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# BASICS

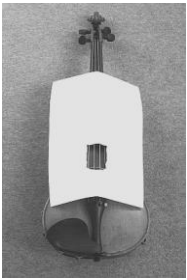
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## Tone production

### Working from the inside out, not the outside in

What is the hair of the bow doing to the string? This is the central question to consider during every moment of playing. What is happening there, at the contact point between hair and string? How are they reacting to each other? What does the friction feel like? What does the give of the string under the bow hair feel like?

- As a result of directing what is happening there, at the point of contact between the hair of the bow and the string, all kinds of movements happen in the bow arm and hand.
- It never works as well if you try to do it the other way round, i.e. if you make movements in the bow arm and hand, in the hope that, as a result of those actions, you will get a hair–string engagement that will create the sort of tone, or expression, or bow control, that you want.



Focus on this area

### Visual image

To create an easily-remembered visual image for a young pupil, take a large sheet of paper and fold it in half lengthwise. Tear off a rectangle the size of the playing area.

Place the sheet of paper on top of the violin (see left). Obviously the student cannot play at the same time; the point is simply to see it. Encourage the student to forget everything except this area, to focus on nothing else, to put all of their energy and effort into directing and controlling what is happening *here*.

### Pull the sound out of the string

The essential thing is to ‘lift’ or ‘pull’ the sound out of the string, rather than to try to ‘press’ it out.

- Although the energy of the bow is directed down into the string, at the same time the feeling and perception of the player is of *pulling* the sound out of the string rather than trying to *push* it out.
- Even in a strong, sustained passage, it can feel as though you are lifting the sound out of the string with the bow, so that the direction is up, rather than pressing the bow down into the string.
- Lifting the sound out of the instrument, so that it sings, is one of the secrets of playing with a tone that is big and fat, but soft at the same time. Pressing produces a tone that is smaller, thinner and harder.

### ‘Pressure’ or ‘weight’?

Many players and teachers avoid using the word ‘pressure’ through fear that it may lead to pressing the bow and squashing the sound. The word ‘weight’ is used instead, to encourage a feeling of ‘sinking the weight of the bow into the string’.

Another view is that ‘pressure’ indicates focus on one point, and ‘weight’ expresses more of a spread-out, unfocused feeling of general heaviness. Sometimes one term is appropriate, sometimes either.

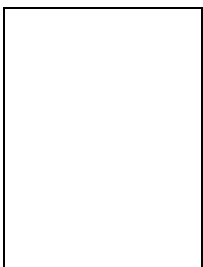
If the fingers on the bow are well distributed; if you are sensitive to the balances of speed and pressure at each distance from the bridge; if you let the bow lead the hand rather than *hold* the bow and try to do things with it; if you have a clear concept of the freely vibrating string, and of the purity and beauty of tone that you want, and of course the exact musical expression and phrasing – and then if you listen – there is little danger of playing with a pressed tone whatever words you use.

### Speed not pressure

Whether it is ‘pressure’ or ‘weight’, the essential thing is that tone production is usually based mainly on speed of bow or, if you like, on bow length. The physical explanation for this rule is that the friction of the bow causes the string to swing from side to side. If the downward pressure is too much for the speed of bow, or for the distance from the bridge, the bow squashes the string and inhibits its movement from side to side.

An extraordinary quality comes in to the tone when you ‘lift’ the sound out of the string rather than engage the string in a downward, pressing way, even in the heaviest, most *forte* playing. One of the keys is to listen as much to the background resonance as to the sound of the principal note that the bow is creating.

What is the contact between the bow and the string actually like? Try bowing *under* the string (see left). Then you can see what it normally looks like from underneath the string when you are playing.



Bow under the G string

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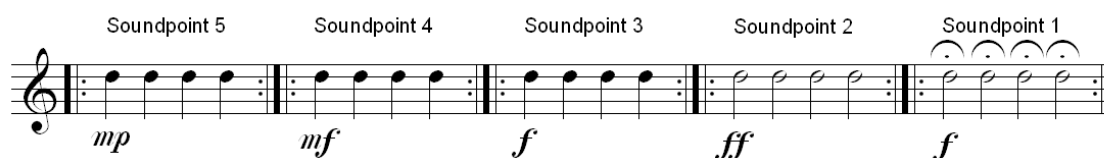
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See how the string swings widely from side to side at the precise point of contact of the hair with the string. Notice how the whole length of the string vibrates between the bridge at one end and the finger or nut at the other. It is not that the string vibrates from the contact point of the bow with the string, but vibrates beyond the contact point on the bridge side. Find how to make the friction of the bow cause the widest possible amplitude.

## The process of finding the correct balances

There are three main factors in tone production: speed of bow, pressure, and distance from the bridge (soundpoint). The string is softer further from the bridge; harder nearer the fingerboard. At every distance from the bridge there is a perfect balance of speed and pressure that makes the string vibrate the most freely and widely.

An exercise that is the starting point for all work on sound, and all work on bow in general, consists simply of long, whole bows played on different soundpoints (5 = near the fingerboard; 1 = near the bridge). The aim is to adjust the speed/pressure/soundpoint balance until the string vibrates widely:



- Draw continuous whole bows, down-bow and up-bow, on soundpoint 5. Play without vibrato but expressively, pretending that the note is in a piece, quartet or concerto. When you are sure the string is vibrating freely and widely, add vibrato; then repeat on soundpoint 4, 3, 2 and 1.

In a true scientific experiment you have to isolate factors and change things only one at a time. If you change more than one thing you cannot tell what is causing what.

Practising this sound exercise, two of the three elements of soundpoint–pressure–speed are fixed: you have decided that you are playing on a particular soundpoint; you are using whole bows at a particular tempo which decides the speed of bow; which leaves only the weight of the bow: so keeping the soundpoint and speed unchanged, experiment with more weight and less weight until the string is vibrating at its maximum. Then, without changing the speed/pressure/soundpoint balance, add vibrato.

Suppose you are playing whole bows on soundpoint 3. The process of finding the right balances of speed and pressure is like this:

- You note how widely the string is vibrating, and how much ring there is in the tone.
- You try a little more pressure. The string vibrates more widely, and the ring increases. So increasing the pressure is the right direction in which to go.
- So you increase the pressure further. The string vibrates more widely still. So increasing the pressure is still the right direction in which to go.
- You increase the pressure still further. Now the string vibrates slightly less widely, and the ring is slightly diminished. So less pressure is now the right direction in which to go.
- So you decrease the pressure, but only by a fraction: now you are using less pressure than last time, but still more than the time before that. Now the string vibrates more widely. So less pressure is still the right direction in which to go.
- So you decrease the pressure a tiny fraction further. Now the string vibrates less widely. So less pressure is now the wrong direction.
- So you give the slightest amount more pressure, i.e. not enough to take you back to where you were before, but an infinitesimal amount more than you were using a moment ago.

This is probably the optimum pressure, coupled with that particular bow speed, on that soundpoint, to make the string vibrate the widest.

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Next month's BASICS looks at some simple ways to improve scales (no surprise there, then).