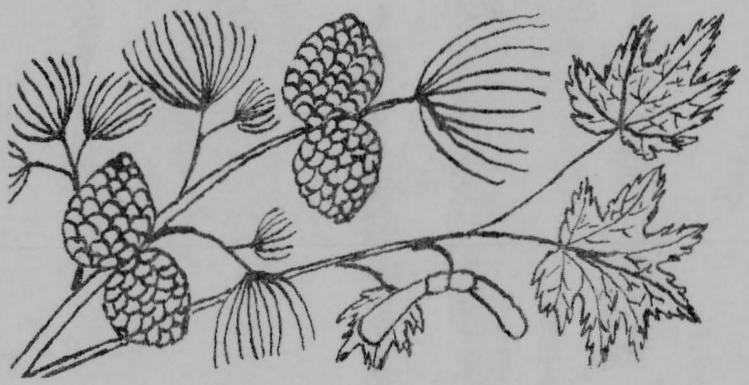
The Violin Makers' Journal

THE OFFICIAL MONTHLY PUBLICATION OF
THE VIOLIN MAKERS ASSOCIATION OF BRITISH COLUMBIA



Devoted to the development and encouragement of the art of violin making in Canada.

THE VIOLIN MAKERS JOURNAL

PUBLISHED MONTHLY BY THE VIOLIN MAKERS ASSOSIATION OF B.C.

Officers of the Association:

President: Mr. Gilson Heyworth, 1683 Renfrew St.
Vice President: Mr. Harold Briggs, 13367 North Bluff Rd. White Rock B.C.
Treasurer: Mr. Floyd Holly, 2636 W. 6th Ave.
Secretary: Mr. Don White, 4631 W. 14th Ave.

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EDITOR: DON WHITE

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EDITORIAL

In our last issue The Rev. Geo. Wright made the suggestion that we establish a North American Violin Maker's Society.

This suggestion deserves our very careful consideration, but is something which should be well thought out before taking any definate steps.

Certainly an organization of this nature would in many ways be most desirable. Rules for Violin Makers competitions might be drawn up as a basis for the judging of instruments. Such an association might even itself conduct an International or even a world wide contest.

The value of a Continental Association to direct the musical minded public towards new instruments and break down the well known prejudice, now everywhere exhibited, cannot be denied.

As to the exchange of ideas, methods and proceedure, this too is important and was the main thought prevalent in our minds when The Violin Makers Journal was created. We believe this ideal is being carried out in a satisfactory manner. Nevertheless a larger magazine controlled by Makers all over this continent might do even better work in this direction.

We would ask you to consider the above thoughts very carefully. There is certainly no harm in thinking and planning for the future.

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There is no virtue in the sweat
of the brow

It's the size of the crop that
matters.
.....Henry Ford

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A FEW THOUGHTS ON THREE ESSENTIALS FOR THE FIDDLE

by William Hall
Listowel, Ontario

In over thirty years of experience in repairing and adjusting violins of all kinds, I have found the most common faults of ownership to be a total lack of knowledge of the functions of bridge, sound post, and the strings. The bridge is usually too thick, and not fitted correctly at the feet, so that they don't conform to the arching of the plate. The curvature of the top not correct, strings either too high or too low, in clearing the finger board.

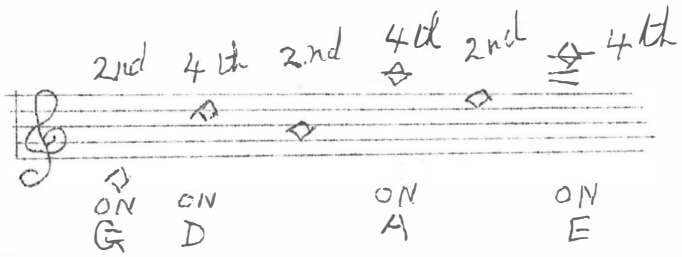
Next comes the soundpost, this mistreated, misunderstood, little piece of wood, had it a voice what tales it could tell! No understanding whatever of its vital role in controling the voice of the violin. It is generally found in the wrong place, wedged in like a gatepost, or so thin in diameter its influence is almost nil, sometimes it is the wrong kind of wood. I've even found the stem of a child's sucker doing duty.

Then the strings, the bane of player, how little attention are given to these by some owners, who boast, "they've been on for a couple of years", I usually reply to this boastfulness, that's pretty good going, if your careful they'll maybe serve your grandchildren. The type of strings I refer to is the thin wire A with its piercing tone, mated to either a thick gut D, or a heavy wire one, that only a rosin saturated bow will cause to vibrate a buzz saw tone. Then there is lastly the clothes-line G. Wow! what a string, the only thing it produces is calluses. The fact such merchandise is in use is a reflection on the manufacturer.

Little attention is given to these items in violin magazines. So starting with the bridge, one should understand its role from a scientific aspect, which is: to convey the vibrations excited by the bow over the whole instrument. This is done principally through the medium of the bass bar, and the sound post. If neither of these two elements is correctly placed, the tone of the instruments suffers. The bridge conveys its impulses or vibrations through the foot of the bridge that rests upon the bass bar, (assuming it is correctly placed) the other foot of the bridge is rendered rigid by the sound post, connecting with the back. The correct placement of this is conceded to be in a line with the foot of bridge, behind it the distance of the thickness of the top plate. The pressure of the strings, particularly the A and E, keep this foot in a state of rigidity, thus allowing the other foot to become the medium of delivering the vibrations excited by the bow, to the bass-bar, thence over the whole body of the violin. One should understand this is a molecular motion, or movement; much the same as an electric current, sets all the molecules in a wire in motion. So the importance of having a bridge so fitted that it becomes an integral part of the instrument should require a lot of thought, as it is part of the vibratory system. It takes a lot of experience to be able to select the right kind of wood in a bridge to suit a particular violin, if it should be old and sensitive.

The strings next require attention, as their movements under the bow should be understood. So taking their movements as from left, to right, and lengthwise, (their frequency being doubled) one can understand this relationship to tone, as the infitesimal motions of the strings have a corresponding influence on the bridge, so that both should act as one unit. Now coming to the sound post the delight of tinkeres, the correct placing of this shows how important this detail is, and why it should only be undertaken by one who understands its role. Itshould be perfectly shaped, so that it slides into place without pressure, and great care taken that edges of F hole, is not marred when fitting the post. The approximate length of the post can be determined by shaping the end of a length of post wood, and inserting it in the top hole of F, and putting a pencil mark on the inside of top on it. Then deduct the thickness of top from this, and cut to conform with top inside. Make trial fitting, using this as pattern for permanent one, slightly wet ends when trimming.

As a final test for eveness of tone on all strings: place second finger on harmonic on each string in third position, and test other string with same harmonic, but in a 4th, finger extension. When these notes have the same intensity, you have done a good job.



The hand remains in 3rd position 4th finger is an extension.

Each two notes should produce the same volume of tone. Viz; If harmonic on G string is louder than harmonic on D string, 4th finger. The post should be shifted slightly toward E string side, the least shade. If the E harmonic on A string is louder than the 4th finger harmonic on the E string, again the post is shifted a shade toward E string. (N.B. The post must always remain upright, which can be seen through tailpin hole.)

It is understood a person should have a good "ear" for these tests and should not spend a lot of time on them as the "ear" gets tired. It shall be found, if the post is placed correctly first of all, with bridge and strings in place very little adjustment is required. The bridge sits opposite the nick in E side F.

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Asked why he was worrying, a man said "nothing".

His friend asked, "Why worry then?"

"Wouldn't you worry about nothing if that was what you had in the bank", was the reply.

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Only one good thing about these payola revelations. It's comforting to think that skullduggery, and not public taste, put many of the "hit parade" records where they are.

..Ottawa Citizen

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WHAT MAKES A GOOD VIOLIN VARNISH

by Carmen White

Modern violin makers seem to have no difficulty in making a violin in the white which will equal, if not actually surpass, the workmanship of the old Italian masters. With proper treatment of the wood, a modern maker may actually approach the tone of the old Italian masters. However, in the matter of varnishing and finishing the violin, there appears a great difference between the modern works and those of the Italian and French masters. Why this difference?

Let us discuss this difference. We should say "these differences" as the old Italian varnish has many points of superiority over the average modern violin varnish. First, there is the matter of color. The old violins are found in brilliant golden yellows, golden reds, red-browns, clear browns, and orange colors. These colors are perfectly transparent and the wood actually appears to be under colored glass. On the other hand, the modern works, including many old French and German works, are limited in color, or else, they are glarish and offensive. Where the old Italian is a clear blood-red over a brilliant sub-varnish of brilliant golden yellow, the modern will exhibit a glarish and offensive imitation of red which looks like a red from a ball of penny candy. Most of the modern violin makers seem to be limited to yellows and yellow browns, with few reds at all, and when a red is used, it is shallow and glaring in appearance. The golden-red of the famous Italians seems unknown among modern violin makers.

Next, there is the matter of permanence. The old Italian varnish has weathered the storms of concert halls, orchestras, monasteries, and studios for more than 200 years. Consider any modern varnish in this same situation. Look at any antique piece of furniture you have in your home. Doesn't it need refinishing? It is perhaps 100 years old. Look at your old upright piano, 40 to 50 years old. What a finish! How long will these lacquers last which today we are putting on our furniture pianos? And if they would last, what would they do to the tone of a fine violin? It is seldom that any piece of finished wood is found that is decent in appearance after 100 years, yet, these old violins are beautiful and lively in appearance after more than 200 years of handling and use. How long will a gum-in-oil varnish last? Can we point to one which has lasted more than 200 years?

Again, there is the matter of appearance itself. The old Italian varnish looks "alive". It glows, it shines, it is brilliant! It looks beautiful from the audience when seen under lights on the stage, while most modern varnishes merely look shiny! Most of the French and German varnishes look dry and lifeless. When shined with polishes and a little alcohol, they appear brilliant for an hour or so, then go back to that dry, lifeless appearance again. The Italian varnish does not need much polishing; its brilliance will be seen with merely rubbing with the hand or with a soft cloth, even without polish or wax.

