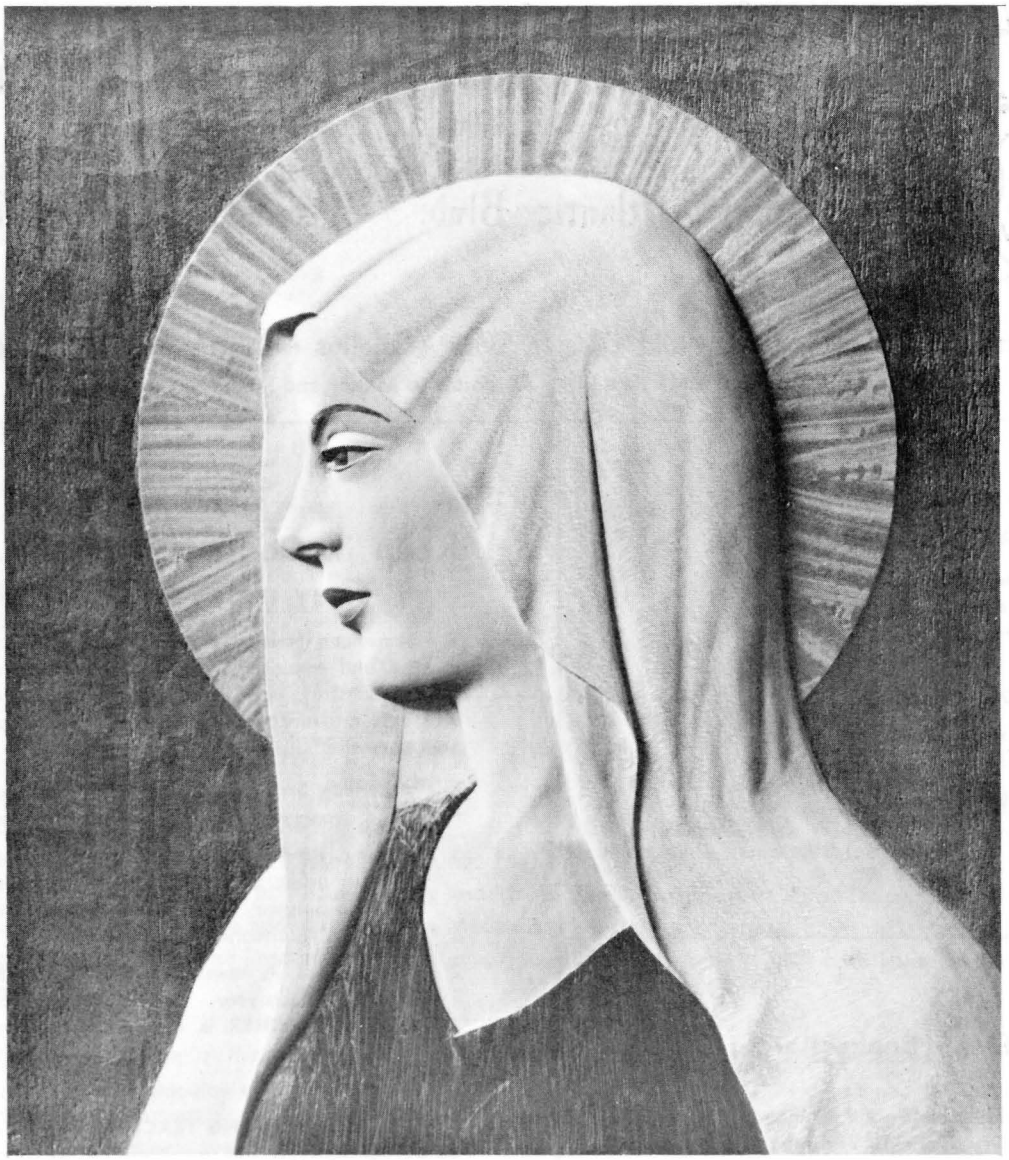
# The Violin Makers Journal

OCTOBER - NOVEMBER, 1961

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



"THE MADONNA"
Superb Wood Carving by Clifford Hoing
(see story, page 1)

Issued as an Educational Feature to encourage and develop the art of violin making.

# The Violin Makers Journal

A Non-Profit Magazine Published every six weeks
by The Violin Makers Association of British Columbia

MEETINGS HELD THE SECOND SATURDAY OF EACH MONTH AT 4360 MAIN STREET.



Vol. 5 no. 1 October-November, 1961

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FRONT COVER STORY

"The Madonna" ..... by Clifford A. Hoing

Our front cover picture for this issue is very appropriate for this season when we celebrate the birth of Christ. It is a reproduction of a wood-carving by Clifford A. Hoing.

We all admire craftsmanship in violin-making and Mr. Hoing's masterpiece "The Madonna" indicates in no small measure his ability with knife and gauge. The Madonna is an original design. Eight different varieties of wood, of various colours, were used. The process is also an invention of Clifford Hoing's. It won highest honours in an English Competition.

If you do not receive your copy of the Violin Makers Journal within reasonable time, please advise us. Notify us promptly of any change of address.

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# EDITORIAL PAGE OF *The Violin Makers Journal*

DON WHITE, EDITOR-MANAGER

The Violin Makers Journal is distributed free to all "Active" Members and "Associate" Members. Active Membership is limited to British Columbia. Associate Membership is open to anyone interested in String Instruments. Associate Membership fee is $4.00 per year. Back copies may be obtained. When paying by cheque please add 25¢ to cover exchange. Advertising rates may be procured from the editor.
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## SPECIAL ANNIVERSARY ANNOUNCEMENT

With this November issue we celebrate our fifth anniversary--we start Volume 5. No. 1. This, we feel, is quite an achievement for they have been five pretty tough years. Editing and building up the Journal has been for me a strenuous effort. That this effort has been well worth while is impressed upon me daily by reading the wonderful letters that I receive in every mail. For these I thank you--they give me that much needed "lift". I have definitely more friends than I can name. What more can a man wish for!

As a fitting act of celebration for this 5th anniversary we have decided to extend the usefulness and purpose of this Magazine, and of our association.

From the very first issue of the Journal, readers have been inquiring as to whether they might join our Violin Makers Association but until now membership has been confined to the Province of British Columbia. Our Constitution has now been amended so that every subscriber to The Violin Makers Journal may become what we will term, an "associate Member".

THEREFORE: "AS FROM THE APPEARANCE OF THIS NOVEMBER ISSUE EVERY SUBSCRIBER WILL AUTOMATICALLY BECOME AN "ASSOCIATE" MEMBER OF THE VIOLIN MAKERS ASSOCIATION OF BRITISH COLUMBIA."

The business of our association, and The Journal, will be directed and controlled by the present local "Active Membership."

"Associate Members" will be asked to channel all suggestions as to any improvements in the usefulness of their association or the betterment of the Journal, to The Association's Headquarters at Vancouver. These will all be reviewed at the regular monthly meetings, and voted upon.

One object of this change is to give our growing body of readers the feeling that having been promoted from readers to Associate Members, they are now part of an organization dedicated "To the development and encouragement of the art of Violin Making." The largest number of violin makers ever to be united into one group for the benefit of all and for the noble art of violin making.

That, for a start, is the main objective that the scheme provides. Other objectives will immediately present themselves, such as the building up and storing of a supply of our excellent B. C. woods. These would be available only to members of the assocation.

Another feature that could be worked out with the help of the Associate Members is an International Violin Competition (open to members only). This has been discussed several times by the "Active Membership" but nothing concrete has developed. To do the thing properly will not be an easy task. Your suggestions might help, for it must become a reality!

Every Associate Member will receive an attractive "Certificate of Membership" signed by the President and Secretary. This can be framed and hung in your workshop and will be something you may point to with pride.

At the end of this Editorial we print a facsimile of the certificate for you to see as it might take a little time before you get yours. We hope to send them out with the next issue.

At this time it might be well to review our finances. When we changed over last March from the old mimeographed effort to a regular professional magazine, done by a competent printer, we were forced to cut down slightly on the number of issues per year. This was done partly to ease the load of your Editor and also to help finance the new Journal. This arrangement has worked out remarkably well. However, we do find that we are not laying up any reserve in the way of cash for emergencies.

We need a new typewriter, filing cabinets, and other office equipment necessary to the running of an efficient office. Also, we are now printing 4 extra pages. We have so much material that we want to present to you. These extra pages cost money.

Your Editor-Manager still works free-gratis, as do all contributors and local members who assist in mailing operators.

It would seem that the most sensible thing to do would be, once and for all, set the price of membership at a rate which will place us on a sound financial basis. After careful consideration we have decided that $4.00 per year would not be at all too much to ask for "Associate Membership" fees. You will note that from now on you will be "buying" membership in the Association--the Journal will be "free to members"! By so wording we can avoid some slight taxation!

On closing this Editorial let me quote from a letter I received from my friend Mr. Robert Atkinson of 47 Marlborough Ave. Hornseat, England. I think Mr. Atkinson sums up the situation very well. Quote:

"Dear Don:

Thank you for your letter and for your promptness in replying about the Smiley tuner.

I welcome your decision that all readers are to be associate members of the VMA of BC. Seeing that you contrive to keep in touch with individual readers, that decision will confirm something that already exists.

In deciding our attitude on the question of increased fees it seems reasonable to consider how the Journal compares with what the booksellers can offer. Then we find:

1. We cannot buy a book in English on our subject for three dollars.
2. The average author of books on "Discoveries" or "Secrets" is unknown to many of us and so also are his practical achievements. The Journal, on the other hand, often has something to say about the work and successes of its contributors so that readers are helped in assessing the value of the articles published.

For these and other reasons I conclude that an increase in fees is fully justified. Having retired, and perhaps therefore being prejudiced, I should prefer the amount to be about four dollars if possible. But if nevertheless it is decided to make it five dollars I shall still remain a reader.

Yours sincerely,
Robert Atkinson "

## The Violin Makers' Association of British Columbia

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_____

is an Associate Member in good standing in the above Association for the year _____

_____ President _____ Secretary

*An Organization* DEVOTED TO THE DEVELOPMENT AND ENCOURAGEMENT OF THE ART OF VIOLIN MAKING IN CANADA

# LOCAL NEWS

by GEORGE FRIESS

The 1961-62 Concert season is well under way. A symphony week was held during the month of September heralded by 'Music in the Streets", a program of music designed to attract and entertain all those who were in the downtown area between the hours of 9 a.m. to 6 p.m. A window dressing competition was arranged and more than fifty leading stories vied with each other to produce the most original and attractive window display based on a symphony theme. This idea met with a most enthusiastic response and great ingenuity was displayed by the individual participants. Some of the instruments of members of the Violin Makers' Association of British Columbia were on display in one of the stores.

Back again in Vancouver: Irwin Hoffman, Conductor and Musical Director of the Vancouver Symphony. Mr. Hoffman made a triumphant tour earlier this year as Guest Conductor of the famous Israeli Philharmonic, receiving standing ovations from audiences at eighteen concerts in four weeks. Working on a tight schedule, his summer season included engagements at Boulder and Idaho, as well as seven weeks of concerts, as resident Conductor of the St. Louis Little Symphony. He also appeared as Guest Conductor at Grant Park, Chicago, where he created a sensation among the music critics of that city. He has been invited to return to Chicago next year as Principal Conductor of both the opening and closing concerts of the season. He also has four concerts scheduled in January next conducting the Dallas Symphony.

A First Chair concert, featuring Ernst Friedlander, Principal Cellist of the Vancouver Symphony, who has written a Second Cello Concerto, was premiered on October 15th. Mr. Friedlander, who was born in Vienna, studied cello and music composition at the Hochschule for Musik and Vienna Conservatory, is well known in the musical world, having played with many leading Orchestras before coming to Vancouver three years ago.

Another Cellist, Gregor Piatigorsky, who needs no introduction, will make an appearance here on December 10, not his first. The writer has had the pleasure of hearing him in Vancouver on a previous occasion, and is looking forward to this next concert of the famous artist.

Kaachaturian, Composer and Conductor, will pay us a visit on January 21, conducting the Vancouver Symphony in a program featuring Esther Glazer, Violinist.

Igor Oistrakh, violinist, son of the famous Russina Violinist, David Oistrakh, will make his first appearance here in two performances on March 4-5.

Mr. Harold Briggs, one time contributor to this column, is planning a three months' visit to Arizona this winter, and while there, intends to look up as many as possible of the Arizona Violin Makers' Association, notably Bob Wallace. No doubt he will have many things of interest on his return. A pleasant trip and safe return, Harold.

The October meeting of the Violin Makers' Association could be described as a lively one. Many things were discussed. Everyone had something to get off his chest which in the opinion of this scribe is good.

Approval was given Mr. Friess to organize a get together of some of the people prominent in musical circles at our annual Christmas party which will be held on Saturday, December 9, at eight p. m. The plans call for music and refreshments.

At this party, the Violin Makers' Association of British Columbia will make a presentation of an Association made Miniature Violin, with Bow and Case, to Mr. Cardo Smalley, Assistant Concert Master of the Vancouver Symphony Orchestra, in appreciation of the support and encouragement he has given our membership.

* * * * * * * *

" The sum of wisdom is that the time is never lost that is devoted to work."

... Ralph Waldo Emerson

# MY EXPERIENCE WITH MICHELMAN VARNISH

by George Collier

Well, here I am again, still working on my comedy of errors, fiddle No-1. It's coming OK and I'm now giving it the Michelman treatment. I have about 4 more coats of color varnish to go, and the instrument will be a rather deep orange.

I have been on vacation for the past month and while on said vacation I visited the Ford Museum at Dearborn, Michigan. In one case in the fine arts section were a Del-Gesu Guarnerius, a Strad, Maud Powell's J.B. Guadinini and a Nicolas Amati. These are the instruments covered in Violins and Violinists some months back. The Strad and the Guarneri are in nice shape, the varnish to my observation being a reddish brown. The Guadinini was as orange as orange can be, with a goodly amount of it worn off. The Amati is in far the best condition of the four and its varnish is yellow and quite light. All of these varnishes, especially that on the Guadinini look like my work with Michelman's formulas. I also saw, in the model violin shop, the Sanctus Seraphin cello described in V&V. It is in beautiful condition and a deep maroon red. I tried getting some color photographs of these instruments, with no luck as I didn't have any flash equipment and tripod for my camera.

As you know, I have been working on Michelman's varnish quite diligently, starting in June of 1959. During this time I have made up most everything in the book and put it on maple slips. These slips have been in the south window of my house for 2 years and have been completely color fast. I found everything in the book just as Michelman said it should be, except that I have never been able to get the clear water phase in the precipitation process. Mr. Michelman states the precipitate should go to the top of the solution in about a half an hour. I have waited a half a day with very little rise. This apparently causes no difficulty as the resins come out very OK. I used artist's grade raw oil when making up the varnishes with good results, getting a completely dry coat in about a week.

