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Extended techniques on the traverso: The case of the *glissando* and the *flattement*

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Abstract The so-called 'extended techniques' have become an essential resource at the disposal of composers wishing to enlarge the possibilities of the flute's sound palette. Over the last four decades, a number of these techniques initially thought and conceived for the Boehm flute have gradually been adapted to the one-keyed flute as well, producing a brand-new set of sonic 'effects'. Composers such as Jukka Tiensuu, Hans-Martin Linde, Jacqueline Fontyn, Masahiro Arita, Jean-Marie Rens and Doja Cojocaru (to name but a few) have proved able to revive the sound possibilities of the traverso and exploit multiple sonorities, multiphonics, microtones, percussive sounds, whisper tones, jet whistles and singing and playing simultaneously, without forcing the one-keyed flute to become a caricature of the modern flute. Furthermore, the post-modernist composers' tendency and need to distance themselves from the strict rules of post-serialism and free their voices from any orthodox approach to music seem to find in the traverso sound and its Baroque legacy the best way of reconnecting contemporary 'effects' with the perennial 'affects' that this instrument is able to evoke.

Keywords traverso; extended techniques; postmodernism; one-keyed flute; contemporary music

Introduction

Following the Neoclassical and Modernist employment of musical instruments such as the harpsichord, recorder, viola da gamba and viola d'amore, the avant-garde and post avant-garde music scene has undertaken a further development of this phenomenon: the revival of several other period instruments from the Baroque era, including the one-keyed flute. Since the 1980s, contemporary composers have shown a new awareness of these orchestral period instruments, employing them with worthwhile and innovative results. Notably, the traverso offers an incredibly new soundscape, thanks to its rich palette of timbres and sound possibilities and its flexibility in producing microtones and embracing other extended techniques. A small group of eclectic and foresighted musicians (including Stephen Preston, Hans-Martin Linde, Carla Rees and Elissa Poole) have been capable of imagining and laying the foundation for a future of new sounds for the one-keyed flute. Their success is determined by the capability of taking distance from the modern flute's advanced achievements and, at the same time, by finding the courage to face new challenges in terms of performance practice, aesthetics and techniques on their early instrument. Within the contemporary music scene, the new composers' tendency and need to distance themselves from the strict rules of post-serialism and free their voices from any orthodox approach to music seems to find in the traverso sound and its Baroque legacy the best way of reconnecting the contemporary 'effects' with the perennial 'affects' that this instrument is able to evoke.

In the following article, I will shed some light on a couple of extended techniques – namely the *glissando* and the *flattement* - that frequently appear, amongst many others, in the contemporary repertoire for the one-keyed flute.

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There is a common understanding that all techniques that sound unconventional, unorthodox or not in line with tradition might be labelled as 'extended'. An inevitable question arises from this: what do we mean by conventional, orthodox and traditional?
If it is partly true that at the turn of the 20th century many pioneers found themselves radically pushing the boundaries of mainstream norms in music as never before, it is even truer that these innovative artists were not the first to seek special effects in the whole history of western classical music. A re-evaluation of the limits of musical instruments is an inherent feature of music at any time. For instance, earlier examples of 'extended' technique such as the striking the string with the wood of the bow, namely *col legno battuto*, can be already found in Haydn's symphonies, Mozart's concertos and later in Berlioz. [2] Furthermore, if we look at the history of the flute at the beginning of the 19th century, the Austrian flautist Georg Bayr (1733–1833) was already working on a method to address one of the techniques that would become so popular a century later: how to play more notes at the same time on the flute or, as we call them nowadays, multiphonics.[3]

Under these circumstances, the difference between what is 'extended' and what may yet be considered 'traditional' becomes questionable. If we take into consideration the extensive baggage of extended techniques that the modern flute carried with it throughout the 20th century, from Debussy to Sciarrino, we might ask ourselves: what still sounds unconventional or unorthodox nowadays? Perhaps not much.
What seems most important at this stage is the discussion on 'how' and 'why' a certain number of techniques – whether traditional or innovative – are favoured by contemporary composers.

I will clarify the 'how' by explaining the way in which to execute such techniques, highlighting the different results that can be obtained on the traverso in comparison with the modern flute. Regarding the 'why', I will explain the musical reason for their existence in an attempt to re-establish a connection between a plain and simple trial-and-error approach and the musical intention and meaning that lie behind them.
The objective of this article is to look at the contemporary 'effects' not just as a mere series of tangled and audacious musical tricks but rather as musical ideas and messengers of different musical motifs, following the Baroque *Figurenlehre* tradition. [4]

Glissando: the effects

The Italian term *glissando* derives from the French *glisser* and literally means to glide. It consists of a glide from one pitch to another. The similarities with *portamento* are many. Nevertheless, the latter usually refers to the carriage of the voice as with the term *portamento di voce* (Vaccai, 1832) or its emulation by string instruments and it is played as a sort of ornamental accentuation of the legato between two notes. The employment of *portamento* seems to relate more to performance practice than to a technique stipulated by composers. It is up to the performer to decide whether to convert certain legato markings into

[2] Namely: in the Fifth Violin Concerto by Mozart, in Haydn's Symphony no. 96 and in the *Symphonie fantastique* (1830) by Berlioz.
[3] For further information, see: Georg Bayr, *Schule für Dopplertöne auf der Flöte* (Wien: F. X. Ascher Antiquar, 18?)
[4] Musical rhetorical-figures are widely analyzed in Dietrich Bartel Lincoln, *Musica Poetica: Musical-Rhetorical Figures in German Baroque Music* (Nebraska: University of Nebraska Press, 1997).

glides in order to connect two different pitches. While *portamentos* do not follow any specific sign but the slur, *glissandos* always follow an actual symbol (usually a short diagonal line or a curve that describes the direction of the glide).

