The Violin Makers Journal

DECEMBER - JANUARY, 1962

THE OFFICIAL PUBLICATION OF
THE VIOLIN MAKERS ASSOCIATION OF BRITISH COLUMBIA

(see story, page 1)

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The Violin Makers Journal

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FRONT COVER STORY

Miss Galina Solodhin, now studying in Australia at the New South Wales Conservatorium, under Professor Hoogsteul, gives promise of becoming one of the world's leading violinists. She is of Russian birth and at present, while only 17 years of age, has full command of the violin technique, playing the leading Concertos in a mature and masterly manner.

She has been offered as a gift several old Italian violins but insists on retaining the violin made and presented to her by Cedric Welstead (see article and photographs on page 18). We wish her continued success.

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EDITORIAL PAGE OF *The Violin Makers Journal*

DON WHITE, EDITOR-MANAGER

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ON EDITING AND MANAGING THE JOURNAL

Lest our Members should misinterpret this Editorial, let me at the outset state that any words of mine which may appear to be critical can only be applied to a very limited number of our readers. Let me also say that I am very happy in my position as editor-manager of what I hope is a progressive and much-needed magazine. Running the Journal is my hobby--second only to violin-making.

Perhaps we made a mistake in emerging from a mimeographed effort to a professionally printed magazine. Readers, especially new ones, are sometimes inclined to expect too much. This, of course, is quite excusable as new members receiving, for the first time, a magazine of professional appearance naturally imagine that it has a huge office staff behind it. With the old mimeographed effort, it was easy to discern that here was a decidedly amateurish endeavour, and excused any shortcomings on these grounds.

Even a well-staffed and well-organized office makes an occasional error. When the office staff is composed of one man, naturally more mistakes will occur. In view of this, the one man staff is decidedly annoyed at being sharply pulled up for a very minor slip, usually that of sending a repeat or final notice after the member has paid his dues. It is not nice to be asked for money after the bill is paid but the fact that we have sent another issue after what we thought was the expiration date, shows that we have no intention of stopping the Journal immediately, and the fact that you received this notice shows that some mistake has been some somewhere along the line. A polite note advising us of the situation is all that is necessary.

The late appearance of the last two issues has also caused some confusion. Sometimes a change of address is not attended to quickly enough for the current issue; sometimes the postal service is at fault. For all the delays and mistakes we are truly sorry and for the inconvenience or annoyance they cause our members.

Let me hasten to say that most of you write exceedingly kind letters advising me of the situation and submitting a glowing testimonial, concluding "I hope you are not ill and that everything is O.K. for I don't want to miss a single issue." Such "reminders" are a pleasure to receive. But when I get a letter suggesting that I am taking money under false pretences, then I do feel very badly. Suddenly my hobby turns sour on me and I am apt to send the writer the balance to his credit, and strike his name off the mailing list. Then to sit down and write an editorial!

I hope that the above will, in some measure, indicate to new members the set-up in the management of the Journal. For their information I would say, that we are not a professional money-making organization. We are one big happy family of violin lovers who are seeking to help each other in every way possible. We must not lose this spirit of companionship, or ever let it be marred by such materialistic considerations as money, receipts and renewal notices. These sordid business details are necessary in some degree to the management of any enterprise, large or small, devoted to whatever purpose. My helpers and I do our very best to attend to them efficiently to keep our small enterprise running as smoothly as possible, with a minimum of errors. But should an error occur, a prompt reminder is all that is necessary to have it cheerfully rectified.

So, welcome, Associate Members, old and new, to the Violin Makers Association of B. C. We hope you will have a real sense of belonging to our organization. May our association as fellow members be long and pleasant.

LOCAL NEWS

by GEORGE FRIESS

by Gilson Heyworth

Mr. Friess, being very busy, has asked me to write for him in this issue.

On December 9th our association held its usual concert and get together, for the Xmas party.

Professor Karl and Mrs. Piltz, along with Dr. Howard of the University of British Columbia, gave us several selections from Beethoven, Handel and Boccharini. Mrs. Piltz on the violin, Professor Piltz on his old Gasparo Viola and Dr. Howard on his cello. This excellent cello was made by Mr. Helin, one of our members.

We all should consider ourselves very lucky to have this opportunity to listen to such top performers, in that they take the trouble to come and bring their instruments. The trio also played on many of the violins etc. made by our local members. I must say, without too much idle boasting, that these instruments compared very favorably with many of the so-called majestic imports from Europe.

We hereby extend our grateful thanks to Mr. and Mrs. Piltz and Dr. Howard for their efforts to entertain us for the evening and also for the interest they and Dr. Marsh of the U. B. C. have shown in our efforts in the past.

Another highlight of the evening was the presentation of a miniature violin and case to Mr. Cardo Smally, who is one of the leading violinists in the Vancouver Symphony. This small edition of a violin was made by Mr. George Friess on behalf of the association, as a gesture of goodwill from our organisation. This miniature was beautifully made and anyone interested in stringed instruments would be very proud to possess it.

One event we all really missed was the absence of our young protege Miss Helen Hagness from Aldergrove. We were too late in asking her to appear as we found she had a previous engagement. I am sure this was a great disappointment to all our members and visitors.

News has reached me that Mr. Peder Svindsay has received a contract to make a cello for, I believe, a local artist. This is a very encouraging piece of news and I am sure it will give us all a lift. If Peder makes it it will be a masterpiece of beauty and the party who gets it will be delighted with it.

I have heard a rumble that Mr. Stobbs of Modern Music is endeavouring to have some string music introduced into the churches. It seems that it could be financed by the sale of records, the proceeds from these sales from what I hear, a portion comes back to the musicians union. If he can swing it it might be profitable.

In conclusion we must always remember this trite little adage:

A "profit" is not without honour except in his own country."

. . . . . .

"A Thought"

The significant thing about Cremona was that each succeeding generation from Andreas Amati to Stradivari and Joseph Guarneri made better violins than its predecessor.

In contrast, look at the hundreds of families that have made violins for 12 generations and the last output is no better than the first.

The Cremonese were willing to experiment and learn. They did not argue a point for a lifetime. A sharp gouge and a good ear settled it for them.

Why are there so few followers?

Carl Farseth
4024 Elliot Ave.
Minneapolis, Minn.

. . . . . .

Mr. Robert Minster continues his experiences with Sangster's Varnish and Mr. Jack E. Williamson and Mr. Carmen White enter the discussion

Mr. Minster writes:

"Apparently, I have a bear by the tail, and cannot let go. I was glad to read in your journal the replies of Mr. E. H. Sangster; Mr. Carmen White; and Mr. Jacklin, to wit: 'Varnish or Sub Varnish.'

Mr. Sangster corrects BOB Minster, and the latter accepts the correction with his characteristic humility, and is grateful--around and about. In this issue, Mr. Sangster is kind enough to reprint Fioravanti's No. 11 formula. I thumbed back to the March issue of the Journal. Nothing in it about a beautiful golden-red varnish, before or after the formula. Just plain varnish. That means, (considering the ingredients) that it could be used as a sub varnish. And I done did.

When I brushed it on my violin, the varnish (sub varnish) was distinguished by its perfect transparency, and four weeks later, by its tackiness.

Then, by the grace of GOD, inherent brilliancy, and the science of deduction, I suddenly remembered that Mr. Sangster recommended a metal stir stick. I used a glass rod. Now, if Mr. Sangster used a wet metal stick, and forgot to wipe it off, and left it lying exposed to the sun and air, then he might get a colored varnish. Probably brown. The iron would also help the varnish to dry faster.

I sincerely hope that Mr. Sangster will not carry out his threat not to write any more, and in the ensuing issue of the JOURNAL will reveal to us precisely how many ccs. of turpentine he added to this formula to obtain the correct brushability.

And lastly, may I add, that after I removed this varnish (sub-varnish) from my violin, and substituted MICHELMAN's sub-varnish, this dried to finger-touch, in two days; it was perfectly transparent, and it sparkled. Fioravanti did not sparkle. Too tacky.

I am grateful to Mr. Carmen White for his RESIN filler formula, altough I do not see eye to eye with him on the linseed oil additive. Makes the tone cottony. I have also adopted his method of compounding Michelman's varnish, particularly the substitution of cardboard for a flat plate.

And Mr. Jacklin says that the N. Y. has a cold climate. Must have visited us in the winter. Try us in July and August. Have fun.

Bob Minster"
Far Rockaway, N. Y.

Mr. Jack Williamson Comments:

Perhaps I can shed some light on what appears to be a misunderstanding between Mr. Carl Sangster, Mr. Robert Minster, and Mr. Carmen White regarding the use of Fioravanti's Formula No. 11, or one of similar nature.

First, Mr. Minster has seemingly been frustrated by the variability of the material known as Venetian Turpentine. This material can be bought in any form from a watery dilution used in the perfume industry to a solid cake quite similar to rather dark, but usually good, violin rosin. In its normal, untreated state it is a sticky, slowly running mass. If used in this form in the formula under question it could result in a tacky, never-drying varnish. In fact, the adherents of spirit varnishes stress this very property as reason for its inclusion in a varnish designed never to dry too solidly, but to readjust under certain conditions. At any rate, its variability poses the first problem of making satisfactory use of it.

To surmount problems of material variability, the varnish maker may use two methods for this type of varnish. Either he can use Venetian Turpentine in its original state in combination with linseed oil and boil the two (with rosin, if wanted) for a long enough time so that both will dry without tackiness, or he can pre-treat one or both materials. If he uses the first method he may destroy part of the cohesiveness imparted by the oil to the varnish, unless he adds some more raw oil just before he stops cooking the varnish. Mr. Sangster recommends this method in a previous article.

Since the degree of heat one uses is difficult to determine, it seems more practical to use the second method. This is to boil the Venetian Turpentine, or rosin, or both until the material gives evidence of some desirable and consistent properties such as firmness and color when cool. One technique which may be used is to periodically dip a cold metallic tool into the boiling material, touch it to a piece of wood, and pull out a slender thread of rosin. If this thread quickly becomes brittle and breaks at the touch, and exhibits the degree of light red color you want then stop boiling your material. Let it cool, break it up, and thus cook equal parts of this, with raw linseed oil, at a high temperature for about 20 minutes. Keep stirring and testing drops on wood as it cooks and you will soon learn about how you prefer to make it from the end product. Varnish made this way generally takes from two to five days to dry in the sun.

So you see, if Mr. Minster had prepared his Ven. Turps or perhaps used greater heat he would not have had

such difficulties. This very simple varnish made from rosin (ww grade) only, or from various mixtures of rosin-like materials, has rather extensive variations and some very desirable properties. By changing the intensity and duration of heating one can get colors ranging from light yellow to rather dark red and red-brown shades. Varnish of this type brushed on the back of a soft leather glove has borne wear for three years without cracking, so flexibility is no problem. Moreover, a carefully applied series of differently colored coats of this varnish is attractive from the standpoint of its luster and warm beauty.

Mr. Carmen White asks exactly how one can get aluminum and iron into the Fioravanti recipe #11. The answer is either by directly coloring the varnish through the use of rusty steel or iron (the writer prefers rusty steel wool), or by the addition of coloring matters made by the metallic rosinate precipitation methods of Mr. Michelman. It is possible to add coloring materials to the completed varnishes without adding so much rosin that more oil is required. If the varnish is heated after the addition of a metal rosinate, the final color is modified. The use of a zinc aligarine addition imparts a pale red to a relatively clear varnish, but after further heating tends toward red-brown. So, by adding another factor, that of coloring, one sees that the possibilities become even more extensive.

For those who like concrete examples here is the information contained on the label of my last experiment with this type of varnish,

Rosin Varnish #19

1 - Rosin (ww grade) boiled until string tended toward brittle and dark. (In frying pan.)
2 - 1.6 oz. of this rosin broken up, cold, was boiled for 20 minutes with 1.6 oz. of pure raw artist's quality linseed oil (stirring all the time).
3 - When nearly cool, varnish was diluted by addition of pure rectified spirits of turpentine (Color = light golden red)
4 - Rusty steel wool added 12/14/58 and withdrawn 3/25/59. Varnish diluted by slow, careful additions of turpentine and filtered.
5 - Result is intense, but transparent red in several coats, and bright yellow in one coat.

It is hoped these paragraphs will help Mr. Minster and Mr. Carmen White as well as others understand Mr. Sangster's adherence to this type of varnish.

Respectfully,
Jack C. Williamson"
San Forenzo, Calif.

* * * * * * *

Mr. Carmen White's Comments:

"I am amazed that some of this science we read so much about has not been turned toward the varnish for our new violins. We read many technical discussions of micro-tone systems and the like, but no one except Mr. Kujawa has contributed stimulating articles on varnish. I liked Mr. Collier's comments on Michelman varnish. One comment he made needs explanation--he said the gums prepared by the book recipes were not as soft as I said they were. I am afraid he did not read my statements carefully. My statement was that these gums prepared by the book recipes were too soft <u>when</u> exposed to temperatures above 90 degrees F. along with humidity above 80%--these conditions exist every summer along the Gulf Coast, and these conditions invariably make this varnish print, stick, and fade--that is, if prepared by the book recipes. On the other hand, I have taken new violins varnished with gums prepared from the latest recipes into the Gulf Coastal areas in hot August with NO bad results. This explanation might save someone from getting into trouble, as evidently Mr. Collier has not exposed his Michelman varnish to temperatures above 90 degrees F. along with humidity above 80%--otherwise, no one would have to tell him that these book recipes make too soft a varnish. He would know beyond a doubt!

I recently asked some violin maker to tell me how aluminum and iron can be gotten into a varnish made by dissolving some gum in oil or turpentine and thinning it. Since then, I have read a paper written by a famous German chemist confirming Michelman's analyses and indicating that the old Italian varnishes <u>really</u> <u>do</u> contain iron, aluminum, calcium, and other metallic elements. This German chemist reached his conclusions entirely independently of Michelman's analyses and without knowledge that Michelman had made any analyses at all. Each operated independently of the other, and each had drawn the same conclusions. Both indicate that fossil-gum varnishes were not used at all--unless some of you chemists and experts are ready to tell us how iron and aluminum can get into such varnishes! Mr. Kujawa has never mentioned the presence of iron, or aluminum or other metals in his technical discussions, and to date, I think he knows more about varnishes than any other writer on the subject of gum varnish I ever read. One violin maker friend of mine wrote me that "any iron in the old Italian varnish came from the cooking pot the varnish was cooked in, and any aluminum came from the strings". I am afraid my elementary knowledge of chemistry will not permit me to accept this explanation, as Michelman writes that analyses of modern violin varnishes indicates NO PRESENCE of iron or metallic elements at all!

