

American Lutherie

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Scroll Carving

by Guy Rabut from his 1995 GAL Convention workshop

Most of the scrolls that I carve are based on historical models. The one I am carving today is based on a scroll from a golden-period Stradivari, 1714-1715. I had the opportunity to examine this instrument, so the outline of the scroll and pegbox was developed from a tracking of the original scroll. I took all of the crucial measurements with a caliper at that time as well.

I also had the opportunity to take photographs. It is always good to have a lot of pictures around while you are carving so that you can get into the aesthetic mindset of each scroll, because each model has a different look or concept.

This is an example of a standard set of scroll views from one of my instruments - a Guarneri model: left, right, front, back. Other views are useful as well. The top view is one of my favorites because it shows the transition between the front view and the back. The turns as seen from the back are often convex, while from the front they are usually concave, so you have to figure out how to go from round to hollow. For the duck tail on the back of a scroll or the turns in the volute, a three-quarter view is helpful. A three-quarter view is also good for seeing the sculpting behind the ears. If you particularly like some detail, extreme closeups are helpful.

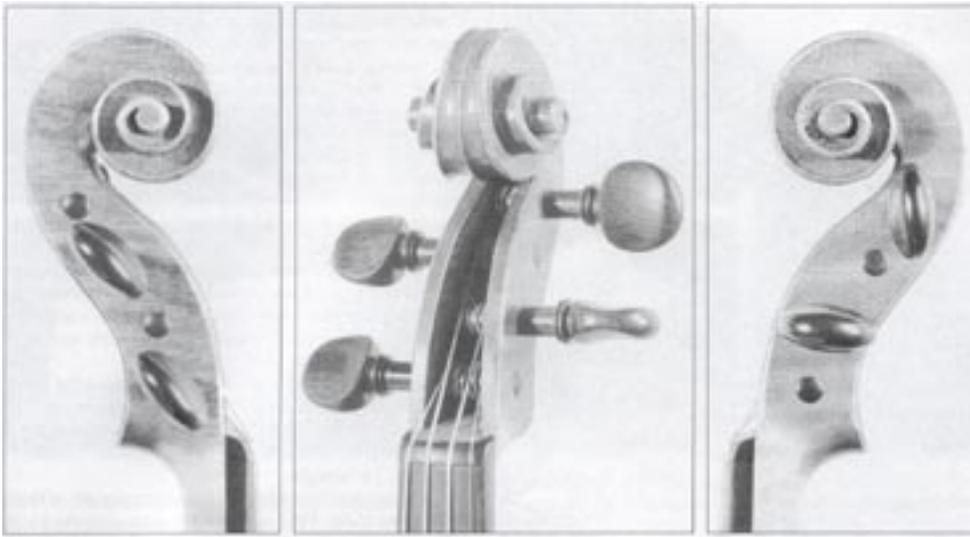
Just a note on photography. I prefer to shoot slides. I shoot Ektachrome tungsten film, EPY-64. I use tungsten lights, and a medium-grey background. I use a 105mm macro lens, and I don't bracket shots. I put the camera on automatic, and I just shoot. Last year we went to L.A. and shot something like 5,000 exposures, and there were only about three duds - somebody bumped the camera. It's fail-safe. You can make prints for reference, you have slides if you want to go to reproduction, and if you are into the modern technology you can scan them on to a CD, put them into your computer, and use that as a base for drawing and design work. It is a very practical and convenient format.



Guy Rabut at work during his scroll carving presentation at the 1995 GAL convention.

If you can't personally examine the instruments you are copying there are a lot of good books with nice pictures, so reference material is not that difficult to get.

A plaster cast of a scroll from a real Italian instrument is a nice thing to have, too. They are safe in the workshop - you're not going to run somebody's varnish. I happen to have a couple that I received as gifts. They show you the three-dimensional as-



pects of the sculpting - how deep a cut is, how it plunges in, the alignment of the ears, whether they are straight through, whether they are undercut - things like that.

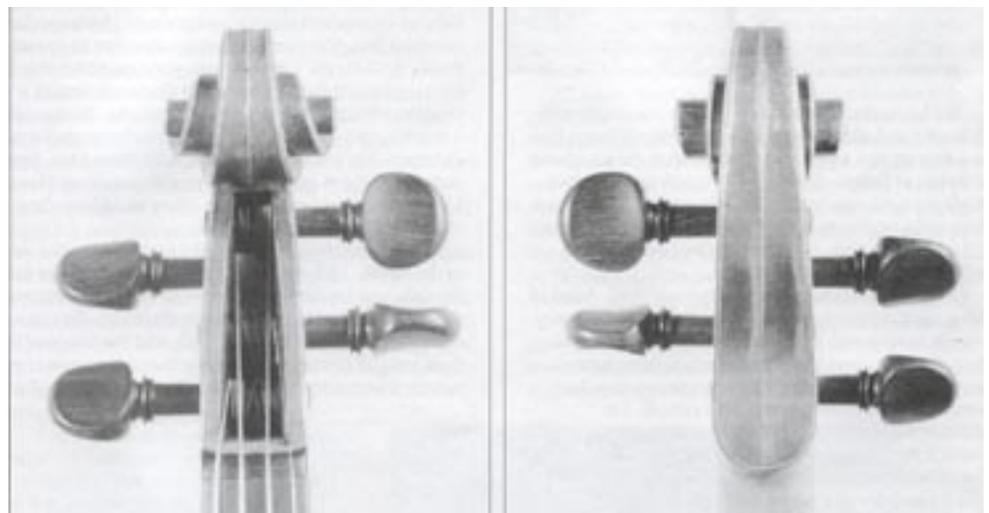
These have been obtained through various colleagues in the trade. As far as I know there is no commercial source

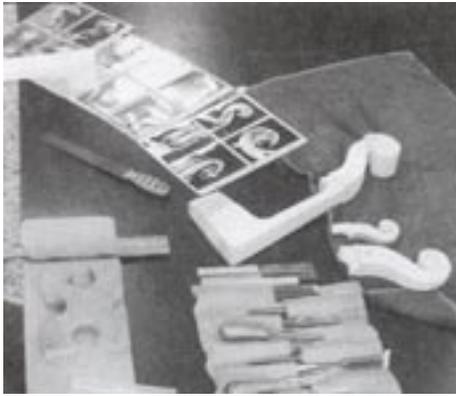
for casts. The process to create such a case is extremely risky and should only be attempted if you are working with someone who has previous experience working with very valuable and fragile instruments.