The *glissando* can evoke many different images. It might give a feeling of continuity and fluidity if slowly executed in order to connect two notes. Alternatively, it is capable of producing a sense of lament, especially if covers a long interval with a *diminuendo* effect such as in the opening violin gesture of *Dikthas* for violin and piano by Xenakis. It can graphically depict a human cry or moan as in the sex scene of Shostakovich's Lady Macbeth, [5] or be clownish and farcical as in his *Leningrad Symphony*. In addition, if the glide goes upwards at the speed of a hiccup, it can create a sense of levity and become sarcastic as often happens when Mahler marks '*molto portamento'* in some of his symphonies. [6] When slowly and gradually accentuated, it can produce excitement, as in the opening clarinet gesture of Gershwin's *Rhapsody in Blue* or sound like a volcanic eruption as in *The Rite of Spring* by Stravinsky. [7]

The *glissando* is one of the techniques most frequently employed on the one-keyed flute in the context of contemporary music. Due to the natural flexibility and the open-hole layout of the instrument, the technique shows extreme effectiveness if executed in one of the following ways:

- by rolling the flute in and out to lower or raise the pitch;
- by sliding the fingers off the rims of the fingerholes;
- by a combination of both the rolling of the flute and the sliding of the fingers.

The *glissandos* can be directed from the initial note either upwards or downwards and cover both small and large intervals, from quartertones to major thirds. Depending on the initial fingering, the amplitude of the *glissandos* will change: in principle, the more fingerholes remain uncovered, the larger the pitch bending will be. Sure enough, a glide from *C″* can descend easily to *A″* (covering a minor third) whilst it will be much more difficult to reach *C″* using the *D''* fingering even though it is only a major second. In the latter case, all the fingerholes are covered to execute the lowest note on the traverso, leaving little room for the motion of the airstream inside the tube.

As will be illustrated below, *glissandos* covering larger intervals can be broken down into a series of shorter *glissandos*. It is only by the rolling of the flute – while keeping the same fingering – that the flautist can control and produce a precise scale of quartertones.
Robert Dick in his *The Other Flute*[8] devotes an entire paragraph to *glissandos*. With a great deal of precision, he employs several charts to explain how to execute them, by sliding the fingers across the rims of the flute's fingerholes. This technique represents an option for the traverso as well. Nevertheless, the smaller and unequal diameter of its fingerholes makes the employment of this technique less effective. Furthermore, the difference between one

[5] In the third scene of the first act of *Lady Macbeth*, Sergei forces himself in Katerina's room and makes love to her.
[6] A few examples of "molto portamento" markings in Mahler's symphonies: the trumpet solo in the 5th movement of the Second Symphony and the horns' parts of the Third movements of both the Fourth Symphony and Fifth Symphony.
[7] Namely the string's effect in the *Dancing out of the Earth* section.
[8] Robert Dick *(*1975) *The Other Flute* pp. 72-79.

species of traverso and another makes the effect of this glissando technique different from one instrument to another: the copies of original one-keyed flutes still differ a lot from one to the next – the result of craft production and not of industrial mass production as with the modern flute –, not to mention the original instruments themselves dating from two to three hundred years ago. This is the reason why any explanation of how to produce *glissandos* by means of charts, as in Dick's book, would never be as precise and efficacious, in the case of the one-keyed instrument. For instance, in the case of a downwards *glissando*, the rolling of the traverso embouchure will be much more satisfactory than the sliding of the fingers. If, on the other hand, an upward glide is required, it is usually best to combine the rolling of the embouchure and the bending of the fingers, simply because the rolling of the embouchure will not result in sufficiently large intervals. The sliding of the fingers on the fingerholes can be executed in two ways:

1. by actually covering the holes and letting the finger come into contact with the flute;
2. by a tremulous motion of the finger just above the hole, without letting the finger touch the flute. [9]

The choice between the two options is left to the performer. Performers should be capable of determining which one fits better according to the musical effects they wish to express.
In order to show as many kinds of *glissando* as possible, a few practical examples will be selected from a number of contemporary pieces. Hence, it should be remembered that the instrument used as a model in this article is a Palanca dated ca. 1760 made by the German flute maker Martin Wenner. Therefore, these instructions might produce different results if other instruments are employed. Nevertheless, flautists should be able to adapt the given instructions to their own instruments with a certain degree of flexibility and find their way to eventually obtain similar results.

Last but not least, the *glissando* can be executed with the head-joint alone. After screwing it off from the traverso middle-joint and foot, the flautist is asked to blow into the embouchure and place one hand – or the fingers – along the rim of the head-joint or inside the tube. In this case, the range of the *glissando's* tone fade is quite big and the sound result can be very loud. Nevertheless, the fact that no fingering can be employed reduces the number of variables for the creation of a microtonal scale. Due to the completely different nature of this technique, an example of the head-joint *glissando* will be shown separately.

Short glissandos

The beginning of *Temps Illusoire* for traverso and harpsichord (1994) by the Belgian composer Jean Marie Rens (b. 1955) consists of a unisono played by both the traverso and the harpsichord that resolves onto a dissonance. As indicated by the *fermata* sign on the score, the dissonance has to resonate over its entire length, and eventually go back to the initial pitch: *laisser battre*. In order to build the proper tension, the flautist has to play the first

[9] Charles Nicholson in his *Complete Preceptor for the German Flute* (1816) describes the vibrato on the flute as follows: "the other way by which the same effect [the vibration]is produced, is by a tremulous motion of the finger immediately over the hole, without coming into contact with the flute by the same motion, and in some instances with the finger covering about one half of the hole."

