

Violin Construction: The Top, Bassbar, and Soundpost

In ANSWER to a letter: "Can you furnish me with the name of a book or treatise on the making and adjustment of the bassbar and sound post of the violin? It seems that various makers have various ideas, and these ideas vary according to the thickness of the wood. Is there a scientific treatise on this subject from the standpoint of experienced violin makers?" We have had word from some of the prominent makers and experts in the United States.

Mr. John Friedrich of New York writes us that the very interesting book "Violin Making as It Was and Is" by Heron-Allen is a good authority on the subject, and will be found quite complete.

Mr. W. R. Ford says that it is extremely difficult to advise on the making and adjusting of bassbars and post, which work, if done properly, requires the attention of the man long trained in the art. He also mentions the Heron-Allen book.

Mr. John R. Dubbs writes that the best work on violin making and repairing is "Allen's" English publication "Violin Making as It Was and Is,"—a large volume, profusely illustrated, and should be in the hands of every violin maker, whether amateur or professional.

By Walter S. Goss

In the violin, as in all instruments played with a bow, it is necessary to have some support for the top, that the vibrations may be controlled, that the instrument can give out the best there is in it, evenness of scale, freedom of vibration, power and brilliancy. The question that arises in the mind of the adjuster is - how much support is needed for each individual instrument?

An author has written "that Stradivarius was quite content with the size of bar in general use during his lifetime there is no doubt, as there is no record or evidence of any experiments having been made by him; a fair argument that none were considered necessary; the instruments finished, the ordinary bar of the period was inserted".

All the masters of the Old Cremonese School did likewise. The more recent longer vibrating string length, more angle to the set of the neck, higher bridge, and the higher tone pitch adopted, brings more pressure on the entire instrument which must have more support. The question is how much support is needed. As the back cannot be strengthened it seems the bar must bear the added burden.

A scientific experimenter writes, "the 'pull' of the string is from the pegs to the rest over which the tail piece draws, giving a pressure of 25 lbs., the back taking 12 lbs., the bar 8 lbs., and the general construction 5 lbs. The weight of the bow, with pressure, of 1 lb., would make the bar bear about 9 lbs. The bar should follow the grain."

There is no doubt a "spring" is usually necessary, although a larger and longer bar seems all that is required in some cases where the modeling is favorable for such an arrangement. In a top of substantial thickness, a bar can be 'sprung in' with advantage. It should touch the top at the bridge line, and stand away at the ends 1/12" in a bar 10 1/2" or 11" long, a little less than 1/2" deep at centre, 10/64" at ends, with a thickness of a little less than 1/4" at centre, and tapering to 3/16" at ends, perfectly fitted, glued and clamped the whole length, and well finished.

There are many designs of bars, but the principle of support must be included in the calculations of the designers to meet with good success.

The measures given for the bar with a "spring" may be subject to slight variations; but noted makers including August Reichers of Berlin, J. B. Vuillaume of Paris, N. Lupot of Paris, and most

other successful masters worked on this principle and considered it sound. A bar with -too much "spring" will shorten the vibrations and not be satisfactory.

The Post should be long enough to steady the vibrations. It must be perfectly fitted to the top and back and not more than the thickness of the top behind the bridge. A very small change in position often makes a great improvement in tone and sometimes injures it. Atmospheric conditions effect the violin, and continued pressure on the back through the post has the effect of shortening the post, a condition that will usually right itself if the post was properly fitted when put in. All old violins will show a fullness on the outside of the back if looked for, caused by such pressure.

The advice of the late David Laurie to violin owners was , "Take your violin to a reliable man, and get it mounted and let the mountings alone. Just so surely as you begin altering this or that you alter the tone, and undo the work of some experienced man who knows his business." If you love your violin, follow this advice and you will not regret it.

By James Reynold Carlisle

REALIZING that at best we can only follow rules which are flexible in operation with regard to violin building, I will attempt to show general causes and their effect which will be of value in bass bar work.

The vibration phenomena which takes place throughout the violin body while being played is not visible and prevents us from seeing the cause, but allows us to hear the effect. This applies especially to the bass bar, which of all parts of the violin has been least understood. In order to gain any knowledge of the bar which will be of value in constructing new violins and repairing old ones, an experiment which has just been made will certainly give an idea as to the relative importance of the bar.