When you are working from a certain model, do you every try to reproduce the original asymmetries and irregularities?

Some people do. If I were making a scroll from one of the makers that was more symmetrical and freestyle I might very well try to reproduce that. A certain amount of flexibility and asymmetry comes just with the working, unless you are so amazingly gifted that you just can't help but make it perfect. I don't have that problem.

I like a scroll to be beautiful and have graceful curves. To me a scroll is a piece of sculpture. It's the one part of the violin where you are working totally with sculpture and line. It has no acoustic bearing. Some people think that something hacked out and crooked is very beautiful, and that is certainly a valid opinion. I prefer something a little more elegant and refined, particularly if I am working off of one of the models whose foundation is about elegance and refinement such as an Amati, a Stradivari, or the better version of del Gesù. I have a middle-period del Gesù casting, from the few years that he was working carefully, and it is reasonably well executed. It flows pretty well. There are a couple of lumps and bumps. When I am making that scroll I





Guy's improvised demonstration workbench, with tools, plaster casts of cello and violin scrolls, a cello neck in progress, and photos of a Strad scroll.

will take those out and make my own lumps and bumps. (audience laughs)

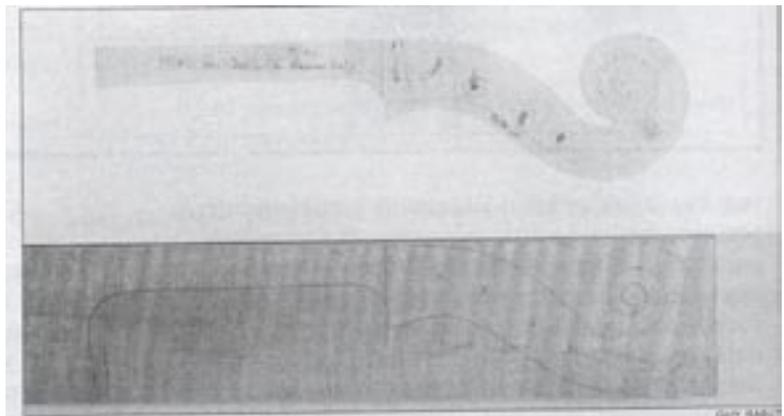
Carving a scroll from a pattern is, for me, a more natural process than just imitating every little lump and bump. If you were trying to copy someone's signature and laboring over each turn it wouldn't have a natural flow. When you write it has a natural flow, and when you work I think it should have a nice, natural flow. It's in line with tradition. If I am working from a Stradivari or Guarneri model, certainly no one would mistake my scroll for a Strad or Guarneri, though they would recognize where it came from.

With any given pattern, you can create scrolls with different attitudes, whether it's one with a circular feel, or a droopy one, or one that points up in the air. Look at different Strads. Strad is relatively consistent, but you'll see each one has a little different attitude. Some have a diagonal axis, some a more horizontal axis, some are fairly centered. You want to give your scroll an attitude, to make it your own.

Tools for scroll carving are very basic stuff. Most of the gouges in my set were made by Dastra in Germany. I'm not in love with them, but they're OK. I bought them years ago and I haven't found anything better. Some people use long gouges, some people use short ones. These were long ones that I cut off. I'm not sure why I cut them off, but that was when I was in school twenty years ago. They're a #6 sweep, and they vary from 6MM to 30MM wide. The 30MM is for one cut on the back of a cello scroll, and I use it once a year for that one cut. I like the soft, gentle #6 sweep. A #7 sweep is too round for me. It cuts too much at one time, and doesn't have as much flexibility. I can't adjust and work with the shape of the tool as much. I also have a few #3 sweeps: a 14MM, an 18MM, a skinny one that's maybe 8MM or 9MM, and a fairly wide one, about 25MM, which I like. They are very flat. I also use a few flat chisels. These happen to be Japanese chisels because I like them, but any flat chisels will work. I use one double-beveled skew chisel for up inside the pegbox, but we won't get to that today.

I also use a few files and sanding-sticks. The sanding sticks I make are shaped like little curved paddles, and I use them for evening the turns of the scroll after I finish my carving. Lately I have been using a metal-sandpaper product from Sandvik, called Sandplate, on my sanding sticks. It lasts a lot longer than sandpaper and leaves a nicer surface. It comes in strips, and they sell holders for the strips, but you can also just glue it onto a piece of wood. I know one guy who glues them on pieces of Plexiglas.

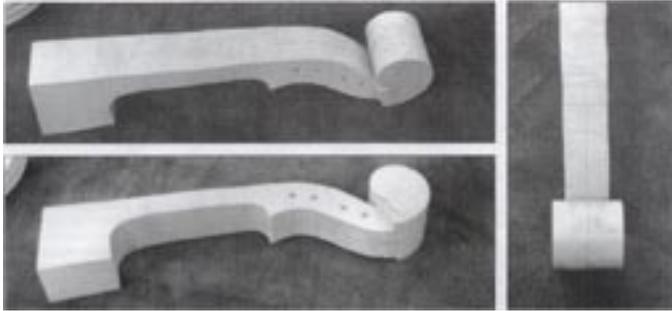
I brought a four-ended Japanese mill file, which is wonderful. The Japanese call them plastics files. You can get them in hobby shops in Tokyo, so



A Strad scroll template, and a neck blank on which the pattern which it produces has been marked. Photo by Guy Rabut.

if you have a friend going there you should ask them to get you a few. They are very sharp and very aggressive for a mill file. I also use a Nicholson Handy File sometimes, and various rasps - whatever works.