Next, there is the effect on tone. This is most important of all. There is no need to discuss the effect of the Old Italian varnish on tone; we all know it so well. However, on old Italian violins where the varnish has worn off, the tone still appears fine, and on the basis of this situation, many modern makers and writers assert that varnish has little if any effect on tone. Nothing could be further from the truth. The situation described above proves only that the worn off varnish of the Italian master did not injure the tone of the violin. Would anyone assert that a varnish which does not injure the tone has no effect on tone? Most of our modern varnishes actually injure the tone of our violins. Many have complained that their violins sounded fine in the white, but poor with varnish. Most modern varnishes are fossil gum-in-oil varnishes, and are much too heavy in actual weight for violin varnishing. Spirit varnishes appear

dry and lifeless, and even if not, they do not promise permanence of 200 years, as do the better oil type varnishes. So, a violin varnish must be light in weight and it must not injure the tone of the violin while adding beauty, permanence and transparency to the work.

To sum up the requirements, then, it would appear that a violin varnish must be permanent, soft in texture, transparent as glass, highly colored with colors, (not merely yellow and yellow brown, as many modern varnishes are), it must not injure the tone in any way, it must stand handling, wear, and daily use and retain its brilliance and lively appearance so that it enhances the work and inspires all those who look at it to a realization that here indeed is a work of art!

It would seem that with all our modern chemistry, our immence knowledge of science, and our burning desire to equal the old masters, such a varnish would have been found years ago. Many have claimed to have found it, but their claims dissolved in smoke upon comparing their varnishes with the real old Italian varnish. Joseph Michelman of Cincinatti, Ohio, is the only modern chemist who has applied himself and his talents to this situation. He has produced a varnish which appears to meet all the requirements mentioned above except that of permanence. On this point, we will not live to speak with authority; however, specimens ten years old show no deterioration of any kind, and the tone remains as fine as ever. It is the writers opinion after having used about everything under the label of "violin varnish" that Michelman has made a real contribution to the lost art of violin varnishing and varnish making. Too many of our modern makers want something in a bottle which can be opened and put on the violin, which dries quickly, and which is somebody's "secret" formula and which is supposed to produce the "old Italian tone".

If one studies the climate of France, Germany, and England, he can see why the old Italian varnish was abandoned in those countries, even if it were known, which many think it was. I neglected to state above that the old Italian varnish must be prepared from plain and simple materials, without extensive equipment and without technical knowledge and skill. Michelman's varnish satisfies these requirements. It accounts for all the variations of the Italian varnishes, such as the harder Venetian and Neapolitan varnishes as contrasted with the softer varnishes of Cremona. It also accounts for the earlier Italian browns and blacks, such as the early da Salo and Maggini violins. The French and German masters must have needed a varnish which would dry quickly and which would be made quickly and without much trouble. A large pot of it could be made up and kept indefinitely and used as needed. Michelman's varnish cannot be thus made or used. Since no two of the violins of Stradivarius appear exactly alike, it would seem that he must have made his varnish individually for each violin. This is certainly not the case with Vuillaume, or with any other German or French maker--their varnishes on specimens of the same period or year appear so similar that one could say that the varnish came out of the same pot, bottle, or jar. This is the case with too many modern violins--they all look alike. The Old Italian violins appear like oil paintings--even when done by the same master the result is not exactly the same; there is an individuality which proclaims itself in every one.

Vuillaume and the other French masters were probably thinking that they had a better varnish than Stradivarius when theyfound that a gum-in-oil varnish could be made from mastic, copal, dragon's blood, gambouge, and linseed oil, as described by Heron-Allen, taken from Chanot, and in turn, probably from Hailand or some early French writer. These copyists have done much to spoil violin varnishes with these "recipes". Of course these varnishes dry quickly, they look nice for a while at least, and when expertly prepared, they look fine for many years--but no one has asserted that they are equal to the old Italian varnishes in tone or appearance. Who, for example would want to duplicate them if he could duplicate the Old Italian varnish of Stradivarius, Serafin, or Peter Guarnarius? These old French (and later, English) varnishes were merely the product of

their times and of the desires for something quick and easy for commercial work, and also for the demands of the climate of northern Europe, which furnishes very little of the needed sunshine for drying a Michelman type varnish. Most modern English writers, that is, those since 1880, usually say the varnish of Cremona is given up as a "lost art" and then end by saying that "so and so has found the secret and has it for sale in bottles at so much per bottle--write today." This is the kind of nonsense which has closed the door on proper scientific research and study of the old Italian varnishes. Michelman has led the way in this research and has made available for us all the knowledge of a process of duplicating the finest old Italian varnishes in any of the violin colors. If any other modern master has a better product, he should make it available to us so it may be used--so far, the writer has not found one, and he has tried everything.

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LETTER FROM ROBERT COTTON, Cherryvale, Kansas

Dear Don:

Happy New Year to you and yours, also to all the other officers and members of the association.

I enjoy every copy of the Journal, and each time I get a copy I read it through and then get out my complete file of them from November, 1958 and re-read the complete bunch of them and enjoy them all over again.

You spoke of Dragon-Skin steel sandpaper in one issue, I have been using it for about 6 months and find it can be purchased in sheets 6" x 12". It can be cut with tin snips and rolled around a large dowel rod and does a wonderful job in shaping the maple backs. I am going to make a rotary sander using Dragon Skin and try it out, I'll let you know how it turns out(that is if it doesn't fly to pieces).

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SOME SUGGESTIONS by Wendell Pratt

As an amateur maker constructing my first real violin after about 30 years of studying the subject and corresponding with other amateurs and makers I have a couple of ideas that might be of interest to others more experienced.

First I have started out using a piece of sponge rubber about $\frac{1}{2}$" x 18" x 12" for a cushion for the plates when carving the inside instead of a small pillow, pad of clothes or a special form as indicated in most books. I have also found it useful in the final sanding and scraping of the outside of the plates as it will hold the plate so that both hands can be used in shaping and also for a rest when finishing the carving of the neck.

Secondly I have used 1/16" plexiglas for templates rather than the usual zinc or brass. It is easy to saw, file, or sand and can easily be marked with ink and a light coating of clear fingernail polish over the ink will keep it in good condition for a lot of hard usuage. It is very good for the long arching template as it doesn't bend or get dented. Paper can be glued to it with rubber cement and be readily scratched for marking.

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ANSWER TO KRISTIAN SKOU

By W.G.Hall, Listowell

Regarding the use of words in English usuage for Pine, and Spruce, Kristian Skou brings up an interesting subject, though he appears to be a little mixed up himself. In the first place no confusion would arise if Latin names were used, as it is a recognised universal scientific language, used in horticulture, and medicine, when one wants to get to the root of things.

I suggest Mr. Skou errs in translating the German word "Haselfichte" as Hazel "Spruce". According to the German Writers Abele and Niederheitmann, it is referred to as Hazelpine, which supplied Stainer, and to some extent the Cremonese. Also, it is referred to by Otto Mockel, as the wood used by Stradivari in a 1693 violin, and found in the famous violin of Paginnini, made by del Jesu Guarneri, and known as the "Canon". This wood is described as being of a wavy grain, and not a sub-species, but of three varieties. I have seen several violins (Italian) with this kind of wood, one in particular looked as if a spider had woven the grain, but in each case the tone had a lovely Oboe like quality.

Perhaps, what Mr. Skou had in mind when writing his article, was the general terms used around lumberyards, without regards to the correct names of species. Surely though, one seeking good violin wood, should have an understanding of the kind of wood sought, and would choose a lumber yard as the last place to find it, if he even had the slightest knowledge of how it is selected in European forests, for musical instruments. There experts are employed to mark the trees that are healthy, and have reached maturity so they can be felled in the proper season, when the sap is in the roots. Then comes the peeling of the logs, and cutting, or splitting into suitable lengths for air-seasoning storage. Experts again grading the pieces according to figure, and quality. Professional violin makers are most particular in selecting the wood they use. It is not a hit or miss method. Through the music-supply houses, who have expert agents to select their purchases, the best violin wood reaches us from these sources, irrespective of where we live. Compare this with the tyro who haunts the lumber yards, looking for something he knows nothing about, except it has to have a nice straight grain, and a ring to it when tapped.

The Canadian Forest service, which is one of the finest in the world, lists thirty five species of softwoods (conifers) found in Canada. Of these very few are listed for musical instruments, and are as follows: White pine - Pinus strobus. Western pine - Pinus Monticolo. Spruce - White; Picea glauca, Black; Picea mariana. Engelman Spruce - Picea Engelmanni. Red Spruce - Picea Rubens. Sitka - Sitchensis. For pine, only two out of five varieties are mentioned as suitable for musical instruments, namely White Pine - Pinus Strobus. Western Pine - Pinus Monticolo. Of the true firs; four in number, not one is mentioned suitable, named Abies. I venture to say anyone taking the above lists to lumber yards, with the object of securing violin wood, would meet with disappointment. But I feel certain the Sitka Spruce would be on the lists of music supply houses, which would be the proper place to find the correct kind. The others mentioned are used for piano sound boards, and organ pipes.

I have seen and tried many violins made with our native wood, and of good workmanship, but not one of them would bear comparison in tone quality, with European wood instruments. Some of the native cedar wood used, had a lovely appearance, with perfectly straight grain, and was taken out of old log cabins that were over a hundred years old, but it was not tone wood. It was named as Eastern White Cedar - Thuja Occidentalis, not one of the cedars is mentioned by the Forest Service as being instrument wood, yet I have seen it highly recommended in Vioin Journals.