Now, I have had some experiences with Michelman's varnish which may seem peculiar to anyone taking on the system from scratch. Mr. Michelman may like to comment on them and such comments will be most welcome. I shall comment on my work in chronological order as my memory serves me, so here goes:

A) When filtering the precipitate from the solution, I first used a piece of an old bed sheet. This didn't work worth a whoop as the precipitate was so fine it clogged the pores in the cloth. I then tried twisting the sheet tight around the wad of solution. This yielded no precipitate as the pressure generated forced precipitate and all through the cloth. I then tried cheese cloth and wet it thoroughly before I poured on the solution. Filtration was then good, the first filtrate coming off rather fast. To get complete filtration, so the precipitate forms a mushy cake, takes about two hours. I then washed this cake right in the cheese cloth and allowed two hours for it to drain. Three washings, with two hours drainage between them, does a good job with minimum loss of precipitate.

B) I then tried drying the precipitate over a 100 degree F heat source. This produced a granular sand-like resin which I didn't like. I next tried complete air drying, which took about a week. This produced a nice cake of resin, shiny and crystalline on the broken surfaces.

C) I expected this resin to dissolve in turps, like sugar in hot coffee. Tain't so, you shake and shake before complete solution is accomplished, but it does dissolve and produce a nice clear varnish. This long shaking or stirring is OK with everything but the dark brown varnishes. With these I got the jell phase before solution was complete and the varnish was useless. This didn't concern me too much as I didn't want anything that dark anyhow. Light and medium brown varnishes take the long mix OK. I tried several different types of turpentine on the dark brown varnishes, but could not get them dissolved before they jelled.

D) In applying this varnish, over-brush as little as possible. The stuff doesn't set up fast, but it piles up with heavy brush marks on even a little over-brushing. A flat ox-hair brush 1/2" wide works out very well on scroll and ribs, but the same type of brush at least an inch wide is a must for back and belly.

E) When I applied the varnishes on untreated slips of sanded maple, the colors came up very well in just a few coats. When I oil treated the fiddle and then applied the varnish, the colors didn't show up anywhere near as fast and several coats were necessary before it took shape. It does show up however and the colors hold true. So, motto, oil treat sample slips before you apply the sample varnishes if you want a true indication of their finished appearance.

F) I didn't find the varnishes from the book as soft as Carmen White said they were. They were soft OK and stayed that way, but not so soft as to be inconvenient. They rubbed out beautifully. Could be his conditions are different from mine.

G) Mr. Michelman published revised formulas for his varnishes, using potassium carbonate as the alkali in which the rosin is dissolved. These revisions were published in V&V, so I got the pertinent issues and again went to work.

D) Everything I say above applies to these new formulas, with some additions, as for instance, when the resin dries,

a white feathery fuzz comes out on it. I at first thought I had not compounded the stuff properly, so made up other batches varying the quantities of solutions used. Everything I did, did no good and the fuzz came. I didn't analyze it as it brushed away from the cake of resin nice and clean and the resin was perfect. Added washings apparently do no good as I got as much fuzz after six washings as I did after three. Reagent grade chemicals were used in all experiments, so I don't believe anything was contaminated from the outside.

E) Orange varnishes made from these new resins, using Cast Oil, a boiled linseed oil of high purity used by artists, dry very slowly, about two weeks being necessary for complete dry-out. These varnishes don't jell as fast as those from the book and I have used varnish 12 hours old, on slips, with fair results. Dont try this on a fiddle however, make the varnish and use it fresh for each coat.

F) Since Iron is a good dryer, I made up a batch of dark brown resin from the new formulas. Then, when making the varnish, I used 1.60 grams of orange resin and 0.4 grams of the brown. This combination, dissolved in 5CC of turps, with 3CC of cast oil added, dries impervious to turps in a week. I can't see where the brown affects the orange color, except maybe to deepen it a bit, as the varnish in liquid form looks about like Port wine. I believe this varnish retains it liquid state long enough so it would be safe for use on a cello or even a bass, if one used proper size brushes so they got it on fast. The resins are quite permanent if kept refrigerated, and one batch of resin will produce about 4 coats of varnish.

G) This slow dissolution business bothered me to some extent as I didn't care to stand around shaking a bottle for an hour. So I got 4 ounces of glass balls 1/8" in diameter and a two ounce pill bottle with a water tight plastic stopper. I ground the resins to a powder in a mortar and poured the powder into the bottle. I then added 5CC of turps, allowing the graduate to drain for 5 minutes to get all that was in it. I then filled the bottle half full of glass balls and chucked the stoppered bottle in my machine lathe. I tumbled the bottle at slow speed for a half an hour, which procedure produced complete solution. I then added 3CC of cast-oil and again tumbled the bottle end over end for 10 minutes. Cast oil is very viscous, so I allowed 15 minutes drainage to clear the graduate, when adding oil to the dissolved resin. I then filtered the varnish through a very fine bronze cloth and put it on the fiddle. 5CC turps, 3CC oil and 2 grams total resin produce enough varnish for one fiddle one coat.

H) The colorless varnishes produce a very light yellowish or orangish tinge when about 6 coats have been applied. These 6 coats, with no rubbing between coats are somewhat pebbly, probably some dust, but mostly something coming out of the varnish, air bubbles or such. I used 600 grit wet-or-dry abrasive paper with olive oil as a lubricant and rubbed out the sub coats. They came out perfect, with a velvet sheen that was completely transparent. I also tried a synthetic wool called Scotch-Brite, with dental grade pumice and olive oil. This worked well in hard to get at areas, but scratched if lubrication got a bit low. Rubbing with pumice and felt was OK, but this polished around the bumps and didn't take them off. Possibly my felt was too soft. The abrasive paper worked out fine and I'm happy with it. I must however, advise caution when using the stuff, so one keeps it well oiled. It scratches like the very devil if lubrication calls off. Keep the surface gooey with oil.

I) I then applied 8 coats of orange color varnish, all of which were Michelman's new formula, and allowed a week between coats. I rubbed out this session with the abrasive paper and olive oil. Right about here, I decided I would put a sun-burst in the back of the fiddle, so I sanded the color varnish in the center of the back almost to the sub strata. I went a bit too far with this and the transition from dark to light is a bit too abrupt. I believe it's going to be OK however as I am now applying subsequent coats heavier over the light area than I do over the edges of the fiddle. The pronounced merging of colors is disappearing and I believe I will be about where I want to be when the final 8 coats are on.

J) Outdoor drying, in bright sunlight, reduces drying time to about two days, provided dust doesn't give one a bad time. I had a lot of time, so I dried indoors until dust would not stick to the varnish. I then put it outdoors for a couple of days, rotating the fiddle so it was sunned on all sides. This procedure results in a good dry coat, with no tendency for the under-coats to lift when a fresh one is applied.

Well, from the above you can see that a fiddle varnished via Michelman's technique will consume a rather long summer. I'm not always that patient so I'm goind ahead with the black light fluorescent tube. These tubes are not expensive and are 4 feet long. They consume about 100 watts and deliver ultra violet equal to that from the sun, if the illuminated object is a foot from the tube. This per General Electric Lamp Division. If this be so, I believe turps proof and dry coats of Michelman varnish can be produced in 24 hours over the lamp. I will keep you posted on the outcome and it may be possible for people in Vancouver, where, as you say, summer comes on Wednesday, to use Michelman's technique with some possibility of completing a job in a life-time.

Guess that's it for now. Luck to you, and the new mag is the best three bucks worth of fiddle information I buy.

"George Collier"
1816 3rd Ave. South, Anoka, Minn.

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## 'FRED" - THE FIDDLE MAKER

by Lance Thornton

Editor's Note: As an insert with this issue we present you with the reproduction of a photograph of 'Fred" the fiddle maker. We consider it a splendid character study, and after you have read Fred's story, written by his best friend, Lance Thornton, you will see what moulded that character.

We believe most of our readers will have the picture framed, as it is well worth that honour. Our first intention was to use it as a Season's Greeting presentation, with a suitable Greeting from the Journal at the bottom of the photo. However we did not like the idea of attaining honour for ourselves from the departed friend of one of our readers, so we present our Greetings separately and enclose them with 'Fred's" picture. We are sure Mr. Thornton will join is in wishing you "The Best", and Fred, too, were he alive.

* * * * * * * * * * *

Fred's full name was George Frederick Handel Baker. He died in April 1961 at the age of 78 in his beloved Somerset, where he was born and where, for the most part, he lived, worked, and died.

Fred had two great loves, the fiddle--he never called it a violin--and sketching. Whether it was one or the other, it claimed his full and devoted attention.

Fred's theories on the violin were unending and he never ceased to talk about them. He believed that the violin was thought up by Leonardo and that the instrument itself had been first brought into being by Da Salo.

From Da Salo and the Bresians, Fred argued that the violin passed on to the Cnemonese and so to the Amati's, who, if they knew the "secret" lost it, preferring to make it a work of art, rather small in tone, but beautiful to look at.

The "secret" so said Fred, was the discovery of a law of nature--a law of acoustics, known to the old master-craftsmen, but lost to modern man. It was, so said Fred, not until Strad who worked in the Amati "factory" (another of Fred's foibles) stumbled upon the law, well on in life, that Strad himself made fiddles that were really good.

Even so, so said Fred, Strad himself frequentlyfell under the spell of creating a work of art, rather than a masterpiece of beautiful tone, according to the "Law".

In the Strad factory, Strad alone - the master knew the law. This Strad appli
while apprentices and craftsmen did the rest. Otherwise, said Fred, how could Strad have made so many fiddles?

Fred claimed that Guarnerius del Gesu discovered the law and applied it, often making a fiddle that looked like a Demon, but which sang like an angel.

It was Fred's pride that he too knew the law. Fred had even tried to sell the 'Law". He had written to the director of the National Physical Laboratory (himself an enthusiastic violinist) telling the director of his discovery and offering to sell it. Alas, Fred met with sympathy but no sale or enthusiasm.

I didn't argue with Fred as he sat in his caravan with his cats, his food, his tools, shavings, unfinished fiddles, spare parts and moulds around him. It was Fred's world and I had no desire to spoil it. Presently Fred would produce a fiddle, always in the white, improvised as to fittings. He would say: "I want you to try this, then he would walk about outside his caravan; up and down the dell where it rested, while I played as best I could on his latest fiddle.

From his vantage point in the dell or on the packhorse bridge, Fred would shout his instructions "Something slow--not so fast--do something on the "G" string" and so on. In the end he would return satisfied by his outdoor listening. "Carries like a songbird," he would say, "beats a Strad. More power, more even. Not quite satisfied with that "D" though, a little weak in the upper register. I must improve it."

In his younger days, Fred had worked in his father's music shop, repairing, doing craft jobs, piano tuning, often for celebrities such as Kreisler (whom he admired greatly) and Pachman.

There we have another of Fred's odd views. We would often talk of modern violin vertuosi, "Fireworks, my dear boy, fireworks--no good--now Kreisler, there was a man!"

In appearance Fred's fiddles were not elegant, more devil than angel to look at. Their tone was good, not overpowerful in my view, sometimes uneven. Fred claimed great carrying power for his violins, I don't know "Fill the Albert Hall," he would say.

Myself, I felt that the tone had to be pulled out, it did not come too easily. I once had the joy of playing on an old Italian violin which really did sing.

Fred held the view that varnish made little or no difference to tone, 'Humbug," he would say, "sheer

humbug!" For himself he didn't bother with varnish. "Just shoved on to protect the thing, no more--may dull it a bit."

Likewise with the idea of playing a fiddle-in, "Rubbish," Fred would say, "either the fiddle has the tone or it hasn't."

Of dealers, he was most caustic, "Antique dealers, nothing else--don't know a thing about musical instruments. They say a fiddle's this or that--how do they know?" I had to confess that I didn't know either.

In his early days Fred was an able musician playing the double bass in a band and the piano.

Of late years it grieved him that he no longer had the energy for his favourite hobby of fiddle making, though in a feeble way, he carried on until the end. He hoped that I would carry on. To this end he was writing a book, disclosing the secret and how to apply it. I have never seen this book. Fred made innumerable devices, jigs, and moulds for assembling violins, often of a very ingenious character.

Fred stuck to the idea of the "factory" as of old, headed by the Master with the "secret" and the know-how to apply it, "then anyone can make fiddles" he said.

On March 9th Fred died. His caravan in ruins, his bits and pieces dispensed. On that day the violin lost a sincere devotee and I, a dear pal. Bless him.

Lance Thornton
Fox Cottage
Holmer Green
Bucks, Eng.

* * * * * * * * *

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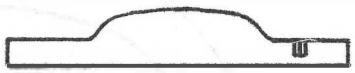
## THE OUTSIDE MOULD

by E. H. Sangster

This article is written to help the beginner or amateur violin maker, not for the professional and I hope I can make myself plain. First one must have a mold to make the ribs. I use an outside mold that is the ribs are made inside the mold. The mold is made of two pieces of well seasoned hardwood and must be made the exact size the ribs are to be and must be perfectly true; that is the sides inside must be at a right angle or straight up and down. After the two pieces of the mold are made exact facsimile bolt them together at each end (see diagram). Now with a 3/16 drill bore holes down through the mold one half inch from inside edge. These holes must be bored straight and true to inside face of mold and spaced evenly, 8 for the upper rib 5 for the Ds and 10 for the lower rib. (See diagram.) Now get some 9 gauge wire (telephone wire is fine) and cut 46 pieces 7 inches long and bend them to fit in the holes (see diagram). Now bend a set of ribs and fit in the mold and the wires will hold the ribs good and snug to sides of mold while you fit in your six blocks. (The upper and lower blocks are made of willow wood and Oregon cedar is fine for corner blocks, easy to fit).

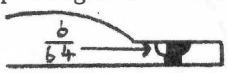
Make a set of linings of willow 6/64 thick 1/4 inch deep,bend them and by opening your bent wires a bit they will hold the linings snug to the ribs while the glue is drying. Now we are ready to work the back. The maple for the back should be seasoned at least 20 years. With your outline template mark it out on the back and cut it as neatly as possible. Now plane the underside level and flat. With a gouge work the edge all around 9/64 thick one half inch in on the upper and lower bouts and 3/8 inch in on the Ds.



This must be done true and even.

Now without glue clamp your back to the ribs in the position it is to be when glued on and with a point (a small ice pick is fine) make a mark all around outside of ribs; take back off and true the back all around 1/8 inch from mark made by point. This must be done as perfect as possible for this will be your finished outline. With your purfling marker make the marks for your purfling as neatly as possible and cut the groove 6/64 deep all around. Inlay the purfling and when glue is dry, with a compass make a mark all around halfway between outer edge and purfling, open compass to 1/2 inch and make a mark all around.