So, I've got my pictures and castings here for when I need a quick reference, I've got a list of measurements, and I've got all of my tools laid out in a row in order. I try to keep them that way so I can find what I need quickly. Let's begin.



Three views of neck blank Guy brought to work on during his demonstration.

Before you start carving there are a couple of things you need to do. First, you need to square up the block. The top is flat, the top being the fingerboard surface. Often a cello-scroll block is wedge shaped because they cut them from the tree quartered in a wedge to conserve wood. In that case I usually glue wood on either side to help me square it up. On a violin that's not

usually a problem. Simply square up what you have. In this case it was big enough to make the sides perfectly square with the top to the width of the ears. (I call them ears. Some people call them eyes.) In this case it was about 41MM. Most Strad scrolls are between 39<MM and 42MM. You choose the look that you like.

The second step is to trace the pattern onto the sides of the scroll. This is a pattern for the scroll as seen from the side, and I have another pattern that wraps around the end and gives me the lines for the width of center section on the front, top, and back, and the shape of the duck tail. They are just outlines. The side template is punches with a series of small holes which are used to transfer the spiral pattern to the wood. I connect the little pin pricks with a pencil line so I can see them better. It really gives me a good idea of exactly what I want to do and helps me to visualize the shape. It also give me a chance to change or correct the shape if I don't like where it's going.

I make templates from 10-mil frosted acetate, which should be available at your art-supply store. Working with acetate to create a pattern is quite simple. Trace the pattern off of a drawing, cut it with a knife and break it out, file and sand it to shape. If you don't like a spot cut it off, tape on a new piece of acetate in its place, and correct it until you get what you want. You can make any layout or placement indicators right on the template. For instance, I've made a little note on my cello-scroll template that says "set back 3.0MM," so I remember that when I lay it on the block the front should be set 3.0MM behind the line of the fingerboard surface. That gives a little margin which allows me to plane the fingerboard surface without taking the nose off of the scroll. On a violin the setback is about 1.5MM.



The carving is begun by using a flat chisel to remove waste material from the side of the pegbox up to the point where the turns will start. The photos on the next eight pages show Guy's scroll-carving procedure, and are presented in the order in which they were shot. Note the sequence of the cuts, how the tools and the work are handled, and how the work is supported.

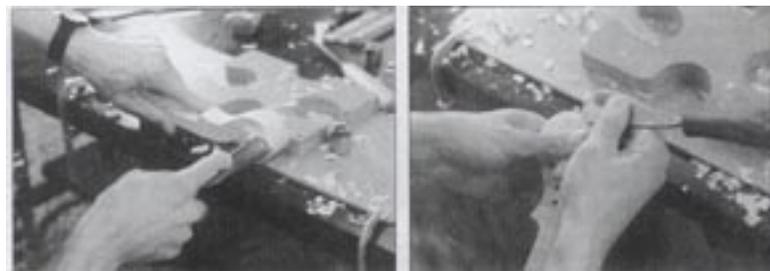
You want to make sure that the side pattern is positioned and

traced symmetrically on both sides of the scroll so that you will at least start out symmetrically. To position the template, make a square indicating line at the upper edge of the nut that goes across the top and continues down both sides of the scroll block. Using those lines as a reference, I secure the pattern to the wood with two push pins, mark the outline, and punch through the holes to mark the points in the turns of the scroll with a needle. I also have my peg hole positions marked on the template. I mark them onto the wood at this point, and I drill them with a drill press while the block is still square. That avoids having problems later lining up pegs.

Next I cut the outside shape of the scroll on the bandsaw, and I refine it until the profile as seen from the side is finished exactly. This is finished. The peak of the bevel of the finished scroll is on this surface.

Once the final profile is established I scribe a centerline down the middle of the whole block.

There is evidence that Strad did it on some of the scrolls that are in less-worn condition. He also used a divider to mark the widths, and those marks are still visible. I use a plastic pattern wrapped around the end to lay out the lines from under the chin, up over the top, and down to the duck tail. Then I cut the waste away from the sides of the neck



and the pegbox up to where the turns start. That's where I am now, and we can start carving.

When you carve you need to support your work. You can just use the edge of your bench, or you can make some kind of an apparatus. I use a support fixture that a friend came up with that's sort of clever. He calls it the 'scroll-o-matic.' The scroll fits into the curves many different ways to support your work as you are cutting. I put a piece of masonite on the bottom of it so I can clamp it to the neck.

Chisel in such a way that you're supporting whatever you're doing. You're always supporting your tool and your work so you can't slip. Don't put pressure against a piece of wood with no support. It could let go and you'll either make a mistake or cut yourself.

Do you generally find yourself holding the work with one hand, or do you ever clamp work down so you can stabilize it better?

I have friends who clamp their work down, and every time I see them do it, it seems like a great

idea. (laughter) I should try to clamp my work more often, but I generally hold it. For a violin scroll freehand carving works well, but for certain procedures I do clamp the work down so I can hold my tool with two hands. If you can clamp it down, hold the tool with two hands, and have better control, all the better.

As I carve the scroll I'm basically going to be making two kinds of cuts, beginning from the pegbox and working out to the ear. First I'm making cuts into this spiral pencil line at 90° to the side of the pegbox, then I'm coming back and making perpendicular cuts to establish the width of the scroll and to remove the waste wood all the way around. I often use the same gouge for both cuts. The first cut, the one that goes in from the side, should be deeper than the second cut, so that you end up having a clean face on the turn. On the second cut, I want the chips created by the first cut to just fall away. I don't want to have to carve them away. You try not to have too many gouge cuts into the sides of the turns, because that surface is a finished surface. Every time you have a finished surface, you want to preserve it so that it will be nice. It's just a matter of working cleanly. Inevitably there will be marks on the sides, but the more care you take the better off you'll be.