For makers who have not studied chemistry at all, it should be stated that rosinates as recommended by Michelman are NOT fossil gum varnishes, and that these metal rosinates are combinations of rosin with metallic elements, as iron and aluminum, and that their properties are QUITE DIFFERENT from the properties of gum-in-oil, or gum-in-spirit varnishes. For one thing, the rosinate varnishes DO contain iron and aluminum, as well as calcium and silicon--as do the old Italian varnishes. For another thing, the Michelman varnish WEIGHS ABOUT FORTY PERCENT as much by ACTUAL WEIGHT as the fossil gum-in-oil varnishes weigh--they are so much lighter in weight that the Michelman varnish may be compared to a celluloid like substance--and the effect on tone is entirely harmless. Can we say as much for gum varnishes? Of course we can say so immediately after the gum varnish is applied and dried--but how about after, say five or six years? Does not the fossil gum varnish continue oxidation and actually burn itself up and bind up the fiddle as in a vise? Does not such a varnish injure tone after a period of two to five years? Now, if we are willing to accept science, say in the preparation of a "micro-tone system", why not accept science in the preparation of this all important varnish for these new violins. How is it that we accept the one and reject the other? Is some science acceptable, and some other science, equally authoritative, unacceptable?

Gum varnishes have been tried by thousands of makers and found wanting--all sorts of gums--vile, flinty shellacs and soft, gummy and leathery resins--all of which spoil the fiddle after a few years. They cannot be readily colored except by anilines and other chemical colors, which are glaring, artificial, and totally unlike the old Italian varnishes in their texture and general appearance and transparency--as well as in tonal beauty and wearing quality. It would appear here that science has indeed made a signal contribution to the art of violin making--in the making and applying of this Michelman varnish, the maker will reach the finest possible attainment of tonal perfection in his new violins, and so far, his result promises to be permanent. These statements cannot be truthfully made about any gum varnishes that I have ever seen or tried.

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AN OPEN LETTER TO JOSEPH MICHELMAN AND CARMEN WHITE

By William E. Slaby

In attempting to learn the art of violin making I have become indebted to many people, not the least of whom are Joseph Michelman and Carmen White.

While in Cincinnati almost four years ago I was brash enough to call Mr. Michelman and ask if I might visit with him to discuss his experiences which he recorded in his book Violin Varnish. He proved to be both gracious and hospitable and I spent a memorable evening at his home discussing violins and varnish with both Mr. and Mrs. Michelman. In the course of the evening I examined many of the thirty-odd violins on which he had performed his experiments--fiddles of every conceivable violin hue--all of which had a transparent magnificence. Subsequently Mr. Michelman gave me assistance when I prepared to varnish my first violin.

At about the same time I came across the book Cremona Violin Technique by the late Justin Gilbert. I tried high and low to learn more about this man and his violins but it wasn't until I discovered the Violin Maker's Journal of British Columbia that I found a man who had experience with Gilbert's methods and who had, in fact, made modifications in these methods as a result of his own experience. This man, Carmen White, patiently answered the many naive questions I put to him in letter form regarding tuning violin plates, Michelman's varnish, and the application of a resin base foundation.

I have since made five violins. I propose now to relate some of my experiences and to raise some questions. My hope is that these two gentelmen will comment on my experiences and attempt to answer these questions. I have the temerity to suggest that these men send this letter and their comments to Don White for publication in the Journal. I think the experiences I have had and their comments will be of interest to readers of the Journal.

My first violin was a copy of the Messiah Strad as outlined in Joseph Reid's book You Can Make a Stradivarious Violin. Top and bottom were graduated ala Reid. I treated the completed violin with linseed oil as suggested by Michelman. Except for the varnish, which I shall describe in detail later, I cannot give any more details regarding this violin because by notes when I started on the violin making kick were rather sketchy. I sold the violin for $65.00 to a dealer who subsequently sold it for $100.00. It had a nice tone, but required a high bridge and was rather crudely purfled.

To save space I will describe the other four violins in chart form:

TOP DETAILS

Violin Number	Source of Wood	Finished Weight*	Pitch*	Thickness
2	International Sales	79.7 grams	F+4/10	7.5/64 all over
3	Sitka Spruce 45 years old	71.5 grams	F+2/10	9/64- to 7.5/64
4	Sitka Spruce 50 years old	67.6 grams	G	8/64 all over
5	Laubi	71.7 grams	G+4/10	8/64 all over

*Finish sanded. with bass bar, but no foundation. Foundation consisted of 6 grams resin, 30cc turpentine, and 8cc boiled oil.

BACK DETAILS

Violin Number	Source of Wood	Finished Weight*	Pitch*	Thickness
2	Michigan Maple	104.8 gram	B	10/64 to 5/64
3	Laubi	108.6 gram	A#+2/10	10.5/64 to 5/64
4	Michigan Maple 60 years old	110.7 gram	A-2/10	11/64 to 5/64
5	Michigan Maple	109.3 gram	A	10/64 to 5/64

*Finish sanded. No foundation at this point. Foundation same as for tops.

Tops and backs of violins number 4 and 5 were oversize at this point. They were reduced to size, purfled, channel cut, and edges rounded after the foundation was applied.

BASS BAR DETAILS

Violin Number	Source of Wood	Finished Weight	Thickness	Length
2	Sitka Spruce 45 years old	4.6 grams	3/16	10 1/2
3	Same	5 grams	3/16 to 1/4	10 1/2
4	Same	4.7 grams	3/16 to 1/4	10 1/2
5	Same	4.7 grams	1/4	10 1/2

THE VARNISH

Violins number 1 and 2 received five coats of sub-varnish (Michelman's modernized formula as published in Violins and Violinists) and nine coats of orange varnish using 14cc of 2% alizerin. Two coats of brown, using 60cc of 5% iron chloride, were applied midway in the finishing process in an effort to deepen the color and give the varnish a more aged appearance. Each coat was sanded before the next coat was applied using 500 grit wet-or-dry paper and water.

The sub-varnish worked quite well, but had a tendency to coagulate in the container while being applied. This did not occur every time but when it did the varnish dried with a dull finish rather than a gloss, and brush marks were inclined to be pronounced.

Occasionally the color coats gave the same trouble as the sub-varnish. Great care had to be taken to avoid streaking--the color seemed sometimes to be suspended in the varnish. The brown varnish, after exposure to light, became quite streaked.

In an effort to prevent premature coagulation I tried (taking a tip from Michelman's book) mixing the chemicals in a tray of ice. Result: no apparent improvement.

I concluded after varnishing violins 1 and 2 that 14cc of alizerin is inclined to make the finish opaque. And 60cc of iron chloride makes the varnish too brown which, in conjunction with premature coagulation, causes a streaked finish.

After finishing violins 1 and 2 I was somewhat dissatisfied with the appearance of the varnish. Even

after intensive rubbing the brush marks were not entirely removed. Further, there was some tendency toward opacity which I attributed to too much alizerin in the orange varnish and too much iron chloride in the brown.

I decided that 10cc of 2% alizerin was the maximum that could safely be used if the finish were to be kept transparent, and 30cc of the 5% iron chloride. My desire, however, was to have a deeper color which seemed to call for more of these chemicals. On reading Mr. Michelman's book for the umpteenth time I noted that he made a red varnish using zinc sulphate which he found had no tendency to coagulate prematurely. I decided to try zinc chloride in the same fashion (Mr. Michelman specified the use of chlorides instead of sulphates in his "modernized" formulas). The result was a deep blood-red varnish that flowed well, left no brush marks, and was transparent as glass. In fact, it seemed to have all the characteristics of Michelman's zinc sulphate varnish.

Next I tried substituting small quantities of the zinc chloride solution in the other formulas to see if it improved the flowing quality. I am pleased to report the experiment was successful. It also results in deeper colors while using less alizerin and/or iron chloride.

In the meantime I had discussed my problems with a chemist friend who suggested that my difficulty with occasional dull varnish coats might be because the resin was not completely dry. Since then I have stored the dried resins in small open jars each of which is kept in a larger closed jar. In the larger jar I place a drying agent such as calcium chloride crystals. These crystals have a great affinity for water and thus insure that the resin is as dry as is practically possible.

There is a product available from chemical supply houses called "Dri Rite" which is made specifically for such purposes. It can be had with a color indicator. When the crystals contain no water they are purple. When they have absorbed all the moisture they can they turn pink. They can be repeatedly rejuvenated by placing them in an oven in an open pan at 300 degrees. When the crystals turn purple they are ready to use again.

I store the jars in the refrigerator, and I make only enough resin at one time for three or four coats of varnish.

I frankly do not know whether the drying and storage method I use is necessary since I started using zinc chloride solution at the same time as I began using the drying agent. Perhaps the zinc chloride alone would have solved my problems. The extra precaution involves no work, however, and since I am now highly satisfied with the results I shall continue to observe it unless you convince me it is unnecessary.

Here are the formulas I used on violins 3, 4 and 5:

PREPARATION OF THE RESIN

	Potasium Resinate	A1-Ca Precipitant	5% Zinc Chloride	2% Alizerin	5% Iron Chloride
Sub Varnish	200cc	90cc	30cc	-	-
Red Orange Varnish	200cc	60cc	80cc	10cc	-
Orange Brown Varnish	200cc	64cc	56cc	10cc	20cc

Actually I test for completeness of the chemical reaction by using blue litmus paper and, if necessary, I add additional A1-Ca until the paper turns a definite red.

PREPARATION OF THE VARNISH

	Boiled Oil	Resin	Dipentene
Sub varnish	3cc	2 grams	5cc
Red Orange	2cc	2 grams	4 1/2cc
Orange Brown	2cc	2 grams	41/2 cc

I used the orange brown varnish for the sides, back, and scroll (4 coats) of violin number 3 to make them match the wood of the darker sitka spruce top. Each violin had three coats of sub-varnish and from eleven to thirteen coats of the finish color. From four to eight days passed between each coat. I began varnishing on May 7 and finished on July 27. After each coat the violins dried indoors in ventilated boxes until dry to the touch (24 to 48

hours, depending on temperature and humidity) after which they dried in the open sunlight for eight hours.

COMMENTS ON THE VARNISH:

1. It is lustrous, transparent though rich coloured, and truly beautiful.
2. I entered violins 4 and 5 in the Arizona contest. While they received a third and fourth place for tone, they received scores of 95 for both varnish and workmanship which placed them both second for composite scores. This in itself speaks well for the appearance of the varnish.
3. Several people have remarked that my violins are responsive and do not have harshness of tone which is often characteristic of newly varnished violins.
4. One comment that is perhaps negative: The varnish is deceptive. While it appears rather hard experience indicates that in reality it is soft. A violin in constant use tends to become black and soiled from the player's hand. This soil becomes apparent at the chin of the scroll and on the back where it adjoins the neck. Have you experienced this, and is this a characteristic of the old Italian varnish? The soil can be removed with a commercial violin cleaner but this tends to remove some of the varnish.

I should appreciate any comments that you might make regarding my procedures. It would also be interesting to know if your experiences with the varnish have paralleled mine.

The Foundation

Now I should like to discuss Mr. White's method of applying the rosin base foundation. I have had two experiences with it that cause me some concern.

1. When heating the plates to expel the moisture they warp. True, they can be sprung back in shape when gluing them to the ribs, but this tends to put the violin under stress and tension. Are there ways to prevent this warping?
2. I find that heating the plates causes some shrinkage across the grain. This becomes serious enough to cause uneven margins. To allow for this, in making violins 4 and 5, I left the plates 1/32" oversize all around. I trimmed them to size after the foundation had been applied. Then I inlayed the purfling, sunk the channel, and rounded the edges. More hot foundation material was applied to the newly exposed wood after these operations were completed.

This is an involved process (although I submit that it may be the very reason Strad allegedly performed the purfling operation after the violin was assembled). Is there any better way to do it?

Have you experimented with applying foundation without first expelling the moisture? Is it not possible that the foundation would displace the moisture? Mr. Michelman found this to be at least partially the case in his experiments with linseed oil as a foundation.

Tuning the Plates

Finally, some questions regarding tuning the plates using your tap tone method. I have no quarrel with this method for I feel I have achieved good results with it. But I should like to know how you arrived at it. My reason for asking this is because I would like to apply similar techniques in making viola and cello plates. I am currently making two violas. They are Tertis models. One is the standard 16 3/4" body length and the other 16 3/8". Center thickness of each back is 10/64" and edge 7/64". Weights without foundation are 155.5 grams and 146.5 grams. Tap tones are E and E+2/10 at 70 degrees Fahrenheit. I have no idea as to top weights and tap tones to match these backs, nor whether the weights and tap tones of the backs are reasonable for their size. Do you have any suggestions of thoughts on this matter?

"Fraternally"

William E. Slaby,
1322 N. Vermont
Royal Oak, Michigan.

COMMENT ON MR. SLABY'S LETTER

by Carmen White

I am delighted to have this full and detailed account of Mr. Slaby's experiences with Michelman varnish and his scientific approach to violin making by recognizing wood-weights, tap-tones, and foundation of plates. Accounts of this type tell us much that we practical minded violin lovers need to know--much more so, perhaps than some of the detailed and technical "scientific" articles. It is my considered opinion based on 30 years experience as a player and as a listener to all sorts of violins that modern violin making must eventually do just as Mr. Slaby has done--work with these important factors, making full and complete notes on each instrument for future reference. When these are available to all violin makers and when experiences are compared and results established, rules may be laid down for beginners--rules which may assure a good result with considerable saving of time. But we are all in the experimental stage at this time, and it will not be easy to make final and complete answers to Mr. Slaby's intelligent questions.

Let us first consider brush marks in the varnish. I have been told and have read that brush marks have been seen in actual specimens of old Italian varnish--specifically, in the varnish of a Bergonzi cello. These brush marks can be rubbed out by continued rubbing with raw linseed oil and powdered pumice stone, and I have never used any other agents for rubbing and finishing Michelman varnish--Michelman himself recommends this, and I do not use any sandpapers or steel wool, as some varnish finishers do. When the brush mark is almost rubbed out, you can usually get a perfect surface by dipping a piece of flannel cloth, first in denatured alcohol, and then in lemon oil polish (to which I add about 1/3 raw linseed oil and shake up). Rub lightly in circles. The alcohol cleans and surfaces the varnish as the oil polishes it--and you really will be delighted with the instant nature of the polish--you can polish a violin in two minutes to a fine mirror-like finish, and most inexperienced makers and connoisseurs will declare that the violin has been "French polished"! Of course, we cannot convince them that this is the natural finish of the fine Michelman varnish. If this process does not get all the brush marks, wait two or three days, then rub down again with powdered pumice stone (FFFF grade) and raw linseed oil--do not use boiled linseed oil here. Then, polish again with alcohol and oil, as indicated above--the second process will usually give you a permanent polished surface.