Now with a one inch gouge very sharp counter sink the purfling between the two lines 3/64. If done correctly




this leaves your purfling 3/64 deep and there is 3/64 from bottom of purfling to underside of back and your back is 6/64 thick at the purfling all around. You are now ready to work the arch on the back and this must be done perfectly true and even with highest point at sound post position. 9/16 at S post position. When outside of back is finished turn it over and dig out the inside leaving it 10/64 thick in the middle tapering it to the 6/64 at the edge. When back is finished on inside to the best of your ability, round the edges nicely all the way around the outside and glue on the ribs and set aside. Now your top is worked exactly like the back except the highest point

of arch which is 5/8 comes at the bridge point and if you are going to use pure raw linseed oil as a filler make top 6/64 all over. If you are not going to use linseed oil make top 7/64 all over except at the purfling. Cut f holes and fit in a bass bar, round edges and you are reqdy to glue on ribs. Fit in a neck and violin is finished in the white. If your wood is good and your work done well you will have a fine violin.

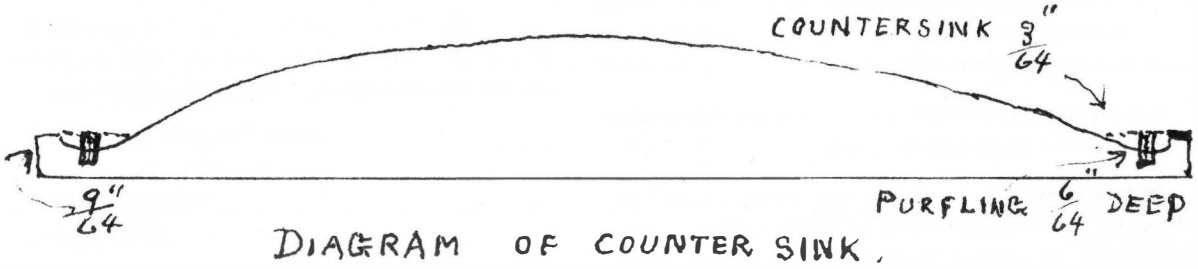
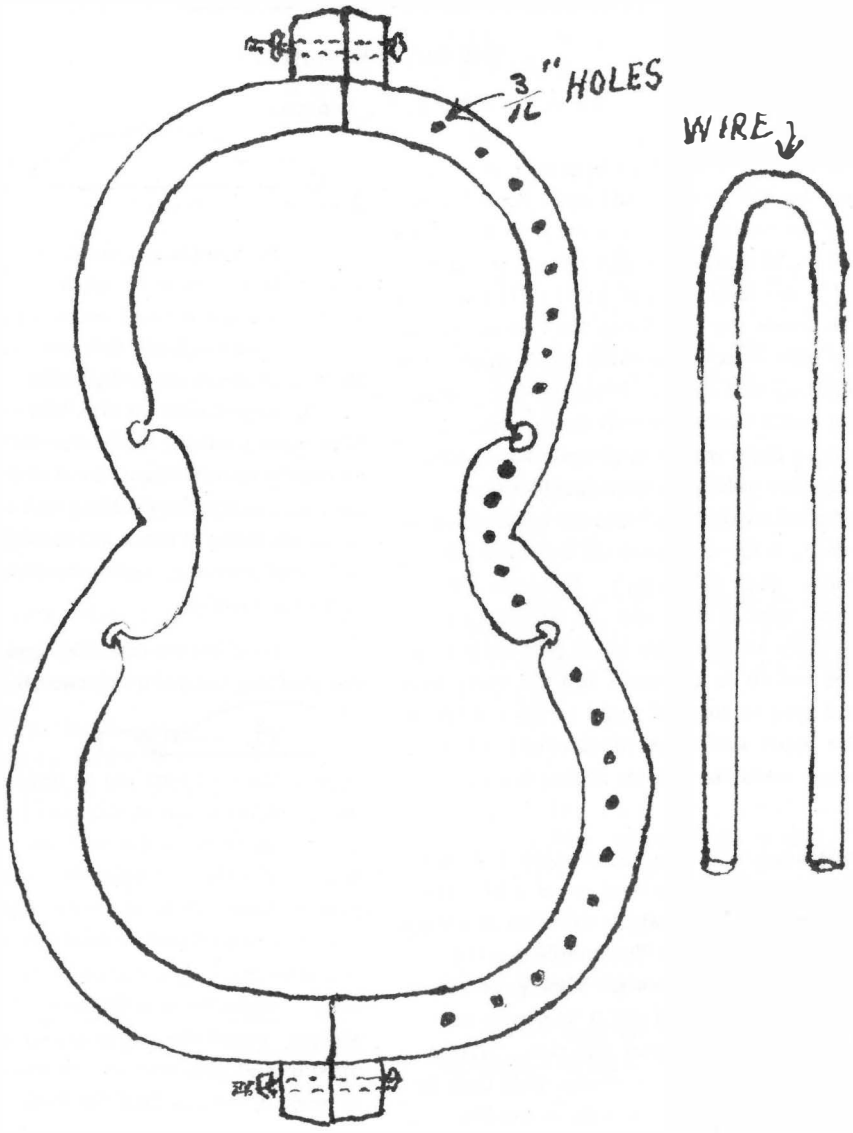


DIAGRAM OF COUNTER SINK.



# WOOD QUALITIES AND OTHER SUBJECTS

by Bruce Yantis
Chicago, USA

## Wood for the Sound-Board

"A bad beginning makes a bad ending." - Euripides.

Wood from a young tree retains a bright reddish-yellow color for many years but wood from a mature tree will have a dull, brownish-red color. Only wood from a mature tree is satisfactory for the sound-board.

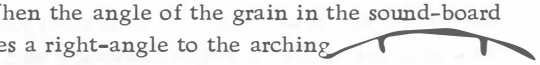
The wood should have straight, even, well-defined graining of medium density; the whole grain being rather soft with soft connective-tissues; heart wood from a mature tree; no fat; brittle and splits along the grain easily; shavings brittle and easily split into threads; the finished sound-board is pliable with a good spring-return when flexed. Only the finest wood will produce good double-stops.

Very dense wood that is left heavy for the sound-board produces weak harmonics and overtones; it also has a cold tone because the connective-tissue is frozen, but if the thickness is reduced enough to free the fibers, the quality is a very unpleasant woody quality.

Only perfect wood and excellent graduation will produce 'power and nuance' in a violin. The spring-response of the sound-board must answer to the most delicate bowings to produce these subtle tonal distinctions, and as the bowing becomes more forceful, respond by degrees of greater spring-action up to the greatest force (pp-mf-ff). There can be no excess rigidity in the sound-board. The greater the nuance-gradation in a violin, the greater its value.

Perfect wood for the sound-board is rare and difficult to find. The great violin-makers of the past were outstanding in their selection of wood for the sound-board and certainly fortunate that such wood was available. It is a fact that we cannot replace the sound-board of a great violin and comparatively recapture its fine tone-values with a sound-board of this era. On the other hand, expert violin-makers of today can replace the ribs, neck or back-plate of any fine violin of the past, with excellent tonal results. The problem of wood for the sound-board has probably inadvertently caused many violin-makers of today, to run to their varnish formulas; convinced that this is the only factor that eludes them in their effort to duplicate the great past. Many violin-makers are convinced that the sound-board wood of today is as good as the wood of the past, and they could be right. Before running back to the varnish pot, let us consider one difference in the sound-board wood of today:

As noted in the preface; there is much evidence that today's wood for the sound-board is cut at a different angle than that used by the great Italian violin-makers of the past. My first contact with this difference was through the excellent book by Dr. Frederick Castle of Lowell, Indiana*; Violin Tone-Peculiarities, 1906. He says:

"When the angle of the grain in the sound-board approaches a right-angle to the arching  power and brilliance are excellent. The grain-angle of today is  The grain-angle can be observed by looking at the edge of the sound-boards lower end. Dr. Castle states that the fiber-action is apparently better when the fibers are not elongated at the points of thinnest graduation (the tone-producing areas)."

Recently, one of the better violin-makers in Chicago showed me a few old Italian violins with this grain-angle. He became aware of this through years of observation and advised me that he had never seen an outstanding Italian violin that failed to have this tendency of grain-angling. I have made a point of observing this deviation at every opportunity and find it to be correct.

## Richness, Resonance, Harmonics and Resultant-Tones

"Whisper cannot give a tone." Bacon

Richness and resonance must be combined for a discussion of their tonal effectiveness. A rich tone without resonance is an impossibility. Resonance without richness makes no musical sense. Harmonics and resultant-tones are the compound parts of a rich tone. The greatest richness of tone occurs when the resultant tones have good strength, and, only the finest violins provide strong resultant tones.

The requirements for richness of tone is a strong fundamental tone combined with weaker upper partials; so assorted that collectively they produce a pleasing musical sound. The reverse of this is called poverty of tone and is the result of a weak fundamental tone with stronger upper partials.

Resonance is the intensification and enriching of a musical tone by supplementary and sympathetic vibrations. A vibrating string alone offers no resonance. When the

*Dr. Castle says: The whole 'plate' yields tone equally as good as the divided plate, provided that the grain of sounding-board stands at, or nearly at a right angle to the arching in the tone-producing area. But when such grain angle is oblique to the arching I have always found that tone to suffer loss in both power and brilliance.

sound-board fibers lying directly under a vibrating string, vibrate in sympathy with that string, we have the beginning of resonance. Thereafter, all parts of the violin should contribute to the growth of resonance, including the air-space of the interior. It should be noted that most parts of the violin enhance resonance through sympathetic vibrations or movement; however, some parts contribute solidity (lack of movement as opposed to movement) as their contribution to resonance. These parts are the ribs, corner-blocks and back-plate. If these parts permit any trembling in the violin, a loss of resonance will occur.

Resultant-tones are also called combinational-tones or Tartini-tones. They were first discovered by Sorge, a German organist in 1745 and thereafter rediscovered by the Italian violinist Tartini, in 1754, however, it should be noted that Tartini was in much error about the resultant-tone that was heard when two other tones were struck simultaneously. Many books on the violin have elected to mention Tartini as the discoverer of resultant-tones (he did not discover them and was wrong in his analysis of them). One should be wary of much history that has been written about the violin. Such errors and romance eventually appear in books on violin construction unfortunately.

Resultant-tones can be a valuable assistance and guidance in the setting of the sound-post regarding tension and location, i.e., use the tones C# and E in the staff as a double-stop and immediately follow this with D and F#, just above the previous chord. You should hear the tone A, an octave and a third below the C# for the first chord, and for the latter chord; D one octave below the sounding D. If one adjusts the bridge location and post tension and position for maximum strength and clarity of these resultant-tones; the adjustment cannot be improved. Obviously this will contribute to richness of tone.

Factors that are detrimental to richness, resonance, harmonics and resultant-tones: poor wood for the sound-board, bridge and sound-post; excess density of wood for the sound-board, bridge and sound-post; Note: soft wood for the sound-board can produce a rich tone but will cause a loss in resonance. Excess or hard-drying varnish on the sound-board; excess gauge or weight of the strings; excess graduation of the sound-board; too thin a bridge (buckles); incorrect interior lines (sound-waves do not arrive at the ff holes properly); excesses in the bass-bar; size and location of the ff holes; extremes in bridge height.

Force must equal the resistance of the sound-board for best results. The position and tension of the sound-post is very important for good results. The bridge should always be located at the maximum arching of the sound-board.

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## HINTS ON GLUE AND GLUEING

by D. H. Whisenhunt

Here are a few points on glue and glueing that may be of interest to your readers and may be helpful to the budding violin maker and perhaps to some old timers.

There have been many adhesives used to join wood and other materials from the dawn of time and some are still in use today. They are mainly made from or are composed of gelatinous or mucilangous materials, such as fish gelatin, horse hoof or hide gelatin or sea weed or kelp. They, as are all things, subject to deterioration with age. In the construction of a violin I use only the hide glue as it can be made strong enough to pull almost any wood apart. It can be weakened down to a strength usable on the upper plate so that it could be removed for needed repairs.

The primary drawback in the use of hide glue is that it takes a little extra equipment, for water bath I use a porcelain coffee cup in a small stew pan on a hot plate to heat glue, and a dairy thermometer to check the heat which should be above 140°F. but should never exceed 150°F. It is better to weigh glue and water but the quantitative measure is usable. The proportions range from 1 1/2 water 1 glue to 4 parts water to 1 part glue, dependent on the quality of your glue, so when you get a quantity of glue you must experiment to get the exact strength you wish to use.

In the use of all glues you must join the work and clamp before the glue begins to jell, so in the use of hide glue do your glueing in a room that is 70°F or warmer--apply the glue and put together immediately--the addition of a small amount of sal cylic acid crystals to the water will retard setting a little and will cause the glue after drying to be slightly resistant to moisture. (I catch rain water and to about a qt., I put in about a half teaspoonful and let dissolve in the cold, then filter, then use in the glue).

Get your work fitted closely, your glue proportions and the temperature right, glue and place clamp on quickly and you will do a job that will last for many years, yet in case of needed repairs can be taken apart, cleaned, and rejoined.

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# NATIVE WOODS OF BRITISH COLUMBIA SUITABLE FOR VIOLIN CONSTRUCTION

By Don White

## Chapter 3. Sitka Spruce

"Of our swift passage through the scenery of life and death,
more durable than we,
What landmark so congenial as a tree,
Repeating its green legend every spring, and with a yearly ring
Recording the fair seasons as they flee.

... Anon.

Sitka spruce and western red cedar are the giants of our B. C. Forests, cedar being the larger of the two. That sitka can, on occasion, run cedar a pretty good second is shown by the picture we produced in the July-August issue of the Journal. This gives you some idea of the size sitka can attain. It reaches perfection on the Queen Charlotte Islands, with wood so straight, combined with strength, resilience and elasticity that during the last world war the demand for its use in airplane manufacture taxed the lumber industry to the limit. It is doubtful if its full potentials were realized previous to the war.

Piano manufacturers soon discovered its particular adaptability for sounding boards and one of our local members, our master craftsman, Peter Svindsay, was one of the first makers in this province at least, and perhaps in Canada, to use it for violin top plates. He found it accoustically of the highest order. I have used sitka spruce several times, always with good success. It is very easy to work with and takes on a good finish when varnish is applied.

I understand that the grain in the wood, used for tops by the old masters has, after a number of years, a tendency to stand out prominently. I have noticed this particularly with sitka spruce. A piece of sitka 5 or 10 years old will appear to have almost a "washboard" effect when stroked by the hand.

About 2 or 3 years ago the firm of MacMillan, Bloedel and Powell River Ltd., the largest lumber manufacturers in B. C., heard of our interest in native woods and contacted us through their Public Relations office, Mr. Roy Balme.

They felt that if it could be proved that B. C. wood was suitable for violins it might be good advertising for the Province and for Canada. They sent us several sample timbers of sitka spruce, very choice material! The violin made by Mr. Fred Fehr of Kankakee, Ill. (featured in the July-August issue of the Journal) was from one of these timbers.

With a desire to learn more about sitka, I decided to visit the MacMillan, Bloedel and Powell River Ltd. at their large manufacturing center in Powell River, a town some 80 miles up coast (north) from Vancouver. This trip proved to be not only instructive, but also one of the most pleasant short holidays I have enjoyed for many a year.