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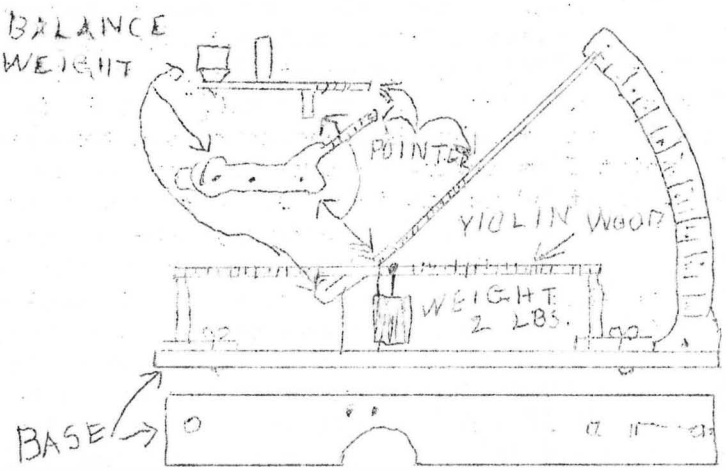
DETAILS OF A "SPINE TESTER"

by Norman Miller
Queensland, Australia

The articles in Weertman's book are very interesting. I use a method of my own for determining elasticity of pine and maple strips to determine the resultant thickness of the plate. Some years ago I was actively interested in Archery, making my own arrows etc. It is necessary for each arrow to match exactly in elasticity and bendability to each other of a set, and to determine this we have a gadget called a "Spine Tester". I am using such a thing to test elasticity in violin wood and to balance the relationship of pine to maple for relative thickness. Here is a description;

Two supports; one at each end of a base. One support movable from say 14" to 18". On these supports rest the piece of violin wood. In the centre of the base is an upright block as a pivot post which has a pointer pivoted through it. This pointer has two steel pins, one of which rests on the pieces of violin wood to be tested. The pointer shows in hundredths of an inch on an extended scale the amount of bend in the violin wood, which has a weight of two pounds hung on the centre. The scale is a piece of wood or stout card cut to the arc that the pointer will traverse and marked in hundredths of an inch. To graduate the scale correctly use a micrometer. Turn the micrometer screw out to the last graduation and clamp in position so that the face of the screw just touches the shaft of wood, (which is 3/16th of an inch square.) and which is placed on the supports. The screw is at the place where you will place the weight about the centre of the shaft. As you turn the micrometer screw down the shaft will bend under it and the pointer will follow the shaft of wood down. Mark the starting point of the pointer on the scale, a mark at every 1/200th will be more than fine enough for use. My pointer is 20 inches long and 1/100th reads as a fifth on the scale below is a drawing.



I have no data to offer as a working guide but advise each worker to prepare his own to his own findings and adapt it to the thicknessess and thicknessing contours he prefers. Strad, Guarnerii and other makers, Heron-Allen, Alton Reid and other books etc. Maybe after many findings are compared from specimens some norm may present itself to become a universal guide. Till then each maker must work out his own average, or perhaps use Meertman's ratio as a guide.

As regards balance point and start of thicknessing centre, for top and back. The principal I use is that the top balances on or just ahead of the bridge line, and the centre of thicknessing starts there. The back balances 3/8th inch behind the bridge line (across the centre of the sound post) I call this the sound post line. Using a 1/4" sound post, the edge of the post is 3/16th inch behind the centre of the bridge. (bridge line). My reason for balancing the back and starting the thicknessing further back is that the start of impact on the top is at the bridge and directly under it, this is transmitted through the sound post, so my back is balanced there and the thickness radiates out from the point where the sound post line crosses the centre join of the plate. Thickest area of the back is a circle using half the width of the bridge as a radius, and as a centre point the place where the sound post line meets the centre join of the plate. Thickest part of the top is a circle of the same area using as a centre point the spot where the bridge line crosses the centre join. My contours of thickness use that point on each plate as the pivot point. The contours of the back then are not just exactly the same as the top owing to the lower placement, which causes the actual areas of contouring to be different. I do not always use a 10½" bass bar for a violin. It depends on balance and tap-tone and could be anything from 9 inches to 10½ inches. Eye, "feel", tap-tone and balance call the tune, and I mean that literally.

Most of my tops are 3/16ths of an inch in the centre, but I am not afraid to go thicker or thinner as the wood demands. The same with the bass bar. I think that many top plates are muffled by the inclusion of a too large bar, say 10½" when the nature of the plate calls for one of lighter dimensions. The last violin I made had a top with a centre area of 3/16" (Guarneri contours) tapering to 1/16th of an inch as per a diagram on page 1X of Jalovecs book. The tap tone before cutting the "f" holes was e' sharp. (that is e' sharp on the D String) when the "f" holes were cut and the bass bar inserted, the note was brought back to e' sharp by means of shaping the bass bar and the resultant bar was 9 7/8" long. With another piece of wood it is quite possible that the tap tone could have been the same, even if the thickness was 1/8" all over according to conventional thicknessing. Perhaps placing a 10½" bar in it would have destroyed the tap-tone relationship and brought the tone down to a tone unsuited for the balance with the back. The point I am trying to make is, why put a bar of a determined length in and not know why. Most of us put in a 10½" bar because some book says so. This brings up a question; which is the most important, tap-tone, thickness, or length of bass-bar? Which one are we going to spoil for the sake of the convention of the other? If we stick strictly to thickness of a predetermined size, the tap-tone may suffer, and certainly will if we install the conventional bass-bar, if such a condition became an issue. Which one then shall we alter? The tap-tone can be restored to the plate by the shaping and thicknessing of the bass bar, which perchance could become heavier, or lighter than the bar laid down as correct. We can control tone to some extent by the nature of the bridge that is used; if a thick soft one is unsuitable, we can use a thinner harder one and so regain tone and brilliance, could we not use the bass-bar installation the same way? I do, and with considerable success. I do not cook my wood before or after making and have no tricks of that sort. I rely on Mr. Laubi and his method of seasoning the wood for at least five years or more in a natural way to give the wood the required condition for making into an excellent violin. I do not hang my violins in the sun before or after varnishing, working and drying them inside a room where air circulates and no sun enroaches. Everything is done by hand and after the violin is completed in the white, the sealing coats are laid on and it is varnished, with a day or perhaps two between each coat. It is not cooked, boiled, or baked in any way during or after manufacture and so far I have been successful in placing several with Symphony players and am prepared to enter them in world competition, especially for their tonal quality and response.

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ABOUT REDWOOD, SOUND POSTS AND OTHER SUBJECTS

by Kristian Skou
Soberg, Denmark

Thank you very much for your letter of November 4th. I was happily surprised at your telling me that you had shipped me a piece of California Red Wood. Very many thanks for it. It seems to be very fine wood, and I should think I can get two tops from it.

The microstructure is very beautiful seen under the microscope, and garnet - red pearls of resin are lying in long rows in channels in the wood. Unfortunately they are not soluble in spirit or oil of turpentine, or they should perhaps have been a nice material for making varnish - but beautiful they are. I have tested its specific weight to 0.338 gr/cm^3 Mr. N. Nicolas, Menton-Garavan, France (the editor of the journal Lutherie) has tested another piece of Red Wood to 0.316 gr/cm^3 perhaps my piece has absorbed a little moisture at the journey - it will disappear.

By way of comparison I can tell you that the Pearyland Driftwood has a specific weight of 0.66 gr/cm^3, that is: twice as much. It is so heavy that one should not think it usable for a violin top, but it has the right transmission capacity for vibrations, and it is so strong that I could give the top so small a thickness as 2,2 mm in the centre - and there is wood enough. The weight of the finished top is 92 gr. - it seems to imply that the weight in itself does not account for the tonal result. I enclose a diminutive piece of the wood, just that you can see how it looks - I have only very small bits left of the wood, but if I should get hold of a real quantity I shall certainly send you a piece.

In the November issue of the journal - just arrived - the age of the wood is quoted to 5780 years divided by 50 years. I should think the fault is mainly my own. I wrote 5780 years divided by 50 years (or I thought to write so, but perhaps I wrote divid instead of subtract, a division sign being the danish form for the subtract sign). 5780 years less 50 years means that the test says 5780 years, but for such an age the test has an uncertainty of 50 years in both directions, all ages between 5730 years and 6830 years being possible.

I think you are right in your suggestion that a top from Red Wood has to be somewhat thicker than else, but there is another thing I think we should take care of. The cell walls are very, very thin (therefore the light weight), and for that reason the wood is very feeble to pressure. The preliminary treatment of the wood and the varnish may be sufficient to prevent the top from being damaged by the pressure from the bridge otherwise with the sound post, and therefore I think we have to consolidate the inside of the top in some way at the sound post area. Damage from pressure in that place is catastrophal for the tone of the violin. An illustrating example on that I had some time ago. A violinist came to me with his violin. The tone - formerly large and brilliant - now was weak and dull. He had experimented with the sound post and thereby damaged the top by pressure. Also several violin makers had replaced the sound post for him, and every time the violin sounded better - but only a few hours or days. I removed the top and found the sound post area full of hollows due to pressure from the upper end of the sound post, and the wood here was nearly without elasticity. There was nothing to do but replace the damaged wood with some better. In that case I replaced it with a bit of the Pearyland Wood, and now it appeared that the tone of the violin was not only better than ever, but the tone character had changed and was now more like the tone character of the pearyland violin than of the character it had formerly. Since then I have repeated that operation on 6 violins, not always with he Pearyland wood - for as I said, I have only small bits left - but also with other old and tested wood - and always with similar results. The wood in the sound post area is of great importance

for the tone character of the whole violin. There is nothing mysterious about that. I should think I am able to give the physical explanation of the effect. but it would demand more time and more space than I can afford in this letter.

A good rule besides is that the wood for the sound post has to be softer - at any rate not harder - than the top wood in the sound post area. Perhaps a sound post from Red Wood is suitable for the top of Red Wood - or I should recommend the sap wood from fine grained (slowly grown) pine (Pinus).

One of your readers has asked me about the late German violin maker August Riechers, his violins, and his methods. There may certainly be others who know more about Riechers than I, but something I can say, as I have seen some of his violins, I have his little book (in German), and I have tried his methods, as well regarding the construction of the violin, the treatment of the wood, and the varnishing. The book is a good little book which I can recommend - only in a few details I cannot follow him (e.g. a depth of 8mm for the bass bar under the bridge is too little for the high tone pitch of to-day (A - 440 cycles/sec. or more)). His violins are nice work and fairly esteemed.