The varnish is soft and does soil and wear off where the hand and chin touches it, as you have described. I am sure this must have been a quality of the old Italian varnishes, as I have recently examined three fine specimens of Joseph Guarnarius del Jesu, and all three of these exhibited signs of wear as you described--one is almost denuded of its original varnish on the back, another was definitely retouched with varnish added, and a third showed big places where the varnish is entirely gone from the wood, and the wood itself appears light yellow in color, just as foundationed wood would appear--it does not look like dirty brown rawwood such as is commonly seen in old French, German, and lesser violins. I am also delighted to know that Mr. Slaby has attracted attention by his fine varnish in the contest. My violins which were entered in this contest did not attract any attention to the varnish at all--in spite of the fact that I had one of them beside a fine specimen of Guarnarius del Jesu just recently, and the new varnish certainly does not yield to the old Italian varnish, either in appearance, color, finish, transparency, and general over all beauty--I had really begun to wonder what standard was used in judging these varnishes--I was afraid perhaps they were using a gum-varnish standard or some other standard. It is reassuring to know that this varnish is being recognized.

I experienced your troubles in heating plates--I have tried applying the foundation without any heat at all and have also tried strong heat and finally, gentle heat. At present, I believe in using a gentle heat over a period of an hour or more--a sun-lamp or an electric hot plate is used, and the plate is placed as a sufficient distance from the heat source so that it is heated gently and evenly. I weigh it frequently during the heating process, and it never really gets hot enough to burn the hand, but it does lose 3 to 5 grams of weight, presumably moisture. The foundation, prepared and hot on a water bath, is added immediately, the plate is left for about 10 minutes to soak up all it will hold, then, it is cleaned up, weighed, and put out in the sun for two or three days, then weighed again. A final polishing is given with fine steel wool and raw linseed oil, finishing with a vigorous rubbing with a soft flannel cloth until it glows with perfect fine transparency and beautiful surfacing. I do not experience any warping or contraction in this way at all. In six or eight months, no one could tell that the plate had been treated by its appearance, except that as age comes, it does not turn a dirty brown color and wrinkle up its surface inside. It has a fine healthy look and a good color and transparency--every grain mark can be seen. Do not treat the gluing surfaces, but otherwise, do treat both sides of the plates simultaneously.

As for the question of how I arrived at the top-tones and weights which I use and recommend, I can only say truthfully that I arrived at them by a process of trial and error--by using various tap-tones and weights in about one hundred examples, and by using known good instruments for comparisons and by my own listening and playing and by using the opinions of players and listeners whose opinions I

(continued on page 17)

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Random Thoughts While Sanding Plates

By NORMAN MILLER

Thinking About Bridges

We all know the average shape and appearance of a bridge when fitted to the various members of the violin family.

Perhaps we have seen one that we particularly like, as to set and shape, and have taken it as a model, made a template from it and in general fitted our violins with one similar.

Most makers try several grades of wood, and either make the entire bridge themselves, or buy the very excellent bridges "in the rough" from a dealer, and then by trial using one of a softness or hardness that suits the instrument being fitted.

It is easy to accept the fact that bridges of different quality will effect a change in the tone of any given instrument.

Other factors of a like nature are also easy to accept.

A thick bridge will give an entirely different result than a thin one. This brings into focus, facts that readily suggest themselves. That a soft bridge would of necessity be thicker than a hard one. There would be degrees of extremes in both of course, and it is between these extremes that an accepted norm is generally found.

It would be found that if a soft bridge was too thin it would not stand the strain. Of course neither does a hard bridge if it is worked too thin, but a hard bridge can be worked thinner than a soft one, as indeed its very hardness dictates, if it is made so that it functions correctly.

The arching of the top-plate, the set of the neck and length of body-stop can influence the required height of the bridge. These in close association with height of the string from the fingerboard, more or less determine the bridge height for each instrument.

Of course some players prefer to have the strings higher or lower from the fingerboard than the accepted normal distance, and, so, often demand that the bridge height be made to accommodate this. So we have to raise or lower the bridge to suit.

In such cases, what would be the procedure to effect such a change. This change must be effected so that the greater or less height does not add too much change to the tone.

Let the simpler appearing change be examined. The player wants the strings closer to the board. The violin is finely adjusted and the tone is full of quality.

The first thing that suggests itself, is simply cut the required amount from the top of the bridge. Indeed this is most frequently done. It certainly lowers the bridge and brings the strings closer to the board, but it is debatable if it was truly the correct thing to do.

Did we consider fully just what that sixteenth of an inch on the top of the bridge was doing to the tone? We all know what the function of a mute is, and what it does; adding weight and mass to the top of the bridge it eliminates or restricts partials and so the tone colour is different. Perhaps that little amount of wood that we so wilfully removed was just what the violin needed to impart beauty to the tone. Its action of release or restraint as the case may have been was necessary. Now we have removed it without any consideration of the result. Naturally we could not have taken away wood from the feet of the bridge to lower it. The feet are generally finely fitted and would not allow of such removal; also the same loss could be experienced if the feet were interfered with.

The correct thing to do is to fit a completely new bridge of the same quality wood, and allow for the reduced height when forming the feet.

The following diagrams will show now one bridge can be so different from another even when they are of the same height. (Diagrams at end of article.)

Try them for experiment. Use three bridges of similar properties.

The diagrams show the form of a bridge in the rough, and three bridges all of exactly the same height made from the same pattern of "rough" blank, yet each has wood distributed in a different manner brought about by taking wood from the under or upper part of the feet, as the case may be.

Diagram No. 1

A violin bridge in the "rough".

Diagram No. 2.

A bridge with most wood taken from the lower portions of the feet. The under-cut has not been touched, nor have the side-cuts or kidney. If the tone is too tight when this bridge is tried, the tone will become freer if the undercut is enlarged as in diagram 3.

Diagram No. 4.

If the violin still shows too tight a tone after diagram 3 has been tried perhaps a bridge after diagram 4 will give further improvement. The wood has been taken away from the underpart of the fee; this leaves the same amount of wood in area C but has a larger under-cut and higher legs than No. 3 and less wood above the kidney in area A.

Further adjustments can be made to all these bridges by enlarging the side cuts and the kidney, either, or both as desired. Changes in tonal quality, and/or output can be effected by judicious removal of wood from these areas. It must be done carefully, as it can be carried too far and the tone ruined. Find out how each one affects tone. Then when a new bridge has to be made to lower or raise the strings, tonal quality can be maintained, or if necessary improved.

If a violin is raucous and scratchy, its bridge would be more effective in helping to remove the scratch, with more wood above the kidney.

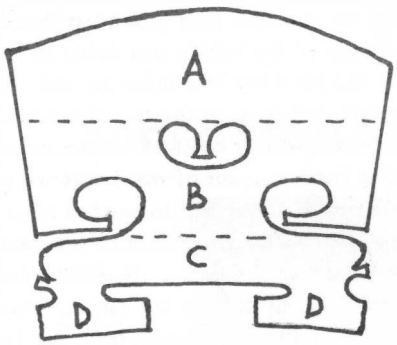
A thin top-plate can stand a bridge with more wood on it, and a thick plate could be improved, if the tone is dull, with a bridge with less wood in area "A"; and so on. Try it.

Other adjustments to a bridge are carried out at the edges or sides a slight bevel removes wood from these areas and generally sharpens tone.

This bevelling is often done as a general practice whether the fiddle needs it or not. It improves the appearance of a bridge and it is often done as a matter of course. However, it would be wiser to do it only when necessary to sharpen, or put an edge to a tone.

Much can be done to bring the final tonal quality of a violin to perfection but the adjustment and type of bridge used. The finest production of Stradavari could be spoiled with an unsuitable bridge.

The thickness, density, area of wood and its placement are as important in a bridge and the resultant tonal quality of the instrument as any part of the construction of plates, etc. Any old bridge will not do.



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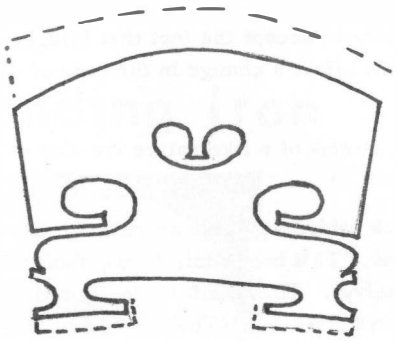
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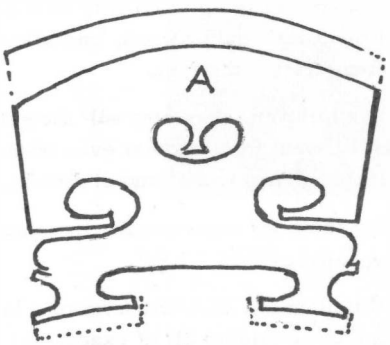

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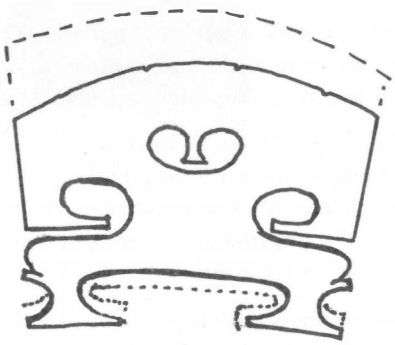
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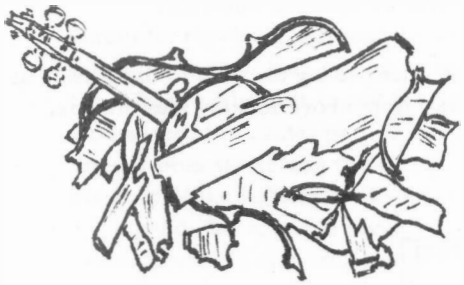


Fiddle Fix.

By H.S. WAKE.

Fiddle Fix No. 12

Most of us of the "FIDDLE FRATERNITY" at times have occasion to send a violin through the mail or by express company; this is always reason for some concern as we fear the worst and imagine all the terrible things that can happen to our precious instrument.

The main concern is usually "how best to pack it safely and securely", and having shipped and received many fiddles which at times (but rarely)have been badly damaged, it has been found that if the instrument had been packed in a more sensible manner the damage would not have happened.

In view of the above comments let us check on how to make just about the strongest, cheapest and safest packing or shipping box for a fiddle that is possible, and which, incidentally, can be used over and over many times. This type of box is sometimes called"Meadows" box; I don't exactly know why, but they are familiar to many fiddle men and for the benefit of those who are not familiar with them and would like to have the layout for one, here it is.

You will need thin plywood, either 1/8th" or 1/4", a few lengths of builder's lath, and a handful of flat head thin nails about an inch long.

For the sides of the box cut two pieces of plywood 7" x 28"; the top and bottom will of course be identical and will be 10" x approximately 29 1/2"; this depending on the thickness of the plywood used.

The builder's lath is 1 1/2" x 3/8" thickness; cut four pieces 28" long and four pieces four inches long for the two sides and assemble them as shown in Fig. 1.

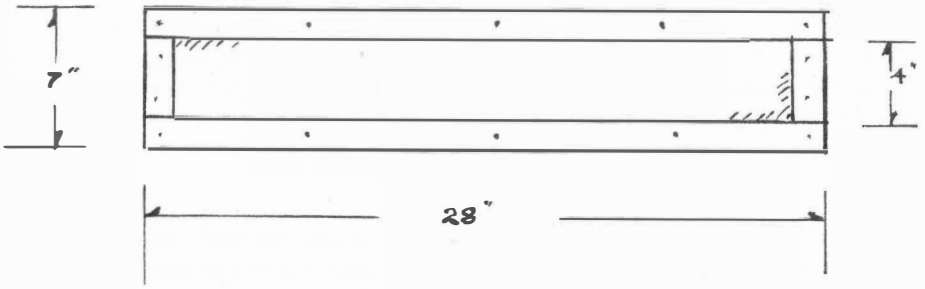


Fig. 1

two sides

Drive the nails right through the lath and plywood and hammer them over on the other side: For the two ends cut four pieces of lath 10" long and four pieces four" long, assemble and nail together as shown in Fig. 2.

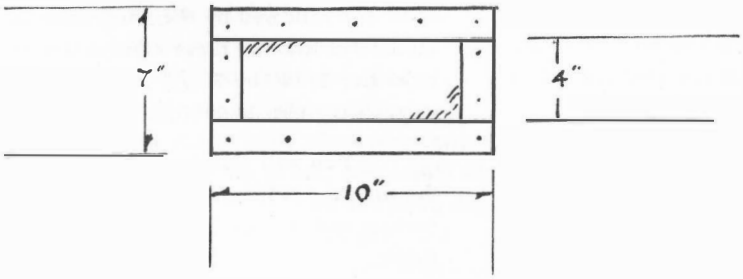


Fig. 2

You now have two sides and two ends ready to assemble and for this you should use slightly heavier nails; fasten the two ends to the sides putting the ends to the outside as shown in Fig. 3 view from above looking into the box.

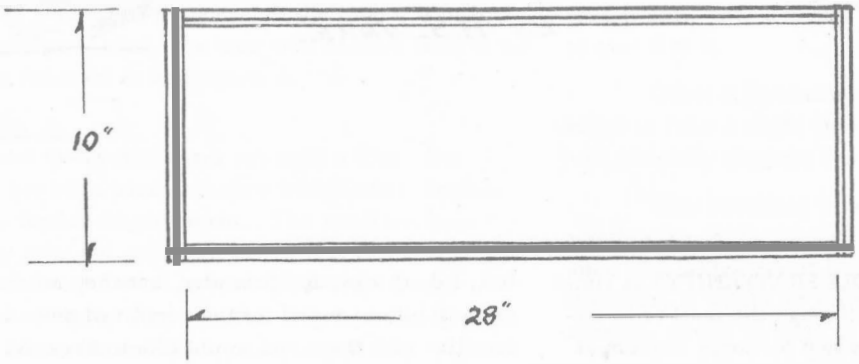


Fig. 3

Use this frame to layout two pieces of plywood for top and bottom and your "Meadows" box is finished as seen in Fig. 4.

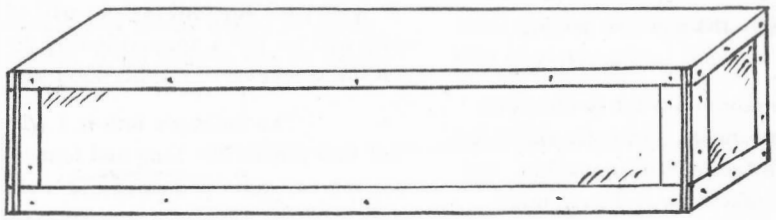


Fig 4

These boxes are well within the limits for parcel post shipment and when a violin is packed inside with loose packing material it can safely be sent to the other side of the world if necessary: However, the writer feels that as an extra precaution it is always better to let the strings down, wrap the bridge in paper and tuck it under the tailpiece, then just pull up the strings sufficient to hold it there.