I travelled to Powell River from Vancouver as a guest of the Company, on board one of their tugboats, the "M.J. Scanlon". The boat ride was a most enjoyable experience. It was very evident that Capt. Ken Gillies and his small crew were determined that their lone passenger should have as pleasant a time as possible. On my arrival at Powell River, Mr. George Richards took over the honours, showing me around the plant and introducing me to Mr. Pool, the superintendent of the lumberyard. I explained to Mr. Pool just what I was looking for and he took me to the shed where the choicest timbers were stored and air-dried.

I soon learned that sitka spruce might be wonderful wood, but that only about 1% of it is suitable for violins. This of course would apply to all woods where special selection is desired.

Among the many timbers I was shown, one had what Mr. Pool called "Bear Scratches". These "scratches" seem to go right through the timber and are most attractive in appearance. The cause of Bear Scratches is unknown. The theory among some people is that they are the marks of bear claws caused by the animal sharpening said claws on tree trunks. This explanation is definitely open to question! Nevertheless the scratches do look remarkably like claw-marks.

Samples of "Bear scratched" sitka have been tested by the Forestry Board of the University of British Columbia who report that they can find no difference in strength and resonance between scratched and unscratched timbers. My next violin will certainly be of "Bear scratch sitka". So far, I have only one timber with these marks, for it is quite scarce.

I returned to Vancouver with two very choice timbers, one of which is marked with these Bear Scratches.

We have since ordered 5 more timbers so a stock of some 200 fiddle tops will be available for future use to all members.

My next chapter will deal with Engelmann spruce and western red cedar. After we have dealt with each species of wood, I hope to compare each as to strength, moisture content, etc.

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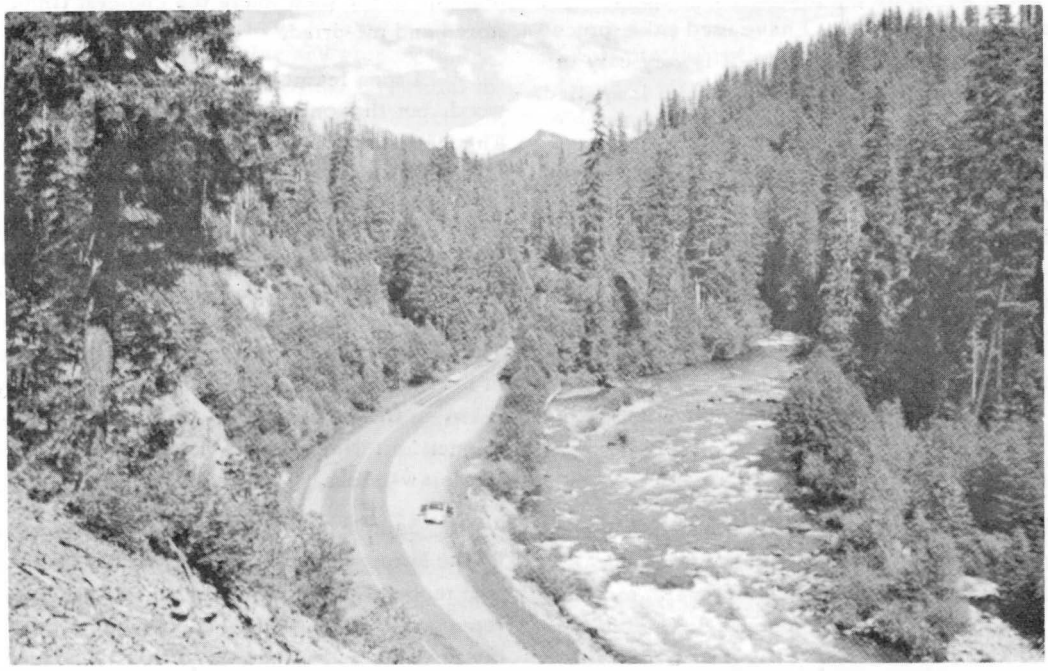
EXCERPT FROM
"CANADIAN WOODS - The Structure of Wood"

(Published by Forestry Branch, Forest Products Laboratories Division, Department of Northern Affairs and National Resources)
Contributed by F. A. MacDougall, Deputy Minister, Department of Lands and Forests, Toronto.

A figured wood of interest among Canadian timbers is the so-called "bird's-eye" maple. The bird's eye structure which occurs in hard maple (Acer saccharum Marsh.) is given to this wood by the presence of numerous radial series of conical depressions in the annual layers. Investigations carried out at the Laboratories indicate that these depressions are caused by the activity of parasitic fungi which are able to exist in the cambial tissue which generates the wood. The cambial layers, as previously noted, are located between the woody cylinder of the tree and the inner bark; from their inner surfaces they deposit the layers of wood on the tree, and from their outer surfaces, the bark. By local depletion of the cambium layer, the activity of the fungus prevents development of wood in certain areas, and though the cambium appears to recover shortly afterward, the region of greatest depletion is marked by a lack of wood or depression where the cambium was inactivated. The subsequent years' growths of wood become deposited on the depressions and conform to them, making long series of conical depressions, which, on the tangential surface of wood, show an approximately circular outline and cause pleasing variations in the grain. These markings may be variable in size (averaging about a tenth of an inch in diameter) and may be grouped as thickly as ten or more per square inch, producing a characteristic mottled effect.

Such series of depressions are found in many hardwoods, but, except in maple, very rarely occur in sufficient numbers to produce an ornamental effect. Radial series of depressions are also common in Sitka spruce, and are probably found occasionally in all softwoods. In the softwoods, the depressions are not usually conical, but may extend several inches along the grain.

Note: Perhaps the above explains the 'Bear scratches". D. W.



Typical B. C. Highway and Forest Scene

# The Technique of Violin Making

By Harry Wake

The Ribs and Linings

The mould or form is completed and the blocks glued in place; this brings us to the making and fitting of the ribs: The first requirement of course is the material; you can specify a wide or narrow flame in the wood, and you can buy them in straight strips or bent to the approximate form; it is also possible to buy the complete matched set of work for the back, neck, and ribs; all taken from the same block; this of course is the ideal situation.

Having selected your strips of maple we will assume that they are straight strips as received from the dealers, that is about 1 3/8" wide and about 1/16" thick; usually 18 to 20" long: They are of course much too thick to use as they are, besides they are quite rough so we will reduce the thickness and put a fine smooth finish on them at the same time: The old method was to fasten the strips to the bench and sand them down by hand with sandpaper wrapped around a wood block, but nowadays we let the electric motor do the hard work for us, either in a drill press or with a motor mounted on the bench; both of these methods will be described here so you may take your choice.

It is a good idea to sand down a couple of extra strips while you are at it, because the bending operation is tricky and it is not unusual for a couple of pieces to break, especially in the "Cs", but don't let it both you too much if they do, because it takes a little practice and even the most skilful workman cannot always predict what a piece of very thin wood is going to do under heat and pressure: So, having your strips selected, let's see what we can do with an electric motor.

You will need either 1/3" or 1/4" H. P. for this job, the 1/3 H.P. is better because there is considerable resistance when the work is being fed through and you need the power: A washing machine motor, or one from an old refrigerator is ideal and as for the direction of rotation, it is not too important; here is a good way to set it up on your bench for sanding ribs so that you can control their thickness very precisely.

Most of these motors have a shaft of 1/2" diameter, so you can purchase from Sears or any similar source a "slip on" adaptor which is made for a 2 1/4" x 3" cylindrical sander; these sanders are collapsible for slipping on replacement sanding cylinders; buy a few of these cylinders of various grits from rough to the finest, and together with the adaptor for the motor shaft you are all set.

Select a spot on your workbench where you can bolt the motor down securely and also have sufficient room on both sides for feeding through the strips of maple: Set the motor so that the shaft with sanding drum mounted on it is facing you, you can then feed from left or right depending on direction of rotation of the motor: With the motor fastened down securely (this is most important) you will have a space of two to three inches between the bench top and the under surface of the sanding drum; build up this space with pieces of wood, starting with a smooth level piece 2 x 4 by about eight or ten inches long, they don't have to be fastened down, then add thinner, flat pieces until you have only 1/16" clearance under the sanding drum; try one of your strips of maple through this space WITHOUT the motor running and continue to build up with flat pieces of veneer, cardboard or paper, until your material goes through and just touches the sander; check to see that the sander runs true and start the motor.

Check the rotation of the motor to decide from which side the work must be fed through: The material must be fed, AGAINST the rotation, in other words you don't want the machine to pull the strip through, you must pull them through and feel the resistance of the cutting action of the sander: Don't try to take it all off in one cut, it's better to take several light cuts from both sides of the strip, then check your work and add a piece of paper to the buildup (fine sandpaper is good), make several passes on all your strips (both sides) and you should have your material reduced to about .050 inch; you can now change to a very fine grit on the sander for finish cuts; continue as above, adding thin paper to the buildup until your strips are reduced to .040 to .045 inch and they are ready for cutting to length for bending.

The drill press method of sanding is essentially the same as above but you can't have quite as good control of the thicknessing: Mount the sanding drum adaptor in the chuck of the drill press (the adaptor will be slightly different

of course( and clamp a heavy block or steel angle plate to the drill press table so that there will be a space of about 1/16" between the sander and the block; feed the work through this space and make the necessary adjustments between cuts for reducing the wood thickness.

The maple strips being nicely finished to the requisite thickness, we must cut them to length; select your matching pieces for the upper ribs, the lower ribs, and the "Cs", if you have sufficient material for an extra pair of "Cs" it is a good idea to have them ready just in case: With a flexible tape measure, check the length of the upper ribs by measuring from the top centerline, around the side to the upper corner; allow about a half inch more than this and cut off the two pieces: Measure for the "Cs" and the lower ribs and cut these off, leaving a little as before: You should now have two upper rib pieces, two lower, and we will say four pieces for the "Cs"; let's hope you won't need the two extra pieces; if you don't, you can use them on your next fiddle; we will now get ready for bending the ribs and this brings us to our special tools again.

There are quite a few different types of rib-bending irons available through the dealers in violin maker's supplies; they are all quite good as they are designed for this work only; those that are electrically heated are of course the best; there is one problem however, and that is the "Cs": every fiddle is different here and the bends are a little tight; this makes it difficult but there is a way to overcome it.

A 200 Watt electric soldering iron has a body diameter of about one inch, and the copper bit or tip of the same iron is about 5/8" diameter; you will find these just right for making the short bends in the "C" bouts; there is one thing you must watch carefully though; 200 Watts is a lot of juice and the iron gets very hot FAST, so regulate it so as not to get too hot or you will burn your wood.

Clamp the soldering iron in your bench vise and have a bowl of water handy, we will bend the "Cs" first which is customary and then the rest should be comparatively easy: Heat up your regular rib bending iron first, to a degree that when you splash it with a little water, the drops bounce and sizzle; take one of your short pieces and submerge it in the water for just five to ten seconds, then place the wet strip on the contoured face of the hot metal and very gently bend it to the approximate contour of the middle part of the "C", by this time all the moisture you had in the wood has gone off in steam, so dip in the water again and back to the hot iron but this time bend it a little more than the required amount of bend, remove from the heat and hold the piece in its bent form for just a few seconds until it cools and sets itself: now repeat this operation on a piece for the other "C" and you can shut off the heat and plug in the electric soldering iron; remember that it doesn't take this very long to heat up, so watch it closely and when hot enough to start bending operations, shut it off: We will make the upper curve of the "C" first, so dip one end only of your wood in the water and immediately apply it to the body of the hot soldering iron; don't try to rush this, give the heat time to penetrate the wood and very gently but pressure to form the bend, dip your wood in the water frequently to keep it moist and when the wood has developed the curve of the large diameter of the iron, start working at the tip of the iron; it has probably cooled off somewhat by this time so you can plug it in again for a short while but, once again don't let it get too hot; try your piece for fit in the "C" curve of the form where it belongs and when you have it bent to a nice fitting to the corner, with about 1/4" or so projecting for trimming off later, you can bend the upper curve of the opposite "C" in the same manner.

You will find all bending from now on considerably easier so we will get on with the lower curve of the "Cs"; these will be best done on the body diameter of the soldering iron, so check the iron temperature and having cut these pieces longer than necessary you must try your piece in the form and mark the approximate position of the lower curve and go to work with the iron as before: Remember to dip the end in water occasionally and with patience plus a little luck you should have the "Cs" nicely bent to shape and ready to fit to the form later.

You may find it more convenient to make the short curves of the rest of the ribs on the soldering iron, whichever iron you decide to use, make them a nice fit to the corner blocks, these you will recall were only trimmed to the line on the inside of the "Cs"; however you still have the pencil line you marked on the block to guide you in the bending; we won't cut away the excess wood outside the corner blocks until after the "Cs" are glued in place, but we will finish bending the rest of the ribs first.

Having completed the short curves of the ribs you can complete the contours of the shoulders and the lower bouts on the regular bending iron; Just dip your wood in the water and with a good hot iron you will find that they bend quite easily; bend them just a little more than the required curve and this will help you in the fitting which will be our next operation.

Returning to the mould we will prepare to glue the "Cs" in place first; it will be obvious that the blocks ONLY must have glue on them, so rub some moist soap on the adjoining wood to prevent the ribs from becoming glued to the mould; take one of your "Cs" and try it in place and with three of the "U" clamps mentioned previously together with small curved clamping blocks, clamp the "C" rib in place; when you are satisfied that all is correct do likewise with the opposite "C" then prepare your hot glue: mark with a pencil on the rib the position of the "C" in the form. This will make it easier to put it back in the same place.