The grain in the scroll block is always slightly off one way or another, so there's usually an easy side and a hard side to cut. One side may cut in nicely, and on the other you may have to go at it a little differently. The easy side is usually the one that comes out nicer. If you look at any scroll there's always one better side, even on Strads.

When I am carving a scroll I try to end each step with a finished surface so I'm not noodling back and forth. So often one step depends on the previous step. Particularly in the scroll, if you go back and forth you lose your continuity, and the reference points are constantly being cut away because of the nature of the process.



Do you reestablish your lines as you cut them away?

Once you've used a pencil line to get where you want to go you don't need it anymore. Then you make another pencil line for your next step. I don't need to put it back. If you work back and forth, then yes, you'll need to redraw lines. I recommend trying to cut right to the line. Finish what you are doing before you move on. Leaving a lot unfinished is a mistake.





For instance, ordinarily I start by making saw cuts to remove waste wood, so I will make a line to guide the saw and once I cut to that line I don't need it anymore.

As I am working my way out towards the ear I need a line on the surface exposed by the 90° cuts so I can see the slope of the spiral as it comes around. Just in front of my work, I need that line. As soon as I create a surface, another surface will present itself, and I will continue that line to show where I need to go next.

You are always turning your work, rolling it around to see what is developing, looking for any irregularities.

I got going trying to make the turns so you could see some of that but I should finish the sides of the pegbox now. I

usually do that before I start carving the turns. I don't take it to a completely finished surface at this point, but I establish the surface so I know where it's going to end up. For that I use these little finger planes, and then I use a rasp, and I clean up with a file or scraper.

I cast these planes from some that my teacher had. They are both the same, but one has a curved sole, and the other has been flattened on the bottom. Just a word on using a finger plane. A little plane like this is used as an extension of your arm. My teacher said, "Hold it like a pencil." That was his admonition. And I said, "What do you mean like a pencil?" And, of course, he said again, "Hold it like a pencil." Eventually we determined that, in fact, you hold it like a pencil. The two fingers in the back are guiding it, the front one is exerting the pressure, and you're riding on your knuckles. You're not pinching it. You keep your elbows in. It's a nice, natural process, and you can plane all day that way.

After I've planed, I file it a little bit. You want to get it down close to the line. I usually use a rasp, but I didn't bring mine, so I'll use this Sandvik Sand plate. It's fairly aggressive and leaves a nice surface.

I take it pretty much down to the line. The line is just an indicator of where I want to go, then I use my caliper to measure it. I like the plastic dial-indicator calipers for scrolls because they have non-marring jaws, they're cheap, and they're plenty accurate for woodworking.

The surface you're working on now, the side of the pegbox - do you leave that flat?

I was just discussing this with a friend the other day. He makes a slightly rounded pegbox. I draw a straight line, and I work from that. It rounds off a little as it comes in to the neck to blend smoothly, but I make it reasonably flat. All the old ones would have





had neck grafts pushed up into them, and that affects the lower end, but I think they were reasonably flat as well.

Is the pegbox wider at the back than at the front at the nut?

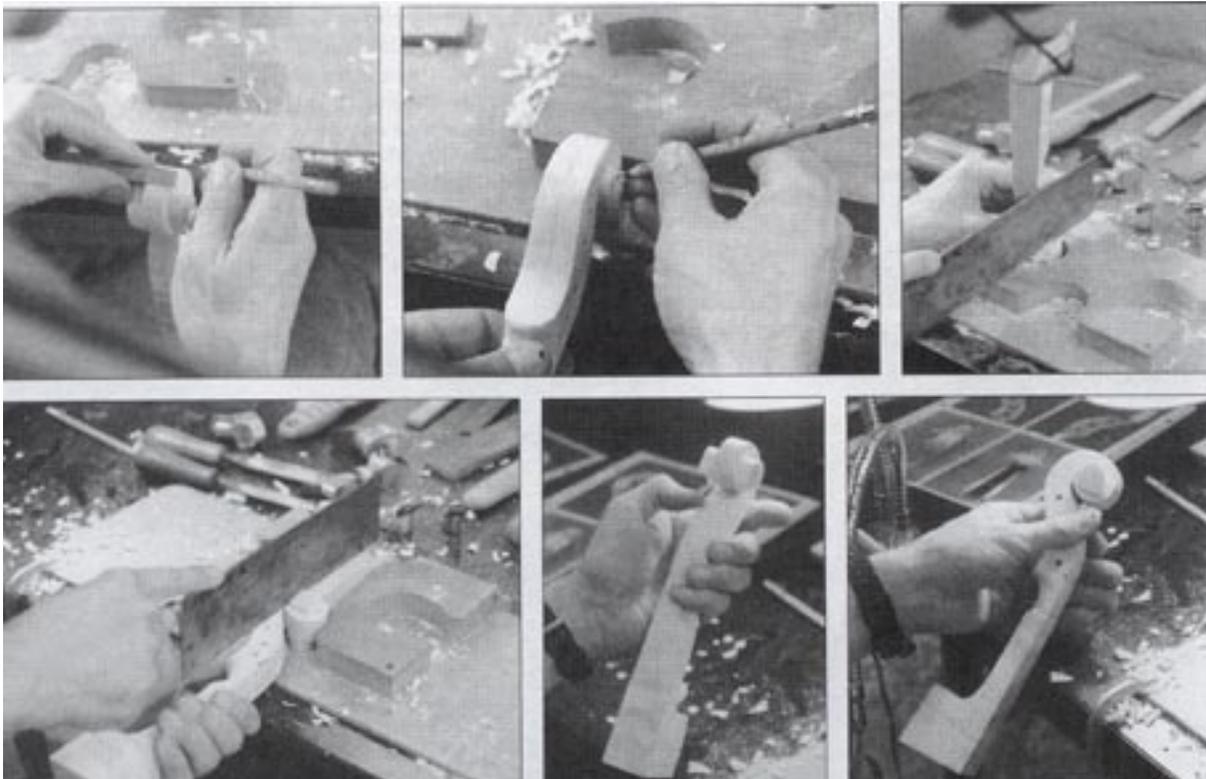
It depends on the width of your duck tail in back. Some of them are wider than others, but generally they taper just a little. I probably have about 25MM in the back, and I'm going to have 24.5MM at the nut. It could be 25.5MM on the back, again, depending on what look you like. Strads usually flare slightly toward the back.

