Proportions

The Florentine artist Leonardo da Vinci (1452–1519), painter of the *Mona Lisa* and sculptor, architect, engineer, and scientist, was once asked to give his opinion of an ancient statue that had recently been discovered. When he arrived at the statue he found it surrounded by people admiring it and using emotive, subjective terms like 'the radiance of the expression' or 'the openness of the gesture', 'the serenity of the line', and so on.

Apparently Leonardo looked at the statue in silence and then took out measuring tools with which he measured the statue in every possible way – the widths, lengths, diameters, angles, etc. He wrote everything down and, without a word, went home. Like anyone else, he too could see the 'radiance', the 'openness', or the 'serenity' in the statue – but as an artist he knew that everything about the statue was the result of certain *proportions*.

Looking at everything in terms of proportions is the key that opens the door to every aspect of technique on a string instrument. It is also a fundamental key to every musical consideration as well, for example dynamics, intonation, tempo, attack, etc.

The single most important point about technique in string playing is that everything is *describable* – unlike intangible and indefinable matters like musicality, communication, charisma, talent, expression, atmosphere and so on. The describing can be done in very few words, and the language of the description revolves around proportions.

When you want to 'improve technique' it means you have to change the way you are doing something, and this often means changing the proportions of one action in relation to another.

Some key examples of proportions

The shapeliness of the violin itself, the exact thinness of the plates, the spiralling lines of the scroll, the design of the bridge, the properties and exact position of the soundpost, the weight, thickness and balance of the bow, are key examples of proportionality.

Each different quality of vibrato is the result of certain proportions of width to speed. These proportions are affected by the amount of finger pressure (e.g. heavier finger pressure may necessitate a narrower vibrato). Leaving aside musical considerations, vibrato must be narrower the higher up the fingerboard it is, in proportion to the length of string: a note high on the G string is played with much narrower vibrato than a note in first position. Vibrato is also narrower the higher in pitch the note, so that first finger F♯ on the E string will generally be played with a narrower vibrato than first finger A on the G string.

All lifted strokes are the result of different proportions of height of bounce to length of bow. The faster the stroke the lower the bounce, the less bow, the higher up the bow, the nearer the fingerboard. These proportions of length to height change depending on the tilt of the bow (how much hair).

The higher up the string the left finger, the nearer to the bridge the bow. Playing top E, two octaves up on the E string, with the bow midway between the bridge and the fingerboard, is proportionately the same as playing the open string with the bow several centimetres over the fingerboard.

The closer the first finger on the bowing hand is to the thumb (which acts as a pivot), the harder the first finger has to work to apply weight into the bow. (A bow hold with the first finger close to the thumb is like a door where the handle has been mistakenly put on the same side of the door as the hinges.)

Everything about intonation is a question of proportions since each note is placed in relation to another note, e.g. tuning any stopped A to the open string, or placing C♯ or E♭ as a 'leading note' to D.

The faster the passage the nearer the fingers must stay to the strings. (The faster the trill the less the finger must be raised.) High-lifted fingers are rarely good in fast passages, though up to a certain speed limit they are sometimes used for greater articulation. However, low fingers are often used in slow passages for greater legato and *cantabile*.

The speed of the shift reflects the speed of the passage: slow passages, slower shifts; fast passages, faster shifts. Slow shifts are rarely good in fast passages, but often a fast shift in a slow passage helps to achieve a clean, inaudible shift.

The louder the volume, the wider the string vibrates (i.e. swings from side to side); the wider the string vibrates, the faster the fingers must lift and drop. There is a sound of 'fuzz' at the beginning of notes if the speed of stopping or unstopping the string is too slow in proportion to the sideways movement of the string.

Longer arms: scroll of the violin pointing more to the left. Shorter arms: scroll of the violin pointing more in front. Larger hands: knuckles lower; in 1st position, first finger positioned closer to (or behind) the nut. Smaller hands: knuckles higher; in 1st position, first finger positioned in front of the nut.

When attacking the string from the air, the beginning of the note will be clean if the angle at which the bow approaches (and then touches) the string is neither too steep nor too flat. The angle has to be gauged in proportion to the speed of descent.

Experimenting with number

Example

Number is the natural expression of proportions, and tone production provides the perfect example.

Every sound the bow makes is the result of certain proportions of speed of bow to pressure to distance from the bridge (soundpoint). The tension of the string is proportionately less, the further from the bridge, so at the bridge the bow speed is slower and the pressure heavier; near the fingerboard the bow speed is faster and the pressure lighter.

Imagine that you could measure speed or pressure exactly, using a scale from 1 to 9: 1 = very slow bow, or very light; 9 = very fast bow, or very heavy.

Suppose that the 'widest possible vibration' of the string is '10'. You could express the ideal balance of speed and pressure on each soundpoint as follows:

Soundpoint 5 [near fingerboard]	Speed 9	+	Pressure 1	=	10
Soundpoint 4	Speed 7	+	Pressure 3	=	10
Soundpoint 3 [central point]	Speed 5	+	Pressure 5	=	10
Soundpoint 2	Speed 3	+	Pressure 7	=	10
Soundpoint 1 [near the bridge]	Speed 1	+	Pressure 9	=	10

Of course we do not always want the 'widest possible vibration' on every note, which would create great monotony of tone and lack of contrast or expression. Sometimes we want light and airy sounds (i.e. slightly 'too little' weight for the soundpoint, or 'too fast' speed); sometimes we want dark, depressed sounds (i.e. slightly 'too much' weight for the soundpoint, or 'too slow' speed). Nevertheless these numbers illustrate the underlying principle.

Example

The give of the wood of the bow and the hair provides another clear example. Place the bow on the string at the heel and, without moving the bow along the string, push down quite hard: the hair gives and the wood of the bow is rigid. Repeat at the point: the wood gives (in the middle of the bow) and the hair is rigid.

To illustrate the proportions, number the different tensions in the wood and the hair on a scale from zero to ten: 10 = much give in the wood or hair, 0 = no give. At the heel (all hair, no wood), the balance would be 10:0. At the point (all wood, no hair), the balance would be 0:10. The middle of the bow is therefore 5:5, where, as you would expect, both the wood and the hair give equally. The entire range from the heel to the point: 10:0 (heel), 9:1, 8:2, 7:3, 6:4, 5:5 (middle), 4:6, 3:7, 2:8, 1:9, 0:10 (point).

Example

At the heel the thumb supports and helps balance the bow in the hand, but even in ***f*** it barely needs to exert counter-pressure. At the point the thumb must exert counter-pressure, especially when playing ***f***.

On a scale from 1 to 10, thumb counter-pressure can be expressed as follows: 1 (extreme heel), 2, 3, 4, 5 (middle), 6, 7, 8, 9, 10 (point).

The amount of counter-pressure should always be *as much as necessary but as little as possible*. A common mistake: start at the heel with minimum thumb counter-pressure; play ***f*** to the point, by which time the counterpressure has gradually increased to, say, '8'; return on the up-bow to the heel without releasing the thumb (keeping it at '8'). This immediately creates tension in the thumb. The increase in counterpressure when playing to the point does not matter; what is important is to release the thumb back to zero when returning to the heel.