Fiddle Fix No. 13

A good set of fiddle clamps of the round bobbin type can be easily made at little cost, and at the same time you can make good use of some of those old broom handles that are laying around.

Cut off about fifty pieces of the broom handle making them each about 3/4" long; make the cut as true as possible and drill a 3/16" hole through each one: Dowel rod can be substituted if you can't find the broom.

Purchase from your hardware store, two or three ft lengths of threaded rod, sixe 10-32; this material is very reasonably priced and can be had in steel or brass; the brass is better for our purpose; also purchase four dozen brass wing nuts size 10-32.

Now if you can find a couple of old felt hats around the house you can make good use of them also; cut about fifty 1 inch squares of the felt and with a paper punch put a hole through the center of each piece; cut the threaded rod into 3 1/2" lengths and assemble each clamp with first two pieces of felt, then a bobbin on each end followed by the wing nuts: as an alternative method of making these clamps you can use carriage bolts size 3/16" by 3 1/2". These will be threaded 10-24 so get wing nuts to match.

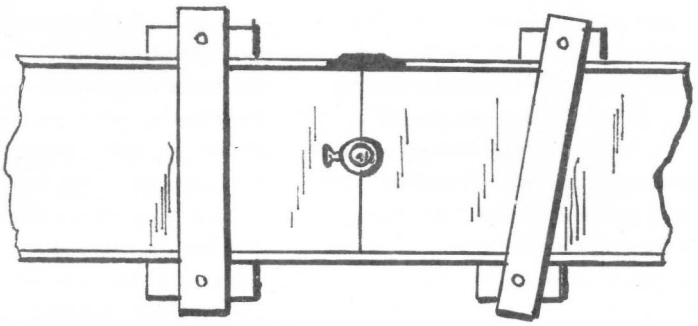
You will find these clamps just right for putting the top on a fiddle; they fit nicely in the curves at the corners and the felt is good protection for the edge of the fiddle.

The same threaded brass rod also makes a good clamp for repairing belly cracks and separated center joint: cut the rod long enough to reach right across the fiddle and bend it to suit the arching; wrap some tape around the center part of the rod to prevent the threads from scratching the varnish and file a groove on the face of the bobbins to fit over the edge of the fiddle; it's a good idea to make several of these; a short one for center bouts and one each for upper and lower bouts; they can be easily bent to suit any arching and when they are in use you can place thin wedges between the fiddle top and the rod to control the positioning of the wood on each side of the crack.

A quickie clamp can be made for use over the ribs of a 'Cello when re-glueing a loosened top or back. This clamp uses no nuts or bolts and is strictly what you might call an emergency clamp or a 'Quickie' for 'Cello.

Cut a strip of wood, say about 1 1/2" wide by 3/8 in. thick and 2 1/2" longer than the span over the ribs; cut two short pieces 1 1/2 x 1 x 3/8" and put a hole through the center; attach these short pieces by a screw through the hole, one at each end of the longer strip so that they swivel; these pieces being placed so that they just rest on the edges of the instrument: All you need do is give the clamp a slight twist sideways and it tightens enough to bring the edges down to the ribs: To make the repair; clean out the old glue with hot water and a thin blade, insert some hot glue with the same blade and bring the parts together with one or more of the above clamps; don't make the mistake of pushing too much glue in there; it only runs down on the inside and makes an awful mess.

'QUICKIE' 'CELLO. CLAMP.



LOOSE. TIGHT.

Put a piece of felt or other protective material under the clamp when in use.

Comment on Mr. Slaby's Letter (continued from page 10)

value highly--all these were used in arriving at my recommended weights and tap-tones. You will note that mine do not agree with Mr. Gilbert's at all--I like a little more reserve in a stringed instrument than his weights and taptones seem to give. You may recall that I own one of Mr. Gilbert's violins which I have revarnished with Michelman varnish, and while it is a fine instrument, my personal taste leans to a little more reserve and power than his violin gives--on the other hand, his is superior in mellowness. You should have many players to try your instruments, particularly in auditoriums wherever possible, and along with instruments of known value, preferably old Italian violins. As you do this, you will do as I have done; that is, you will arrive at the weights, tap-tones, and treatment of wood which give you the result you want--or the result which your judgment and that of critical musicians tell you is best. Be sure to tell us about these!

My experience with violas is strictly limited. I never saw a Tertis model viola which sounded good, and since they look horrible also, I do not recommend that you use this model for your work. On the one or two I have tested, your tap-tone of E and E plus 2/10 sounds right for your weights--you may get a good result and I hope you do. And if you do, please write it up for us, as I want to hear one Tertis model viola which sounds good! I will admit to prejudice against their appearance--I think they are most offensive to the eye, but if they sounded fine, we could overlook the appearance. It might be added here that Mr. Sangster uses raw linseed oil for foundation exactly as recommended by Mr. Michelman in his book, without heat, and he suns the oil-treated violin for a whole summer in our hot Texas sun before varnishing. I have played on three of these and can tell you that they really sound fine. It is important that A FILLER be used. Raw wood and gum varnishes kill our new violins within a year or two.

THE WELSTEAD VIOLIN

Consistent with our new policy of presenting in each issue photographs and description of a violin made by a craftsman still living, we herewith present a violin by Cedric Welstead of Sydney, Australia.

Before allowing Mr. Welstead to give you details of the instrument I would like to say that I have some personal interest in this violin. As I write this I am listening to a remarkable performance of The Mendelssohn Concerto played on this very same instrument. One hardly knows whether to admire the more--player or instrument--both are of the highest order. I am receiving this through a Tape Recording sent me by a friend of Mr. Welstead's.

On the front cover of this issue is a photograph of the young virtuoso and the story of her career is on page 2, so, much as I would like to, I must not dwell on the artist's rendition, except to say that the violin under her skillful hands displays all the qualities desirable in a solo instrument. It is brilliant yet has the sympathetic tonal qualities of the old Masters.

The following is a brief description of the violin written by Mr. Welstead. In a future issue of The Journal he will present his views on violin construction which is centered around what he terms "Balanced construction". He has also made a very complete research into the realm of varnishes. The theories will prove most enlightening.

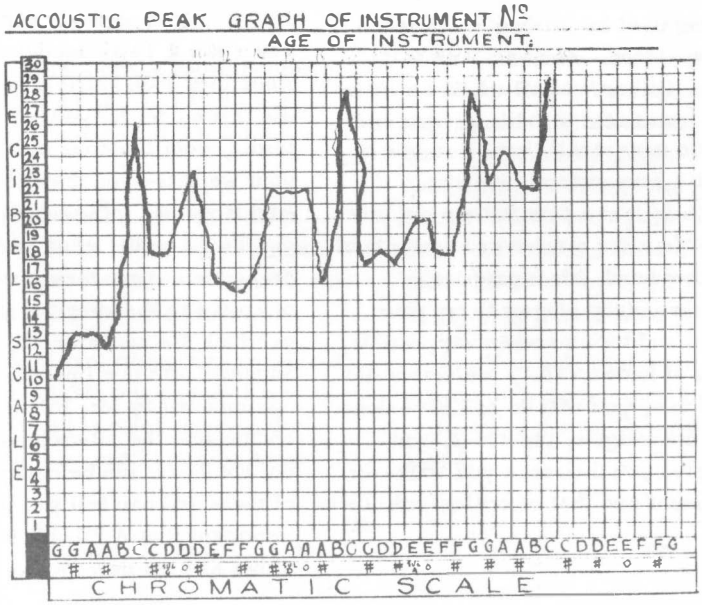
* * * * * * * * * * * * * * * * * *

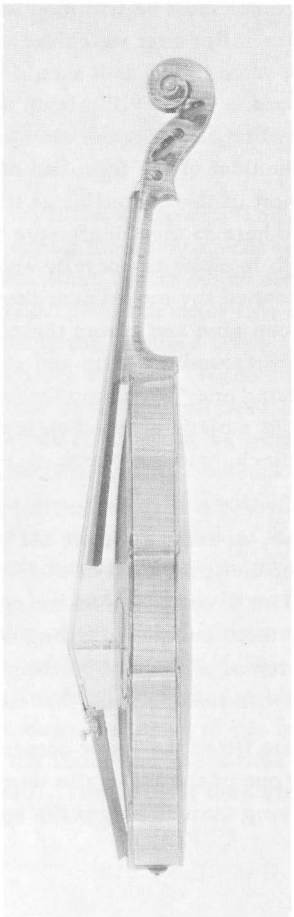
VIOLIN NO. 1, by MR. CEDRIC WELSTEAD

The instrument is basically of the Strad. pattern, being 14 ins. long; the other lineal measurements being 8 1/16" x 6 5/8 x 4 1/4". The ribs are 1 1/4" at the end pin tapering to 1 3/16" at the neck, the internal capacity is 1820 cc. the thicknessing of the diaphragms are as follows: (I must explain here that I express all my measurements in relation to thicknesses in fortieths of inches, as I have found that by using this fraction, I can maintain a safe margin for error, so your readers will have to convert my measurements to their own fraction). First the back. The centre is $\frac{6}{40}$" full, tapering to the edges and ending abruptly at the linings to $\frac{3"}{40}$ the external edges being $\frac{6}{40}$" thick. The table is $\frac{5"}{40}$ at the centre, and over the greater area remains at this dimension, then finishing at the linings to $\frac{4"}{40}$ it will be seen that the mass of the table is concentrated away from the edges. The varnish is an oil varnish of deep orange to red.

The acoustic peak graph illustrated will be of interest to Prof. Chatwin and Dr. Saunders; this graph was made by a set of carefully developed means contrived to establish the areas of greatest volume (I do not concern myself with body tones, air tones etc., preferring to leave this to the physicists, the instrument was not constructed to correspond to these peaks, but has a natural resonance which gives these peaks, which according to Dr. Saunders are ideal). The weight ratio of the wood for back and table is $\frac{10}{7}$. I consider this factor most important if we are aiming high at balanced construction in order to create a concert instrument, and this ratio must be established by careful selection of material - I believe old Strad. was conscious of this.

I think this is all I can supply in relation to this violin at the present moment. I would like to thank you very much for your interest in my work, hoping I can in some measure contribute to the aims of your excellent Journal.





Cedric Welstead N.S.W.
Sydney. FACIEBAT ANNO. 1955.

The Technique of Violin Making

By Harry Wake

(continued from page 16, October-November, 1961 issue)

Remove the clamps from one side and keep clamps and blocks together for quick pickup; brush some hot glue on the corner blocks inside the "C" of the mould and on the ends of the "C" rib: Put in place and clamp snugly but not too tight, you don't want to squeeze all the glue out of the joint: repeat this operation on the opposite "C" rib and leave overnight to set.

When the clamps are removed from the "Cs" you can trim off the excess wood of the ribs at the corners, but still leave about 1/8th inch projecting beyond the corners for trimming to a miter later.

The upper part of the corner blocks can now be cut off to the line and the upper ribs prepared for fitting; soap the mould near the blocks as before and try the upper rib in place against the corner block on the form: Now the 1/8th" of the "C" rib that was left projecting beyond the corner must be trimmed with a thin sharp knife to a nice miter over which the wood of the upper rib will ride; when this is as it should be, clamp the upper rib in place with a "U" clamp through the nearest hole and small block under the clamp: wrap the Rib around the shoulder of the form and cut it off square just about 1/4" short of the centerline at the top: The neck will be fitted here so they don't have to come too close; clamp this rib in place temporally and fit the opposite rib; having soaped the mould near the blocks (top and corner) you can glue and clamp the corners first, then' bring both ribs around the form and glue the ends to the top block, using one "U" clamp through the top hole in the mould; put a piece of wood on top to hold the two ends to the block, and the clamp on top of that.

Proceed with the bottom ribs, doing the corners first, however, at the bottom we are going to make a clean joint of the lower ends of the ribs right at the centerline: This is one place where many workers have trouble, any discrepancies in fitting usually being covered by the insertion of a piece of purfling or ebony; a little care and you can make a joint that can hardly be seen.

Having fitted the lower corners, glue them in place; bring one of the lower ribs down around the form and put a clamp through one of the holes to hold it in place; when you are sure that it is snug all around, make a mark right at the centerline and cut off the end of the rib square and true; don't glue this down yet but bring the other rib down and around and put the end of it underneath the one you have cut off; with a sharp thin knife score a line on the lower one, using the upper one as guide, loosen the clamp and with a piece of plywood underneath, cut the second one off; these should now come together and fit perfectly; soap the mould near the block, apply the hot glue, bring the ends together and clamp securely: When the clamps are removed trim off the corners and prepare to fit the linings.

Before we can do anything with these we must clean up the work we have done so far; remove all clamps from the form and with small plane and file trim off the excess wood of the ribs so that they are flush with the top and bottom surfaces of the mould; be careful here because it is very easy to split the wood: Remove the six bolts that hold the two halves of the form together and with the help of the two "push out" bolts we will remove the upper half of the form from the rib frame; this can be a ticklish job but if you were careful in the glueing it should come out without too much difficulty: Run a thin blade between the ribs and the form to make sure that the ribs are clear, and if the form has been treated with soap near the blocks it should come right out, because if you recall we glued the blocks to the lower half of the form only: Now, if for any reason the upper half will not separate, the only alternative is to remove the complete rib frame from the form; this is fairly easy, just run the thin blade between all the blocks and separate them from the form, you can now part the form and place the lower half back in the rib frame; it should be glued at the blocks with thin glue as before because we want the ribs fitting close to the form while we fit the linings inside the edge.

The upper block you will notice, is shorter than the depth of the ribs; this of course was done for a purpose, so we will reduce the height of the ribs right at the block so that they are flush with the block top surface: Now, take a thin flexible straight edge or rule, wrap it around the outside of the rib and scribe a line on the rib from the upper corner to the top of the upper block; plane off the wood of the rib above this line so that you have a gradual tapering down

and blending at the upper block.

We are now ready to start work on the linings so you can select some strips of fine grained spruce; these should be 1/8" x 5/16" and lengths to suit, with the grain showing on the wider side of the strip; you can run these through the rib sander and reduce the thickness to about 3/32": These, you will find are quite easy to bend, there is one thing however that can be mentioned here; some makers like to splice the linings of the "Cs" right into the blocks, the ends being trimmed to a "V" and fitted into a slot cut into the block to receive it: This is a nicety that can be dispensed with here and we will fit our linings to butt right against the blocks: Bend the linings as you did the ribs and make them a nice fit to the ribs or you might distort the curves when you put the clamps on; spring type clothes pins are just right for this work: Glue and clamp the six linings in place leaving just about 1/32" above the top edge of the ribs for trim off later.