(to be continued)

MISCELLANEOUS ADV. SECTION

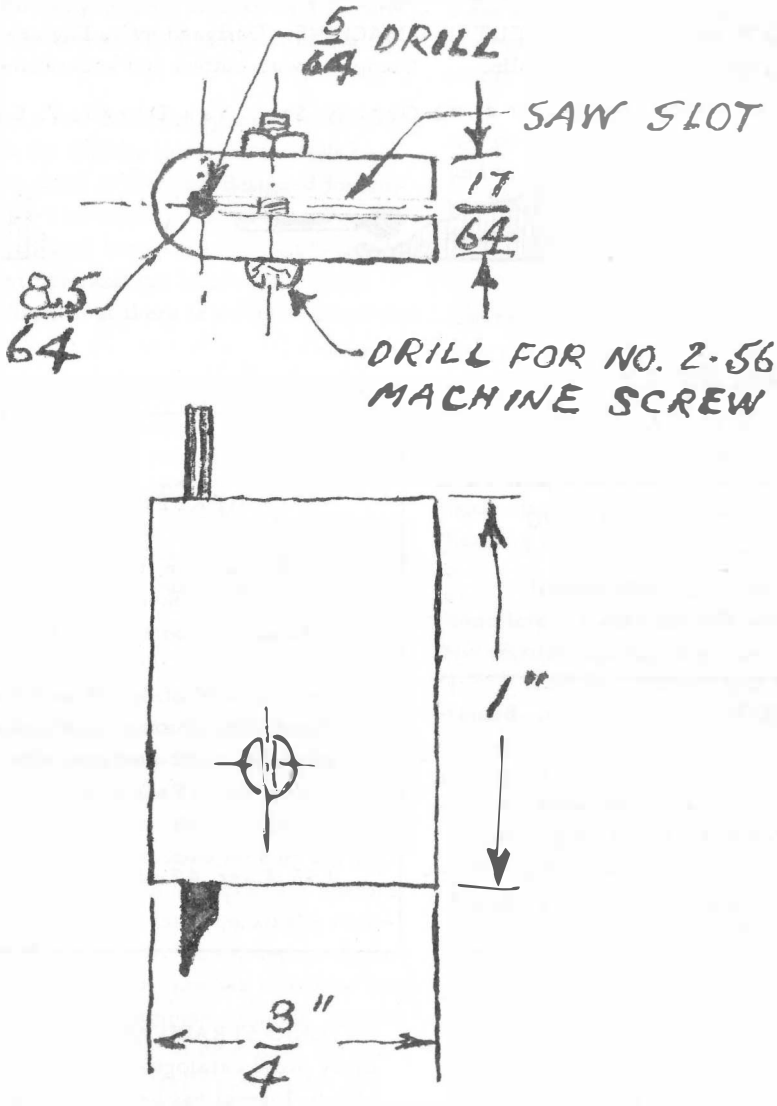
Price 50¢ per line. Send copy to the Editor. Closing date for next issue October 27, 1961

# MARGIN LAYOUT TOOL

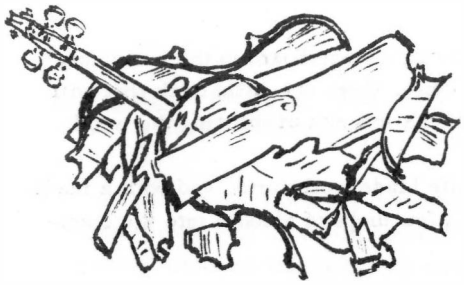
by Wm. E. Slaby

In preparing the outlines for top and bottom plates I follow the procedure which the Hill brothers attribute to Stradivari; I assemble the ribs on an inside mold and then project my plates from the ribs. This procedure provides an even margin with suitable allowance for any slight irregularity in the curve of the ribs, something that cannot be done if the plate is trimmed to exact size before glueing on to ribs. Originally I used a compass to trace the plate outline. I found this difficult to use in tight places and developed the simple little tool shown in the drawing. It does an accurate job and is virtually foolproof. The tool illustrated provides a margin of 6/64". By varying the dimensions any width margin can be provided for.

The drawing is largely self-explanatory. A piece of brass is squared to the overall dimensions. Layout and drill the hole for the pencil lead. If anything, keep the hole more than the 8.5/64" from the edge of the brass block since when rounding the edge this can be brought to the proper dimension. Drill the hole from both ends of the block to assure alignment. Drill the hole for the clamping screw--5/16" from both the left and lower edges. Carefully cut the slot with a hacksaw. Round the edge with a file. Insert a sharpened pencil lead and clamp it with a 2-56 round head machine screw. Test the tool to see if it provides the 6/64 margin. If necessary reduce the radius of the curve on the guiding edge.




MARGIN LAYOUT TOOL



# Fiddle Fix.

By H.S. Wake.

To reduce strips of maple to the right thickness for the ribs of a fiddle can be either a tiresome job or an easy one, depending on how you do it.

I like to let an electric motor work for me whenever possible; it's true, you might say, that the old masters never used power tools, but that does not necessarily mean that they wouldn't have if they had been available.

Here is how I set up a 1/4" H.P. motor for rib sanding, so that I can control the rib thicknesses to fine degree.

Assuming that you have a motor available either 1/4 or 1/3 H.P., purchase from Sears, Roebuck Co. or similar source a threaded (1/2" - 20") adaptor to slip on to the 1/2" dia. motor shaft; also get a 2 1/4 x 3" collapsible sanding rig which is made for use with this adaptor, these are made so that you can slip on to the device a paper cylinder or tube which is surfaced with sanding grit; these tubes come in various grades from very rough to the finest for finishing; they are reasonably priced so get an assortment and several of the finest, you will need them; set the motor on a convenient, level spot on the workshop bench where you can anchor it down securely. Now the direction of rotation of the motor will decide whether the sander will be to your right or to your left as you face it, however, the direction of rotation of the sanding drum must be towards you from the top, so that the dust is thrown downward and away from you.

With the motor fastened down securely (you will see later why this is essential) there will be a space of from two to three inches between the bench top and the under surface of the sanding drum; build this space up with flat pieces of wood starting with a smooth level piece 2x4" x about 12" long, until you have just about 1/16" clearance under the sander; try your strip of thin maple through this space WITHOUT the motor running and continue to build up with flat pieces of wood, cardboard or even paper until your material goes through and just touches the sander enough to rotate it freely; check to see that the sanding drum runs true and start the motor.

Feed the strips of maple through from the BACK towards you and pull it steadily through; you will soon get the feel of it, make two or three passes with each strip of maple, alternating each piece end for end, and dressing both sides of the material.

With the motor off, add a piece of paper or thin cardboard to the buildup, then run all your strips through again and perhaps a third time until you are close to the thickness required. Change to a finishing grade on the sander and add a thickness of paper to the buildup; you may be able to take several thicknesses out and add one thicker one, but only light finishing cuts should be taken at this stage: The average sheet of paper is from one to two thousandths of an inch thick so you will readily see that this device will give you excellent control of rib thickness THE EASY WAY.

NOTE: Be sure the sander runs true: Feed the material through from the back and once started, keep it moving.

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On the final rubdown with a newly varnished fiddle, I find that the use of water with the abrasive is better than oil and faster: Here's the way I do it; take an old felt hat and cut out a few pieces about two inches square; put some fine pumice powder in a small glass jar having a screw top with some small holes punctured in it. Do likewise with a similar jar for powdered rottenstone; next I fill a squirt bottle with water to which has been added a few drops of any household detergent; wet a piece of felt well with the water, sprinkle the fiddle surface with pumice, add a squirt of water from the bottle and start rubbing: wipe off with a wet rag and repeat until all bumps and roughness are removed.

With a new piece of felt continue the rubbing with rottenstone instead of pumice, but be sure to remove all traces of the pumice first; this will leave a nice satin finish, however, if a higher polish is required, use finer powders and continue the process.

Be sure to remove all traces of each grade of abrasive, and use a new piece of felt for each step in the process.

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Occasionally we run across a fiddle that has particularly attractive sound holes; it is a good idea to take a copy of these; either for future reference or for immediate transfer to our own work; perhaps with slight modification.

Here is the method that I use. It is quick, will give you an exact copy, and can be transferred to your own fiddle top in exact contra-facsimile.

Take a piece of ordinary white bond paper, size 4x5 inches and place it over the 'F' to be copied, with the longest edge of the paper exactly on the centerline of the fiddle, fasten down with cellophane tape.

Press the paper in close contact with the fiddle surface and with the side of the pencil point rub along the paper over the edge of the 'F' hole; this will give you the exact outline of the 'F'; be sure to mark the position of the nicks in the sides of the 'F'; they are important.

Remove the paper from the fiddle and place it over a piece of carbon paper, carbon side up, and very carefully trace the outline you have made, then draw a straight line from the inside nick of the 'F' hole, to the centerline edge of the paper; you now have a right and a left 'F'; one on each side of the paper.

To transfer now to your fiddle top, measure your 'stop' length from the top edge of your fiddle to the position for centerline of the 'F' at the nicks, and make a pencil mark on the wood, then at this point draw a straight line lightly across the fiddle top.

Place the paper pattern on the work so that the edge of the paper is exactly on the centerline of the fiddle and the horizontal line you marked on the paper from the nick of the 'F', exactly coincides with the horizontal line you marked on the wood; fasten the paper down with tape and slip a piece of carbon paper under it with the carbon face down.

Carefully trace the outline of the 'F' just hard enough to leave the outline on the wood; now it is only necessary to turn the paper over and place it in position on the other side with the carbon under it, trace the outline and you have the two 'Fs' marked on the wood in exact contra-facsimile.

Distance of 'F'; from centerline can easily be modified one way or the other when positioning the paper pattern before tracing to the wood.

This pattern can be kept and used many times; it also can be renewed by tracing it through to a new piece of paper.

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When removing a fingerboard in the customary manner with a dull knife, there is a little trick that will make it easier, and with less risk of splitting the wood.

Get the knife blade well started and with a medicine dropper inject a few drops of alcohol into the opening.

This does not soften the glue, but the alcohol moving in just ahead of the blade appears to make the dry glue release its hold, and the fingerboard lifts off easily in most cases. (Note: Keep the alcohol off the fiddle and keep a rag over your left hand; even a dull knife can give you a nasty dig should the fingerboard let go suddenly.)

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If you would like to brand your fiddles, and by brand I mean burn your mark into the wood, here is a way to make your own branding iron.

Everyone has, or should have an electric soldering iron, so let's get it out and make a double purpose tool out of it.

Drill a small hole in the side of the copper soldering bit and thread the hole for a small brass, round head, machine screw; I used 10 - 32 size, make it short (about 1/4" length of thread) and screw in place; file away the top of the screw head just enough to remove the slot; now into this round, flat brass head you proceed to cut your initial or monogram with small files: Sounds difficult but the brass is soft and my initial was easy anyway; A 'W'; of course some letters will be more difficult to cut than others.

Now just plug in and your branding iron is ready for use.

Multiple letters could be mounted side by side and should be placed so it's not to interfere when the iron is used for soldering.

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# VIOLIN PRIMING

by Harry Clare

Editor's note: Mr. Harry Clare manufactures varnish of superb quality. He is probably one of the best authorities on this subject in England today.

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It is now over thirty-five years ago since that eminent authority on violin construction, Mr. Frank Howard, wrote an article on my work as a violin maker, which was published in the December issue of the "Strad" (London) in the year 1925.

In the private correspondence that had previously passed between Mr. Howard and myself before the above issue, practically every aspect that mattered concerning fiddle building was discussed or touched upon between us, including of course the age old topic of the varnish, and relative thereto, the preparation of the wood by "sizing" or "priming" before the varnishing.

It is this preliminary preparation question I now wish to dwell upon; a subject I truly believe by many, to be but very superficially understood, or alternatively, and as I am well aware, totally ignored by many modern makers.

I recall to mind that Mr. Howard asked me what my own individual opinion was regarding this operation of "sizing" an instrument; the "size" then being referred to as a "filler".

I well remember too, that at that time I considered this vital subject could not in any way be so briefly dismissed, being in my own judgment, of profound importance, and one well worthy of an article entirely and strictly on its own account. And what it has pleased me to write as the title--head of what I now wish to say and comment upon; it being understood I hope, that I have nothing to retract from the statement I made in the article published in that journal, The "Strad" December 1925, but rather to add considerably more relevant matter, which will I hope help to materially clarify or totally eliminate a possible misconception that may have arisen in the minds of many, from the statement I then made that "I did not believe in any 'filler' at all".

To begin with I detest the word "filler", when meant to be used as a sizing of the wood. As it was then and still is by some makers, before the actual varnishing of any instrument of the violin family. And the chief reason I have again taken up pen to state, or as you will, re-state my views and experience of the past fifty-five years or more, and also as a timely help I trust, to those who may be possessed with a desire at some future time maybe, to make an instrument, and I hope also as a friendly guide to anyone with the same project in mind, be it violin, viola or cello, to help him avoid one of the most disastrous pitfalls many violin makers, including myself, have fallen into, following our earliest efforts at Construction.

My wish to record or recapitulate afresh my observations and convictions of what I am now writing, are the result of many years practical work at the bench, much study in the laboratory and lastly but by no means least, my long experience as a professional player of both violin and viola, chiefly in theatre orchestras, covering a like period, during which time in the latter capacity, I have invariably played upon one of my own creations; my various occupations, having therefore conjointly taught me a good lesson as to how an instrument should be finally finished, not only regarding the wood-work, but also of what is to follow; briefly stated, to size or not to size before the final operation; the application of its covering of varnish, and by this I mean oil varnish.

Speaking retrospectively, and covering a period of a full half-century past, there remains or exists in my mind now, no possible doubt, that especially and chiefly concerning the belly-wood, the pine, this preliminary priming with size is absolutely necessary, but after so many years spent in making and playing the violin and viola, my findings are such that I consider the hardwood of the back, ribs and scroll, the sycamore, does not require the priming to the same extent that one must bestow upon the other portion of the instrument, the belly or front, with the proviso, that with the sycamore, a good smooth surface has been finally attained, and that a good clear, but uncoloured oil varnish is going to be used firstly. This clear varnish of course applies to the whole instrument, when and after the part requiring sizing, the belly, is completed.

I must explain that when I speak of "clear" varnish I mean uncoloured; and now before going further and so to speak, dismiss these very essential sycamore parts, let me say that the assertion I have now made is based upon the fact that sycamore, of which they are usually if not invariably made, requires but very little preparation on account of its being so much less absorbent, due to its natural hardness and density, than that of its companion wood, the pine of the belly, so if the conditions I have enunciated in the last paragraph are faithfully complied with, and even if there should appear to be a possible slight sinking of the varnish into this hard sycamore, there need be no misgivings that either tone or final appearance of the instrument will be adversely affected.

The great dissimilarity in structural growth of the two timbers under consideration, being as widely different in density, one may say as the two poles, is undoubtedly the cause of the softer and more spongy pine being three or four times more absorbent than the sycamore, and now having said this, I come to the very core of what I have to say henceforward.

Let us pause awhile to ponder why this particular wood, pine, was chosen in the first place centuries ago, presumably in preference to all other white woods, to make this upper plate, the belly, which I consider to be the true soundboard of the instrument.

The choice, one may fairly assume, now clearly and infallibly shows the wisdom of the old master luthiers of long past generations; this wood then being found by them to be the most elastic and springy, consequently the ideal article for their purpose, doubtlessly after many and oft repeated trials and rejections of the various timbers then at their disposal.

Obviously then, it is very essential that we modern makers should do our utmost to try to maintain and preserve this inherent elasticity or springiness, so vitally important to the ultimate tone of the fiddle.

Let us suppose then, that an instrument has just been finished "in the white", and quite ready for varnishing, we nonchalantly begin our work by giving the fiddle its first coat of oil varnish, which when having dried, we proceed coat after coat in the same manner, until we shortly discover to our dismay, that the first few coats that have been applied to the belly, our soundboard, have apparently largely disappeared, proof positive that the greater part of the varnish has sunk right into the wood, as into blotting paper, through the soft spongy parts of the wood; that is, in between the grain or threads of the pine, which varnish when dried will assuredly have densified its texture, with the final result of rigidly stiffening up the whole belly most disastrously, greatly if not totally nullifying its elasticity, its most important feature and so reducing this whole section of the instrument to be almost utterly devoid of the verve and spring it possessed in the first place, so much so that it is now no longer capable of performing its true function, and rendering of its best as a soundboard.