Regarding his treatment of the wood it was (apart from the unsuccessful experiment with the rosin) limited to the outer surface of the violin. He started (as mentioned by the author) with three coats of pyroligneious acid. This acid is obtained by the destructive distillation of wood, and it contains acetic acid, methyl alcohol, acetone, and small amounts of other organic compounds. It gives the bare wood a brown yellow color, and only for that reason he used it. Then followed a coat of Peru balsam in spirit. This balsam will never harden totally, but it fills the pores, and connected with the outer varnish it will form a flexible coat. (This treatment is regarding the effect and the colour very like the treatment of the wood with propolis). Then followed a coat or two with gamboge in spirit, a poisonous gum-resin originating from the tree Garcinia Morella (East India and Ceylon). It is somewhat soluble in spirit and given an intense yellow colour. The outer varnish then was applied - a spirit varnish. From curcuma and red Sandal - wood he extracted the colour with spirit, and in this solution he dissolved 3 parts of sandarac and one part of mastic, and to a quantity of $\frac{1}{2}$ litre he added 10 drops of oil of turpentine. When skilfully applied (it is difficult, and Riechers himself did not always succeed in that) the varnish is rather nice and of a rather good quality, and for those who believe in a spirit varnish I can recommend it, but it has nothing to do with the old Italian varnish, and it has the defect of most (if not all) of the spirit varnishes that in time the coat of varnish will form a network of fine cracks. Of course, we can also find cracks in old Italian varnishes - in particular such varnishes as are called 'dry' - but these cracks have a quite other (more irregular) appearance. Riechers believed the old Italian varnishes to be spirit varnishes, because they are easily soluble in spirit, but I can assure you that the varnish I produce with iron (and madder) as colouring agent without spirit, but containing a good deal of linseed oil, is just as soluble in spirit as the old Italian varnishes, and I should think the same is the case with the Michelman varnish. (Our varnishes are based on similar principles, even if they are produced in somewhat different ways).

You disclose, Mr. Editor, that you practise the method of sanding down the plates from the outside with the violin strung up. It is a method mentioned now and then, and from a tonal point of view I should admit that it may be just as good as any other method, presupposing that the violin maker is mastering the method, but from an aesthetical point of view I do not like it. Dr. M.E. Gordon mentions that some of the Italian makers of today practice the method for their violins - well, but many of these violins are not beautiful and without the slightest resemblance with the masterpieces from the great period of Stradivari. Not to name a still working maker take e.g. Stephano Scarampella (1843-1927). The tone of his violins is good, and for that reason they are very esteemed, but in their outer appearance they are a compound of genius and

crude work with marring scrape marks on the plates. There is such a disproportion between their inner and their outer value that one nearly is driven to despair.

Say we have formed the outer surface of our plates in beautiful curves (so we believe at least), and then we should ruin these and the whole appearance by sanding down! If we know where to take off from the outside we also know where to take off from the inside. If I have to remove wood from my plates after the violin is finished in the white - and it happens - I always remove it from the inside. It is more troublesome of course, but the beauty of the violin is preserved. It also happens that a violin sounds well in the white but not so when varnished because the varnish has altered the elasticity of the plates. If we must correct this fault the wood to be removed has to be from the inside. The only alteration of the outer surface of the plates I make after they have been glued on the ribs is the purfling and the edge. I always lay the purfling in after the gluing together - it is tonally the best, and the old Italians always did the same. The curves of the plates doesn't need to be altered by that method. Only a narrow area along the edge has to be formed and smoothed. I do not believe Stradivari used the sanding down method. There is no evidence of that and the violins from his great period (I have handled and examined some of these) have no remarkable marks of tools and scratch marks of "sand paper" as stated by Dr. Gordon being the case with the "Swan" - the last violin he ever built at the age of 93, when the exactness of hand and eye was declining. For the rest sand paper was not in use at that time, but other materials for smoothing were used by the craftsman in old time, e.g. small bunches of a plant, a horsetail (Equisetum hiemale) whose stalks is scabrous containing a large amount of silicon. It leaves similar scratch marks as sand paper.

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CURVED BLADE VIOLIN SHAVE

by W.E. Slaby

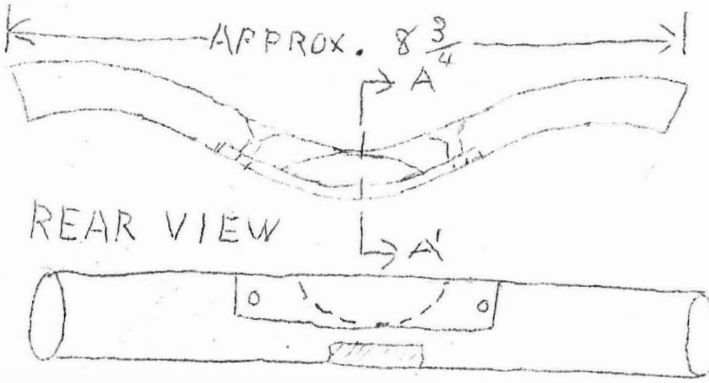
Here is a tool that will make rough shaping the tops and backs of violins mere child's play. I learned of it from Joseph Deulin, a Detroit violin maker who recently retired after working more than thirty-five years at the craft. Deulin dispensed with planes and scrapers altogether, but for myself I still prefer to use these two tools for final shaping.

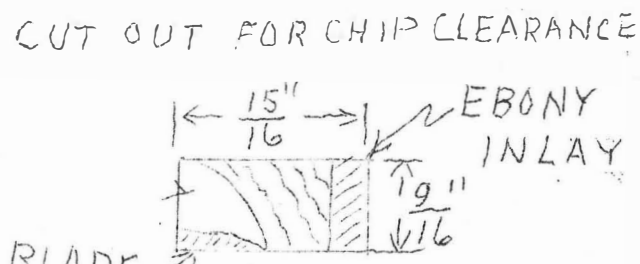
Blades for this tool can be purchased from Snell-Atherton-Norcross Co., Inc., 72 Snell St., Brockton, Mass. They are part of a tool they make for shaping wood heels for ladies shoes and are called "Duplicating Heel Shave Blades." They come in twelve different curvatures, the most useful being numbers 5 and 9, but you may wish also to try numbers 8 and 13. Numbers 2 through 7 cost $1.06 each and numbers 8 through 13 cost $1.20 each - add a few cents for postage. The ends of the blades are tapped and come complete with screws.

I hope the drawings are self-explanatory, but a few words of instruction: Use hard maple for the handle. The exact shape is not important except that the curve where the blade fits should follow precisely the outside curve of the blade. The opening through which the chips pass should be kept extremely small. Start with a zero opening and by experimenting slowly file the face of the curve until the tool cuts properly. If all is right it will cut wood as though it were butter. If the slot is too large (more than a scat 1/32") the tool will grab and chatter. My first effort was unsuccessful.

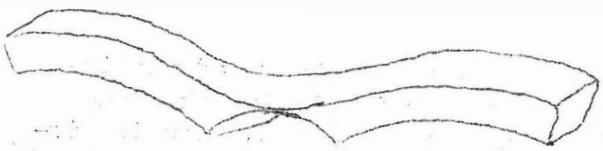
The ebony inlay is to minimize wear on the surface of the tool. This might be even better if made of brass in which case it would have to be fastened with two or three very small screws.

In use the tool is pushed away from you like a spokeshave. Go to it and watch the shavings fly.

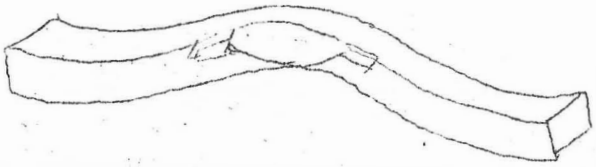




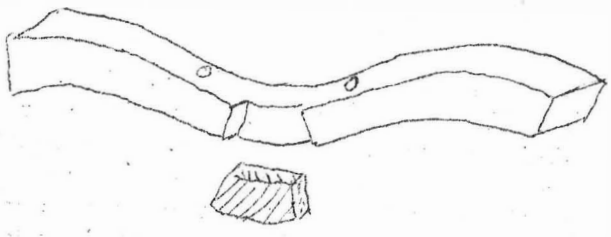
STEP 1. Layout and cut out Blank



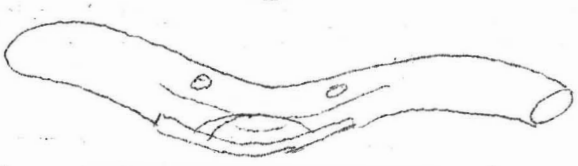
STEP 2. Cut chip clearance throat.



STEP 3. Cut Rabbets for Blade.



STEP 4. Fit 1/4" thick ebony inlay. Drill and counterbore screw holes.



STEP 5. Fit Blade and shape Handles.

CURVED BLADE VIOLIN SHAVE.
W. E. SLABY.

MASTER-TONE

A Story of the Violin
by P.F.Wright
By kind permission of Mr. Herman Weaver President of the House of Weaver

Concluded from last month.

The top is about to be graduated. The first groove of this operation has been cut just inside the line where the ribs join. Distribution of wood being of prime importance in determining the penetration of violin tone, at the time of designing the lines and arches, tables were plotted. The position of these contours was worked out mathematically. From these theoretical thicknesses departures, suggested by experience, to compensate for the peculiar textures of both top and back were made. Thuse, the graduations of each violin become a separate study. In Mr. Weaver's case, callipers are used which register to 1-10 of a millimeter or 4-1000 of an inch. Where extreme care, such as this is used, it is any wonder that a superior instrument is the result?

The wood used in this violin has been gathered from spots extending from the Cascade Mountains in Washingtonto the State of Maine. An old building, erected in Colonial days, contributed a part and a piece of antique furniture another. That which came from the virgin forest was the soundest of strictly prime timber, cut at the most favorable season of the year. After being worked into stock sizes, for violin maker's use, it has been seasoning for years in dry, but well ventilated, lofts.

Mr. Weaver knows the history of each piece and takes pleasure in relating it to the visitor. The top has one story, the back another, the ribs another, the end blocks another, the corner blocks another, the linings another, the scroll another and, by the time it is completed the bass bar and sound post will each have contributed a story.

Although this particular instrument is very much of an all American product, wood from European sources is conspicuous in others. Partiality to any locality plays little part in the choice of these materials. The question uppermost in the master violin maker's mind is, how to combine different pieces of wood to produce the most perfect instrument? It is not unusual for a choice piece of wood to repose in the rack for years before another turns up to combine with it to suit his taste. Thus each piece of material, used in the construction of a masterpiece, endows it with history even before its intimate association with temperamental, and sometimes tragic musical career begins.