When the clamps are removed you can remove the rib frame from the form and fit the rest of the linings to the other edge: All excess wood must now be trimmed off flush with the edge of the ribs, being careful not to cut any of the ribs away: The excess wood of the blocks on the inside can also be cut away at this time to follow the inside curves of the frame.

The linings can now be trimmed to taper from the 3/32" thickness at the top edge of the ribs to zero thickness on the inside; this is done with a thin, sharp knife but you must watch the grain direction of the wood or it will split away; sometimes you will be cutting towards you, and others you will be cutting away from you: After going all around with the knife, go over the linings with a medium grade of sandpaper to finish them to a nice clean taper, don't make the mistake of leaving too much wood here, the purpose of the linings is to give the rib frame a certain amount of rigidity and to have a surface all around onto which to glue the top and back; finally the entire inside of the ribs is cleaned up and completely gone over with a fine grade of sandpaper: make a good job of the cleaning up; Everything should blend in together, the corner blocks after trimming should blend to the ribs and follow the curvature of the inside; the linings should blend to the ribs and fit nicely where they meet the blocks; the top and bottom blocks should be trimmed off nicely, the top one being left more or less square: That is just the corners removed and rounded off; the lower being made more crescent shaped: All this work being completed satisfactorily you can put the rib frame aside to await completion of the back and the belly.

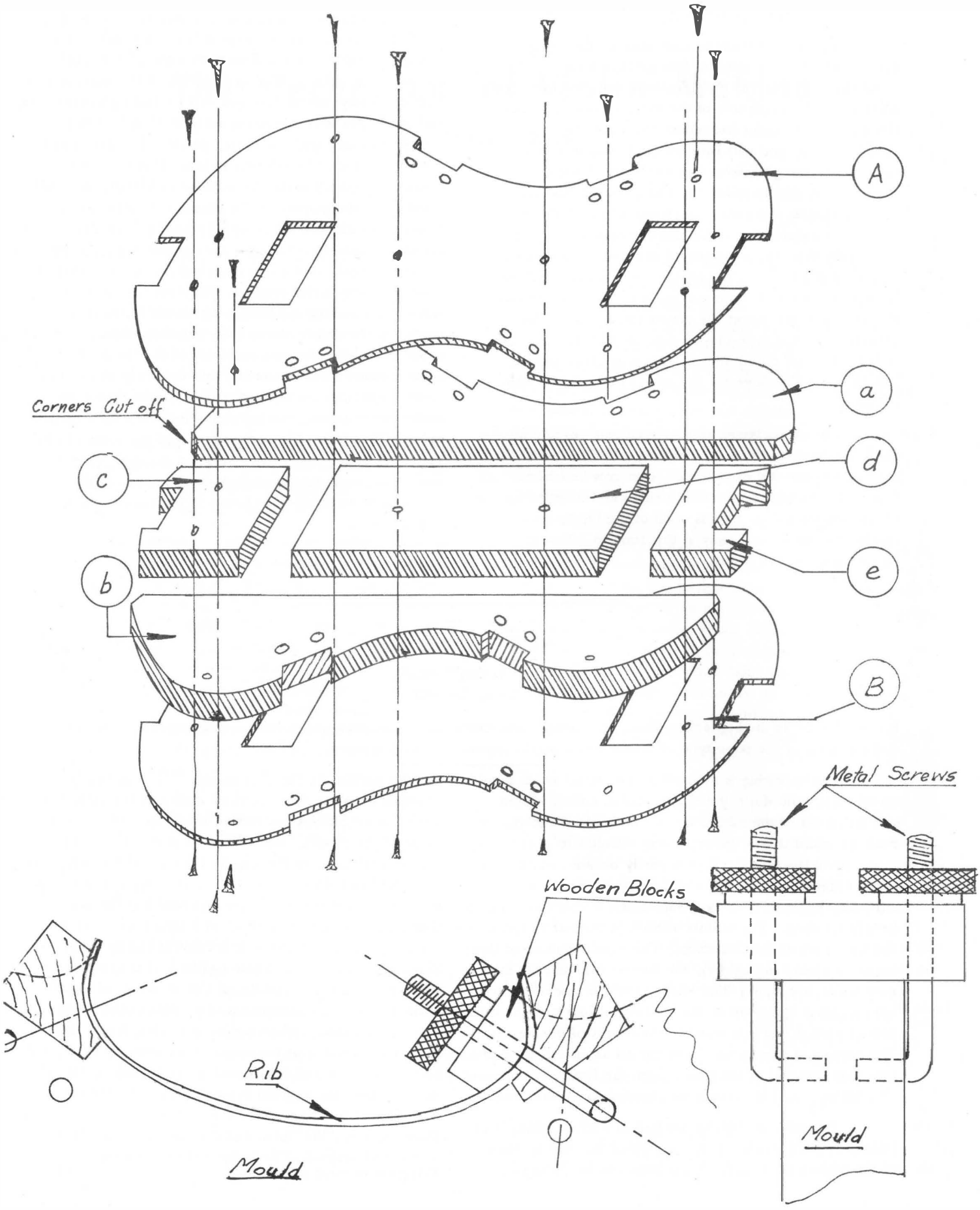
A HANDY VIOLIN MOULD

by Charles Vystrcil
Brisbane, Australia

Editor's Note: In the September issue, Mr. Harry Wake describes the building of a violin mould. Here is a slightly different version of the same type of mould which might appeal to some beginners. D. W.

The following is a drawing of a mould which should be of great value for any amateur violin maker. Often ribs taken out of the mould are in a short time distorted to such an extent that it becomes very difficult to glue them perfectly to the plates. This is partly because an amateur is not able to finish a violin in 2 weeks as a professional can, who works on it daily. Sometimes a year passes before he can finish it. The middle section of the mould left inside the ribs prevents the distortion. The mould consists of three major sections, the top (A), the bottom (B), and the middle sections (a, b, c, d, e.) The whole mould is assembled and held together by means of wood screws. (Note that the thickness of parts A and B is equal to the height of the linings. The corners of parts a and b are cut off as shown, to facilitate easy removal of the mould from the finished instrument.) The entire mould is made from plywood to prevent warping.

The outline of the procedure of violin making is as follows: The blocks are fitted and glued into the recesses of the assembled mould. These then can be trimmed and the middle rib fitted as shown. The ribs can be clamped to the corner blocks by means of specially designed screw clamps and blocks which are rounded to the shape of the mould. Now the other side of the corner blocks is trimmed to the required shape and the rest of the ribs glued in the same manner. When dry, the top A and the bottom B of the mould are removed and the lining is then fitted and glued in either as a continuous strip as in the guitar or in sections as it is conventionally done. When the back is completely finished, it is glued on the ribs. (Note that the middle section of the mould still remains within the instrument to prevent distortion of the shape of the ribs.) When the belly is completely finished, the middle section of the mould is removed by taking out sections c, d, e and then a and b. (This can be easily done by inserting a chisel between the block and the mould.) At this stage the inside of the instrument can be finished, i.e., the lining and the insides of the blocks rounded as desired. The belly is then glued on.
(Diagram on next page.)


A
a
Corners Cut off
c
d
b
e
B
Metal Screws
Wooden Blocks
Rib
Mould
Mould

The String Section

Conducted by
CARMEN WHITE

"Good tools do good work." In no phase of art is this statement more true than in the playing of the stringed instruments. We have seen how important it is for young students to have good instruments in the very beginning. It is even more important that advanced players and artists have fine instruments. In these days, we all hear fine music by great artists played to us by recordings, by radio and by television. So, it is not enough today to merely play well--to be heard and appreciated, the advanced player and artist must play better than ever before; not only must he play better, but his tone and sound must actually be as fine as the top artists, as he will certainly be compared with them. Of course, this means he must obtain the finest possible instrument within his financial ability, as beautiful tone demands a fine instrument.

Recently, one of our finest concert violinists had just given a great performance of the Bruch Concerto for violin. A charming lady with a radiant personality, she readily presented for my admiration her Joseph Guarnarius del Jesu violin, dated 1743. With this problem of instrument selection in my mind, I asked her how she happened to select that particular violin. Her reply startled me indeed. She said she did not really select it herself, but that she obtained several fine concert violins and took them to Carnegie Hall in New York along with several artists and musicians whose word she trusted. There, she played these violins for these critical judges, one after the other, and she stated that every time she played this particular Guarnarius violin, all the critics unanimously agreed that "This is IT." So, thus, she chose her concert violin! We could learn much from this procedure. There is one important point here, and that is, the trials must be held in an auditorium. She was quite insistent on this point. In fact, when I presented two new violins for her to play in her hotel room, she played them but remarked that no one could tell about them without going to the auditorium, and would we please adjourn immediately to the hall? So, by her graciousness, she accompanied us to the concert hall at three o'clock in the afternoon on the day of the concert, along with her Guarnarius del Jesu violin--all to try new violins! After playing these new violins in the hall, along with her del Jesu violin, and after going back and listening to them all, she did not hesitate to render her verdict in the manner of one who knows what she is talking about--and it was much more favorable than this writer had dared expect.

Now, we will turn to another example to show the other side of this picture--and this second example is all too common among us--we are all familiar with it. For the reader's information, it should be explained that the two new violins mentioned above are different--one is a Guarnarius del Jesu model, and the other a Stradivarius model. They are quite different in tonal character, but both sounded fine in the hall. These same two violins were taken into the studio of a fine player who is also a teacher. He aspires to be a great soloist and some day he may do so. He played a couple of passages on the Stradivarius model and immediately said that something in the violin was keeping the tone from coming out--that something was radically wrong with the fiddle. He had not touched the G string at all, and had barely played on the E string! Then, he played the Guarnarius model, and immediately admired it very much. Total playing time, about two minutes! And in the studio at that! Then, he played a violin which he had "on trial" by a good second class Italian maker, which sounded rather indifferent. Actually, in the studio, he sounded better on the Stradivarius model than he did on either of the other two violins-but he immediately discarded that particular fiddle! I asked him how he arrived at such a conclusion and he stated that he never could play a Stradivarius violin, that he had several offered to him, but could not play them at all. My reason for asking him this question was the fact that he actually sounded better to me there in the studio on the Stradivarius model than he did on his own indifferent Italian violin, and also the tonal result of the Stradivarius model was better to me, the listener, than was his tonal result on the Guarnarius model, which he liked so much.

To continue this story: the same two new violins were taken to another artist who owns and plays a famous

famous Guarnarius del Jesu violin. Surely, I thought, he would prefer my Guarnarius del Jesu model! But not so--he played the first movement of the Spanish Symphony on the Strad. model and pronounced it "even, beautiful, and ringing like a bell"--it was his choice! So, you see, two prominent artists disagreed on these two violins within one hour! But the point I wish tomake is the manner in which decisions were reached! It takes more than one or two passages from a sonata to determine, even in a studio, whether a violin is good or not. And the player himself can be mistaken, in spite of the fact he thinks he "knows it all", as some do. Had I told the first player mentioned above that he sounded better on the Strad. model than on his own violin, he would have thought me a foolish and presumptuous person indeed--but it is my considered judgment based on thirty odd years experience in listening to instruments that he DID, and that he would be better off with a Stradivarius type violin, as that suits his style of playing--his bowing is much too light and weightless for a good Guarnarius type instrument--he would sing on a Strad!

So, you see, we have described two approaches to choosing violins for the artist--one artist takes several fine violins to the hall with a jury of selected listeners and critics rather than make the selection herself--with an unquestionable result--a beautiful choice! Another jumps from one violin to the other, always seeking something miraculous, never satisfied, and never really testing any violin fully! The latter may end up with a second rate but high priced old violin which may not sound so fine to the listener, but which may satisfy him under his left ear. In this manner, damage may be done to an otherwise promising career.

Last spring, I reported on a promising young student who was practising diligently on an inferior old violin which he had "inherited" from an aunt--under the delusion that it was a superior instrument. At that time, I predicted that he would give up the violin on account of this poor instrument. Recently, I discovered that he has indeed given up the violin and is now studying to be a public school music graduate! So, another really talented and promising young violinist has been lost to us because of a poor fiddle!

Other examples come to mind to show how a string player is at the mercy of his instrument in competitions. Our orchestral competitions were held again this year in which young artists competed for a substantial cash prize and an appearance with the symphony orchestra. Out of 23 entrants, only four string players appeared, three cellists and one violinist. One of these cellists was a really talented boy who played the Boccherini Concerto in a masterly manner, but since his cello was so weak and poor, he did not even get into the finals with his good playing. The cello, strung of course, with metal strings, sounded as if it were half full of cotton! The lower register was practically non-existent in the auditorium--it simply could not be heard at all. How discouraged this boy must be today--he knows he played well, as indeed he did, but instead of realizing where the fault lies, he probably thinks the contest was unfair. All he needed was a good instrument!

The one violinist was a talented girl and played well. Her violin was a new one of the raw-wood and gum-varnish variety and one of my violinist friends told me how she had been rehearsing at his home and he said the violin and playing were wonderful and that surely she would win the contest! The playing was fine indeed, but the violin sounded so weak and dry in the hall that my friend who sat in front of me just sat and shook his head! I asked him afterward what he thought, and he told me that he liked the fiddle in his home, but that he did not like it in the hall--we both felt frustrated indeed. I then prevailed on him to lend her his Cappa violin for the evening finals, as the judges had reluctantly admitted her into the final competition because she was the only violinist who entered. She played the Cappa violin in the evening performance and made a fine impression despite the fact that she only had a few hours to get used to it--she did not even sound like the same player! What made the difference? The good violin, of course! The violinist did not win the contest, but she might have done so had she chosen her violin with more care. In the last issue, I warned against the practice of allowing the teacher to make the selection of the instrument. To those who think I may have been too severe in this matter, let me point out that this violin was selected and approved by the girl's teacher and that he had allowed her to play this poor weak violin for four years! He still thinks it is a fine violin, as he had no financial interest in her getting it--it was given to her by the maker, which puts her under obligation to play it. But her teacher did not warn her or disapprove and so she spent more than three years of hard work on this poor fiddle.

A final word--beware of "inherited" and otherwise free instruments. A few violin makers give new instruments to teachers and students in the hope that sales may follow. I would never accept such an instrument as a gift, as that would put me under obligation to use and play that maker's instruments, and to recommend them to my friends. More satisfaction will follow if the player tests his violin as recommended in the last issue and if he chooses the best of what is available to him, regardless of whether the instrument is new or old and regardless of who made it. Let tone and performance in the hall be the test! And having made a choice, pay the maker or dealer a fair price for it. In this way, you are under no obligation and if you see fit to change later, you may do so without hurting anybody's feelings.