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note from an almost absolute silence *pppp* and increase its volume with a *crescendo*. Once the harpsichord joins the traverso, the latter keeps slowly getting louder. At the very end of the *crescendo*, the initial *G"* quickly glides upwards to A ♭ *"*, following the short curve that Rens marks on the score.

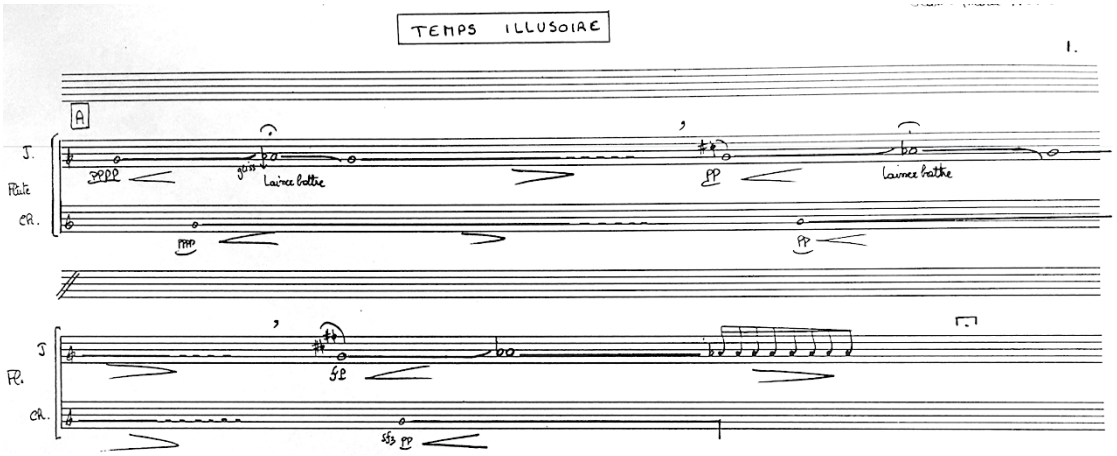

Figure 1 Temps Illusoire by J. M. Rens

The dissonance that is produced as a result of this has to last as long as possible – as marked with the *fermata* sign. After that, the dissonance resolves to *G''* with a *decrescendo.* There are two examples of *glissando* that appear here: the first that goes upwards and the second that goes downwards. They are both among the easiest to perform: they are fast, they cover a small interval, they have to be played with a *crescendo* if upwards and a *diminuendo* if downwards. Nevertheless, they should be played smoothly and accurately.

The first *glissando* goes to *G"* to *A* ♭ *"*. In spite of its ease, this simple glide presents a perfect example of the technique of rolling of the embouchure, and its limitation when solely relied upon. A new fingering should be introduced when the rolling motion is complete, following these instructions:

1. as the note is sounded with the usual fingering, the flute should be slowly turned out, away from the player, who should open the embouchure;
2. the lip opening is rapid and modest and consists of both upper and lower lip expanding and increasing the distance in two opposite directions;
3. letting the chin and jaw support the movement of turning out the flute;
4. controlling the air pressure in order not to increase the dynamics too abruptly and to avoid making the sound too breathy;
5. before cracking the note, rapidly change the fingering to allow the normal playing angle to be restored;
6. this last movement should be as quick and precise as possible.

Alternatively, this same *glissando* can be executed by the sliding of the fingers alone:

1. start by sounding the note with the *G"* fingering position, then slowly lift the right ring-finger and move it from its central position towards the edges of its fingerhole;
2. the left index, middle finger and ring-finger should be moved slowly at the same time to their fingerholes;
3. coordinating the air pressure with the sliding of the fingers in order to make a good crescendo.

In comparison with the rolling of the embouchure, the advantage of this last technique is to leave the player free to keep the same playing angle during the whole glide.
The process of performing the second *glissando* from *A♭″* to *G″* with the rolling of the traverso involves:

1. slowly turning the flute in, closer to the player while playing the first note;
2. moving the upper lip slightly downwards while moving out the lower lip and jaw out in the opposite direction to the rolling of the flute in order to give more space to the airstream directed from the upper lip;
3. controlling the air pressure in order not to decrease the *diminuendo* too abruptly or to make the sound too opaque;
4. before reaching the lower pitch, quickly changing the fingering and restoring the normal playing angle;
5. this last movement should be fast and precise.

If made with the sliding of the fingers, it involves:

1. sounding the note with the usual *A♭″* fingering position, gently placing the left ring-finger around the edge of its fingerhole and slowly covering the hole completely with it;
2. coordinating the right index, middle finger and ring-finger, making sure these three fingers are sliding away from their fingerholes, all at once;
3. coordinating the air pressure with the sliding of the fingers in order to make a good diminuendo.