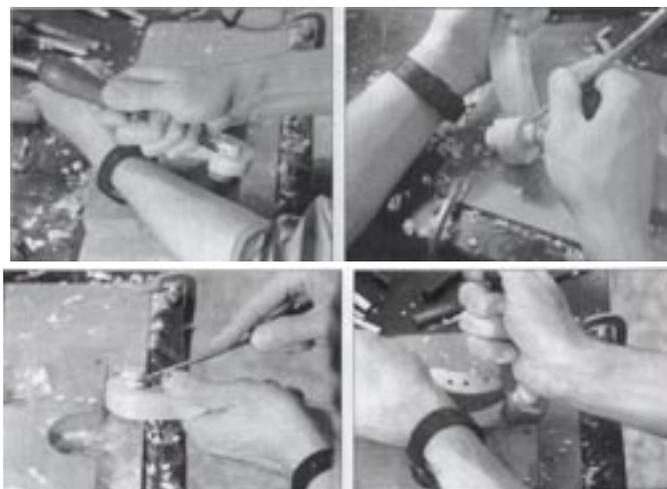
I'll do the little round part where the back of the scroll meets the neck with a knife. I often hold my tool hand in place with my other hand just for stability. All the pressure is from my thumb in this case. My right hand is just holding the knife. This thumb is applying all the pressure. It's amazing the amount of power you have with that thumb.

If you can, always slice with the knife as you're pushing it. As you know, if you try to cut a tomato, even with a sharp knife, and you just push it straight into the tomato it ends up all over the place. You have to use a slicing motion.

I'll cut down the neck to where I've made a stop cut. A little stop cut gives you control, so you're not flying off into the air. If you give yourself something to go up against you're always safer. I'll leave the rest of the neck until later.

Just an aside on tool handling: whenever you are cutting with a knife or a chisel you always want





to brace yourself and your work in some way. The worst thing you can do is to be holding your work, with one foot up, watching TV. It is just bad form. When you play tennis, there's a certain way you grip the racket, or in golf you spend hours practicing your swing and holding the club right. There's a reason you do that. There's a physical, mechanical way of doing something which is efficient, safe, doesn't get you tired, and will help you avoid hurting yourself. The same is true for tool handling. The French always tell you to keep your elbows at your side "coudes

au corps," (elbows to body) is the expression. They'll shout it out if they see you working with your elbows out. They want your elbows down. Maybe it's because they forgot to shower, I don't know. (laughter)

My elbows are braced against my body, the work is braced, the hand that is holding the tool is being braced by the other hand, so nothing is loose. You have more power and control when you're braced. You're not going to slip or be flying all around. It's very important to keep yourself clear of the edge of the tools, because hopefully these things are sharp. (laughter)

I do find myself, sometimes, letting my arm come out a little, but I try to keep it in control. As long as you're aware of what you're doing, you've chosen to do something, it's perfectly all right. But if you find yourself doing something that is not efficient and safe, then stop. Quite often there's a premonition I don't know what it is. You think, "This seems like a really bad idea..." and then it happens. If you look at my hands there are plenty of scars from cuts, but not many of them are recent.

It's time to check the widths with a caliper to see where I am in terms of final widths of the pegbox. I'm sure it's very close to my template, but I'll check one more time just to make sure that it's what I intended.

I like to make the duck tail to describe a section of a circle. It's not pointed, not square, and not square cornered. It could be a slightly squat circle. In other words, the diameter of the circle that describes the curve could be a little wider than the width of the scroll. You can stick a compass in on the centerline and swing an arc, which is what that little compass-point mark is that you see in the middle of the ducktail. I don't mind leaving those little marks. They are part of the construction of the violin and give you a sense of the process. Sometimes these marks can be useful. For instance, I mark the bridge position on my tops. Working from a point in the middle, I mark with a divider where I want the outside of the two



bridge feet to be. When the instrument is varnished, the finish sinks in to those two pin pricks. I can always place my bridge using those marks. I don't have to measure, or mark it with tape. Anybody putting the bridge back will see them.



We have the outside of the pegbox close to completion, and I'll go back to cutting the scroll. I use a saw to remove the waste wood. The more wood you remove with your saw, the less you have to chisel. Once you make the saw cuts, you have square corners, and you can cut the corners away with a gouge. It's just a process of cutting squares and making them round. Try not to undercut with the saw. If you are going to undercut, do it intentionally, and do it with the gouge.

This scroll-o-matic is pretty handy for sawing. I just hold the neck in one hand with the scroll braced in one of these recesses. It's completely solid, and I don't have to clamp it in. My other hand is free to make the saw cuts.

I normally use a little Japanese backsaw, but I didn't bring mine. It is very sharp and precise, and I like the fact that it cuts on the pull stroke. I find it easier to hold the scroll steady while cutting towards myself.

As I begin to define the spirals of the scroll a strong light will help by creating a contrasting shadow. If you get the light right, you'll get a shadow on the turns that helps you see what you're doing. Up to this point I have basically been following my line, but once I start finalizing it, I want to take a good look and get rid of any little bumps and lumps.