On Mr. Weaver's desk is a letter relating to a violin at the time that it took its rightful place in musical activities. It is from Europe and in it the writer acknowledges receipt of the violin. Briefly, the story is as follows: The writer, a musician who had been in this country for a number of years, tested one of Mr. Weaver's Mastertone violins and became very attached to it. At about the same time he was offered a position in his native country which he accepted. Although he was profoundly impressed with this violin, he had not yet outlived his early prejudice for things European. He tested violins in every market at which he stopped along his route, without finding one which suited his tastes and purposes as well. Having become convinced, against his will, he ordered it sent to him after reaching his destination.

Mr. Weaver's studio is an interesting place and the variety of things to be learned about violins changes on each visit. A prospective customer is testing some violins. One is a Weaver Mastertone and four or five others are old masterpieces, of which there is always a representative stock on hand. Whether the price, the best instrument for business purposes or the gratification of his own taste is the controlling

motive in his thoughts, is not known. The significant thing is that he alternately plays upon Mastertone and then upon one or another of the old Masterpieces. Figuratively he is playing Mastertone against the field.

While this is going on another gentleman enters in a highly agitated frame of mind. He has with him a bow that has been broken. It is a genuine Vuillaume that he values above price. To restore it requires the making of a new head that must be spliced for some inches along the remaining portion of the stick. The artistic manner in which Mr. Weaver accomplished this, while preserving the original balance and spring was a marvel to all who were fortunate enough to observe the work, and a matter of supreme satisfaction to the owner.

Restoring attracts an endless variety and there is a story of interest attached to each instrument. One time it is a Nicolas Amati to have the peg holes rebushed and to be generally overhauled. Another time it is a Gaspar da Salo viola for bass bar and general repairs. Then a pedigreed Joseph Guarnerius, valued at $30,000 arrives for general repairs.

On another occasion an old Italian cello is brought in. There is no pedigree and the name of the maker is unknown. Nevertheless, fragments of history accompany it.

The lines are good. The wood is very old—probably not a day less than two hundred years. The varnish and certain tricks about the linings and blocks are characteristic of the old Italian makers. It has been repaired on four different occasions by as many different workmen and the work of each is distinguishable in the order in which it occurred. The graduations are crude but, fortunately, both top and back have been left heavy in wood so that there is leeway for proper distribution.

Another instrument revealing the uncertain ideas of the old masters regarding wood distribution, was a Grancino which had been smashed to kindling wood. Even the bass bar had been driven through the top. When this violin left Mr. Weavers hands it had not only been so cleverly restored that no indication of the accident was visible, but the tone had been so vastly improved that the owner could hardly believe it to be the same instrument.

The stories of two basses of American make may interest the reader. One was a Prescott which was in need of almost everything in the category of restoring.

During the early history of the United States, before organs had come into general use, string basses were extensively employed in church choirs and the making of these instruments was quite an industry in New Hampshire, during the early part of the last century. Those made by Dea Abraham Prescott were of high repute and, on account of their superior tone, are much prized by bass players today.

The Prescott bass has a novel feature in its design. At the lower corners, instead of the ribs being joined in an angle, one terminates in an almost complete circle of very small diameter. While this does not affect the tone or materially enhance the symmetry of outline, it is a trick that no violin maker cares to imitate. The more experienced he is in bending ribs the greater is his respect for the mechanical genius of Prescott.

Another remarkable American bass encountered in Mr. Weaver's studio was that by George Gemunder. During his lifetime he made but two basses, one of which has been destroyed. Hence, this is the only string bass in existence built by him.

It is a copy of Stradivarius. The maple in its back, ribs and neck were selected with the same care, as to figure, as that bestowed upon his violins. Every detail

including the delicately carved scroll, is carried out with precisely the same degree of perfection as found in his smaller instruments. And the varnish, also, is the same as used upon his violins. The writer has never seen another bass that compared with it in beauty.

The top wood is of American white pine with two holes that have been plugged. A casual observer might overlook this. But any violin lover, who is looking for such things, can find the plugs with ease. Gemunder was clever enough to have concealed them more effectually, had he chosen to do so. It so happens that this wood came from the timbers of a noted old building. At the time of its erection the frames were held together by wooden pins. That Gemunder plugged these pin holes in such a manner as to be easily found, impresses one with the idea that he must have done so purposely, in that the story of the instrument's origin would be obvious.

What has been told indicates, in a general way, things to be seen and learned at Mr. Weaver's studio. Those mentioned did not all occur on the occasion of one visit, nor has all that transpired on any one visit been related.

Four hundred years of violin history, progress in the art of violin making, progress in its acoustics and in its design are gathered together here. Lessons gleaned from the life work of Maggini, Amati, Stainer, Guarnerius, Stradivarius, Lupot, Vuillaume and the more recent masters are all included, and the most salient points coordinated in Mastertone.

There are no lost Cremona secrets exploited to befuddle the mind of the visitor, for the advantages of the best instruction, intensive study in violin acoustics rare native talents and mature experience place Mr. Weaver in a position where he has nothing to conceal. He is a master violin maker and any violin lover will be well repaid for visiting him at his studio, the home of MASTERTONE.

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God grant me the serenity to accept the things
I cannot change

Courage to change the things I can

And wisdom to know the difference.

.....Motto of the A.A.

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Some people pursue Happiness

Others create it.

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RESINS AND OTHER MATERIALS USED IN VARNISH

by Sczipan Kujawa

Editor's Note: Discussions on Violin Varnish are now quite common in the pages of The Journal. A list of those gums, resins and oils etc. most commonly used might prove a handy reference to those interested in this always argumentive question. Mr. Kujawa here catalogues and comments on a few.

RESINS:

Canada Pitch, Burgundy Pitch, Mastic, Sandarac, Jalap, Guaiac, Dammer, Scammony, Lac, Podophyllin, Mineral Asphalt.

FOSSIL RESINS:

Amber, Copal, Kaurie, Congo, Manilla, Zanzibar, Copalin.

BALSAMS:

Balm of Gilead, Copaiba, Peru, Tolu benzoin, Dragons blood, Storax, Canadian Liquid-amber.

GUMS:

Gutta-Percha, Caoutchoc, Gum Arabic, Accroid, Alsace, Anime, Acacia Vera, Butea, Tragacanth, Elemi, Juniper, Sandanum.

GUM RESINS:

Olibanum, Frankensence, Galbanum, Scammony, Gambodge, Euphorbieum, Asafetida, Aloes, Myrrh, Ammoniac, Senegal, Thus, Cinnibar, Orpiment, Anime, Opoponax.

TURPENTINES:

Chian, Chio, Vierin, Venice, Strasburg, Bordeau, Cyprus, Spirits of Trupentine.

COLORS:

Safflower, Saffron, Brazilwood, Logwood Madder, Sandlewood, Cochineal, Colceolaria, Slipperwort, Hypericum Red, Dyersweed, Licorice Root, Cudbear, Woad, Walnut Husk, Blood Root, Puccoon, and many others.

Some of these are listed in two places when liquid and when dry.

LACQUER: A varnish obtained from the Japanese Varnish Tree (Rhus Vernicifera).

OTHER MATERIALS:

Ambergus, Feld Spar, Musk, Butter of Antimony, Urea, By the way Feld Spar contains, Silica, Alumina, with Potash, soda or lime.

OILS:

Linseed, Castor, Fish, Cotton Seed, Olive, Walnut, Hemp, Perilla, Tungoil, China Wood, Poppy, Oils can be obtained from many different nuts and seeds.

ESSENTIAL OILS:

Rosemary, Lavender, Almond Bitter, Cloves, Cedar Leaf, Cedar Wood, Hemlock, Myrbone, Mint, Geranium. Essential oils can be obtained from any plant that has an odor in its flowers or leaves.

I wouldn't want to state that these are all catalogued correctly, but pretty close.

Oil Amber, or Amber oil, is not obtained from Amber, 50 years ago and still today is obtained from the copals.

Your label does not read oil of Amber, but as I stated, Varnishes made from Amber oil or Oil amber, or Ambergris or Liquid amber, are not an amber varnish.

Amber is worth today $350.00 to $500.00 a lb. according to size, color, etc. formally amber was obtained from Germany, scraps that is, what was left over from making beads, pipe stems and carvings. I combed the two cities of St. Paul and Minneapolis which are large cities, I was able to obtain only 3 broken pipe stems. What have you in amber. Some of those gums, resins and balsams, are only water soluble, some are used only to obtain oils from, which are very valuble in spirit or oil varnishes. Almost any essential oil in alcohol will cut the hard fos il copals. There are retarders used also in spirit varnishes to prevent them from drying to fast.

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ELASTIC TONE

by Sczipan Kujawa

Why is it that we don't hear more about an elastic tone in a violin? All great violins have this elastic tone. It gives power and penetration, the true maiks of a real good violin.

There are three classes of tone and possibly a fourth, such as Jacob Stainer's but for the Italian there ar three: The Amati, Strad and Guarnerius. The Amati, very sweet but no power. Strad: powerful and mellow. Guarnerius: Brilliant and immence penetration. I have an article by Kriesler and Ellman which says that only a Guarnerius will fill a large concert hall....then why so much about Strad?

We know that a straight rod will vibrate easier than a bent one, then why have an arched violin? I will try and explain: Suppose you put a cardboard in place of the top of your violin. You would have sags or weak spots which would interfere with vibrations, exactly between where the cardboard rests on, that is, between edges and sound post, but if it were arched you would have equal pressure all over. Too high an arch makes the boards too hard to put in vibration. Arching is very important so that the stress will come equal over the whole board. The dip around the edges should be very shallow. Tone comes out easier, but it loses power. I like my edge without going too deep around the edges.