Long glissandos

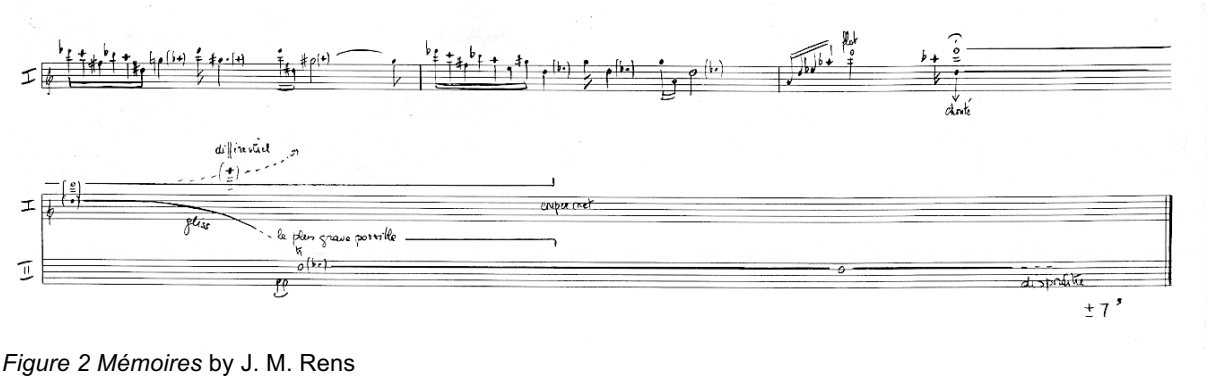

Figure 2 Mémoires by J. M. Rens

Mémoires is a duet by Rens for two traversos.[10] The piece offers another example of *glissando*, this time longer and trickier to execute than the previous one. The initial chord consists of a multiphonic on *D‴*, with the highest *D⁗* sung by the first flautist. The glide goes downwards from *D‴* to '*le plus grave possible*' (as low as possible).
To cover a large interval, a combination of the sliding of the fingers and the rolling of the flute is required. As marked in the score, Rens suggests switching the fingerings on the way down to the lower pitch, from the initial *D‴* to *G⁗*:

[10] As the composer marks, following the tradition of the basso continuo: *pour traverso et traverso obligé*.

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1. while playing, start executing the *glissando* simply by turning the embouchure downwards as low as possible (usually *C #‴* should reachable before the sound cracks);
2. at the very last moment before the sound cracks, slowly slide the left index on its fingerholes and let the right index and annular lift rapidly up in order to switch fingerings from *D‴* to *G″*;
3. once *G″* is reached with the new fingering, continue with the rolling down of the embouchure as far as *F ″* (or, with some practice, *E ♭ ″*);
4. if not satisfactory, first slide gently the right index, then the right middle finger and eventually the annular before the sound cracks (this last fingering in combination with the rolling of embouchure should lead to *C″*).

Evidently, the whole *glissando* will not sound perfectly homogeneous over its length especially before the *G″* fingering is applied. As mentioned at the beginning, this is due to two physical factors:

1. the more fingers cover the fingerholes of the instrument, the less room there is for the airstream to bend without cracking the sound;
2. the higher the note, the more difficult the downward glide;
3. a fork fingering (such as the Hotteterre *D‴″*) will only increase the risk of cracking the sound.

Shake glissando

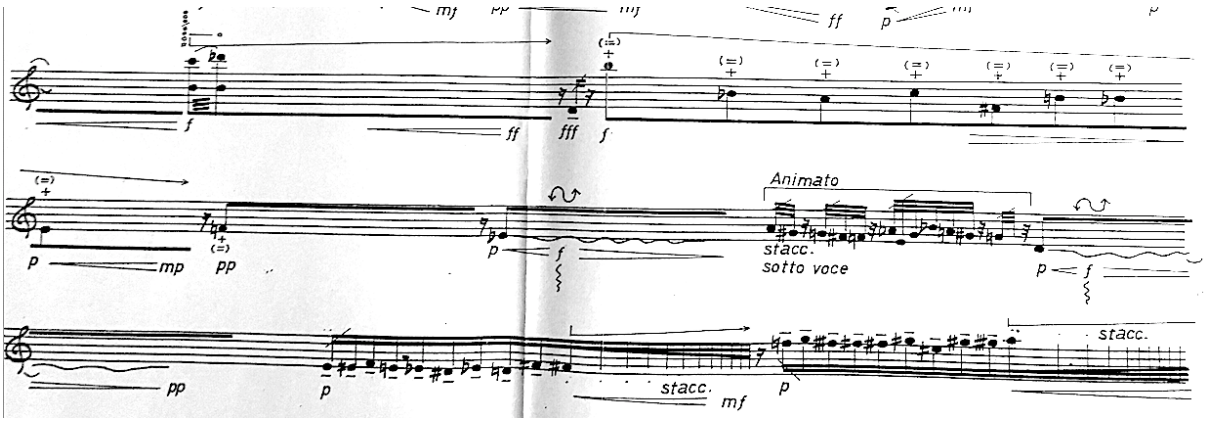

Figure 3 Legende by M. Arita
Audio sample: from *Legende* by M. Arita – Matteo Gemolo, traverso
https://soundcloud.com/matteogemolo/excerpt-from-legende-by-m

In the tangled and meditative *Legende* for traverso, the Japanese composer and flautist Masahiro Arita employs several extended techniques, including the shake *glissando*. This consists of an undetermined variation of the pitch produced by shaking the flute.

The acoustic result lies somewhere in between a vibrato effect and an actual *glissando*, depending on the speed of the airstream and on the length of each glide. The choice of this particular kind of *glissando* is based on a very simple fact: to play *E ♭ ″* and *D″* (the last fingerhole for the latter is covered by the key) each fingerhole is covered, leaving no option other than to shake the flute to produce a variation in pitch. As Hotteterre explained with

regards to the *flattement* on the low *D‴, D♯″* and *E♭″*: "I would say that it can be done only by means of artifice because ´this is the lowest note on the flute, and since you have no finger left unemployed to do it with, it must therefore be done by shaking the flute, which imitates a softening [...]'[11]

Therefore, to execute a *glissando* on that note the only two remaining possibilities are either the rolling of head-joint up and down or the shaking of the flute, as the composer prefers to call it. The difference between the shaking of the flute and an actual *flattement* is very subtle. With the latter, the pitch of the note can only be flattened. As Tromlitz states: 'the note must tend alternatively a little towards the low side and back up again and keep fluctuating'[12] On the other hand, the shaking of the flute should be performed in much the following fashion:

1. while playing with the selected fingering, make sure that the lower lip is in a firm but flexible position;
2. to start rolling the embouchure, make sure the movement starts gently from both the wrists and allows the opening of the mouth hole as a consequence of this;
3. once half tone above is reached, turn back to the normal playing angle;
4. having reached the normal playing angle, roll the embouchure downwards, by turning the wrists in the opposite direction;
5. ensure that the lower lip and jaw start a counter-motion outwards in order to give enough room to the airstream directed from the upper lip;
6. once the lower semitone is reached, turn back to the normal playing angle;
7. repeat the same process up and down, adding the dynamics written by the composer.

