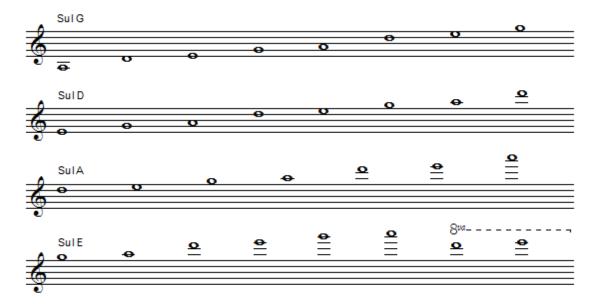
### **BASICS**

# Intonation

#### **Open-string notes**

A great trick that fascinates not only children but adults is to play a note on the violin while holding down the sustaining pedal on a piano (which frees the strings from the dampers). The note resonates through the piano because the string with the same pitch as the one you played vibrates 'in sympathy'. It's quite magical, but only the very beginning of the subject of vibration. The vibrations of even the quietest note played in a concert hall affect every cell of every person (and every seat, every carpet fibre) in the hall.

Watch the open strings on the violin vibrate sympathetically in just the same way as the strings on the piano do. Adjust the tuning of each stopped G, D, A or E to find the widest possible movement of the open strings.



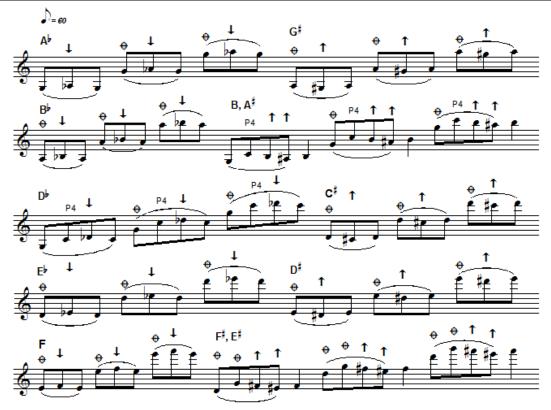
Pausing on each note, adjust the finger microscopically sharper and flatter until you are sure that you are right in the centre of the pitch, and the amplitude (the sideways swinging from side to side) of the sympathetically-vibrating open string is the widest. Listen to the great resonance that fills the violin when the stopped notes are exactly in tune with the open strings. Notice the hard edge that comes into the note when it is fractionally sharper or flatter to the true pitch.

#### **Sharps and flats**

The next step is to add the accidentals around the open-string notes. On a keyboard C# and Db are the same note, which is called 'tempered intonation'. On a string instrument the sharps can be sharpened and the flats flattened, so that G# is then somewhat higher than Ab. The Catalan-Spanish cellist Pablo Casals called this 'expressive intonation'. Casals used the term 'gravitational attraction' to describe how, say, Ab seems to want to move down towards G, and G# seems to want to move up towards A.

In the following exercise think of sharps as 'leading notes' to the natural a semitone above, like the seventh degree of the scale wanting to resolve into the tonic (marked as an up-arrow). Think of flats as 'leading notes' in the opposite direction, as though they wish to resolve down a semitone to the natural below (down-arrow). Tune the open-string notes to the open strings (marked below as  $\oplus$ ). Tune C as a perfect fourth (P4) above G.

### **BASICS**



Use every possible fingering, and also continue up into the top octave. For example, the second group can be played on the G string and the D string, each starting on the 1st, 2nd and 3rd finger. The third group can be played with two fingerings on the E string, and with three fingerings on the A, D and G strings.

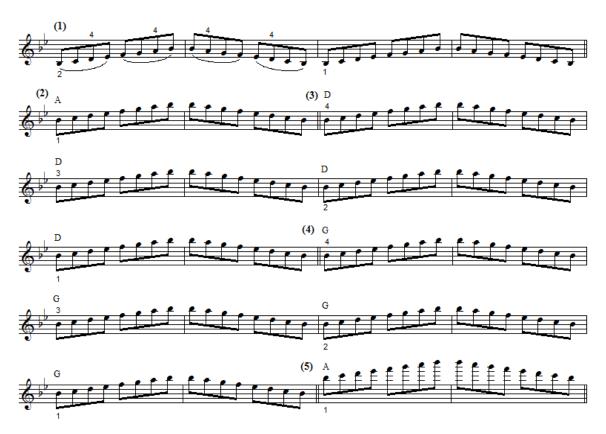
When we play the violin with the piano (or in much orchestral playing), some notes may be tuned expressively but many will be played tempered, so it is useful to play the exercise with piano intonation as well, ignoring the pitch directions indicated by the arrows.

#### **Uniform intonation exercises**

These have a remarkable effect on the intonation. Uniform intonation means that the pitch is even: the same letternames in the different octaves are in tune with each other, created by having a consistent logic behind the tuning of each note as in the exercise above. The idea of uniform intonation exercises is to play the same group of notes with every possible fingering, making them all sound exactly the same, since the right tuning of a note is the same no matter which finger you play it with.

You can do this in pieces, or just take a random group of a few notes and play them in every position, with every fingering. Here is a superb example, applying the idea to scales:

## **BASICS**



You can see for yourself the amazing power of this exercise if you do a simple experiment: first, play a three-octave scale and give yourself a mark out of ten for intonation. Then do the uniform intonation exercise once, for ten minutes, in the key of the scale. Then play the scale again. Perhaps you scored 10/10 the first time; but if before you scored 5 or lower, you might find that now you are reaching 8 or even 9. The question is, could you have improved the scale as much just by playing it over and over again for ten minutes, or even playing by it in rhythms or speeding up with the metronome. This is a super-effective way of ironing-out the intonation.