Cello Technique Principles & Forms of Movement
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• Vibrato:

• Application of Vibrato:
  • A very important factor for every sort of vibrato is the frictional resistance between finger and fingerboard, because it transfers the arm impulse, which is parallel to the fingerboard, into passive rotation of the forearm.
  • The vibrato gets wider with a stronger arm impulse, but cellists need to increase the pressure of the finger to avoid back and forth slides of the finger.
  • A loud sound often has a large vibrato, whereas a soft sound has smaller amplitude.
  • The consequence is a lot of pressure on a loud and vibrated note because of the large amplitude of the string and the wide vibrato.
  • Normally the necessary pressure can be provided by the arm weight, but counter pressure from the thumb to the playing finger increases the firmness of the finger and the rotation axis.
  • The thumb always follows the contact place of the individual finger.
  • The more the playing finger is a continuation of the forearm axis, the less effort is necessary to achieve the maximum rotating effect on the string; if the finger is not in the right place on this axis, the circle of the hand has to be much wider for the same vibrato effect.
  • The breadth of the fingertip is another individual factor.
  • A broad finger has a larger contact point on the string and uses consequently more string during a rotation than a smaller one.
  • That is the reason why a 4th finger needs a bigger vibrato motion than the 2nd does for the same effect.
  • If the amplitude of a small finger is not wide enough, there is the opportunity to allow the finger to shift its position slightly on the string; the thumb has to be very relaxed.
  • This technique can also be used to vibrate double stops like thirds and sevenths.
  • An additional way to support a weak finger is to combine the upper arm vibrato with the wrist vibrato.
  • The coordination of both is not a problem, because the wrist motion is the continuation of the upper arm movement.

• Vibrato and Pitch Level:
  • There is a difference of the vibrato of a wind player and of a string player.
  • Wind players produce vibrato mainly by changing the volume of the tone and string

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1 This handout is based on the book: Cello Technique, Principles and Forms of Movement, Gerhard Mantel, based on the German original “Cellotechnik:Bewegungsprinzipien und Bewegungsformen”, translated by Barbara Haimberger Thiem, Musikverlag Hans Geric, Köln, 1972, English translation: Indiana University Press, 1975
players with the changing of the pitch.

- During an intensive vibrato the extreme pitches may differ a quarter tone or more, but the ear is still able to define a pitch (the middle between the extreme pitches) and to recognize intonation faults.
- The amplitude of the chosen vibrato is not only a matter of aesthetic but also of the length of the string.
- There is always the same ratio between the lengths of the string that produce two pitches of a specific interval.
- If a cellist uses the same amplitude of vibrato in every pitch, there will be different acoustic variations of pitch.
- To produce the same vibrato effect e.g. an octave higher than a given pitch, you have to use only half the amplitude of the lower note.
- This control is not very easy, especially during a concert, where intense passages tend to have a too wide vibrato because the cellist feels the intensity of the music and reacts with a big vibrato.
- In the cello technique there is a natural “brake” in upper positions to avoid too wide vibrato: the thumb.
- The higher you get the more the position in which the hand vibrates (in relation to the fingerboard) is slanted and that causes a lesser amount of the amplitude to affect the string.
- The usual rule is that the frequency of the vibrato should be greater in high pitches than in low ones, but it should not get extremely fast and shaky.
- Sometimes cellists cannot avoid playing an expressive note with the thumb.
- The thumb vibrato has to have large amplitude because the contact area is very narrow.
- To get a good rotation axis it is necessary to bring the other fingers closer to the thumb, so that the entire arm rotates around the axis of the thumb.
- During the vibrato of the other fingers the thumb stays on the string and accompanies the vibrato motion elastically.
- If the vibrato is very intense, the thumb can leave the fingerboard.
- In very high position it is uncomfortable to keep the thumb close to the rest of the hand; that is why there is a bigger gap than a second between the first finger and the thumb when the thumb is not used in the high positions.