There is no specific speed at which to correctly execute this kind of *glissando*. This choice is in the hands of the performer. Nevertheless, it should be carefully considered in order to balance the downward and the upward motion in a satisfactory manner.

Headjoint glissandos

In the fourth movement of *La Fenêtre ouverte*, op. 85 (1996), trio for traverso, viol and harpsichord, the Belgian composer Jacqueline Fontyn (b. 1930) asks the flautist to unscrew the traverso's head joint and execute a number of glissandos with it.
The first *glissando* '*avec le bec*' can be executed by rolling the flute up and down, following the curves the composer has drawn on the score. With the exclusive use of the head joint, the flautist should be able to cover a major third, from a low *F″* to *A″*.

[11] Translation from "Principes de la flute traversière, ou flute d'Allemagne, de la flute à bec ou flute douce, et du haut-bois, divisez par traitez" (Amsterdam, 1701): "je diray qu´il ne se peut faire que par artifice. Comme l´on ne peut se servir d´unucun Doigt pour le faire, (puis´quils sont tous occupez à boucher les trous,) on ébranle la Flute avec la main d´enbas, ensorte que l´on puisse imiter par ce moyen le fftement ordinaire."
[12] "Der Ton bey der Bebung sich wechselswerte ein wenig unterwärts und wieder aufwärts ziehen und schwebend erhalten muss," Tromlitz Unterricht 240 transl. 214

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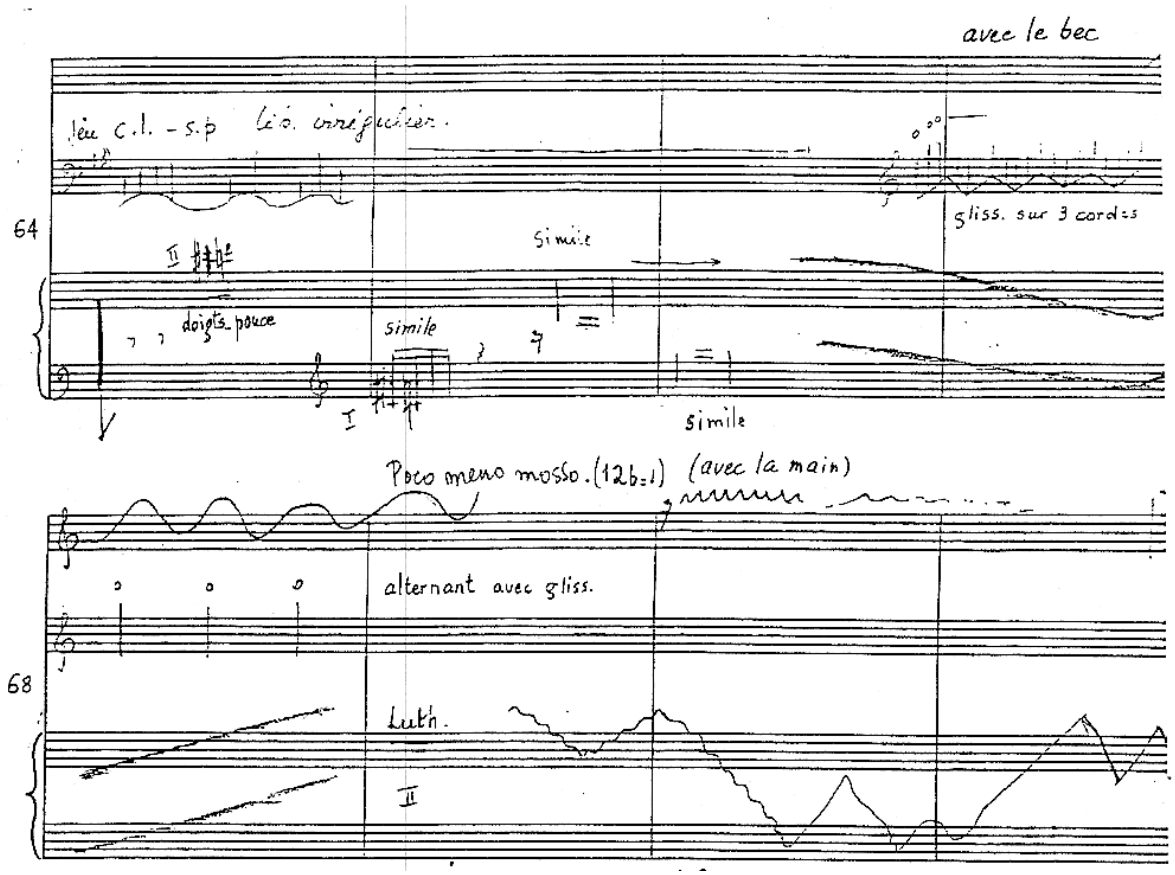

Figure 4 'Un peu timbré' (*La Fenêtre ouverte*), by J. Fontyn
Audio sample: from 'Un peu timbre' (*La Fenêtre ouverte*) by J. Fontyn – Europa Ritrovata, Matteo Gemolo tr.
https://soundcloud.com/matteogemolo/excerpt-from-un-peu-timbre-la