It's close enough so that I can now draw my line on the front surface. You really need to keep your surfaces perpendicular and square as you go. It just keeps the whole thing in line.



I keep the sculpting somewhat generous in the beginning, and develop my final concept as I proceed. It's a connect-the-dots process. You begin with the points you know, such as measurements of existing scrolls, photographs, and drawings, and it's just a matter of blending all of



these aspects together. It's not as scary or mysterious as you might think.

I've just drawn around again, and I'm going to make a few more cuts. Before I cut my line away I see one more spot I want to fix. Once you lose that line, you've erased all the evidence of any layout work you have done. You can opt to leave the line if you want to leave the extra wood. On the side of the scroll you want to cut right through the middle of the pin pricks, not cut them away completely. As you cut through each pin prick you will see half of the pin-prick mark left on the side and on the corner. You might find it hard to see those little pin pricks at this point. That's why I draw the line through the marks to make the spiral more visible.

Ordinarily when I am working I have two lights, and I'll push one out of the way and pull the other one in, and alternate them so I get light from both sides at different angles. As I said before, you need good light. A window is nice. Figure out what works best for you.

Do you leave a round button at the end of the ear?

It's relatively round. I think when I designed it, I pretty much made a circle. There's some variation, but I try to keep the circular concept.

As you are carving are you keeping the shoulders square?

Yes, the faces of the turn are flat and square. There's no sculpting yet. I am establishing the nature of the spiral, and the nature of the curves. When those two things are defined I will draw lines to show where the edges of the bevel on the corners will be and do the sculpting, but we won't get that far today.

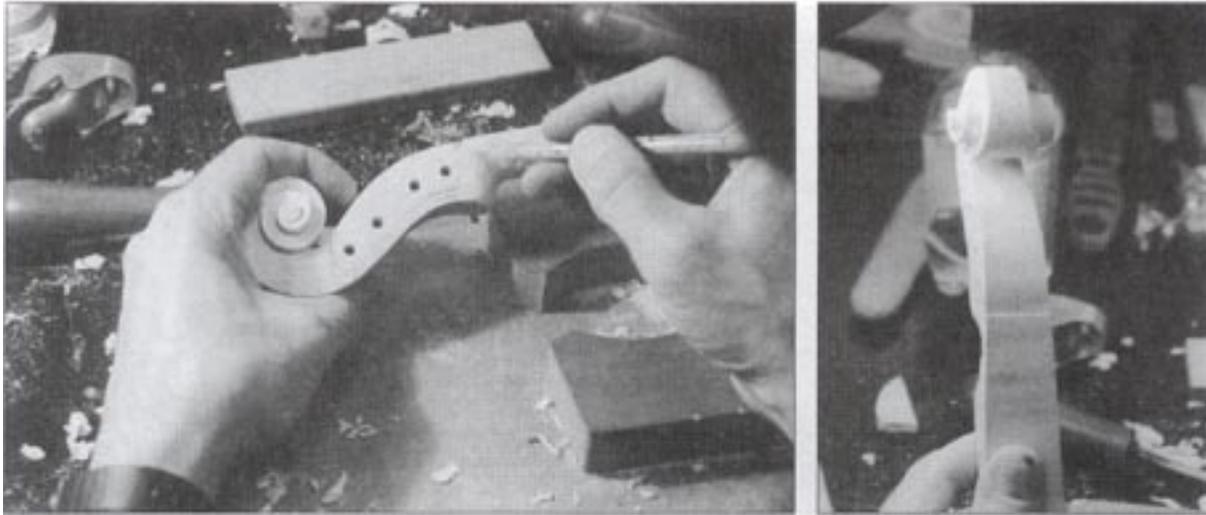


For the most part I do the sculpting by eye. I will refer to some of my photos or a plaster cast, but most of the sculpting of the turns is done by eye, from experience.

Where do you generally start the undercut?

The undercut sculpting of the sides of the scroll usually begins just above the upper peg hole. It goes in fairly quickly to the deepest point towards the front of the scroll and then it becomes shallower around the back in the second turn. It becomes deeper once again as it proceeds to the front and remains fairly deep as it finishes up by the "comma" of the ear. I like to create a lot of dynamic energy by varying the depth of the sculpting at the spiral turns. One should always look for ways to keep the viewer's eye engaged by creating a dynamic interplay of sculptural forms. The three-quarter front and back views of a scroll are very useful to observe the depth and finish of the sculpting of any given scroll.

Could you comment on the types of wood you like to use for a neck and scroll?



I choose a neck block which is dense, even a bit heavy. I look for fine grain and mild, shallow flames. If you select deeply flamed wood for a neck you will find that it is more difficult to carve and it has a tendency to warp. If you look at the scrolls of the great makers you will see, for the most part, wood with fairly mild flames. Often the maple on the back would be more highly figured than that of the neck.

Do you use European woods exclusively?

Mostly. I don't really care where the wood is from as long as the wood has the qualities that I like. If it looks like a good piece of wood, I'll use it. Most of my wood is European because I bought most of it there. The maple in this neck I bought in Germany. It looks European to me.

Does the cost of wood affect the price of your instruments?

The cost of the wood is negligible in terms of the cost of the instrument, except for cello wood, which is getting rather expensive. But still, in terms of the cost of the instrument, it's maybe 10%. I don't always buy the most expensive wood. Some of the wood that I like the best is not necessarily the most expensive.

Have you used any of the domestic maples?

I've used some domestic big leaf maple. Big leaf maple is not generally as hard, so it can be tougher to scrape, and it's not quite as strong, but it's OK. I haven't yet used any of the maple coming out of Minnesota or Michigan. I believe it's what they call red maple, or soft maple, but it's not necessarily soft. My experience with North American maples other than big leaf maple is that they are a little heavier, a little harder, a little more rubbery. In the neck it's not a big issue, really, as long as you can carve it. I don't want a soft, punky maple for a neck. Your pegs are going to split it, and the neck is going to warp. Definitely, I go for the harder and closer-grained wood.