(String Section continued on page 27.)

. . . . . .

The four "first chairs" of the Portland Symphony are here seen with instruments made by one of our associate members, Dr. Dan N. Steffanoff. Tonal quality of instruments was pronounced first class. The musicians are: Hugh Ewart and Carl Ottobrino, violins; Glenn Reeves, viola, and Roman Dukson, cello, while the maker stands in the rear. Further particulars in next issue.

"STEEL STRINGS, AGAIN!"

I would like to say a few words to Mr. Carmen White about steel strings. When I came to Australia I used gut strings too, because I also think that on violins etc. should not be used any others. But in this climate I was taught a lesson. They never lasted too long especially in orchestra playing. So I started to use steel strings.

Firstly, they last at least one year without changing the fine quality of tone they possess. Secondly, they are as soft and easy to play as gut strings and if you listen to two instruments strung with guts and steel strings you won't find any difference.

Charles Vystrcil,
Brisbane, Australia

A VISIT TO MITTENWALD

by Raymond Elgar
(Author of "Introduction to The Double Bass")

Two years ago I decided to visit Mittenwald, the original home of probably one third of the violin family of instruments in circulation throughout the world. The visit was well worth while as I have brought away many memories of this most friendly village and no doubt some readers will find my recollections interesting.

My journey was by air to Munich and thence a two hour train ride through most pleasant scenery as slowly the flat land merged into the mountains in which this village is situated. On arrival my first call was at the Hotel Post to arrange my accommodation, this delightful Hotel in the main street catered excellently, the food was first class and the bedroom looked out upon the Karwendel Mountain which dominates the village. The country air was very fresh and clean and everything was spotless. I soon made my way out to commence explorations and my first call was to the Church almost opposite the Hotel with the sculpture of Matthias Klotz fronting the ediface, the church has a gallery for the orchestra and amongst the instruments here was a fine double bass. Further explorations along the main street revealed the violin shop of Geigenboumeister Johann Reiter who emerged from the masses of instruments hanging from the ceiling and on view heaped together on all sides, he spends most of the summer time showing his premises to the very many visitors who call, for Mittenwald is a favourite halting place for coach tours for their refreshment break. Next, to the only other violin establishment on the main street, where the proprietors have established a museum with many examples of local skill. Directly a small party are assembled a conducted tour is made of the rooms and violins in all sizes and stages of manufacture are exhibited with a description of the work involved. There are also many of the old local makers violins on view, with accent on the Klotz family. This completes what can be termed the tourists attractions and the eager enthusiast must travel to the outer parts to find the real makers and the heart of the industry. The dominating premises is the large factory with some 200 workers; from here all possible requirements are available from wood of 100 years age to every conceivable accessory including reproductions of master instruments and imitations of accessories such as are usually only associated with certain top establishments. Amongst the makers employed in the premises is F. G. Pfretzschner, master-bowmaker and a descendant of this famous family.

In the older part of the village are many half timbered houses, their outside walls beautifully decorated, the paintwork remaining immaculate for very many years due to the clean atmosphere. The violin makers hang up their instruments in the windows to dry the varnish.

Next of importance is the Violin school which has pupils of all nationalities there. The terms are about 5/- a month plus accommodation which has to be found. This is quite easy in the wintertime, but not in the summer due to the tourists wanting the hotels. The course is about three years after which time the student returns for the examination, students are first taught to make the bodies and afterwards the necks, later a complete violin, and finally they are taught varnishing. The teachers are the leading makers in the village and a point of interest is that every instrument made at the school is sold immediately, due to the high standard of work.

The double bass maker has his premises situated adjacent to the shop where the wood is steam pressed and laminated for the ply type construction, here are employed several assemblers and finishers, also there is a smaller output of completely hand made instruments of exceptional quality.

One of the most interesting makers specialises in miniature instruments all made on traditional lines, the work is of the very highest order. See illustration of Double Bass below. He is assisted by his sister but regrets that due to the eye strain involved he will soon have to return to full size instrument making again. He also makes up a set of 20 separate items all mounted showing all of the stages of violin construction in miniature. He is one of the principal instructors at the school and his words of advice included--a ripple in the grain of table wood is very good for tone, but bad if in the maple back, also cutting the

soundholes wide at the nicks is not good for tone.

There is only one bowmaker in Mittenwald working from his home, also a house of tone wood merchanting with a fine stock of the very best material.

A trip on the chair-lift takes the visitor to the top of the ski runs and all around are the famous straight and true pine trees on the slopes. I cut short my visit to Innsbruck and returned for two more days to Mittenwald which I finally left with much regret. One tip however, apart from the hotel principals there are very few English speaking residents and a knowledge of the local language is very handy. A visit to Mittenwald makes a wonderful holiday.....

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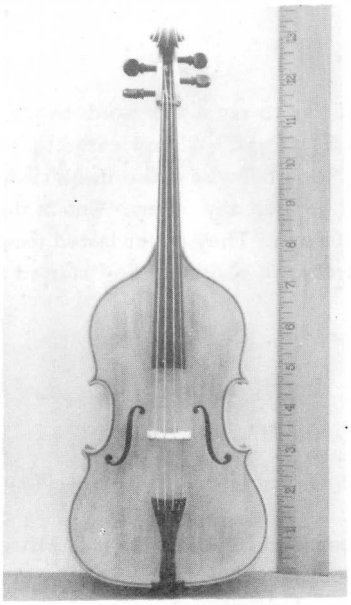


Miniature Double Bass

THE "LUTHERIER" CEASES PUBLICATION

Many violin makers will regret to hear that a most enterprizing magazine has ceased publication. The editor of "The Lutherier", Dr. Nicholas, has worked hard in the interests of violin makers, especially from a scientific angle. Having the editor and secretary living in different countries has added to the many difficulties of operating a magazine to a minority group such as violin makers are.

All makers will thank Dr. Nicholas for his efforts. The editor of The Violin Makers Journal has asked him to write for us as often as possible so that his investigations will not be lost to his many admirers. The following is his first contribution.

When the Violin is Made by your Own Hands

by N. Nicholas

This is a short excursion into the ethical side of our craft. Several times we have been discussing the question when a maker of instruments can say that it is his own work. In all debatable questions it is most important to define the postulates on which to base the following deductions. If the postulages are agreed upon, then deductions can be argued from the logical point of view.

Shall we agree then that: (1) the tonality of a musical instrument is of paramount importance; (2) the parts of an instrument which are responsible for the tone are most essential; (3) any accessory not related to the tone production has no importance; (4) the quality of the tone does not come into discussion.

If we agree to these four points we can proceed with an examination of an instrument, say a fiddle. A luthier can call it his own work if he has made a belly and back, bent and assembled the ribs, and glued the sound box together. The neck came in too, but here we have a snag. The old masters have their necks changed as well as the finger boards. Do they lose the claim that it is "All my own work"?

If they do not, then anyone who has bought and fitted these two parts already made cannot be turned down in his claim. It is the custom to attach great importance to the shape of the scroll and to its individuality. But it is only from the aesthetic point of view. From the point of view of tonality the scroll has no importance. If one has bought an already cut scroll but fitted and finished the neck, logically speaking he did not lose his right of claim.

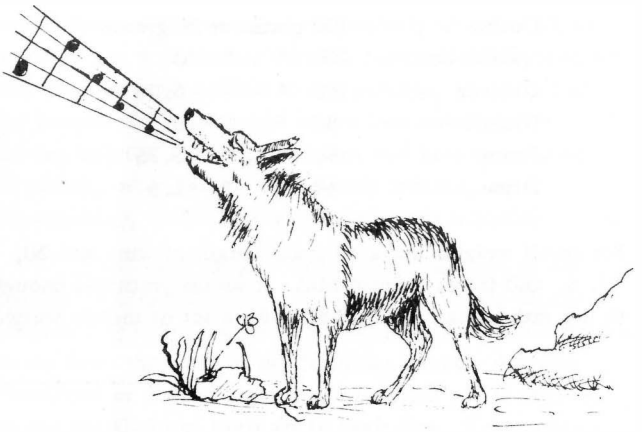
Finger boards are usually bought readymade, but we can argue whether they are essential or not. So are pegs and tail pieces. But when we come to the bridge, then we have to think again. It is essential for the tone, but no-one is bothered to make them now. The variety is so great that ability to choose and fit the right bridge may be considered as a skilful job.

Last but not least is the sound post. As nobody will make a fiddle without it then we take it for granted that it must be fitted by the maker.

In conclusion we may accept that any luthier who made a complete sound box and fitted the neck, finger board and bridge, can call the violin his own work.

Wolf Notes

by The Editor



Christmas Mail

First off I must thank the scores of Readers who contributed to the overwhelming shower of Christmas Greetings which descended upon me over the Festive Season. It will be impossible for me to acknowledge them all, so please accept my sincere thanks for such thoughtfulness. These things make my work light indeed!

The "Old" Violinist

A couple of issues ago I suggested that if any of you owned any old copies of the now defunct magazine "The Violinist", I would be very pleased to receive them on loan. It was only a matter of days before I received word from one of our B. C. readers advising that he would be glad to present to our Association a complete set back to around 1920, and some as far back of 1917! His name--Mr. Albert Blaney--I would like to take this opportunity of publicly thanking Mr. Blaney for such a useful gift. I have not found time as yet but in the near future I will go through them and give you the highlights of this very lively magazine.

Membership Certificates

Your Membership Certificates have arrived from the printers and are most attractive in appearance. Whether we can enclose them with this issue remains to be seen. Your name has to be filled in and the certificate signed by the President and Secretary which will take time. We will do our best. I do hope you will all frame it and hang it in your workshop--good advertising for you and for your association--I would suggest a frame about 1 inch larger than the certificate, that's how I did mine.

Mr. Leo Larrson of San Francisco has suggested that we use some kind of stamp or sticker, presenting one for each year that you have been a member of our group. We hope to work out some variation of this suggestion in the near future. Thanks, Leo, for the idea!

Violin Varnish

Remember about a year ago I remarked that "Great minds think alike"? That the majority of letters I received at a certain time would be on one certain subject? Well, in this issue, it's varnish! It now only remains for the "Subject" of these controversies to give us his viewpoint to make the argument complete. I hope Mr. Joseph Michelman will respond and do a little "summing up" for us. "Pretty please" Mr. Michelman!

New Advertiser

We are more than pleased to welcome "Kaplan Strings" to our advertising circle. Those of you who favour gut strings and have not tried "Yellow Spiral" Kaplan strings are in for a treat should you purchase them. Isaac Stern uses Kaplan strings, so what more do you want?

Harry Wake's Purfler

My main Christmas present this year was one of Mr. Harry Wake's Router and Purfling Machines! This from my family and partly from my fine friend Harry Wake himself. I have only had time to "play around" with it so far, so will give a full report later. I must say, however, that the one back plate I worked on, has the most perfect purfling trench I have ever made, clean cut and even and I managed to get almost completely into the four corners! This machine is going to save me hours of work.

In this issue Harry introduces his "Sensational" Bending Iron. These two machines will make a happy combination. If you think we should not use some mechanical help in our violin building, read what Dr. Nicholas says in his article in these pages.

Weights for "Smiley's" Scales

Here is part of a letter from Mr. Wendell Pratt, Concord, New Hampshire, quote:

"Smiley's last supplement on scales brought to mind an article I saw in the Popular Science Magazine a while ago which showed how to make a set of scales to measure chemicals and suggested using U. S. coins for accurate weights:

Dollar	400	grains	or 26	grams
Half dollar	200	"	" 13	"
Quarter	100	"	" 6.5	"
Nickel	80	"	" 5	"
Penny	50	"	" 3.25	"
Dime	40	"	" 2.5	"

For small weights cut a 40 grain length of wire into 20, 10, 5, and (five) 1-grain bits. It seems practical enough to use rather than paying $5.00 for a set of metric weights.

I made a set of scales last winter. Smiley's measurements of Strad instruments seems very intriguing. I stepped around Reid's and Fraser's mould outline, and got just 100 cm. and am going to borrow a planimeter from the office which measures irregular areas to the 1/100 sq. inch and check some diaphram areas too.

* * * * * * * * * *

VIOLIN PRIMING

by Harry Clare

Part 2.

The evidence I have gathered to verify or substantiate the strong opinion I now hold and am writing of, lies chiefly but strangely enough it may seem to most readers, not in seeing what is left of the original varnish, which is often practically intact even on an old master, but a close scrutiny of what remains where this varnish in parts, has evidently now been well worn down to the wood, showing what is often spoken of as an indefinable and mysterious something still left at the wood surface level, which I myself have now no hesitation in declaring to be no more or less than the original priming or sizing that master articles used in the first place before the varnish, and, as said before, to prevent absorption into the wood and thereby definitely ensuring the unstultified tone one expects from these famous and now much sought after instruments.

An allusion to the last paragraph, raises a point regarding this unavoidable wearing away of the varnish down to the surface of the wood, having gradually been brought about by centuries of usage, the vast amount of handling done coincidentally over the same period, and others, by no means virtuosi;--the dealers, the fiddle collecting fraternity, besides the ever growing multitude of curiosity mongers: briefly, all individuals involved in this quite unintentional denuding of various parts of these Italian products, have not really done a disservice by doing so in regard to our subject, but quite to the contrary, have materially aided, in no small measure, by now allowing us as far as seems possible, to closely examine these apparently naked surfaces, thus helping us to acquire the knowledge sought after. I now contend that had not this disappearance of varnish taken place, we should perhaps for ever, have remained without the smallest vestige of a clue as to how they achieved making such superlative instruments, leaving nothing to be desired in respect of both tone and appearance.

"A thing of beauty is a joy forever" wrote Keats, which saying applies very aptly and collaterally with the observations I have already made, and with the deep conviction I now hold and wish to bring forward before my readers, which is that I have a rock-firm belief that th these famous old fiddle-makers of Italy had a two-fold objective in their priming preparations, namely, that the final appearance of their art works when fully varnished, in addition to the preservation of their pre-eminent quality of tone.

In an endeavour to illustrate my last assertion of this dual-purpose aim of their sizing, I propose to make a comparison which will assist me considerably, and also help to create in the reader's mind a mental picture of the procedures I shall adopt to express myself as lucidly and concisely as possible.

To start with then, let us take say, a copy of a Strad pattern violin, the maker himself being present with us, having just emerged from his work-shop. He proudly exhibits to us his first effort at construction, which of course is still "in the white". We see at a glance it has evidently been fairly decently made, considered as a first attempt. We note that due attention has been given to his selection of woods, measurements fairly correct, surfaces well finished and smoothed, and the various parts all agreeing nicely one with the other, and before making our departure, fittingly congratulate him on the success he has so far achieved, promising to return when he has decided to start varnishing his fiddle tomorrow.