The second *glissando* 'avec la main' can be performed with the help of the right hand. The use of one hand enlarges the interval down to *E″*, enabling the flautist to reach a much larger interval, namely a tenth: by placing the right hand alongside the rim of the head joint, the natural length of the tube is increased, allowing the flautist to reach wider intervals. In order to reach even greater intervals, a combination of the rolling of the flute and the placing of the right hand around the rim of the head joint is favoured. As Dick explains in his *The Other Flute*:

> The first technique is to place the end of the head joint in the crook of the right hand (between the thumb and forefinger). By closing the right hand one finger at a time, the length of the head joint is increased, and the pitch is lowered. When the right hand is tightly closed, the head joint is effectively stopped. (Dick, 1975 p. 79)

An alternative means of executing the *glissando* on the head joint consists of 'placing the edge of the heel of the right hand on the rim of its open end, and then moving the right hand towards the embouchure' (Dick, 1975, pp. 79-80). In such a way the *glissando* can be executed at faster pace, for instance as a rapid tremolo. Nevertheless, its range will be slightly smaller (an octave down to *G #″*).

***Glissandos*: the affects**

As seen throughout a variety of examples, different kinds of *glissando* demand different techniques. Their meanings, within their musical context, change too.
In *Temps illusoire*, Rens wishes to create a two-dimensional soundscape that consists of a simple and primordial tension between sound and silence. Hence, the glissando is employed as a sonic bridge between these two dimensions. A glide initially allows the sound to arise out of absolute silence; and again another glide, this time in reverse, retreats into silence. The tension between the stillness of the harpsichord's long note and the traverso's slow *glissando* – up and down – creates a sense of continuous motion within the same circular sound mass.

Compared with those in *Temps illusoire*, the *glissandos* in *Mémoires* seem to have a different meaning. Instead of being the hidden engine that sets into motion the primordial sound mass from silence to sound and vice-versa, the last glide placed at the end of *Mémoires* suggests the idea of eternity: in fact, this *glissando* – performed by the first flute – ends with a long note played by the second flute, *pianissimo*. This last note is left resonating as a sort of echo of the previous note. Compared to the latter, however, this note lies still, lifeless as a sonic consequence of the previous motion. In this case, the *glissando* represents an opportunity to trace a connection between two voices that merge and become a single unity, in much the same fashion as in 'Mierontie/Beggary', second movement from *Tiet/Lots,* quartet for traverso, baroque violin, viol and harpsichord, composed by the Finnish composer and harpsichord Jukka Tiensuu. [13]

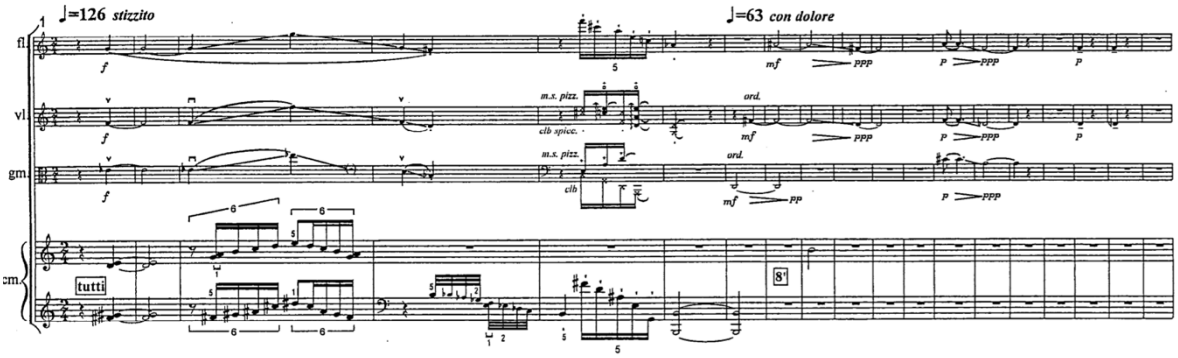

Figure 5 'Mierontie/Beggary' (*Tiet/Lots*) by J. Tiensuu
Audio sample: from 'Mierontie/Beggary' (*Tiet/Lots*) by J. Tiensuu – Europa Ritrovata, Matteo Gemolo tr.
https://soundcloud.com/matteogemolo/excerpt-from-mierontie-beggary

Throughout the whole movement, the composer makes extensive use of *glissandi* for both the string and the flute parts, conferring a strongly plaintive nature on the piece. Along the lines of Xenakis, these *glissandos* embody the idea of continuity of matter; but in this specific case, serve to quite ironically express the shaky and limping walk of a beggar, as the title itself suggests. In order to render this impression of instability, the four instruments employ a variety of different combinations of rhythmical patterns. Thanks to the use of large *glissandos*, bow vibratos and descending arpeggios or scales, these sections can efficiently mimic the tragic fall of the beggar, who seems to lose constantly his balance, trying to walk straight and eventually collapsing on the ground.

[13] For more on this subject see Matteo Gemolo, 'Jukka Tiensuu's new music for the traverso' *The Flutist Quarterly*, Winter Issue 2018, pp. 26-31.

The shake *glissando* written by Arita in *Legende* has little to do with the two previous ones. In Rens, both *glissandos* served the purpose of connecting either silence with sound or two different voices. Therefore, their trajectories were precisely predetermined by the composer. They were meant to bring unity within a dual system. On the contrary, in the case of *Legende*, Arita employs the shake *glissando* in order to break any possible connection between opposites. There is no direction either. The main thing here is not the *glissando*'s destination but its journey. There is no trajectory, but just a flow.