A new violin has been finished off, varnished and strung up in the usual manner, with the bar purposely left out. Upon trying out the tone we find that there is a distinctly muffled and muted sound, and false tones and defects of different degrees of intensity. The tone is anything but desirable.

The top is now removed, a bar carefully glued in place and the top replaced. Again the violin is tried and while we still hear the muted and muffled sound, with but one exception all defects have disappeared. This one exception is a tendency of the open A string to break down in tone under bow pressure. While this does not always show up in all violins, it is a general thing, and seems to indicate that the violin will be of first quality when finished.

After noting carefully the rectified and improved condition of the tone since adding the bar, a sound post is put in place and the violin is completed. The tone is now full and resonant and of good quality. The muted effect has been eliminated, defects have disappeared and the A string no longer breaks but responds largely and quickly. Experience has shown that the spruce tops must be reduced in thickness until they respond freely to string action. This top is much too vweak to support the string pressure, resulting in the numerous tonal defects mentioned above. The function of the bar then is to rectify the faulty vibrations by making the top more rigid, and to bring about a harmonious action throughout.

Without the sound post the tone is still weak, due to the fact that the top acts independently of the back and the breaking of the A string is caused by a weakness yet remaining in that section. The addition of the post then seems to be the final connection in a complete assembly and brings the tone sounding plates into unison.

As each violin maker has his own particular style in model, arch, graduation, etc., it is reasonable

to say that while there is a fixed rule to follow in fitting and shaping a bar, this rule must be flexible and will vary in proportion to great difference found in violins.

A rule of primary importance is to get the bar fixed to the top in a way that will give maximum rigidity with minimum resistance. This can be accomplished by chalking in the bar to a perfect joint with every part touching perfectly. If this is done properly there will be no need to use thick glue as this would only check freedom of vibration. The shaping of the bar will influence the evenness of scale on the G side mostly, but affects the entire scale generally. The rule, therefore, is to cut the bar in such a way as to allow the bridge to sit directly on one of the nodes. The nodes of the bar are always at a point one one third of the length from either end.

Tap the point A and a clear tone will be heard; but at B it is completely dead.

This will show that a bar fitted to a Strad arch would be as follows:

This combination is acoustically perfect and as the years go by will improve rapidly and finally develop real Strad tone.

There are so many types of arching that the following sketches may help in determining type of bar for each violin.

No. 2, rounded arch.

: No. 3, pointed or peaked arch.

It will be noted that the law of node formation has been disregarded in the two types shown above, and generally cannot develop a tone of satisfactory proportions. Although Joseph Guarnerius very often used the No. 3 arch with wonderful results, it seems to be exceptional, and his fine tone is due to several other causes which will not be mentioned here.

In fitting the bar it should not be sprung at each end, which tends to prevent an Italian sounding tone from developing.

Of equal importance is the ability of the individual maker to feel or sense correct proportions in building his violins. While we must follow out certain measurements we must also allow the inner self to dictate proportions in such a way that the finished work will be one of art rather than a mechanically measured wooden box.

A summary will show that the bar must always be in keeping with the arch of the top, the thickness considered of course on the G side. Make a perfect joint, use thin glue, clamp in with scarcely any pressure, with freedom of action always in mind. The bar thickness should be as follows:

| Thickness of top at bridge | Thickness of bar |
|----------------------------|------------------|
| 6/64" | 3/16" |
| 7/64" | 3/16" |
| 8/64" | 3/16" |

The depth of the bar should be at most, even with the under surface of the violin edges.

The post must be round, stand straight up and down and fit snugly only; and in direct line with the right foot of the bridge and 1/8" approximately back of the bridge foot. You will also notice that I regard the post, so long as it is fitted properly and made nicely, of no particular importance other than that mentioned, that is, to create a unison of the parts.

Time and playing will do the rest.

Once when Rubinstein had been talking patronizingly of "Papa Haydn," as is still done by those who cannot appreciate the superiority of eternal freshness to momentary novelty, Brahms flashed back at him: "Yes, presently you will be Grandfather Rubinstein and then Great-Grandfather Rubinstein; but he will still be Papa Haydn." . . . Grandfathers Malipiero and Schoenberg please take notice.