On our return to his work-shop, we find alas, that he has, during our absence, conceived an idea to save time and expense in purchasing coloured varnish, to finish his work, by staining, and forthwith commences to stain his instrument, likely enough thinking that after the staining job is finished, on which he is now engaged, a coat

or two of clean varnish will suffice to give his violin the good appearance he expects it to finally have, instead of which, he finds to his utter chagrin that try as he will, he cannot possibly distribute this stain evenly over all the surfaces that require covering, and has perforce to carry on adding here and there a little more stain, hoping to level up to uniformity in depth of colour, such parts that have been under or overdone as the case may be, which of course is next to if not quite impossible.

Nevertheless, he goes on now to begin his varnishing, and proceeds to give the instrument a good lavish coat of his clear varnish, which we as lookers-on, consider far too heavy, and being oil varnish will consequently take up much time in drying properly, and before leaving him in about a quarter of an hour hence, we perceive that the varnish he so generously applied but a few minutes ago, has already begun to sink into his pine bellywood, but does he stay his varnishing? Not he!! On goes another coat tomorrow, long before the first coat is thoroughly dry, and as regards the front of the fiddle or belly with the same result, slow disappearance of his varnish, still further clogging his pine-wood. What can such a workman expect now, when his work is finally finished after still more varnish thus applied, with regard to both its tone and appearance, he finds that through his indiscrimination or lack of knowledge in this last part of his work, which should have been its crowning glory is a most disappointing failure for him, caused undoubtedly by the unpreparedness of the wood, being un-primed.

However, not being too greatly discouraged by this, his first attempt at violin making, our workman makes a second effort later, and like his previous violin he has succeeded equally well with all his woodwork, and has now reached the varnishing stage, but no stain of any kind for him this time; no thank you! he is going to use an oil varnish to begin with, a coloured one, and continue with this until his handiwork is completed, allowing each coat to dry more thoroughly than he did with his first fiddle. So all his surfaces being nicely smoothed and ready, on goes his first coat, which when dry is followed by another and as before, very soon sucked into the belly-wood like a sponge, coat after coat being applied in the same manner, until he decides that having put on enough to show a good shiny surface, and with the depth of colour aimed at, together with a good substantial body of varnish, most likely overdone, he is satisfied that this time at any rate, all is well finished, totally oblivious or ignorant of the fact that the varnish he has been using, being coloured, has also acted almost as a stain too; no sizing having been applied beforehand, consequently absorption, thus being unchecked has been allowed free access to the soft spongy parts of the pinewood belly and between the grain and threads, having drunk in the bulk of the varnish, now show up darker, where they should be lighter, and conversely, the grain threads, contrary to what they should, now stand out lighter where they should be darker; the "natural" appearance of the wood now is entirely obliterated; to sum up, not a jot better than his previous effort, and for the same reason needless to say perhaps, no "priming"; for besides the appearance of the two instruments having been so spoiled, it is also woe betide the tone of either, after being so grievously treated, ever approaching, much less attaining to full maturity of tone.

I will now resume with the second part of my comparison or illustration as at first suggested, for which purpose I again return to an example of one of the masher-works from the hand of say Nicholas Amati, Antonio Stradivari or Carlo Bergonzi to name but a few of those in the top flight of their art in their day. From any of this famous trio named above, a specimen from any one of these most able craftsmen, would show that their magnificent productions exhibit the scrupulous and infinite care taken in the final finishing of their art-works, the studious attention and research given to the subject I now wrote of is far too clearly obvious to be ignored, no evidence whatsoever in any of the products of the above men, of a choking up of their belly-wood with varnish or any description of "filler"; the tone of these instruments, in the first place, and after centuries of use let us not forget, is abundant proof of this aspect, and secondly, not the slightest indication of disfigurement here; caused by the unsightly staining brought about by erroneously beginning their task with coloured varnish, but instead, we see the grain threads of their pine wood belly actually enhanced, showing up to the very best advantage, as clearly as though looked at through a perfectly clean, transparent piece of coloured glass, its "natural" appearance, if anything now more strongly pronounced to the eye, as though the wood was still "in the white", but with a beautifully coloured, and highly polished transparent surface added. All of which comparison I have now made is in absolute contradistinction to the two fiddles I introduced in the first part of my illustration, and fully commented upon, and coincidental with this second part of my comparison, and which I sincerely hope, has not been beyond the powers of the reader to fully comprehend or understand.

Before bringing this rather lengthy essay of mine to a close, I wish to tell my readers of a recollection of mine, which is a quotation from a long-past issue of that well known London journal "The Strad".

In several previous issues of that magazine, before the particular issue I desire to refer to, the old subject of violin varnish had been discussed and debated upon for month after month. Views, opinions, contentions and counter-contentions were put forward by correspondents and other contributors, only very often to be ridiculed, hotly contested, and disputed but rarely agreed with in the following issue of the paper, by someone or other

Challengers and retaliations in the controversy by the various participants seemed to me would go on endlessly, until my reading was abruptly halted by a statement by one who had occasionally taken part in the foregoing Contest--a Mr. Lowry Piper.

I cannot now remember exactly his actual words, but I distinctly recall to mind what they implied, being a subject connected very closely with what I myself was studying at the time, roughtly 50 years ago. The above gentleman I may say at once, always gave me the impression he was very knowledgeably informed. I do not know if he was an actual violin-maker, but he was undoubtedly highly esteemed as a writer on fiddle matters, by "Strad" readers especially at that time now so long ago, but to come to the point, as near as I can remember his words were: "Violin varnish should look well, without doing any harm" with which I heartily agreed and still do.

This article of mind is not of course one on violin varnish, but a subject apart, yet admittedly in very close alliance with it, as I have endeavoured to show, but the short sentence of Mr. Piper I have just quoted, contains in those nine words the whole essence and substance of what I have been writing, and now I leave the reader to judge for himself, after reading all I have written, namely:-whether it is really a question of the varnish doing harm, meaning of course tonal injury, which I am certain is implied by Mr. Piper, or, the total absence of what should have been applied before the varnish.

END

As promised I now give the formula or recipe for the liquid "Priming" preparation mentioned in the article.

Priming Formula

The utensils required in its compounding are few and simple and easily obtained; as follows: Two well cleansed half-pint bottles, white glass preferred, a medium sized plastic or glass funnel, three or four pieces of fine linen (for filtering) about 5 or 6 inches square. The solvent: one gill (1/4 pint) spirits of wine, (if procurable), if not, one gill methylated spirit. The ingredient resins (weight in avoirdupois), 1/2 ounce of sandarach , 1/4 oz. benzoin, 1/4 oz. gum mastic, to be dissolved in the order written as follows: One bottle contains the spirit, into which put the sandarach, shake occasionally until thoroughly dissolved. Keep bottle tightly corked as much as possible during mixing to prevent evaporation of spirit. When thoroughly dissolved (the sandarach) about 4 days hence, reduce the benzoin to small pieces by crushing, then add to the mixture to dissolve as before; when so dissolved, the first filtering will be necessary to partially remove the muddy residue left by the benzoin.

Proceed as follows: Into the mouth of the funnel place a piece of the linen, and press the material downwards so as to completely cover (inside) the outlet spout, now insert the funnel spout into the second bottle, into the funnel (with linen) gently pour out the contents of the first bottle; when thus transferred add the gum mastic which in turn is dissolved. Now thoroughly clean out the first bottle used, with a small amount of spare methylated spirit, now when the mixture is all ready and appears to be completely fluid, transfer again to bottle one, filtering as before through linen via the funnel, a further filtering into bottle two through blotting paper this time, will be found very advantageous, though slower in transference, but will more effectively rid the liquid of turbidity. A try-out on a spare piece of pine wood or spruce, sufficiently smoothed in surface can now be recommended, applied with a flat 1/2 inch hog-hair brush of good quality, which tool will also serve in the more serious work of priming and varnishing of an instrument. Concerning which latter operation I now give my method of working, which will be found to present no difficulties whatever to the operator.

When the fiddle is finally finished "in the white" we begin, let it be thoroughly understood at the outset, on our pine or spruce belly wood only. To this portion of our violin viola or 'cello we give it its first coat, or "size" but in the case of a 'cello, we should want a larger brush, say an inch, we take a dip in the "priming size" and commence our work as though varnishing, spreading as evenly as possible over the whole belly, when this has been done put the fiddle aside for an hour or so (back downward) after which time has elapsed another coat of the "size" can be applied, and when completed again put aside. Along the grain threads will now most likely be found a slight shine, in the event of which all that is now required to effectually seal up the whole plate of wood and so prevent penetration by the varnish to be applied later, is usually one more coat of the "priming" thus connecting up each grain thread with its neighbour on each side of itself; which coat is now applied, and a still further coat may be applied if found necessary which will not do the slightest injury, but not forgetting to allow the previous coat to harden-up as much as possible. When all is dry, a slight rubbing down with the finest glass or sandpaper to smooth up what apparent roughness has been created by the priming will prepare the whole instrument to be ready to receive its first coat of CLEAR VARNISH, until by this varnish a perfect surface is established over the whole work. Then and only then should one commence colouring operations.

* * * * * * * *

SCIENCE FOR THE MAKER #5
Pr-Continued
 G. Smiley

Review--See S6 Table

We have performed resonance experiments on the corpus of the completed instruments and an intense cavity-resonance (Cr) has been identified and located in cps. (S1-10 and S24-25)
(It was mentioned Cr can be preset by measurement with a ruler.)

All the other resonances on the S6 Table were "lumped as Brs". Later it was pointed out that there is a Reverse-Series of cavity-resonances called the Gamma-Series: $\mathcal{J}'/1$, $\mathcal{J}'/4$, $\mathcal{J}'/8$... (S19, 20, 24, 25)

I did suggest that some resonances formerly classified as Body=Resonances (Brs) probably belonged in the cavity-series (S22). All of the resonances shown on the S6 table exist--about this there is no dispute. The classification problem can be settled in the laboratory.

Taptone questions were left suspended in midair. This, too, can be settled in the laboratory.

FREE-VIBRATION: An object (belly) is suddenly set into vibration by a blow. Shortly thereafter it vibrates freely by itself at its own natural frequencies.

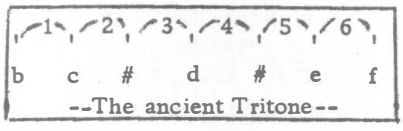
FORCED -VIBRATION: An object (belly) is forced into a continuous vibration at any desired frequency or frequencies. Many violin bellies have been studiedin this way. Their graphs have been made. What do the graphs show?

PLATE Resonances (Prs)

Using an electromagnetic-driver, a PLATE is "buzzed" across a wide frequency-spectrum by a pure-tone audio-generator. A microphone picks up the sound-output of the plate and this may be measured in decibels (db) with a meter and/or an oscilloscope.

Again we find an amazing array of peaks. If we confine our spectrum to 220-880cps, the sound-output of the plate shows a number of peaks which at first glance seem to show no orderly arrangement. Yet a closer look shows one or more pairs of peaks spaced at intervals a diminished-fifth apart. (S28 Spot-graph)

Let us confine our attention to the most intense such peak-pair in a thin-belly (65 grams) with peaks at b and f'. This is an interval of six semitones if you will look at your monochord.



--The ancient Tritone--

Half an octave = 6 semitones = 3 wholetones = the ancient TRITONE.
(See pages S13, S28)

Can one set about carving a plate to get such a pair of sound-output peaks any time he desires. Yes. If one has sufficient electronic equipment this is an easy matter.

The thickness of the resulting plate will depend on the characteristics of the piece of wood being used, and so will the final weight of the plate. ACCORDING TO THE WOOD! How often we have read that enigmatic statement.

But let us take another look. Make an 85 gram belly. Buzz it and make a graph of its sound-output--and find a peak pair a diminished fifth apart (6 semitones=60 tenths apart). They will be found too high (too far to the right) on the graph. Now remove some more wood and the pair shifts to the left. Keep removing wood until the pair has shifted down to b and f'. (S13, S28)

Such a finished plate may weigh 72 grams--another may weigh 64 grams--BUT THEIR OUTPUT-PEAK RESONANCES ARE AT THE SAME LOCATION. Why? Ask the wood!

Thick in the center and thin at the edges? Thickness the same all over? Thin in the center and thick at the edges? (I have a preference but it is not relevant to the following.) Take your pick! You can still make the belly-Prs come at b & f' if you wish. You can also make your back-Pr come at d' (this is a diminished third from each of the belly-pair, ie half a tritone or 3 semitones = 30 tenths.).

If you make your plates that way you will find that they follow the prescription on the spec-sheet, S13. There are also other good plate-prescriptions, but wouldn't you like to fill just one prescription and be sure you had done it?

Before we go into how you can do it, let us look at the

Epitaph of a Pot

A battered fiddle was taken in trade by a dealer and presented to me for experimental purposes. Originally a factory job--it had been regraduated by a Missouri Maker. He had taptoned: belly - c'256; back = c'256. The legend is there in his handwriting. (Note: Cr was not 256cps--nor even near it.)

Using electronic tests (and also my tuner) this is what I found.....

POT	BELLY	BACK
Weight	85 grams	122 grams
Prs	g' & d'' flat	a'

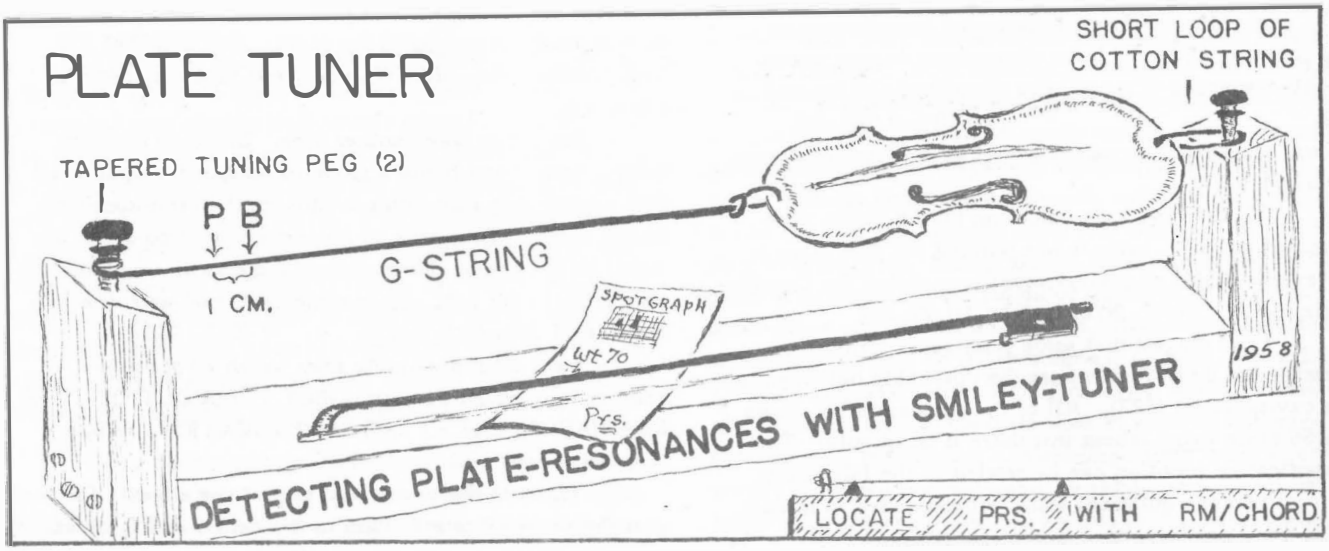
A number of makers have taptoned those plates--obtaining a variety of frequencies--all different from any of the above. This is what is meant by taptone-confusion or pitch confusion.