Following this line, Fontyn employs the head-joint *glissando* in much the same fashion as Arita but with a more radical outcome. The rapidity and intensity of the *glissandos* in *La Fenêtre ouverte* suggest the idea of a wild turbulence pervading the surrounding space. While in Arita, the shake *glissando* was still kept inside the system, Fontyn's *glissando* triggers the outside and lets it travel beyond its boundaries. The explosion of the traverso *glissandos* does not leave the surrounding space without consequences. Both the viol and the harpsichord react to it. A spatial notation is employed by Fontyn to depict a series of punctual events, such as a cascade of scales in the harpsichord part and *glissando* arpeggios for the viol. In this scenario, the continuous matter is fragmented and broken up into a discontinuous soundscape.
Here we can sum up the four different meanings that *glissandos* are able to evoke:

1. A sonic bridge that interconnects two opposite dimensions in a dual circular system such as silence and sound (ex. *Temps illusoire*);
2. A trace of eternity that is left reverberating into silence (ex. *Mémoires*);
3. A random and spontaneous motion within a system, without direction or trajectory (ex. *Legende*);
4. An eruption of vibrations that travels beyond its natural boundaries and pervades the outside from the inside, in a motion that goes from continuity to discontinuity (ex. *La Fenêtre ouverte*).

Flattement and vibrato: the effects

The finger movement on the edge or above a tone hole can produce a gentle or rapid pitch fluctuation called *flattement*. It can vary in amplitude and speed according to the effect the performer wishes to produce. The same result can be obtained with vibrato: the motion of the airstream produced by the movement of different muscle groups such as the diaphragm, the abdominal wall and the throat.
The *flattement* is traditionally regarded as an ornament and frequently employed in the French Baroque repertoire. J. Hotteterre describes its use on long notes in his *Principes de la flûte traversière* (1707). In P. D. Philidor's *Suites à flûte traversière seule* op. 1, 2 and 3 (1717-18) the *flattement* is explicitly marked as an embellishment with a horizontal wavy line.[14] Its function is to arouse a different number of affects in much the same way as vibrato does. Due to its expressive purpose, it is often considered a sort of finger *vibrato*. The gentle effect that the *flattement* produces, is 'extremely touching in tender pieces' as M. Corrette observed in his *Méthode Raisonnée pour apprendre à jouer de la flûte traversière* (1773).

[14] This is one of the rare examples in which the *flattement* is marked on the score. Usually its employment depends on the personal taste and style of the flautist.

Although conceived as an ornament for centuries, only very recently has vibrato become an integral part of the flute tone production technique. Since the time of Marcel Moyse, its extensive use has made it a fundamental expressive component of modern playing:

> Moyse in particular shows a very flexible approach to vibrato and phrasing, and his vibrato is quite moderate in speed. [...] Pre-war recordings of French orchestras show that vibrato was in general use by French flautists in the 1920s and 1930s [...] about 1930 several flautists in America had developed a style which distinguished them from most flautists in France [...] Marcel Moyse was active as a player and teacher in America from the 1930s onwards, but despite the great flexibility and more moderate speed of his vibrato, American flautists have continued to favour a faster and more constant vibrato than European flautists of the French school (Philip, 2004 pp. 113-4).

While this kind of vibrato in modern times has become a persuasive feature in the tone production technique of modern flute players, in the contemporary repertoire the employment of both finger and regular vibrato seems to look back in time by favouring its pre-modern function as a temporary effect in much the same manner of a Baroque ornament. For this reason, the use of flattement and vibrato are often carefully marked on the score and selectively classified by speed and amplitude.

The absence of vibrato

Following the line of the early music revival and historically informed performance practice, an increasing number of contemporary composers have begun to rediscover the beauty of a straight and pure tone when it comes to the traverso. The presence of a vibrato or *flattement* is carefully marked in the score, making of it the 'exception' rather than the 'norm'. As early as 1996, the Swiss composer Robert Strizich wrote the following preliminary performance notes for his *Tombeau*:

> The notation 'Vb' indicates a pronounced vibrato (with pitch fluctuation). Whenever this notation is found, a Baroque-style *flattement* (or finger vibrato) should be performed if at all possible. However, in the few instances where a true *flattement* is not possible, the necessary vibrato should be produced by varying breath pressure. Where no indication occurs, the performer may apply – with discretion – a small amount of breath vibrato, as long as it is not too pronounced (Strizich, 1996 p.2)

Tombeau (1996), for baroque flute and harpsichord, represents one of the first examples in which a contemporary composer clearly stated how the traverso tone production should be purified from the continuous vibrato so typical of modern playing. This approach shows composers' increasing awareness of one of the most important features that distinguishes performance practice on the one-keyed flute from the one on the modern Boehm model: the employment of the vibrato as a passing effect.

Only a year before, the American composer John Thow (1949–2007) made no reference whatsoever to the traverso tone production in his *To Invoke the Clouds* (1995) for two traversos. On the contrary, still in line with modern flute playing, Thow marked a single 'non vib.' sign (no vibrato) at the very end of his piece, as if the presence of the vibrato up to this point had simply been taken for granted.
It is interesting to note how the calling into question of one of the major features of performance practice on the traverso has begun to have an impact on the way of playing the modern flute too: as early as 1972, at a time when it was still inconceivable to write a modern

piece for the one-keyed flute, the Finnish composer and harpsichordist Jukka Tiensuu composed his *Ouverture et Cadenza* for (modern) flute and harpsichord. In the performance note of this piece, he carefully indicated three different ways to vary the vibrato, according to its speed and micro-tonal amplitude. His expertise as a harpsichordist and true connoisseur of the early music repertoire surely influenced him on this matter. In his later pieces dedicated to period instruments Tiensuu never failed to mention that 'vibrato should be avoided in general'[15] or that it should be 'reserved only to emphasize the most passionate moments of the piece'.[16]

The presence of vibrato

Under these circumstances, vibrato has regained its function as a temporary effect. From now on, the presence of vibrato has to be marked on the score, if required by the composer.