Have you ever tried any alternative woods?

I made a viola with elm ribs recently. Elm has a tendency to split, though. I don't think it's that good. It looks pretty. Some of the Amatis have some sort of chestnut or ash for the ribs. I've never used it. I've used poplar and willow for backs for cello and viola, with good results.

Do you use any power tools in scroll carving?

Only for a couple of steps. I cut the pattern on the bandsaw, and then use the drum sander to go around the profile just because it's quick, but you can file it and rasp it by hand. I drill the peg holes on a drill press. Later on I drill my pegbox to remove most of the waste wood with a forsnier bit. Other than that, it's all hand tools.



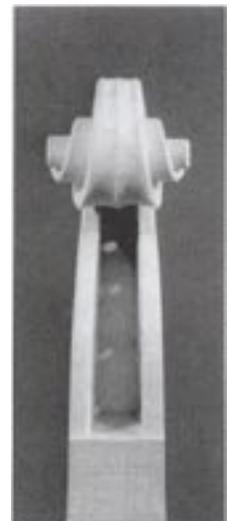
Could you say something about sharpening?

All my gouges are hollow ground, because it make sharpening easy. I have an angled tool rest I made out of a piece of wood that I use with my grinding wheel to regulate the hollow-ground bevel. I also shape the ends of my gouges so that the cutting edges aren't straight like a flat chisel, but are slightly curved. Some people say that the curve of the sweep should be the same as the curve of the end. I just round the ends slightly to make it work for me.

To hone a hollow-ground gouge you rock it on a sharpening stone until you find the flat of the bevel, and then just slide it back and forth with a rocking motion. I use the artificial Japanese stones and put them away. I also use a small Belgian stone I found at a flea market. I don't know where to get them anymore. I heard that the mine in Belgium is finished. They used to be common, and were used for razor sharpening, and they're wonderful. This one is reasonably soft, and I like that. I just rounded the end of it a little bit so I could use it as a slipstone on the inside of the gouges. Most of my tools I don't strop because it rounds them over too much. With the scroll gouges, it's not as crucial. In fact, you're not really using the flat of the tool quite as much. These gouges are soft enough so they strop very easily.

I sharpen my gouges fairly often during scroll carving, partly because the steel is so soft, but also because I want a clean cut. What you see on the side of the scroll is the cut from the gouge. If you gouge's edge has little teeth or nicks, then of course it will leave tracks.

How long does it take you to carve a scroll from start to finish?



For a violin scroll, if I don't get interruptions, a couple of eight-to nine-hour days, a day being from when you come into the workshop to when you leave. Who works an eight-hour day? (laughter) The phone rings, people come by, and all that.

What do you do if you make a mistake and break off a corner or tear out some grain while you are carving?

If you chip something off, just get your Elmer's glue out and glue it back on. Do it right away. It's not the end of the world. It'll be fine if it's not structural.

What do you do if the scroll block is not wide enough for a particular model?

If you are making a cello and the wood for your scroll is a little too narrow you can take a piece out from right in front of the head, split it in half, open it up, slide it out and glue it on to extend the ear. You can get another 3MM-4MM that way. Once you've blended it in and cut it you'll see a very faint line, but it blends in beautifully. Many of the old Italians glued on ears. It's perfectly acceptable.

Is the scroll a baroque design, or is it taken from other earlier instruments, or was it created for violin?

I think it's a universal baroque shape. If you look at furniture or architecture, it's just a way of finishing something. Even the Romans used scroll shapes for decoration. It would have been natural to finish the violin neck with it. Carved heads or crests were used on some of the instruments, but 99% were scrolls. It is traditional, and it's a nice shape to work with.

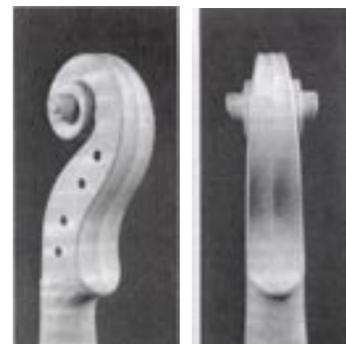
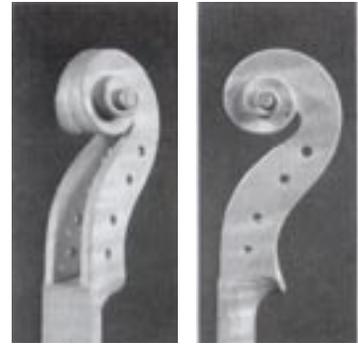
Where the flutes end underneath the front, are you knifing or gouging that?

I gouge it around to the front of the scroll, and then I knife the underside with a long, thin knife. You start at the front and work your way all the way back in. I leave the knife cuts. There's no scraping or anything. I scrape the back, top and front lightly, but I stop scraping as I proceed under the chin which is just cut with the knife. You'll see little facets in there.

Do you like tool marks on the scrolls?

Yes, some of them. Strad is so clean that there are not a lot of tool marks. There are some on Guarneri scrolls.

Why do you suppose there is so much variation in del Gesù's work, with regards to the scrolls? It's almost as though he didn't have any awareness of the earlier work. It's almost as if there were two different people.



Some people have suggested that. I don't know why there's so much variation. It's a tough one, because there are some very organized scrolls, very neat, but those late ones are really out there, and it happens in a short span of twenty years. I've been doing this for almost twenty years and I've evolved and changed, but not like that. So, who knows what happened? Strad worked until he was 93, and his scrolls are very consistent.

How much documentation follows these instruments, as far as who has owned them, and who has worked on them?

Some instruments are very well documented, but many lack such documentation. If an instrument was owned by a famous musician or important royalty there is often a great deal of information. In more recent times many of the important violin dealers have collected and kept good records on instruments that they have handled. As to the work that has been done on any instrument there is usually some oral history passed on to each owner, but most of the specifics get lost.