It may not come amiss at this stage, if I recall a favourite saying of one of my old teachers, when I was quite a youth, who very often would quote to me a maxim current to him and other violin makers of his day, which was that: "Varnish, no matter how good--never made a fiddle; but it has spoiled thousands," in which saying the reader will doubtless find much food for thought.

"Prevention is better than cure" says the old adage, but unfortunately in this case, there can be no cure once the foregoing treatment has been administered, perhaps "perpetrated" would be a better word.

What then can be done, it may be asked, to protect this precious pinewood from being saturated and so "filled" by either oil varnish or any other slow-drying concoction, mistakenly and incorrectly used as a sizing.

It will therefore be helpful to have recourse to a study of the work of the old masters of Italy, and as far as we can, try to ascertain their methods of working, and what do we find? Surely it is most apparent to any keen observer of the master pieces wrought in that country, principally in Cremona, Brescia and a few other places, that these highly-skilled craftsmen were one and all, we may now be very sure, well aware of the lamentable effect that would follow, and finally be revealed to them, had their works undergone any such treatment I have now described.

During my career as a professional player, I have of course travelled about a fairish amount, and all the violinists or violists I have come in contact with and who moreover, have had like myself, privilege or opportunity to view and examine one or more of these master works at close range, have been willing and ready to endorse the opinion I have unshakably been convinced of for many years. That these Italians did use some quick-drying preparatory liquid prior to varnishing to prevent absorption. I say this because I cannot in my own mind conceive any notion whatever, that these old luthiers, after having thoroughly dried their timbers by seasoning and storage for many years, and so ridding them of all their superfluous moisture or sap, then allowed them to imbibe or swallow oil varnish to the extent of nearly soaking through the pine wood belly, and with the same inevitable result written of in the previous paragraph.

The answer we seek then is to try to discover for ourselves, as near as possible, a similar liquid preparation to that used by these highly gifted artisans used as a first priming or size; to effect like them, complete arrest of varnish absorption when this latter substance is first applied. This "priming" then must of necessity have possessed the indispensable quality of rapidly drying, to bring about the result they desired, and which they so evidently achieved.

Alcohol therefore suggests itself to me immediately, as their chief agent in compounding their size, and also as the most probable answer to our quest; being, I have found, perfectly satisfactory alike, as a solvent of the ingredient resins or gums used in its composition, and being so quickly desiccated, as a vehicle in its application.

I shall give the formula or recipe for the priming I have invariably used for years, and with very successful results, at the close of this article, to those who wish to make it for themselves, it being easily made and applied; and one they can assure themselves is safe to use.

It may be thought by many that to follow an alcoholic fluid compound (such as the one I intend to give later) with an oil varnish, properly so called, is downright unwise and unthinkable, but in my own work of violin making and finishing off, I have found that surfaces of the wood so treated with it, receive the varnish that must follow with perfect adherence, on account of the completely cohesion and unity of the priming and varnish.

(to be continued)

# The String Section

Conducted by
CARMEN WHITE

**Selecting the** Violin and Bow (continued)

Now that we have agreed to select the best instrument and bow within the reach of the young player, we must consider the actual selecting and choosing of the violin itself. The first question is how much can the family afford? The figure is usually much too low when considering a violin, but for a piano or a band instrument, a more sensible figure is usually taken. Many families do not hesitate to spend $150 to $400 for a band instrument for a beginner, but if one were to suggest to them a violin in this same price range, serious objections would instantly be raised. Consider this: the average life of a band instrument is from three to five years with good care and its depreciation is considerably higher than that of any other instrument. On the other hand, a violin is like a diamond ring--whatever value it has is generally increased with proper care and playing, and it will last several lifetimes without depreciation. Which, then, is actually the better investment? How is it, then, that many families will actually sacrifice for a band instrument at, say, $350, and then demand a violin for a beginner for $39.95? Let us tell such families in all seriousness, there is no better investment in music, pleasure, and in actual financial value than an investment in a fine violin. Certainly no musical investment can be more permanent--not even that of the fine grand piano in the living room!

Let us agree, then, on a figure or range of say, $300 to $500 for a violin and bow. About $75 of this figure must be set aside for a suitable bow and case. Several instruments within the price range should be obtained for trial. Most dealers and violin makers will readily offer good instruments for such trials, as the instrument is benefitted by playing anyway. The very first thing to consider is the physical playing condition of the instruments. Violins from reputable dealers and violin makers will probably be in top playing condition and ready for any trial. Violins offered by individuals may be priced slightly lower, but usually they will require a complete adjustment and professional attention before they can be played--and this will cost from $10.00 to $100.00, or even more, depending on needed repairs and adjustments. This should be taken into account when pricing the violins--remember that a violin at a "bargain" from an individual may actually cost more in the long run than one of equal value but priced higher from a dealer or maker--because the latter is ready for playing without additional expense in repairing and adjusting. Moreover, one can never tell with certainty whether the individual's violin needing repairs will sound as it should--disappointment can come from this situation and often does. Better pay a little more and get a violin already adjusted and ready to play, then you can compare it adequately with others and make a sensible decision.

This leads us to examination for physical defects of each instrument. Use a good violin of known value for comparison. Cracks and unglued places are, of course, obvious and can readily be noted, but an improper neck angle and improper bridge height is not so obvious except to the professional judge. In old violins, note whether the edges are too thin and weak--if you live in a hot, humid climate, this can lead to trouble, especially if there are cracks, even well repaired ones. If the neck is set too straight, the tone is likely to be blatant and sharp in nature and these characteristics are made worse if the bridge is too low--with an added weakness in carrying power. Here you need professional advice or a careful comparison with a good violin of known value. Beware of extremes in arching--too high or too flat. It is true that many fine instruments exhibit extreme archings, but far more poor ones do so, and a good general rule is to avoid any extremes in archings, edges, model, varnish, and general physical appearance. Remember, the young player must live with this instrument in a most intimate way for some hours each day, and if its appearance to the eye does not inspire him, he may lose interest. Thus, the varnish itself becomes important in making your selection.

The usual violin colors are red, red-brown, orange-red, orange, old brown, and last but most common, yellow. Those who wish to develop appreciation of the finest old Italian violins will probably choose red-brown, old brown, or orange-red as colors, all other considerations being equal. But if a yellow violin sounds better, by all means, take it! For it is the sound that counts! Let us now proceed to make some tests for that sound.

You will need the services of a good player with a fine bow technic, preferably not your teacher. You will need also a violin of known value for your comparisons, and an hour or so of time in an auditorium on two different occasions, say a day or two apart. If you do not trust your own ears (and why not--anyone can tell the difference between good and poor tone if he hears both in a hall, one after the other), get some musician whose word you accept, and who is NOT FINANCIALLY INTERESTED in the transaction. Pay him, if you have to, as it will be money well spent! Most people here turn to their teachers. This is a mistake for several reasons. First: many teachers are not good judges of tone at all. Some teachers themselves have played all their lives on poor and inadequate instruments and have thus ruined their ideas of good tone. Others may be expert judges, but may have a financial interest in the transaction, and may thus recommend certain violins because they will make a small commission on the sale. There is nothing wrong with this idea--certainly the teacher knows more than the pupil about violins and usually, the teacher's word is taken without question--and it is only fair that the teacher should be paid in some way for his time and trouble in helping make the selection. Nevertheless, it would seem better to obtain the service of someone who is not financially interested in the transaction, even if a fee must be paid for the service, as this removes all doubt from the purchaser's mind.

Having settled these matters to your satisfaction, the next thing to do is to take the violins to the nearest auditorium, have the player play each of them and go back and listen with your two good ears! And here, I wish to give a bit of good advice! Do not be afraid to trust <u>your</u> opinion! Listen to the violin of known value--then, to one of those under consideration--then again to the violin of known value and to another under consideration--make notes as you listen. In such tests, I have found that untrained ears can readily detect the better, the finer, and the more appealing sound--and can just as readily spot the weak G string, or the poor squeaking E string! So, trust your own ear and express your preference! Be sure the player plays something which shows off the entire scale--also double stops and chords. Have something which demands tonal reserves and something which demands delicacy in bowing--such as springing and spicatto bowings, where the player must depend entirely on the violin for his effects. Have a soft, rapid scale played and listen to see which violin gives you the clearest, cleanest sound and articulation! Do you hear a "muddyingup" of the soft scale? Is the utterance clean and clear? Can the soft response be heard in the back of the hall--even down to a whisper? If so, give careful consideration to this violin! Provided it rises sufficiently in powerful passages, you can depend upon it, even though it may have yellow varnish!

The most common faults will be found on the lower string, the G, and high on the E string. Many violins which have fairly good middle strings will sound bad on the G string and perhaps weak on the E string. If the violin is an old one or weak in wood, the B-natural, A-flat, and B-flat may "wolf" or "howl" when played high on the G string--a good player would test these notes carefully. Sometimes, these wolf notes can be corrected, but more often, they cannot. On the other hand, if only one note wolfs, the violin may have other beautiful characteristics to more than balance the bad tone--Kreisler himself is said to have had such a note on his favorite violin, a fine Guarnerius del Jesu, but he learned how to "pet" certain tones on that violin so the audience never realized the weakness of the violin. So, do not let the presence of one wolf note make you throw aside a fine violin, even though generally we wish to avoid these wolf notes.

Should two violins seem to be about equal in value and desirability, leave the final choice to the player himself--even if he is a beginner and knows little, he will have some preference, and he is the one who will have to "live with" the instrument intimately! Selecting a violin is like selecting a pair of shoes--one must go by feel, by personal preference, and by that indescribable something which says to the player himself, "This is IT". This stage of selection should not come, however, until the listeners have weeded out the undesirable instruments and until known professional advice has included two or three violins for the final selection. But, having reached this stage, it seems sensible to let the player himself make the final decision as to which instrument shall be chosen from, say two or three, all of suitable quality.

The most common fault in judging violins in the auditorium and elsewhere is to judge on the <u>volume</u> of tone produced from the violin. Even fine musicians are guilty of this mistake. Of course, we do not want a weak or poor instrument, but mere volume alone is not the proper approach for judging. We must listen to the sweetness, the appeal, the purity, and delicacy of tone--to the response to soft playing, and to what can be DONE with the tone! Does it rise readily from the softest to the most powerful strokes of the bow--and can they all be heard in the back of the hall? Do these all sound beautiful and appealing? Are the open tones or strings clear, clean, and free from objectionably characteristics, such as "gourd" sounds? Once I was listening to a violin which impressed me greatly--so long as it was played mezzoforte (medium loud) it was remarkably good! But when I asked the player to "dig into the violin" with some of the Chaconne of Bach, the result was disappointing. Again, I asked the player to play something delicate, with soft, rapid passages--and again, the violin was simply not

capable of responding to such demands. But so long as it was played mezzo-forte, it was a fine violin! Despite its beautiful mezzo-forte, a student would be disappointed with the violin--it would not inspire him to practise for hours, but would rather make him want to throw it aside and go play baseball!

Here, I am reminded of the story of how Jan Kubelik, the famous violinist, once left his Emperor Stradivarius violin in a well-known shop for repairs. The experts who adjusted it had it played and all of them agreed that it was weak in tone. That night, they went into the auditorium and heard Kubelik play it, and they all marvelled that the violin was not weak at all, but that it met every demand put on it in a large auditorium with a great audience present! So, you see, experts can be fooled--and there is only one way to find out what is good and what is not--that is, take the violin along with a violin of known value to an auditorium and play both, and listen with your good ears!

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"Dear Don:

Congratulations on the continuous improvement of the Journal! The type is much more readable, the articles full of varied interest, and the illustrations are particularly welcome.

I was delighted to see the photographs and description of a violin (F.R. Davidson's--and obviously a beauty!) Do you realize that you may have started something big here? Your rival magazine is world renowned, and eagerly sought, for its account of an old instrument, described in each issue. What about making the presentation of a contemporary instrument a regular feature of the Journal from now on? I can't imagine anything better calculated to stimulate craftsmanship and give joy to their eye, too. I'm sure there are lots of your worthy readers who would gladly supply you with photos and descriptive material; and this latter will be at its best when presented by the maker. Each will have his own ideas about what is important--and why shouldn't they? (Imagine what a thrill we'd have if we could have had such comments from the great Italian, French and English makers of the past!)

Incidentally, I think the pattern of photos which you have hit upon for the Davidson violin is superior to the traditional one--back, front, side views. The fourfold layout, finishing with a close-up of the bridge and f-hole area, is more satisfying; and also fits your size of page.

If you're going to follow this up, don't forget the violas and modern cellos! And what about some of those prize-winners of the Pacific International Exhibition as a start?

With best wishes,

"Leonard Marsh"
3408 West 18th Avenue
Vancouver, B. C.

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A Good Bow Grip

Most players like to feel that they have a firm grip on the bow, but most windings provide very little for the fingers and thumb to grasp. This can be overcome very easily.

Take a piece of hot water bottle tubing, or slightly larger tubing (if you can get it). Cut a piece about six inches long.

Detach the frog by taking out the tightening screw. Pull your piece of tubing up onto the stick so that it just clears the tightening screw. Cut a slit in the tube so that the frog can be replaced. Put your tightening screw back in place and you have a "grip" that will make bowing a lot easier.

Don.

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In A Violin belonging to Palestina (In Latin)

"I whom the axe from sylvan life
did trenchantly divorce,

Was dumb while living - but, now dead,
am full of Sweet discourse."

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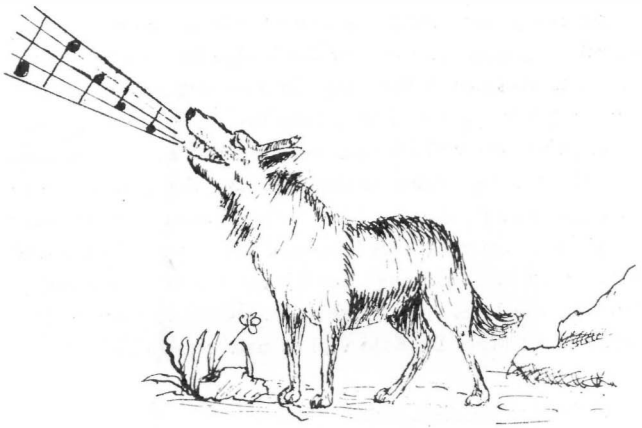
# Wolf Notes

by The Editor



## A Hectic Time

The last 2 months have been somewhat hectic. First there was an unavoidable delay in putting out the September issue, for which we apologize. The delay forced us to immediately concentrate on the Oct. -Nov. issue, with no breathing space in which to catch up with "Unanswered mail!" For once, we might have to "pass up" some letters and only attend to those of a business nature. We hope those writers of "friendly" letters will understand and excuse us. To them we say "Thanks for your letter and write again soon."

## The New Organization

Something which I have dreamed about for a long time now becomes an actual reality! All subscribers to the Journal, as from this issue, automatically become "Associate Members". I have many times suggested that: "This is your Journal". - "You readers supply all the articles." Then why not be part of our "Central" organization? We hope you will be pleased for you are now connected with an Assodation whose sole and only object is to encourage the making of better violins throughout the whole world.

