on the "Cannon". A calculation of the distance between the belly edge rebate and the chin of the scroll shows the neck of the "Cannon" to have been about 2.5 mm longer than that of the "Alard",50 and that these lengths were respectively 7 mm and 9.5 mm shorter than modern practice. Although the variable position of the nut makes the calculation of the original string length somewhat imprecise, it was certainly around 5 mm shorter than it would be today.

Once the side profile of the head and neck block had been cut and rasped to shape, Del Gesù established the widths. Although the 1737 "Consello" and the 1742 "Lord Wilton" heads display deeply incised scribe lines between the Xutings, these are generally less evident on Del Gesù heads than on other Cremonese heads, including those of Stradivari and even the Amatis. Stradivari's method of marking out the pegbox and scroll widths is evident from the surviving drawings and templates, which in turn can be matched to the markings on his heads.51 This method was probably developed by the Amatis, whose heads are marked in a comparable way, albeit with fewer points of reference. Only a small number of Del Gesù heads have pin markings on the central spine (between the Xutings), and these are not necessarily accompanied by a visible scribe line. For instance, the exceptionally well-preserved head of the "Alard" Del Gesù has fine pin marks similar to those of the "Alard" Nicolò Amati, but there is no sign of a scribe line.52 The rarity of such markings may be a result of natural wear or Del Gesù's method of working the Xutings, which were often finished with an abrasive and occasionally quite shallow. However it may simply be that a different system of establishing the widths was adopted (perhaps with a paper template).53 Like the central scribe lines, the equally rare presence of deep pin pricks at the point of the chin on the "Haddock" and the "King" may be an indication of another system.

The Cremonese pegbox had a particular function which dictated its shape. Over the centuries it had evolved only gradually. The most obvious change since the time of Andrea Amati was an increase in width at the A peg end, presumably to allow more room for fitting the A string. It was probably Stradivari who first altered the delicate line of the Amati pegbox for this practical purpose. When a Stradivari pegbox is viewed from the back it can be clearly seen that the line of the pegbox narrows suddenly as it turns into the scroll. On the working drawing, this change is centred around the circle from which the straight lines were cast towards the semi-circle of the chin. Del Gesù certainly preferred the wider pegbox (most apparent on the Giuseppe Filius Andreæ heads), but initially his pegbox tapers were more subtle than those of Stradivari. In addition, although Del Gesù's scrolls vary greatly in size, with a few late exceptions the pegboxes are remarkable for conforming to the essentials of depth, curve and especially width.

With the marking of the neck and pegbox widths completed, Del Gesù probably cut along the sides of the neck block (creating the tapered root), down past the pegbox cheeks and up to the first turn of the scroll in one action. This necessitated changing the angle of the cut from the neck and root as the saw reached the chin and the sides of the pegbox.⁵⁴ If, as seems likely, the neck and pegbox sides of the later works were again quickly finished, from the line of the saw, with little or no further reference to any marking out, this too was a chance for some considerable "restyling". A saw cut which remained proud of the line would result in a fuller pegbox, whereas a cut which ran on or inside the line would produce a narrower pegbox. This may help to explain measurement differences between, for example, heads of the "Cannon" and the "Leduc"; it may also account for the wavering lines of the pegbox sides of the "Leduc".

Count Cozio describes the neck of a violin with the "Nepos" label of 1727 as brutto, meaning ugly. Taking this one-off remark in the context of all his notes on Del Gesù, it seems clear that he is referring to the "feeling" of the neck. It may be that Del Gesù's method of sawing the head and neck and quickly rasping them to a finish caused the necks to feel somewhat uncomfortable.

Once the widths of the neck and pegbox had been established, the turns of the scroll with all their variations were completed. After 1740, establishing the widths of these turns seems to have been a rule of thumb operation, dictated by the cutting tools rather than the drafting tools. The bosses of Del Gesù's own works appear to have been finished with an abrasive and probably previously shaped with a rasp: On the well preserved head of the "Alard" there are unmistakable traces of a rasp around the bosses. The bosses of the Filius Andreæ type heads, however, were generally finished with a flat gouge. Although the finish of the eyes varied, their final shape was usually determined by a single knife cut where the volutes enter the eye. The same applied to the final cut of the chamfer at the eye.

Before cutting the head Xutings Del Gesù probably hollowed the pegbox. The purest surviving pegbox interiors are those of the "Cannon" and the "Alard". The bottoms and ends have been finished with a small rounded gouge, wide enough to cover the broadest part of the base with about three rough strokes. There is a clearly perceptible flat platform below the G peg, almost reaching the E. The interior does not appear to have been varnished, but does seem to have been sealed in some way. Del Gesù was unique among Cremonese makers in chamfering the inner edges of the pegbox walls. In addition the "Alard" walls have been trimmed back at the nut to allow ease of passage for the E and G strings, although this may have been a later modification.

The Xutings were finished as has been described and as a final touch the chamfers of the scrolls were applied. These were invariably blackened, even on the inside of the pegbox. The black has often penetrated deep into the wood, and while in many cases it has worn away, it has remained in place longer than the varnish layers.

Del Gesù's neck and head wood was generally maple, although some early instruments have scrolls of beech. Although in later years, he was quite willing to use deeply figured wood for the scrolls, as the "Vieuxtemps" and "Leduc" demonstrate, he more often chose an unfigured maple which seldom matched that of the backs (see p. 134 for further discussion for Del Gesù's choice of wood). The most obvious reason for this was that, like most other Cremonese makers, Del Gesù preferred to carve scrolls from plainer maple because it was more manageable. The assumption that most scrolls of the 1732-40 period were actually made separately by Del Gesù's father, and the possibility that they were furnished as a job stock rather than for particular instruments might further explain the mismatching of head, back and rib wood. The "Kortschak" and "Lord Wilton" are interesting in that the ribs, back and scroll are of similarly figured maple throughout, a very unusual occurrence.