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A CRITICAL EXAMINATION OF ROELOF WEERTMAN'S BOOK

by J.B. Erwin
Dallas, Texas

In the past issues of the Journal I have examined the diagrams such as beams, bridges, ropes, etc. with some disappointment. An architect has a basic working knowledge of the simple types of systems of structures. When the structure becomes indeterminate, thin shelled, moving, etc. the architect usually employs the services of a consulting engineer whom he directs to investigate the problems. The most simple beam requires several formula and diagrams - bending, shear, deflection, etc. - to analyze it. When these become restrained, deformed, cambered, irregular, and thin shelled the formula become complicated and indeterminate. To add to this complication consideration would have to be made for the grain and strength of the wood, "f" holes, excentric sound post load, vibration, etc. to by formula determine the perfect arching, thickness, size, pattern, etc. which would produce a desired tonal quality. Mathematically there could hardly be a more difficult set of shapes and conditions to analyze. The purpose in my mentioning the technicalities is to be able to say that some of the diagrams reproduced in the Journal mix several of the properties on the structural members of the violin. A deflection diagram showing simple loading does not present a complete picture of the violin.

To work on these formula would require the services of a complicated mathematic calculating machine plus some mathematician to determine the formula which the machine would process.

It is my opinion that it would be simpler to follow the old Italian violins which by trial and error have had adequately determined the size, pattern, thicknesses, etc. To re-develop the old Italian violin pattern would be useless. We have them now. If we wish to determine and record how the old Italian violins sound and make sound we should continue testing the old instruments.

The few old Italian instruments I have seen violate what by some of the best authorities is not the best practice. The old Italian violins are not perfect in workmanship and when played vary from one to another. In spite of some defects a basically good old Italian instrument sounds very well. The Strads I have seen set us a pretty high standard to work to.

The above is not written with the intention of out-shouting some of your contributors to the Journal. I am only calling attention to some more complicated conditions of structure which make a simple diagram not present a complete picture of the forces present in a violin.

Your comments and diagram of a machine to test the top and back puzzle me. I would say to measure deflection of the top and back would be a quality by which you could measure its strength. Combinations of stronger spruce and softer maple producing the same deflection of top and back could result in very nearly the same thickness of top and back. The difficulty in measuring deflection would seem to me to be the device and arrangementfor accurately reading such a delicate reading. It would have to be conducted under laboratory control to meausure it carefully enough to establish a reliable set of readings from which to judge the merits of a top and back. By the mere shape of a violin it is very strong for the materials incorporated. This inherent strength makes accurate deflection readings more difficult to obtain.

I wonder if in a fine instrument the deflection would or should be the same for both top and back. The top is a thin shell with two concentrated loads on top with a single concentrated load of the sound post on the underside. The back on the other

hand is a diaphram with a single concentrated load of the sound post off center. If nothing else the back should be stronger or heavier if you please to compensate for the shell arching inherent in the curve of the top and different type loading. Strad made his backs heavier in thickness than the top according to Hill. From a practical standpoint when the backs approach the top in center thickness, I have seen the backs lined with additional wood to strengthen the back and give it more power. The back with a concentrated load in the center should approach double the thickness of the top in the center to make it balanced in strength in its loading condition to the top which has concentrated loading at three points which more nearly approaches a uniform load. This conversation of uniform load and concentrated load may be a little confusing. A simple way to remember the outcome of the formulas to calculate a simple beam is that a given beam will carry just twice as much uniform load as concentrated load at the center of the span. When a beam has equal loads at more than third points it closely approaches uniform loading.

Such even simplified speculations as above have ignored two fundamental conditions. First the usual structural formula and simple illustrations of beams have some merit and application, but these formula are derived with the assumption the structure is static (at rest) and the ends are unrestrained. The violin is constantly vibrating and is rigidly restrained around the edge. Second, no consideration has been made for quality of tone. After all is said and done, how to accurately and consistently obtain fine quality tone is the purpose of all testing.

A question might arise from this conversation, why not make the back of spruce and the top of maple. Worked to the proper compensated thicknesses it should mechanically be alright. The top of maple might be made 3/64 all over and the back of spruce 1/4 thick graduated to 8/64. I think the experiment would be disappointing as to the quality and the instrument would be somewhat heavier.

Your comment that we should maybe get away from the old Strad archings, thicknesses, and conventional species of wood is interesting. If as you suggest we make the top of redwood I would simply use the same flat arching (because I like it better than high arching) and thicken it up some to stiffen it somewhat. Right now I have a stock of two maple trees. One is much harder or tougher than the other. This year I made two violins one from each type maple to the usual thicknesses. I am now working on a couple violins one from each type maple and I am thinning the back $\frac{1}{2}$ to 64 all over on the harder maple to compensate for the wood somewhat. I am really quite pleased with the violins this year. I think Strad probably did the same thing as well as change his mind about the patterns as he developed. The old Italians apparently didn't particularly strive for mechanical accuracy. The accuracy I work for I am not sure is absolutely necessary, but I hope it reflects the work in a more perfect balance on all the strings and positions.

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You all have powers you never dreamed of. You can do things you never thought you could do. There are no limitations in what you can do except the limitations in your mind as to whate you cannot do. Don't think you cannot. Think you can.

Darwin P. Kingsley

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AN INVESTIGATION INTO THE GRADUATION OF STRADIVARIUS AND GUARNERIUS VIOLINS

by Don White

INTRODUCTION:

In attempting this series of articles I do so with great humility realizing that I am completely unfit to pose as an expert on these matters. I feel better men than I should long ago have informed the Violin Maker of certain definate aspects regarding the graduation of Stradivarius violins of his last and most noble period. Also that Joseph Guarneri realized this change and developed it to produce what most makers and violinists admit to be the finest violins ever made.

I refer to the fact that in these wonderful instruments the thinnest portion of the top plate was not near the edge but:- "Somewhere within an area - halfway between the bridge and the farthest point from the bridge" with the edges nearly always being the thickest portion of the plate.

In Strads earlier periods the thinnest portion was at a point farthest away from the bridge.

All makers since Guarneri (with few exceptions) reverted to Strad's earlier graduations, even accentuating the thin edges, with the result of a steady decline in the quality of violin tone.

To continue this introduction I would like to state that my investigations were encouraged by Mr. Carl Forseth of Minniapolis who has for the last two years bombarded me with facts relative to Guarneri's graduations. Ithas taken me time to digest and arrange the data presented by Mr. Forseth and I would like to thank him for his perseverance with me, in spite of the fact I did not give him too much encouragement. His kind loan to me of the book "Die Kunst Des Geigenbaues" by Otto Mockel has by the charts, (I am unable to read German) done much to convince me of the necessity to dig deeper into this matter.

I would also like to thank Mr. J. Fred Fehr, Kankakee, Illinois, for the loan of the Book "Violin Tone Peculiarities" by Frederick Castle, written in 1906. Castle follows very closely the graduations of Guarneri and has worked out theories that follow quite thick edges with the thinnest portion at spots that I will disclose later on in this discussion. Frederick Castle developes many theories on Violin Making that I feel could be easily broken down. These are however overlooked by much valuable information that the author presents in most logical form. By far the most interesting book I have read on the Violin.

Lastly Mr. Kristian Skou recently sent me a list of graduations which disclose the truth of the statements I have so far presented.

These graduations of Mr. Skou's I had already studied as they are taken from Mockels book but receiving them from such a prominent maker was perhaps the incentive I needed to embark on this series of articles. I am not sure from Mr. Skou's letter wether he follow's these graduations or not but I believe he does?

Having now presented my "Credits", which perhaps generally come at the end of a work of this nature, let me proceed with the evidence.

THE EVIDENCE:

On searching for authentic graduation charts of Old Master Violins we are immediately confronted with the fact that whereas there are abundant charts of Amati, Stradivarius and many other makers instruments of that period and later, there are relatively few charts of Joseph Guarnerius violins. In fact Mr. Skou only presents one. A quotation from Joseph Castles book however helps us in forming an opinion as to Guarneri graduations. Quote:-

"Concerning data for the "Joseph" Honeyman states thus:- "The belly is always thickest at the edges, and thinnest throughout the central areas."

There we have the words of Honeyman, a well known violin authority.

I will close this chapter with the graduations sent me by Mr. Kristian Skou. These should give the reader something to think about till we resume our discussion in the next article which will offer theories supporting thin centres.

GRADUATIONS PREPARED BY KRISTIAN SKOU - DECEMBER, 1959

Here are the thicknesses of top and back in some of Stradivari's violins, The measurements are given in Otto Mockel: "Die Kunst des Geigenbaues" (The Art of Violin Making). They are given in millimetre, and the numbers refer to the following areas:

For Top

1. Under the bridge
2. Between the bridge and the bottom block
3. Between the bridge and the top block
4. Near the upper bouts
5. Near the lower bouts
6. Close to the edge
7. Near the "f" holes

For Back

1. Under the bridge
2. Between the sound post and the bottom block
3. Between the sound post and the top block
4. Near the upper bouts
5. Near the lower bouts
6. Close to the edge
7. Near the middle bouts

Antonius Stradivarius 1693

Top	Back
1. 1.8 mm	1. 4.2 mm
2. 2.1 mm	2. 3.0 mm
3. 2.0 mm	3. 4.0 mm
4. 1.8 - 1.9 mm	4. 2.7 mm
5. 1.8 - 2.2 mm	5. 2.5 mm
6. 2.5 - 3.2 mm	6. 2.6 - 3.0 mm
7. 2.6 - 3.2 mm	7. 3.3 mm

Antonius Stradivarius 1712

Top	Back
1. 2.5 mm	1. 4.3 - 4.6 mm
2. 2.9 mm	2. 3.4 mm
3. 2.8 mm	3. 3.8 mm
4. 2.7 mm	4. 2.7 - 3.0 mm
5. 2.6 mm	5. 2.7 - 2.8 mm
6. 2.5 - 3.2 mm	6. 2.7 - 3.0 mm
7. 2.7 - 3.2 mm	7. 3.5 mm

Antonius Stradivarius Large Form

Top	Back
1. 1.8 mm	1. 4.2 mm
2. 2.1 mm	2. 3.0 mm
3. 2.0 mm	3. 4.0 mm
4. 1.8 - 1.9 mm	4. 2.7 mm
5. 1.8 - 2.2 mm	5. 2.5 mm
6. 2.5 - 3.2 mm	6. 2.6 - 3.0 mm
7. 2.6 - 3.2 mm	7. 3.3 mm

Antonius Stradivarius 1709

Top	Back
1. 2.2 mm	1. 4.2 mm
2. 2.3 mm	2. 2.5 mm
3. 2.5 mm	3. 2.9 - 3.0 mm
4. 2.1 - 2.3 mm	4. 2.4 mm
5. 2.2 mm	5. 2.4 mm
6. 2.4 mm	6. 2.9 mm
7. 2.7 - 3.0 mm	7. 3.5 - 3.7 mm

Antonius Stradivarius 1726

Top	Back
1. 2.1 - 2.4 mm	1. 3.6 - 3.8 mm
2. 2.[illegible] mm	2. 2.5 mm
3. 2.2 mm	3. 3.1 mm
4. 2.2 - 2.5 mm	4. 1.9 - 2.1 mm
5. 1.9 - 2.2 mm	5. 2.0 - 2.3 mm
6. 2.3 mm	6. 2.0 - 2.6 mm
7. 2.6 - 3.2 mm	7. 3.0 - 3.3 mm

A Joseph Guarnerius 1733 has for the top:

1. 2.5 mm
4. 3.0 - 3.2 mm
5. 3.0 - 2.3 mm
6. 3.2 - 3.5 mm

Also Hill gives in his book: "Antonio Stradivari, his Life and Work", the measurements from 18 Stradivari violins being of similar amounts, but not so detailed.