When you create the round surfaces on those faces, are you using the shape of the gouge to define that curve, or is the gouge not as tight as the curve you are cutting?

The gouge is just slightly flatter than the curve, so the corners of the gouge are clearing the surface. This allows me to shape more easily. I want more control over how these curves are blending, because at any given point it's not just a #6 or a #7 sweep. There are sets of gouges which supposedly, if you match them end to end, create a perfect scroll, but what's a perfect scroll? They are all a little different. I want a little more flexibility.

Do you use gouges with increasingly tighter curves as the turns on the scroll get tighter?

I don't. My approach is to go to smaller gouges with the same #6 sweep. The widths in this set are 4MM, 6MM, 7MM, 9MM, 10MM, 12MM, 14MM, 18MM, 20MM, 22MM, 25MM and 30MM. You can get by without so many. Depending on the model I'm making, I use fewer gouges. If I want to leave more chisel marks I use a flatter #3 sweep gouge, and just leave the big bold chisel marks there. It gives you a very nice faceted look. Strad's work didn't have that faceted look, so I won't do that here. Some of the del Gesù scrolls have more tool marks, which is nice.

There's not that much wood to remove when you're carving a scroll, when you really get down to it, particularly in a violin. It goes reasonable quickly. A few cuts and you're there. And a few more cuts and you've gone too far. (laughter)

Could you quickly review the whole process, especially the final steps that you didn't get to today? For instance, are you beveling the corners before you start hollowing the faces? What's the order?

Some people like to work both sides of the scroll at the same time. Some people like to work one side and turn it around. Working both sides the same time is going to help you with your symmetry in some ways. It's a personal preference. I generally work both sides at the same time to the

same level of finish.

First I get it to the point where the spirals are defined - they are kind of square spirals - then I refine those lines and shapes. After I finish the turns completely I finish the side, and I do the pegbox next. Then, I flute that back, and I do the bevel very last. I have a friend who keeps a bevel going the whole time, sort of a working bevel. He learned that way. It's a different style of work.

For the bevel I make a little line 1MM-1.5MM out from either side of the corner defining the layout of the bevel, then I do the sculpting using the line as an indicator of where the bevel will be. Once I've done all of the carving and scraping I put the bevel everywhere. For that I have a little Nicholson mill file which I've rounded on all the ends and the corners. I ground it, polished it, and buffed it so that the nose of the file doesn't tear up the inside of the turning if it hits it. It works very well. I use it for one purpose only.

Do you ever burnish the bevels?

No, I just file them. I even avoid scraping the bevels as a scraper tends to chatter. I don't fuss over any surface. I do it, and leave it, and move on. I like the surface to have some life. I don't want this thing to look as if it was airbrushed. By the time you put on your undercoat and you varnish it, it has been handled so many times that it's finished enough.

Do you do any scraping or sanding at all on the scroll?

I scrape the sides but not the faces. If you use a nice sharp gouge, it's amazing how good a surface you get. Try to cut as much as you can. Abrading, scraping, and all those things are fine, but cutting is the fastest, leaves the nicest surface, gives you the nicest look, and it's more fun. If you're doing too much sanding and filing you haven't cut enough. The only place that I use sandpaper on the finished surfaces of the instrument is on the neck, and on the edges of the body.

Has your approach to violin making changed very much since you started?

I think that I'm always developing new ideas, particularly in the acoustical area. You can't get that in school. You get basic fundamentals, but you have to learn and develop your acoustic sense by working with musicians. The other area that only develops with time and exposure is the aesthetic sense. In school you learn one particular aesthetic, which is the way it should be. But after you've looked at a lot of older instruments and have more exposure to other ideas you begin to develop your own personal ideas. There's the odd technique or tool that someone will show me, like this scroll-o-matic. I used to use a bench stop, and I was never very happy with it. This seemed like a good idea, so I made one, and liked it. There's always new things to learn and changes to make to improve what you are doing or how you are doing it. It's fun to figure out new ways of doing things.

Do you stockpile scrolls?

I only make scrolls ahead when I need to take some work with me on a trip away from the shop. Scrolls and the necessary tools travel very conveniently. I never mind having an extra scroll or two ahead for an upcoming project.

Are there any successful scroll makers using nontraditional means like carving machines?

There's so little wood to remove that by the time you set up some very clever routing-device carving system I don't know if it would be worth it. I know they do that commercially. There's a fellow in Germany who showed me little 3/4 size lion-head scrolls that he carved all by machine. There were amazing. But I like carving wood. That's why I became a violin maker. (laughter) I don't like selling, I don't like running a business, but I actually do like carving wood. Cutting scrolls is great. When the wood is nice, it's a real pleasure. It's one of the most enjoyable parts of violin building.

Where did you get your training?

I went to the school in Salt Lake City. I graduated in '78 and I worked for Jacques Français, a violin dealer, doing repairs and restoration for five years. When I left there I just worked at home making my own instruments and doing restorations and repairs. About five or six years ago I stopped doing a lot of repairs just to concentrate on new instruments. About three years ago I moved my shop out of my living room and into a studio in Carnegie Hall, which I share with a bow maker and an instrument dealing business. I wanted to separate my business from my home life.

How do you market your instruments, and how many can you make in a year?

I primarily make instruments on commission, and some I make on spec. I sell for the most part directly to musicians who come to my shop. There have been productive years when I have made as many as ten, and other years, like when I was renovating my studio, when there were fewer. It varies each year.

This side of this scroll that I have been working on is pretty well roughed out, and I don't think we have time to go much further. Once it's roughed out, the scroll is about halfway completed. By the end of the day I'm usually pretty well defined in the curves. It's a good point to stop. In the morning you come back and look at it with fresh eyes. You always see a few bumps you didn't see the day before. The second day, I finish it.