Now that fiddle could not be said to be a complete failure, for in its dismembered state it has served a very useful life. Fortunately it was too disreputable to tempt one to salvage it.

It had some interesting features. To make it look like a short-necked Strad, three nails had been placed in

the mortised neckblock. Also pen and ink had been used to draw out the corner-purfling in the "proper" manner. "However the graduation was not even.... it was bumpy.)

FORTUNATELY the "brad awl holes" had been made in the belly--and they had not been pegged with wood.



SMILEY TUNER: Wood frame is made from a stock 2x4 as shown. Construction-time 10 minutes. Tiny holes are drilled in plates at the purfling to take the strings (back-holes to be pegged in the long-abandoned ancient-tradition; belly-mortises take care of the top). Place tuner on a stool.

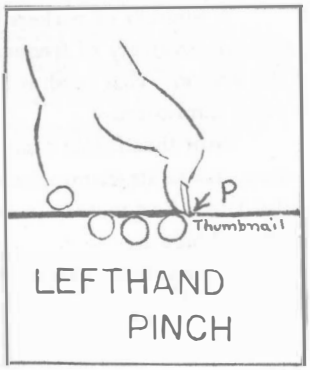
METHOD: Tighten g-string until its pitch is about f. Pinch the g-string at P and (always) bow (B) about 1 cm to the right of the pinch. Bow downward--not horizontally. Slowly move pinch (P) to the right, bowing (B) in same manner and at same distance from the pinch (P).

RESULT: The sound-output from the plate is negligible and of poor quality until you detect a Pr--when the plate sings out loudly and musically. After you have detected a Pr, locate its pitch in cps by using the RM/chord.. Now keep moving pinch (P) up the string until you have detected and located the other Prs. Record them on a spot-graph as shown in the next column.

Work slowly as haste can make you miss a resonance. A Resonance (Pr) occurs at a POINT on the string. With a few minutes practice one can easily detect Prs in the 220-440 cps range.

FIND PRS: You are concerned with the two loudest resonances of the belly--which occur approximately a TRITONE apart (S27). The back, being thicker ordinarily puts out one loud resonance in the low range of 220-440 cps. See Spec-sheet (S13) & Spot-graph.

GRADUATION: Removal of tail-peg disconnects the plate, which has to be done many times during the graduating. Strings are left attached as they do not interfere with the wood-carving.



SOUND-ISOLATION: The short-loop of string isolates the plate from the wood-frame of the tuner. The left hand prevents sound transmission from g-string to wood-frame.

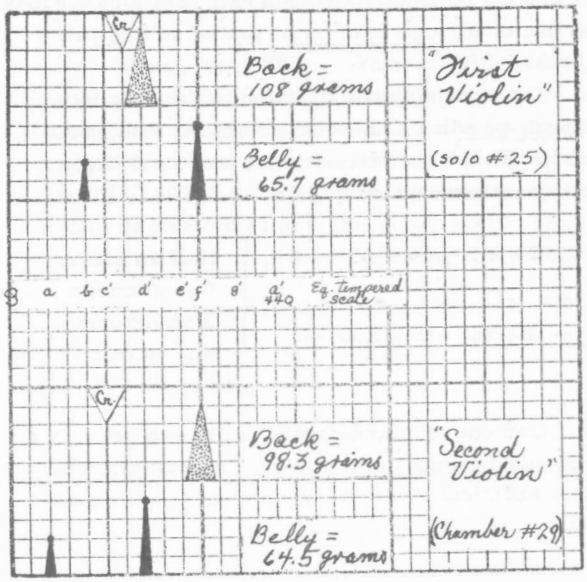
OBSERVATION: A study of the graphs of Strad's first-violins show Cr to be a TRITONE above the open g-string. His second-violins show Cr to be approximately a semitone lower. (Page S25: #2, #3, #6)

Was this good or bad???????????????

References listed below will be found on page S25.

In 1958 (#12) the Saunders-group published plate-resonances traces obtained by electronic-methods, which showed the cps of Plate-resonances, ie the Prs shown below by black peaks.

The spot-graphs show my simplification and reinterpretation of that work. Note: they did not publish the Crs



of the instruments for which they showed plate-resonance traces.

The white Cr peaks shown are my guesstimates based on a study (including experimental work in this lab) of the Stradgraphs (#1, #5, #6). #3 contains the first publication of the #6 graphs. Note: C. Hutchings built the #25 and #29 violins.

It has been possible to duplicate the tritone-pair of Prs in their first-violin here. Because of wood differences, my belly was heavier and the back lighter than their weights shown below. Resonance of my cavity (Cr) is as illustrated for the first-violin. Results excellent.

Prs. can be obtained more easily with the tuner than with the oscilloscope and/or meter method. Although I use both, checking tuner-method against electronic-method, others--using the tuner without my assistance--have detected and correctly located the Prs--consistently, and with no confusion of pitches.

Homework

All progressive makers who have seriously studied the series should own RCA Victor's EXPERIMENTAL RECORD LM-1922 titled "The Sounds of Music of the RCA Electronic Music Synthesizer". This record, released in 1955, contains an excellent short course in musical physics from the aural standpoint. It will train and sharpen your ears. Study this record and then review the science series from the beginning and you will find the going much easier. Content summary of the record:

THE PHYSICAL PROPERTIES OF MUSICAL TONES

I. Frequency--Pitch
II. Quality--Wave Shape--Acoustic Spectrum--Timbre
III. Growth, Duration and Decay--Time
IV. Intensity--Loudness
V. Portamento, Vibrato, and Deviation

Hear the synthetic instruments: violin, piano, orchestra, etc.!

Archive Section

The ancients knew quite a few things about controlling tone which are virtually unknown today. For example, if one compares the tone of the finest romantic and classical organs with that of the finest Baroque pipe organs, one is immediately struck with the greater charm of the earlier instruments. It would seem that the passage of time has not been synonymous with progress in "quality". One cannot fail to be struck with the superb "taste for sound" exhibited by the makers of the older organs. It has never been excelled.

If you would like to provide your ears with a most instructive aural treat with the bonus of a fine visual text, get the Columbia Masterworks Album by E. Powers Biggs titled "The Organ", DL 5288. He will conduct your ears and brain on an extensive organ tour of the periods mentioned. A real collector's item!

Another superb album (with highly informative brochure by R. D. Darrell, plus bibliography) is "Spotlight on Strings" Vox DL 320. Contained on the record is a Comparison of Violins, old and new.

Four violins--Nicolo Amati 1674, Giuseppi G.B. Guarnerius 1706, A. Stradivarius 1723, G. B. Haenel 1956--in turn play the test-piece Bandinage by Winternitz.

I have listed the instruments in chronological order rather than in the order of play on the record. Listen and see if you can identify the instruments correctly from the sound alone, without referring to the manual. If you do not know exactly what to listen for you have but one chance in 24 of naming all the instruments in correct playing order (have someone check your score against the manual so as not to spoil this as a test record for yourself). I did it on the first hearing but found many others could not. It was possible to verbalize "listening hints" which enabled even non-musicians to determine the correct order on the next replay. This should surprise no one who is accustomed to identifying voices instantly on the telephone.

Warning

The preceding are valuable aural records. They can easily be ruined by poor record playing equipment which can peel the fine tonal distinctions from the grooves!

Study the records by yourself when everyone is out of the house and everything is absolutely quiet--or you will miss much.

The Postponed Preface

Once upon a time lavish royal gifts were the product of artisans of great reputation--goldsmiths, jewelers, painters, and bowed instrument-makers. Consider the latter group.

Despite plentiful competition, but one Cremonese maker in the Baroque period enjoyed the distinction of being THE instrumentmaker of MANY kings. It is doubtful that Stradivarius achieved his contemporary continental importance solely because of the beauty of his varnish, form, and purfling. Certainly his competitors on Cultellar Street could match the visual aspect or facade of his fiddles--and at competitive prices. But how about the aural aspect? Let us speculate.....

Suppose that Stradivarius had studied the work and books of Leonardo, Praetorius, Mersenne, and the Galileos, and therefore knew more than other makers. Suppose also that he procured private tutelage in SOUND from Vincenzio Viviani. As a result, he could have possessed special secrets to enable him to make better-sounding violins--in several prescribed voicings.

Say that he knew how to set a cavity-resonance (Cr) at the exact pitch he desired, and also that he used efficient devices to tell him when the belly and back were suitably-mated with the requisite mismatch of the plate pitches (Prs).

Had he employed 50 fast-working apprentices he could have so "voiced" an entire day's output in a very short time in the evening after the shop was empty..a few minutes to take out the necessary wood to tune the plates precisely, and even less time to grind down the ribs to get the prescribed cavity-height. If an apprentice noticed SLIGHT changes in his work the next morning, he could not divine their significance.

Would it be "good business" to publicize effective tone-control technics that overnight could turn sons and apprentices into great competitors? Would such an eminent master need to provide his apprentices with more information than was supplied by other makers to their apprentices? Had he done so the simple technics and tools would immediately have become "common property" and there might be no need today for such a periodical as the Violin Makers Journal--and little need for such extended modern electronic study of fiddles. ... End of speculation.

There is no longer a single violin-factory in the States. A mere handful of makers in the Western Hemisphere attempt to eke out a partial living by making violins. Commercialization of the art no longer seems economically wise in this part of the globe. On this continent the serious interest in improving violinmaking is largely confined to amateurs. Although the basic structure of the violin has been standardized since the Baroque, and many craftsmen are capable of making accurate visual replicas of the masterworks, it has long been established that no visual replica had ever become an aural replica.

Recent electronic technics have made it possible to unriddle most of the problems in a long-baffling series of violin questions. It has finally been possible to "crack the curve" (ie. the graphs) of the sound-output of the violin. Although this knowledge is impressive--it is equally humbling, for most of the results in sound-quality can be easily controlled at the maker's bench with technics and equipment that could have existed in the Baroque era!

Science History Notes #5

An art is already highly developed before its first textbook is written. For examples see page S23. Observe in particular the dates of the following books. Schlick's 1511 book on organ. Praetorius on instruments, 1620. Mersenne's 1635 books on instruments. Galileo's 1638 work on acoustics and resonance (rizonanza).

Galileo Galilei 1564-1642

Because they were quicker to grasp a new idea, Galileo addressed the 17th century practical man rather than his local professorial peers. He usually wrote and spoke to him in his native Tuscan tongue rather than in the Latin of the learned.

His republic-supported public-lectures at Padua drew audiences of up to 2000. His name was known to all--his books were best-sellers, not only in Italy but all over Europe. They were quickly translated into Latin--and other languages including German, French, and English. Reports of his work were published as far as Peking, China.

He learned his mathematics from a practical man and enjoyed talking with artisans and applying science to their practical problems. He tutored Medici. He made himself a member of the Medician-stable of scholars--musicians, mathematicians, scientists.

Europe had long been enmeshed in a Medician rete. Thrones that were not sat by Medici received Medician-ambassadors. And wherever there were Medici, their sports--music, mathematics, science--were practiced and enthusiastically supported.

Galileo's words acknowledge his admiration of the pioneer scientific work of his English contemporary, Sir William Gilbert, who wrote De Magnete. Galileo corresponded with the greatest minds of his day--including, of course, Mersenne. Letters! Many still unpublished. In fact but a small portion of what he wrote has been put into English translation; and experts are still laboring over an Italian compilation of his works. It will be many years before these appear in English.

His was the era that saw the birth of the scientific-society whose members were the 17th century virtuosi--the "amateur" of that day. The contributions of the virtuosi were beginning to be published in what we now call scientific-journals. The work of the virtuosi was routinely frowned upon by the traditional-pedants, called Peripatetic Philosophers, of the Universities who "demolished" with "logic" ideas that had been proved by careful experiment, called dimostrazione by Galileo. The experimental scope of the virtuoso was broad--for it was not then fashionable to specialize in a single field.

The geometric-military-compass of Galileo and its text were very popular and he profited from the sale of thousands of these instruments. This combined proportional-divider and pocket-calculator was manufactured and used for at least two centuries after the death of Galileo, finally being supplanted by the slide-rule.

The 1606 text which accompanied the dividers was dedicated to the Medician Grand Duke he had tutored--Cosimo II. His 1638 book was dedicated to Cosimo's son and Ducal successor, Ferdinand II. (All of the sons of Cosimo II were tutored in science by Galileo.)

Galileo's telescopes were the envy of all courts. Although making them took time from study, he supplied them if he had received a go-ahead from his Grand Duke. In his writings he says he would not divulge the proper method of their manufacture to other than an authorized representative of his Grand Duke. (Note: Cosimo III, son of Ferdinand, was the Grand Duke for whom Stradivarius made the 1690 set of Tuscan instruments.)

By his own words, Galileo possessed many valuable secrets which were intentionally withheld from public knowledge via the lecture platform or printed page.

The Medici, originally merchants, were practical men who could see financial advantage in monopoly, and craft monopolies could be temporarily maintained if certain secrets were carefully guarded.

The continuation of Galileo's "paycheck" depended in great measure upon the fact that his secrets were financially valuable to his sponsors. He was careful to remind his sponsors of the fact when he was "angling for a raise". Such secrets were an asset that enhanced a man's bargaining power.

Misconceptions on the knowledge, education, communication facilities, and philosophy of the Baroque Period are prevalent. Their constant repetition acts as a deterrent to many who otherwise would "try to get at the facts". One can learn a great deal more about the knowledge and attitudes of the period by reading the words of the men who worked in the period itself. All statements to the contrary, there is much useful information to be gleaned from musty old tomes. A short bibliography is supplied for the preceding material--Galileo's words in English translation: (See next issue.)

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