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YOUR EAR CAN TELL

From "The Vancouver Sun"

The emotional message of music depends largely on the true colors of tone.

High fidelity retains the color in the music--it conveys that surcharge of meaning, and feeling that went into the original making of music. In one way, high fidelity is a "space machine" transporting the listener back to the time and place where the music was first recorded.

"How can I tell just by listening whether a high fidelity system is really good?" is a question often asked by potential buyers. The expert answers, "The human ear, unaided by any instruments, is still the best judge of tonal quality. But you must know just what to listen for. Here are some pointers.

"The strings should have their normal "gutty" sound in the lower registers and the violin and cello should sound different when playing in the same range.

The very low bass should march up and down the scale pretty evenly. Beware of one-note boom bass--the typical juke box sound.

The cymbals should have a fine sharp silvery crash with a sense of ringing afterwards--not just a splash of sound.

The flute and the very high notes of the violin should be crystal clear--never harsh and unyielding.

Piano should be crisp in "touch" and firm in pitch and at the same time full and solid-sounding in the bass.

When shopping you may compare different systems in terms of these criteria. Any system doing well on these five points is bound to give you full satisfaction".

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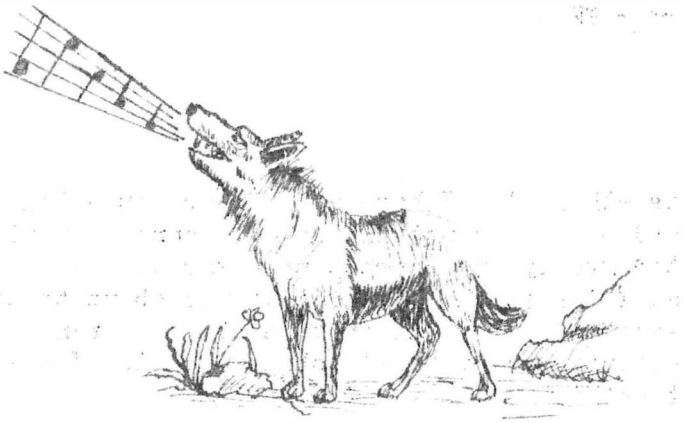
It's great to be great but it's greater to be human.

.....Will Rogers

.....

WOOLF NOTES

by The Editor



THE MAIL BAG:

It is always a delight to receive letters from my many friends. Still I must admit a feeling of relief in the fact that my mail has been a little light since Christmas. I don't think I could stand that strain too long. I still have over 20 letters that simply must be acknowledged.

MY NEW VIOLIN:

It is I think only natural that in writing a column of this kind one is inclined to talk a lot about himself. Perhaps its a good idea for in that way we become better aquainted. Anyway I feel I should tell you about the violin I have just finished and am now playing "In the white". I felt that if I were to write a series of articles on thin centers I should at least make some few experiments myself.

Having two old plates handy which had been finished except for graduations I decided I would spend a little time on thinning out portions of the center.

The back cost me $1.50 at a lumberyard the top was a piece of European "Pine" which I got very cheap as it had, of all things, a nail hole through a spot 3 inches from the tail end. This I managed to patch. I had discarded these plates as being unfit for a violin.

The back I graduated from 3/16 to 1/8 at the edge. A strong back with hardly any bend. The top at the bridge is 1/8 on the g side and a little less under the E. At places throughout the top it runs down to nearly 1/16th. Then for 1 inch from the edges it runs from 3/16 to 1/8. These places I cannot reveal at present as it would spoil my future articles. The violin at present sounds as good as any I have yet made. I tell you all this so you may be more inclined to listen to my articles. Even this one experiment shows we can get away from orthodox graduations. I am a little anxious with the thought that our readers might think that I am trying to break down the theories of Roelof Meertman and the well known trio - Saunders, Hutchings and Hopping. The "Saunders Groove" could still be applied and Meertman's tests still applied. So don't worry!

VIOLIN TONE:

I was quite fascinated with Carman White's suggestions that each person develops his own idea of perfect violin tone, and this was often formed by the instrument he played as a youth. I know that my ideal was fixed by listening to a fine violinist who used to play at the old "Silent" movies. The tone he produced can only be described

as ethereal. I have never heard such tone since, it just seemed to "come out of the air" and one could not in any way connect it with cat-gut and resin. He used to imbibe too freely and consequently was always hard up. He sold me the violin to pay for a new addition to the family that was about to take place. I couldn't get anywhere near the same tone from his instrument and strange to say he himself couldn't get quite the same effect from my "Bill Robinson" which I used to lend him. Although he liked it better than his own.

At our January meeting several good violins were played by a visitor, and friend, Louis Kolfman. The different quality of tone produced from each violin was very noticeable. Some had a beautiful contralto quality while one in particular had a real soprano tone. This latter lovely violin by the way, was one Louis made himself.

Which tone should we aim for? That is a question hard to answer.

ROELOF WEERTMAN'S BOOK:

The installment this month is composed mostly of charts which are to be applied to this chapter which started in the December issue.

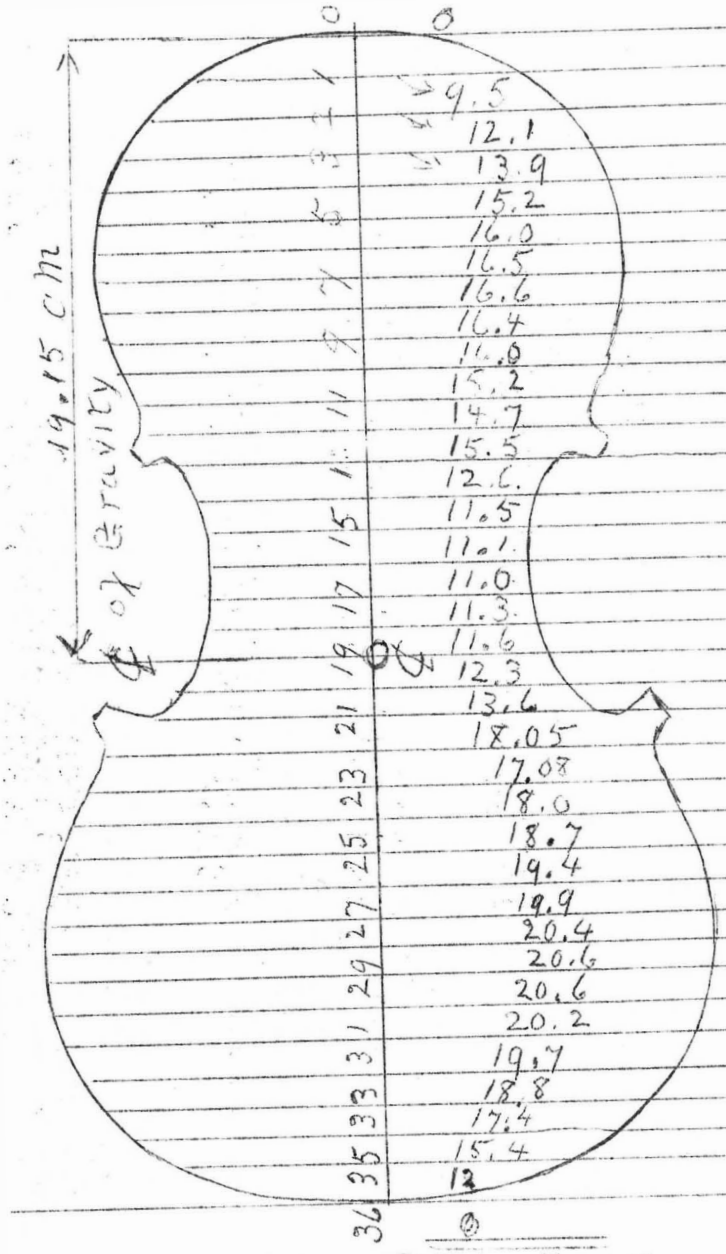
The installment follows on the next page.