Now a word about fees. It would be very desirable to have all Membership fees due and payable on Jan. 1st of each year. The member would then simply pay his fee for the coming year. At present renewals fall due each separate month. To change over at this time would involve considerable work, supplying a statement to each reader showing how much he might owe for the balance of this next year, 1962. It might also be rather disturbing to our members. We will therefore leave things as they are at present.

Your Certificate of Membership when you receive it will read "that you are a member in good standing for the year ending ------- 1962." In place of the dashes we will fill in the month your present subscription expires. This will also be very handy for our members who will only have to refer to their Certificate to tell when their fees are due.

## Illustrations of Violins

Elsewhere in this issue you will find a letter by Dr. Leonard Marsh. His suggestion that we publish in each issue photographs and a complete description of some established makers instrument is one I hope to follow. Also he is correct when he asks for a side view. What can we tell from the "flat" top and back view. Many a maker has discovered a great deal by noticing some peculiarity in the arching of an old master. To my mind most of the photographs of "Old Masters" are useless for seldom do they show the side view. I can get just about as much information (and pleasure) by looking at the flat picture of my own instrument--dare I turn it on its side?? Don't forget then when submitting photos I am mostly concerned with a side view.

## Leonardo's Hygrometer

Roaming through our huge Provincial Exhibition last August I came across a remarkable collection of models of Leonarda di Vinci's inventions. This display was put on by the IBM people of Cash Register and typewriter fame. This genius Leonardo had, even in those far off days, already invented machine guns, tanks, the first clock to register seconds, the water pump, an auto jack (well it was just like our modern ones), a hygrometer and many other things.

When I saw the hygrometer I could see it was exactly as illustrated in "Smiley's" "Science for the Maker" last issue. I thought of "Smiley's" words:" Strad and others had the knowledge, and also the opportunity to use these things."

## What Type of Wood Did Strad Use

I have read several times of the pronounced growth-rings in old violin tops, especially Strads. My friend Frank Koscak of Milwaukee, himself a fine maker, has something to say along these lines: quote from a letter:

"I had 2 Pique violins for repair, had the tops off on both, the graduations were the same on both. The

wood in tops was about the same hardness and consistency as Sitka spruce. The feet of the bridge had made prominent depressions in the tops. In comparison with other higher grade violins, I would say the tops used were too soft. The better old Italian violins I had seen apart had no bridge indentations on the tops, and the growth rings or lines were hard, wire like, even where the grain was very fine. Guarneri Del Jesu used softer wood in the tops than Stradivari, although the Guarneri tops were quite fibrous, the lines very strong, just about the same as the wood in a Gasper De Salo viola I had worked on."

Testimonial for This Issue

I think it might be nice to publish at least one new "testimonial" in each issue. I select this one, from many, for the writer goes on to suggest very worthwhile ideas. The writer is Gordon Rook of 33 Greenview Court, San Francisco, California. Quote:

"Dear Don:

Please renew my subscription to "The Violin Makers Journal". Congratulations on the new format--it's terrific! I have always enjoyed the magazine, but its new format makes it possible to publish articles that would not have been possible before and it is much easier to find specific articles that one might want to review.

Your association has a wonderful opportunity to further the art of violin making more than any other time in its history. You are making information available that has not been available before to the average violin maker and are disseminating ideas of scientists and violin makers alike for evaluation of the progressive violin maker.

The results of these different methods such as various methods of graduations--Cassel, the double heart method, Microtone, etc., methods of impregnating or treating wood,--fillers, sealers, sun treatment, etc., and the evaluation of varnishes, if these could be done by the members as an organization project and evaluated by the members of the club, as was done in the case of Norman Miller's violin. This would mean, of course, that there would have to be standardization of as many of the other variables of course, such as model, archings, the wood used, etc. It would seem that progress could be made by leaps in this kind of a venture."

Letter from Robert Hill, 18 Mardale Crescent, Edinburgh 10.

"Dear Don:

Thanks for your letter of Feb. 2nd. Also thanks for the invitation to write an article on wood treatment. This, if it transpires, would be simply an article reporting results after I have had time to prove it, as the treatment consists simply of saturating the wood with alcohol after the plates are roughly finished, and when dry, graduated to the required thickness. I haven't the slightest doubt that Makers over there can make as good violins and probably better than are made in this country. I think perhaps I didn't explain myself properly in this connection. My ideas on this point are rather difficult to explain but I shall attempt here to be more precise.

It seems to me that when Connoisseur or Violin maker talk of tone, they are biased in favour of Quality rather than quantity. I have a German factory fiddle with a very big tone, but with quality hard as nails. I always use this instrument when big sound is required. I know well that if I thinned the plates out, I would get much better quality but small tone. Also, I have a lovely Galbusero Italian Violin in which I nearly trebled the power by a process which I will describe later. I will have to change this Violin back to normal if I can because it has lost much of its quality. So you see, I think that if you make your plates thicker in the center and much thinner at the edges, you will get the power wanted, but poor quality which is not wanted. I think that what most players dislike about such a violin apart from its hard tone is its lack of response, because to perform some of the big solos, response is an absolute necessity and without this for such work at least, power goes for nothing. I think you will agree that good quality tone enhances the power. Thus we require response with power enhanced by quality.

The adjustment I made on my Galbusero is as follows...I took off the belly, and removed the bass bar. I replaced this by a bar three sixteenths thick. The bar tapers to one eighth inch at its ends and it is curved exactly as, but of course, opposite to the belly curve, it's highest part being directly under the foot of the bridge. My theory here may be all wrong, but here it is for what it is worth ... If we measure the shallow bass bar from tip to tip, and compare its length between the same points along the belly curve, then we find that the distance along the belly is greater than that along the bass bar. Thus, if sound waves describe an endless chain travelling along the belly via the bass bar, then there is a traffic jam along the bass bar and the sound waves are impeded on their way around the circuit. Whereas, when both paths are of equal length, tone power is increased. You will probably say this is daft, but it is certain that the adjustment greatly improves power. The soundpost in this case should be only three-sixteenths inch thick.

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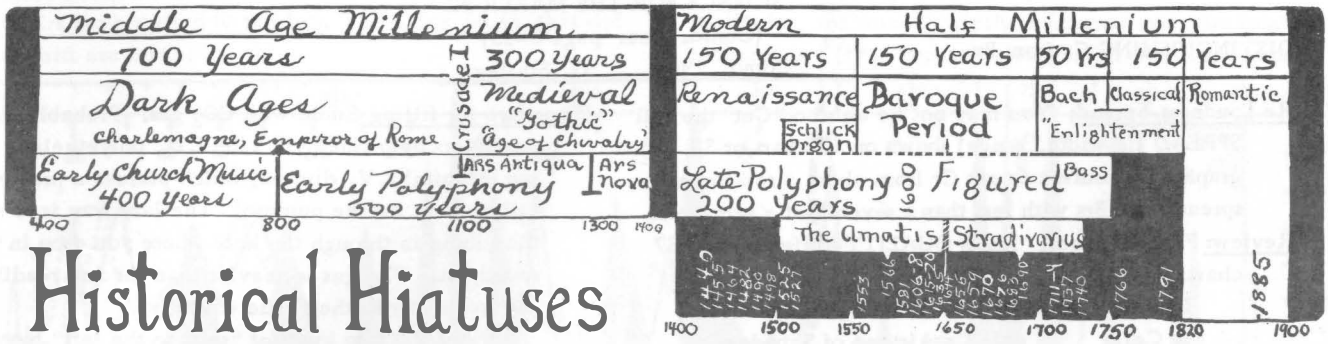



# Historical Hiatuses

Pestilence, politics, and power-conflicts have created historical hiatuses. Fiction has been sold as fact by authors lacking scholarship or valid source-material, or integrity.

War-enchanted politico-economists called "historians" proudly cultivated literary blindspots in the more important areas--science, mathematics and music. Although revolutions have ravaged libraries, rich documentary material still exists in manuscript, moulding in archives--useful knowledge unretrieved.

Other than the Catholic Religious, few possess sufficient geographic and linguistic tools to penetrate our great Renaissance and Baroque legacy--the most serious deficiency being usable Latin. From Burkhardt (page 146): "Latin was at that time the 'Lingua franca' of instructed people, not only in the international sense, as a means of intercourse between Englishmen, Frenchmen, .... and ...Italians, but also in an inter-provincial sense... Even the Florentines of the 15th century wrote Latin--in order to be more widely read."

Instead of retranslating antique Caesar and Cicero, how much more profitable would have been classroom study of the countless more interesting and scholarly papers written in Continental Latin. Following ignorant pressures ("What need have we of Caesar and the 'dead language'?") Latin is silently sloughed from our schools. One might not mourn if all the needed translations had been accomplished --but they were not! (Pre 1553 = Latin manuscripts. Post 1553 = Latin manuscripts plus books printed in Latin. Volunteers?).

Note: In the 17th century textbooks were standardized and numerous. (See Smith I, p. 413. Opus cit. on p. S20.)

* & ≠ Available texts are indicated by asterisks. OP = out of print.

1440 Earliest European Printing. Wood type

1455 Gutenberg (Ger) Cast type

1464 The first cast type to enter Italy.

1482 Pareja (Sp) EQUAL TEMPERAMENT

1490 Aldine Press. Venice, Italy

1498 Petrucchi (It. First metal music-type. Mantua, Italy.

1511 Schlick, A. (Ger). "Spiegel der Orgelmacher un Organisten."

1515≈ Leonardo da Vinci. (It) Hygrometer. Projector (S18r)

1527 Rome pillaged and burned by Charles V.

1553 Ortiz (Sp). Treatise on Division Viol. PRINTED in Rome.

1562 Zarlino, G. (It). "Le Institutioni harmoniche", Venice.

1566≈ Amati, Andreas. Made 24 Kings Violins for French Court of Catherine dei Medici. (S5r, 8, 20)

1577 Salinas (Sp). "De Musica libri septem" (Naples?) Meantone T.

1581 Galileo, Vincenzio (It). "Dialogo della musica antica e moderno". Florence, Italy (S5, 20r)

1606 Galileo Galilei, Military Compass & Text. Personally tutored Italian Medici. Physics. Acoustics. (S5r)

1608 Monteverdi (It). Opera Orpheo. Violins first (?) appear in a music score. (S8)

1615-1620 Praetorius (Ger). SYNTAGMA MAGMA--Printed in German and Latin. See June cover of VMJ. The Skiagraphia contains first accurate technical drawings of musical instruments of and up to the period, including violin. (S8t, 11r)

1635 ≠ Mersenne (Fr.) Harmonie Universelle. Printed in French. Revised and corrected by Mersenne in Latin (1648)! There is a translation of 7 of the 17 books of the 1635 French text--596 pages, not indexed. Re 24 Kings Violins. (S2r)

1640 DETERMINED SPEED OF SOUND. Figured EQUAL TEMPERED SCALE. Wrote other books, including geometry. (S5, 8, 11, 19)

1656 Viviani, Vincenzio (It). REDETERMINED SPEED OF SOUND. Last pupil of Galileo, contemporary of Stradivarius, mathematician to Italian Medici at Florence, Italy. Physics. (S20r)

1659* Simpson, Christopher (Eng). "The Division Viol". First printed in Latin. Second ed. 1677 in Latin with English translation: 67 pages. 750 copies were reprinted in facsimile in 1955. ($11.50 (1688 OP "Compendium of Music")

1670 Mouton, Gabriel (Fr). Proposed a mensural system like metric system, base 10. Pickard (Fr) suggested seconds pendulum (S5, 8, 11r) as unit of length--approved by Huygens. 1789 recommended by Pres. Thomas Jefferson for the USA.

1676 Mace, Sir Thomas (Eng). "Musik's Monument"

1683 Playford, John (Eng). "A Brief Intro. to the Art of Discant"

1688 Schnitger (Ger). Built organ of St. Jacobi-Kirche in Hamburg and TUNED it intentionally in EQUAL TEMPERAMENT.

1690 Stradivarius made violins for court of Italian Medici of Florence, Italy.

1711 Shore, John (Eng) invented the tuning fork.

1756* Mozart, Leopold. "Violinschule" (Tr. Knocker--1951. $5.75)

1766* Burney, Chas. (Eng). "A General History of Music". Again (1960) made available by Dover in 2 vol, $12.50, 1914 pp.

1791 Metric System adopted in France.

1885* Helmholtz (Ger). "Sensations of Tone" Opus cit. on p S5. Four German editions (1862-1867). The Ellis-translation complete with his hard-to-get Pitch Study was again made available by Dover in 1954. Ellis, by means of footnotes and appendix, brought the 576 page indexed work up to the date of 1885=Tr of last Ger ed 1877. (S5, 6, 7, 8, 11, 19)

1885 Tyndall, John (Ir). "Sound" Third edition was reprinted and revised in 1898. One in German (1885) was personally proofread by Herman Helmholtz! Other editions were 1867. R1875, 1883, 1893. R1898=3d ed. Rev. & enl.--authorized.

SCIENCE FOR THE MAKER #2

(Contd. from page S-10)

DISTINGUISHING Cr from Br



Re Loudness-Spread: You may not be able to "Get" the full SPREAD (ie width, range) shown on S7 chart or S9 graph. Be content to get Cr from about a semitone spread, and Brs with less than a seventh of a semitone.

Review: First 10 pages. Know QUALITY-difference on S7 chart.

In Violin or Viola Cr=Airtone of Saunders

In Cello dbl- Cr=Airtone of Saunders.

Assignment:

Practice graphing--GUESSING peak-heights if by ear or MEASURING peak-heights if by meter.

Peak-detection by ear or mike + meter.

Peak-location in cps use RM/chord. Do not guess.

Peak-identification (Cr or Br????) follows:

Peaks--Several Cases--Draw Them!

a. The S9 graph and S7 chart show Intensity greatest for Cr and less for Brs. THIS IS NOT ALWAYS THE CASE. (Nevertheless Cr has a wider SPREAD of influence and the total effect is greater than for any Br and so MAY seem louder to the ear. Intensity height on metered instrument shows lower, but fat underpeak area of Cr usually greater than in spikelike Br.)

b. In the S9 graphs redraw the Br peaks to the same heights as the Cr peak. If you were to test a fiddle with peak heights like that, the ear can still distinguish Cr by SPREAD & QUALITY.

c. Most instruments test with MANY (but not all) Br-peaks higher than the Cr-peak; ear should still be able to tell them apart by SPREAD & QUALITY.

d. The S9 graph shows a Br superimposed on Cr in the Huggins Strad, and this not uncommon occurrence is a trifle more difficult case, but many technics are available, among which:

4 IDENTIFICATION TECHNICS

(* # References ..... on page S25)

COTTON PLUG technic for Airtone. (* #8)

FEATHER WHISP technic for Airtone. (* #8, #15)
Saunders used a 40x microscope, but a 150x Jap-fabbed you-assemble microscope with a nice clear field costs 99¢. You will have other uses for this later so do not finger lenses. (Radio Shack, 730 Commonwealth Ave., Boston 17, Mass, USA. Cat. #109--Aug. 1961. P97LX312--ships 21bs--about 12¢ post.)