TABLE I

Outside					Inside				
A	B	A B = C	D	E	A	B	A B = C	D	E
1	95	95	95	95	1	12	12	12	12
2	121	216	242	337	2	66	78	132	144
3	139	355	417	754	3	132	210	396	540
4	152	507	608	1362	4	145	355	580	1120
5	160	667	800	2162	5	152	507	760	1880
6	165	832	990	3152	6	157	664	942	2822
7	166	998	1162	4314	7	158	822	1106	3928
8	164	1162	1312	5626	8	155	977	1240	5168
9	160	1322	1440	7066	9	150	1127	1350	6518
10	152	1474	1520	8586	10	144	1271	1440	7958
11	147	1621	1617	10203	11	136	1407	1496	9454
12	155	1776	1860	12063	12	124	1531	1488	10942
13	126	1902	1638	13701	13	112	1643	1456	11398
14	115	2017	1610	15311	14	104	1747	1456	12854
15	111	2128	1665	16976	15	100	1847	1500	14359
16	110	2238	1760	18736	16	101	1948	1616	15970
17	113	2351	1921	20657	17	104	2052	1768	17738
18	116	2467	2088	22745	18	108	2160	1944	19682
19	123	2590	2337	25082	19	114	2274	2166	21848
20	136	2726	2720	27802	20	125	2399	2500	24348
21	185	2911	3885	31687	21	144	2543	3024	27372
22	178	3089	3916	35603	22	159	2702	3498	30870
23	180	3269	4140	39743	23	170	2872	3910	34780
24	187	3456	4488	44231	24	179	3051	4286	39066
25	194	3650	4850	49081	25	188	3239	4700	43766
26	199	3849	5174	54255	26	194	3433	5044	48810
27	204	4053	5508	59763	27	199	3632	5313	54123
28	206	4259	5768	65531	28	200	3832	5600	59723
29	206	4465	5974	71505	29	199	4031	5711	65434
30	202	4667	6060	77565	30	197	4228	5910	71344
31	197	4864	6107	83672	31	190	4418	5890	77234
32	188	5052	6016	89688	32	180	4598	5760	82994
33	174	5226	5742	95430	33	164	4762	5412	88406
34	154	5380	5236	100666	34	102	4864	3468	91874
35	120	5500	4200	104866	35	36	4900	1260	93134
		550.0	104866			490.0		93134	

$10486.6 \div 550.0 = \boxed{19.15}$ (35) = G

$93134 \div 4900 = \boxed{19.01}$ (35) = G

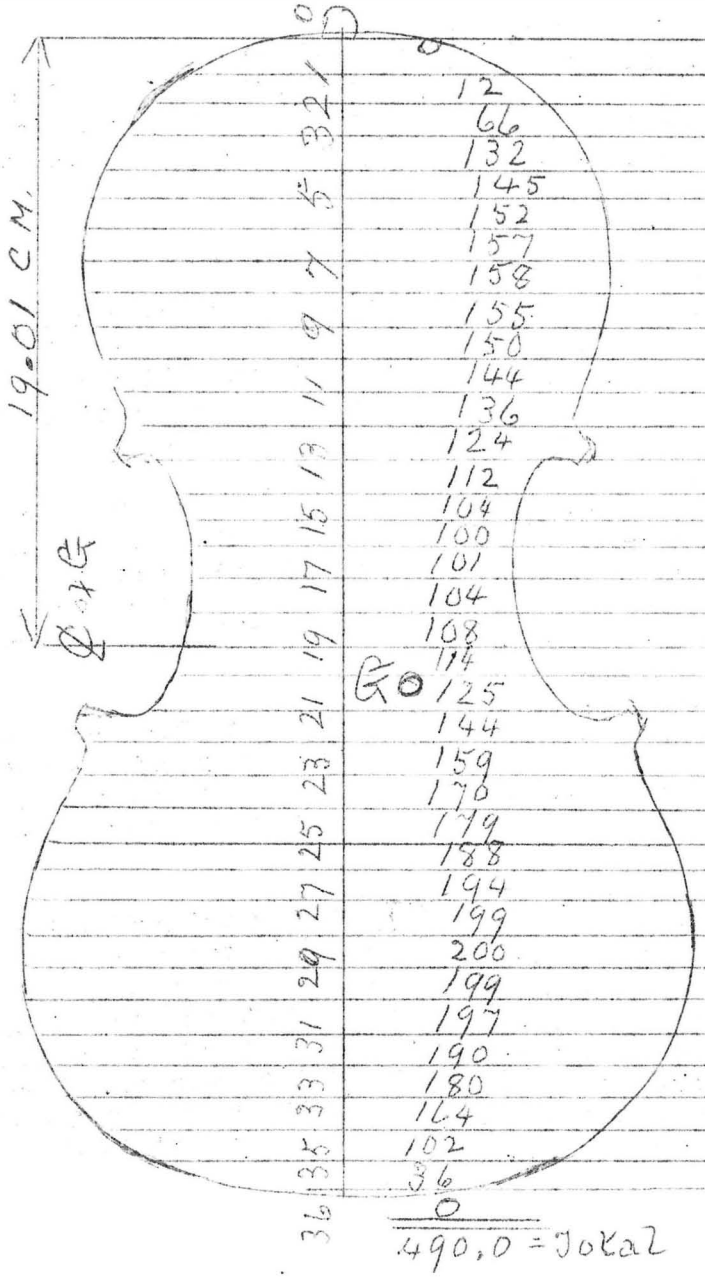


1	9.5	9.5 × 1 = 9.5
3	12.1	12.1 × 2 = 24.2
5	13.9	13.9 × 3 = 41.7
7	15.2	15.2 × 4 = 60.8
9	16.0	16.0 × 5 = 80.0
11	16.5	16.5 × 6 = 99.0
13	16.6	16.6 × 7 = 116.2
15	16.4	16.4 × 8 = 131.2
17	16.0	16.0 × 9 = 144.0
19	15.2	15.2 × 10 = 152.0
21	14.7	14.7 × 11 = 161.7
23	15.5	15.5 × 12 = 186.6
25	12.6	12.6 × 13 = 163.8
27	11.5	11.5 × 14 = 161.0
29	11.1	11.1 × 15 = 166.5
31	11.0	11.0 × 16 = 176.0
33	11.3	11.3 × 17 = 192.1
35	11.6	11.6 × 18 = 208.8
36	12.3	12.3 × 19 = 233.7
	13.6	13.6 × 20 = 272.0
	18.05	18.05 × 21 = 378.5
	17.08	17.08 × 22 = 391.6
	18.0	18.0 × 23 = 414.0
	18.7	18.7 × 24 = 448.3
	19.4	19.4 × 25 = 485.0
	19.9	19.9 × 26 = 517.4
	20.4	20.4 × 27 = 550.8
	20.6	20.6 × 28 = 576.8
	20.6	20.6 × 29 = 597.4
	20.2	20.2 × 30 = 606.0
	19.7	19.7 × 31 = 610.7
	18.8	18.8 × 32 = 601.6
	17.4	17.4 × 33 = 574.2
	15.4	15.4 × 34 = 523.6
	12	12 × 35 = 420.0
	0	0 × 36 = 0
	TOTAL - 550.0	TOTAL - 10486.6

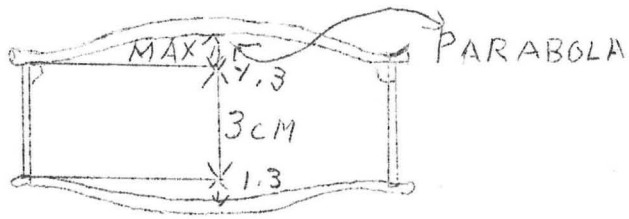
TOP PLATE.

$\frac{10486.6}{550} = 19.0\,cm$

FIG V



0	0	
1	12	12 X 1 = 12
3	66	66 X 2 = 132
	132	132 X 3 = 396
5	145	145 X 4 = 580
	152	152 X 5 = 760
7	157	157 X 6 = 942
	158	158 X 7 = 1106
9	155	155 X 8 = 1240
	150	150 X 9 = 1350
11	144	144 X 10 = 1440
	136	136 X 11 = 1496
13	124	124 X 12 = 1488
	112	112 X 13 = 1456
15	104	104 X 14 = 1456
	100	100 X 15 = 1500
17	101	101 X 16 = 1616
	104	104 X 17 = 1768
19	108	108 X 18 = 1944
	114	114 X 19 = 2166
	GO 125	125 X 20 = 2500
21	144	144 X 21 = 3024
	159	159 X 22 = 3498
23	170	170 X 23 = 3910
	179	179 X 24 = 4286
25	188	188 X 25 = 4700
	194	194 X 26 = 5044
27	199	199 X 27 = 5313
	200	200 X 28 = 5600
29	199	199 X 29 = 5711
	197	197 X 30 = 5910
31	190	190 X 31 = 5890
	180	180 X 32 = 5760
33	164	164 X 33 = 5412
	102	102 X 34 = 3468
35	36	36 X 35 = 1260
36	0	0 X 36 = 0
	490.0 = Total	TOTAL = 93134



$490 \times (3 + 2 \times 1.3 \div 2) = 2107\ cm^3$

$\frac{93134}{490.0} = 19.cm$

BACK PLATE.

FIG VI

The sides have an average height of 3cm. The inside archings of top and back have a depth of approximate 1.3cm. The volume then is 3cm x 490cm^2 plus twice 1.3cm times 490cm^2 x $\frac{1}{2}$, because since the inside archings are parabolic in curvature, the volume is about one half of a solid with straight sides. The total volume of air in the soundbox then amounts to about 2100cm^3.

This air weighs about $\frac{4}{10}$ grams.

As calculated the center of percussion is approximately at station 19. For top and back. Since the sides are lower in front near the neck than below near the end button the center of percussion of the airmass moves behind the bridge and sound post, right where the airmass is being excited by the action of the bridge.

Taking stock of our important findings so far we find that the final center of percussion of the airmass is in way of the bridge and soundpost. The construction center of gravity must be held throughout the making of the top and back at 19cm from the narrow end. The sum of the weights of the finished top and back is approximately 140 to 150 grams. The pressure of the feet of the bridge is 4200 grams for the right foot and 3250 grams for the left foot.

It seems sound to keep the balance point of top and back at 19cm from the end as soon as the archings take shape, we can check our progress by using a weigh scale-preferably two. And proceed to weigh each end of the slab we are working on and calculate the center of gravity. Table II will however provide a fast check for this purpose.

This table saves a lot of time. Simple lie each end on a triangular block on each scale and read the dial. A glance will tell which end is too heavy and needs correction. For a graphical solution of finding the center of gravity see Fig. VII. On a vertical line mark off in order the separate lengths of the lines of stations 0 to 36. The complete line represents the sum total of all cross lines then to an arbitrarily located pole draw radial lines from station numbers. Parallel to each radial line draw corresponding lines in each strip under the outline of the inside form. Connect each terminal and draw a parallel counter part in the lines of force diagram. Locating the center of gravity.