MUTE technic for Brs-shift: An ≈ 2-gram mute or weight clamped on fiddle-bridge produces ≈ semitone shift to left in Brs. Cr will not shift, remaining at sans-mute location. (* #1, #15)

GAS technic for Crs-shift: Filling fiddle with Carbon-di-Oxide gas makes Crs shift to the left. Brs will not shift, remaining where they were in air-filled fiddle. (Possible $CO_2$ sources are: Vinegar+bakingsoda+moisture-trap. Dry ice. Fizz bottle+cartridge. Commercial $CO_2$ tank. (* #8, #15)

Procedure for filling fiddle with $CO_2$ gas. Probably most neatly accomplished via 1/8" I.D. polyethelene tubing (hospital I.V. discard) which pierces a pre-drilled tailpin kept for the purpose. The lazy way is to run the tubing in through the hole where you drop in the soundpost. The gas is heavier than air and readily displaces the air in the fiddle cavity.

Now that two kinds of "shift to the left" have been mentioned, you and I will perform an imaginary experiment so that you will understand the GAS type. (You are to work out the MUTE type with graphs and reports.)

Shift Cr to the Left, or the
"Scotch-sans-Soda Experiment"

I am working with a Pure-Tone-Generator which puts out FUNDAMENTAL only. For purposes of explanation I will say that my generator (a labor-saving-luxury) is just a pure-tone-instrument which performs a portamento when I turn the dial. Another nice little convenience is that cps are read off the pointer on my generator.

You are working with a Harmonic-Generator (portamento-bowed-fiddle) which is being played by a bribed confederate. He slides his finger slowly up g-string, bowing forte-----sans vibrato, and his fiddle (your harmonic-generator) will is putting out or sounding the FUNDAMENTAL + A LONG SERIES OF OVERTONES. When your confederate reaches a loud resonance, you are to find the exact cps by means of your ear and RM/chord.

We are working with essentially the same methods and so we will get similar results.

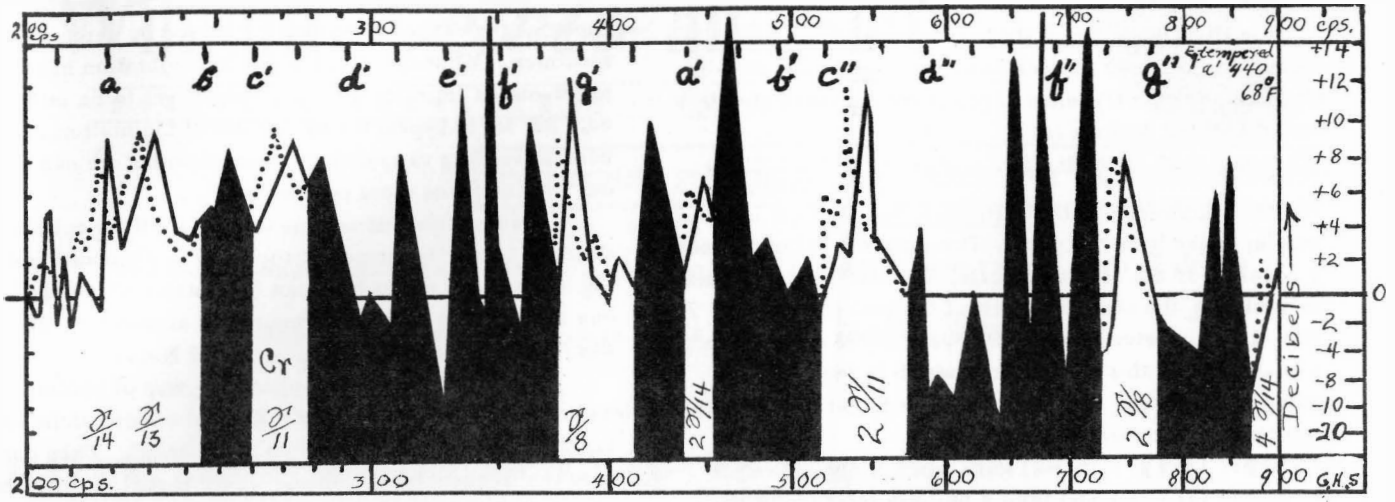
Now review c in the preceding column and memorize the part up to the dash. We are going to study the S25 graph which was taken from part of a peak-packed graph of an actual steel model (it could just as well be the graph of your violin!) mentioned in the last issue (S19r).

AIR-RUN. If you will pretend you are S9 metering that bowed fiddle you will draw those peaks like the unbroken peak outline on S25 graph. After he is done sliding up the g-string you are going to check the long tubing hanging from the pierced tailpin in your partner's fiddle, and you will find everything in order.

GAS-RUN. Now you will connect the tubing to your $CO_2$ supply which you do not have (unless you can find a spare cartridge in your emergency-kit for bribing confederates). Naturally you will decide to sacrifice the cartridge in the interest of science--and you let the gas into the fiddle-cavity via the tubing. Although realizing he will have to take his Scotch with plain water, your confederate goes back to bowing the g-string and you return to the meter and make the second graph: this time the white peaks (Crs due to air in cavity) of the air-run are transformed into the dotted peaks (Cr due to $CO_2$ in cavity). Since

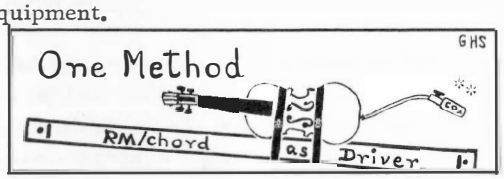
dotted peaks lie to the left of the white peaks we say that the Crs have shifted to the left. The black peaks that did not shift are Brs! ! !

ful an output as my electromagnetic-driver. This makes it simpler, for we are chiefly concerned with the loudest resonances. (**. Propate-torch gas OK but dangerous.)




AIR-RUN. After the $CO_2$ gas has had time to diffuse out of the fiddle, repeat the air-run and you will find that you are retracing the unbroken black peak outline which you made on the original test-run.

You have performed an air-run, a $CO_2$ run, and a REPEAT air-run. You have now located (in cps) and identified all the peaks (Cr or Br) shown on the graph. Review this imaginary experiment (tracing paper will help) as many times as you need--that is, until the words and the ideas no longer "snow you". Your time has been well spent for you could set up the experiment and make it work with your equipment.




It took 4 hands and considerable scrambling for you to do the preceding experiment--but envy not the labor-saving equipment. Although I can do my runs with one hand, you may dismiss your confederate and get by nicely with 2 hands.

You will use RM as a DRIVER by placing it in contact with the violin (S6r, S9L).

Set unstrung fiddle & monochord parallel to each other and on cellulose sponges. Tilt RM-stick against fiddle-belly bout edges. RM-stick is now in contact with fiddle (which does not have to be strung-up!). When you pluck the monochord-string the violin will amplify the sound. (If stick breaks contact with fiddle, no sound will come from fiddle. To avoid this, try 2 elastic-bands with hook-and-eye fasteners.) Now pluck RM on right side of movable-bridge as you slowly move the bridge to the right. When you locate (read cps markings off RM/chord) the loud resonances put out by the amplifying test-fiddle, write them down and later graph them. If you are working with a mike and meter setup you will draw your graphs similar to mine. You will not detect as many resonances as I do since RM/driver does not have as power-

HOMEWORK: Now you are prepared to tackle the peak-packed-papers of Dr. Saunders et al.+ You will not find them difficult reading if you have worked the series. You will enjoy searching for clues and studying the genuine graphs of many of the famous instruments listed in the S6 table. (* #2, #5 below)

Bibliography of Peak-packed-papers:

* These papers can be obtained by buying photocopies through your library-service. Price per page varies from 5¢ to 20¢.


| | | | | | |
|---|---|---|---|---|---|
| 1. | + | JASA | pp 81-98 | =18 pp Oct. 1937 | (S) |
| 2. | + | JFI | | =20 pp Jan. 1940 | (S) |
| 3. | | CIM | | = 6 pp Apr. 1940 | (S) |
| 4. | | JASA | pp 399-402 | = 4 pp Jan. 1941 | (W, C, S) |
| 5. | + | JASA | pp 169-186 | =18 pp Jan. 1946 | (S) |
| 6. | | JASA | pp 886-891 | = 6 pp Sept. 1947 | (K) |
| 7. | | V & V | pp 39ff | = 6 pp Jan. 1953 | (S & Hu) |
| 8. | + | JASA | pp 491-498 | = 8 pp May 1953 | (S) |
| 9. | | | | | |
| 10. | | Strad | pp 48ff | = 3 pp June 1956 | (S) |
| 11. | | Strad | pp 54ff | = 3 pp June 1957 | (S) |
| | | | 102ff | = 4 pp July 1957 | |
| 12. | | Strad | pp 120 ff | = 5 pp Aug. 1958 | (Hu, Ho, S) |
| | | | 158ff | = 2 pp Sept. 1958 | |
| 13. | | Strad | pp 161ff | = 2 pp Sept. 1959 | (Hu, Ho, S) |
| 14. | | Strad | pp 361ff | = 3pp Feb. 1960 | (S) |
| 15. | + | JASA | pp1443-1449 | = 7 pp Nov. 1960 | (Hu, Ho, S) |

W = Watson, R. B.
S = Saunders, F. A.
K = Kessler, J.
Hu = Hutchins, C.M.
Ho = Hopping, A.S.
C = Cunningham, W. J.

JASA = Journal of the Acoustical Society of America, Amer. Inst. of Physics, Inc., 57 E. 55th St. New York, 22, N.Y., USA.

CIM = Overtones, Curtis Inst. of Music, Rittenhouse Square, Phila. 3, Pennsylvania, USA.

JFI = Journal of the Franklin Institute, Phila. 3, Pa., USA.

STRAD: May have back issues. See adv.

V & V: Ditto. Henry Lewis and Co., Chgo. See. Adv.


Error: S5r--line 12: write 1653 as 1653 meaning 1635.

SCIENCE FOR THE MAKER #5



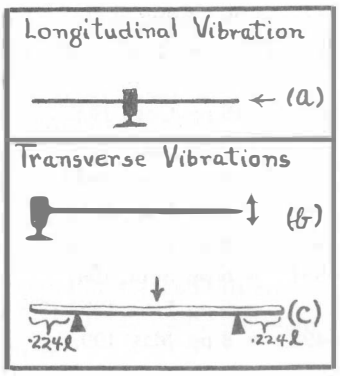
## Introduction to PLATE RESONANCE (Pr)

The sound from a string (piano, violin, guitar, monochord) set into free-vibration is a composite of THE Harmonic (forward!) series of pure tones, and the simple one-two-three formula is:

(2) formula: 1f, 2f, 3f, 4f, 5f, ... etc. THE HARMONIC-SERIES.

We are accustomed to this forward-series, but here is an example: Strike b on the piano. The fundamental of this note b is 247cps in our tempered scale. The ear hears this fundamental plus the other members of the series: 247, 494, 741, 988, 1235 ... etc. Almost all physics books give the simple explanation for this phenomenon which is caused by the string dividing into segments during its vibration--and this can be demonstrated visually.

A Physics Text Review will show you this about free-vibration: (a) The sound from a uniform rectangular stick or rod, held in the center and struck on the end in the direction of the length of the stick (longitudinally) produces this same series. If half-the-stick is removed and the stick be held at the end and struck in the same manner as before, the odd-members of the harmonic series are produced (1f, 3f, 5f ... etc.).




(b) If the full-length stick or rod be held at an end and struck transversely, the sound produced is an inharmonic series: 1f, 6.25f, 17.25f, 34.4f...

(c) If a stick be supported approximately 1/5 of the length from each end and struck in the center, a different inharmonic series appears: 1f, 2.76f, 5.4f .....

But let us return to a discussion of the simpler whole number (harmonic) or forward-series and see what some ears do with it. Strike b on the piano and ask some small children (or even some adults) to sing it. Some will sing the fundamental (247cps) and a few will sing one of the other tones in the series--transposed down by octaves! (Some will "hear" a chord and be unable to sing what they have heard --and unfortunately these individuals who hear so well are sometimes mistakenly labelled tone-deaf!) In summary: Most would sing the b, others would sing d'# or f'# or b'. (The latter group must be trained to sing the b.). Remember: when a note is struck on a piano the musical sound heard is a composite of pure tones in the one-two-three forward-series.

Now back to the review of the percussed rod in which FOUR different composites have been summarized. Remember that in each case we have dealt with a rod or stick of uniform thickness, and that a violin-plate, although symmetrical in contour, is not flat nor is it necessarily uniform in thickness.

Rods or plates (bellies or backs)--we have been concerned with the free-vibration caused by percussing the specimen. What relationship this free-vibration has to the sound-output from forced-vibration has yet to be established. But let us bypass the intricacies of the matter...it has been interesting to speculate about them but we can spend our limited space more profitably.

When different makers tap a plate their opinions differ as to the "frequency of the plate". Of course holding and tapping points have not been standardized and one might argue that this alone might account for the discrepancies. But does it in practice? No.....

Let 3 makers decide upon one way of holding and tapping one plate. Send each into a room alone to tap the plate and write down its "frequency". Then compare the frequencies obtained. There is still a difference of opinion. Why?

Tapping a plate produces a sound which is a composite of several frequencies so the one that a maker selects from the composite would seem to be governed by the laws of chance.

Now a light-belly and a heavy-belly can be made so that both have a strong f' in the composite (with electronic tests showing strong peaks at b and f' in the light-belly, and at f' and b' in the heavy-belly...and of course there will be some lesser peaks.). Observe that I did not say how the sound produced by this electro-magnetically driven belly (forced-vibration) is related to the percussed--tapped--sound (free-vibration).

But do assume we have such a light-belly and a heavy-belly. All makers agree that the light-belly has a "lower" sound than the heavy-belly. In both, the f' can be easily demonstrated. Some might too-quickly decide that one plate was an octave higher than the other--if you consider the b and the b' resonances (and ignore the f'). Actually the heavy-belly is a tritone (ie. a half-octave: S27, S30) higher in pitch. Yet it is not surprising to find that different people give amazingly different answers. One might argue we could be trained to hear what we should hear--but in practice this does not always work out. Compare with children trying to sing a note to match that struck on the piano! They are dealing with the "simple" harmonic composite--but we are dealing with a more difficult inharmonic composite.

Obviously we are faced with complex obstacles. I do not feel that it would be appropos to mention them in this Series if it were not possible "to do something about it". Several makers have said, "We would be glad to be RID of taptone-confusion--and we cannot afford electronic methods!"

Could there be a way to eliminate this confusion of pitches--a way that would compare favorably with the results got by the electronic methods? (When even these methods admit of some plates with so many resonances that it has been "impossible" to determine their significance.

There is a very simple mechanical way. See December VMJ.