In *Mémoire,* J. M. Rens mentions three approaches:

- *sous vibrato* for a very slow vibrato;
- *vibrato* for a regular effortless vibrato;
- *sans vibrer* for a straight tone.

The *sous vibrato* always appears on long notes and serves the purpose of destabilizing the otherwise straight tone quality of the traverso. This slow-motion way of producing this specific *sous* fluctuation of the pitch does not have the same expressive meaning as a regular vibrato. Compared to the latter, the *sous vibrato* is rather controlled and its pulse more regular. It does not suggest any positive connection to the 'sweetness of sound quality' ('lieblich')[17] as a regular vibrato would do.

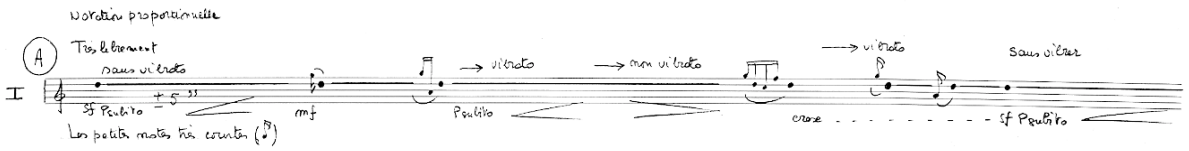

Figure 6 Mémoire by J. M. Rens

Contrary to what Rens does, in *Anspielungen* (1988), H. M. Linde does not diversify the use of vibrato according to its expressive function. He prefers to mention the muscle groups that are involved in the production of two different effects:

- diaphragm vibrato (marked with a wavy line);
- tongue vibrato (marked with a wavy line within a circle).

While the diaphragm vibrato can vary its amplitude and, with that, its expressive function, the tongue vibrato has a much tighter amplitude and a simpler effect: it results in a limited and rather noisy fluctuation of the pitch. Nothing of the sweet and tender quality of traditional vibrato is left here. This subtle movement of the tongue produces a variation in the timbre that is much closer to the roaring effect so typical of the flutter tonguing rather than to

[15] Jukka Tiensuu, *Mora* for tenor voice and Baroque Orchestra (Helsinki: Finnish Music Information Centre, 2012).
[16] Jukka Tiensuu, *Tiet/Lots* for Baroque flute, Baroque violin, viol or Baroque cello and harpsichord.
[17] Greta Moens-Haenen, 'Vibrato' In *Grove Music Online*

tenderness of regular vibrato. Tongue vibrato could be regarded as a flutter tonguing in its primordial state.

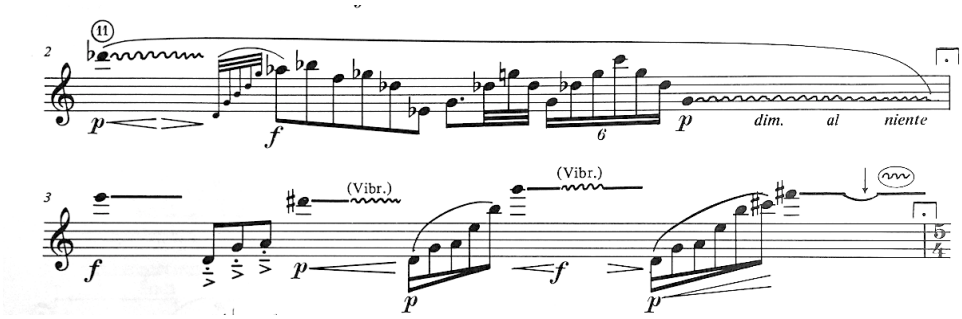

Figure 7 Anspielungen by H.M. Linde
Audio sample: from *Anspielungen* by H.M. Linde –Matteo Gemolo, traverso.
https://soundcloud.com/matteogemolo/excerpt-from-anspielungen-by

The finger vibrato or flattement

In the eyes of many contemporary composers, *flattement* is often employed as a sort of hallmark of 'Baroqueness'.

Compared to regular vibrato, *flattement* can produce a much wider fluctuation of pitch. The fingers that put in motion this special kind of vibrato can vary its amplitude and speed with a greater degree of precision than the traditional vibrato produced by the contraction of the inner muscle groups such as the diaphragm, the abdominal wall, the throat or the tongue, as shown earlier.

A beautiful use of *flattement* is made by Linde in *Anspielungen.* The composer employs this effect on long notes when played *ppp*, in contrast with a regular vibrato on loud tones (*ff*). The *flattement* is therefore able to create a very gentle and intriguing fluctuation of the pitch that gives a more meditative character to the second section of this piece. In contrast with it, Linde places a more expressive and proactive vibrato on loud notes.
Audio sample: from *Anspielungen* by H.M. Linde –Matteo Gemolo, traverso,
https://soundcloud.com/matteogemolo/excerpt-from-anspielungen-by-h

A completely different approach to *flattement* is undertaken by the Canadian composer and flautist Owen Underhill (b. 1954) in his *The Celestial Machine* (1988) for traverso, baroque violin, viola and harpsichord. In line with his eclectic style, Underhill builds up a few interlude sections in which he allows himself to go back to the good old days of tonality, by creating a strong contrast with the harsh atonal character of the rest of his piece. It is in these two tonal sections, marked *Pesante impietoso* (heavy and merciless), that *flattement* can finally re-establish its potential for expressiveness as a reminder of a lost Baroque time. Within a more singing melody, on top of a few tonal chords played by all the instruments (with little microtonal fluctuations), the traverso is able to create a dramatic and dynamically rich melody, by employing a wide and slow fluctuation of the pitch. Underhill employs finger vibrato instead of a regular vibrato as a sort of tribute to the Baroque time, capturing its true essence of ornament.

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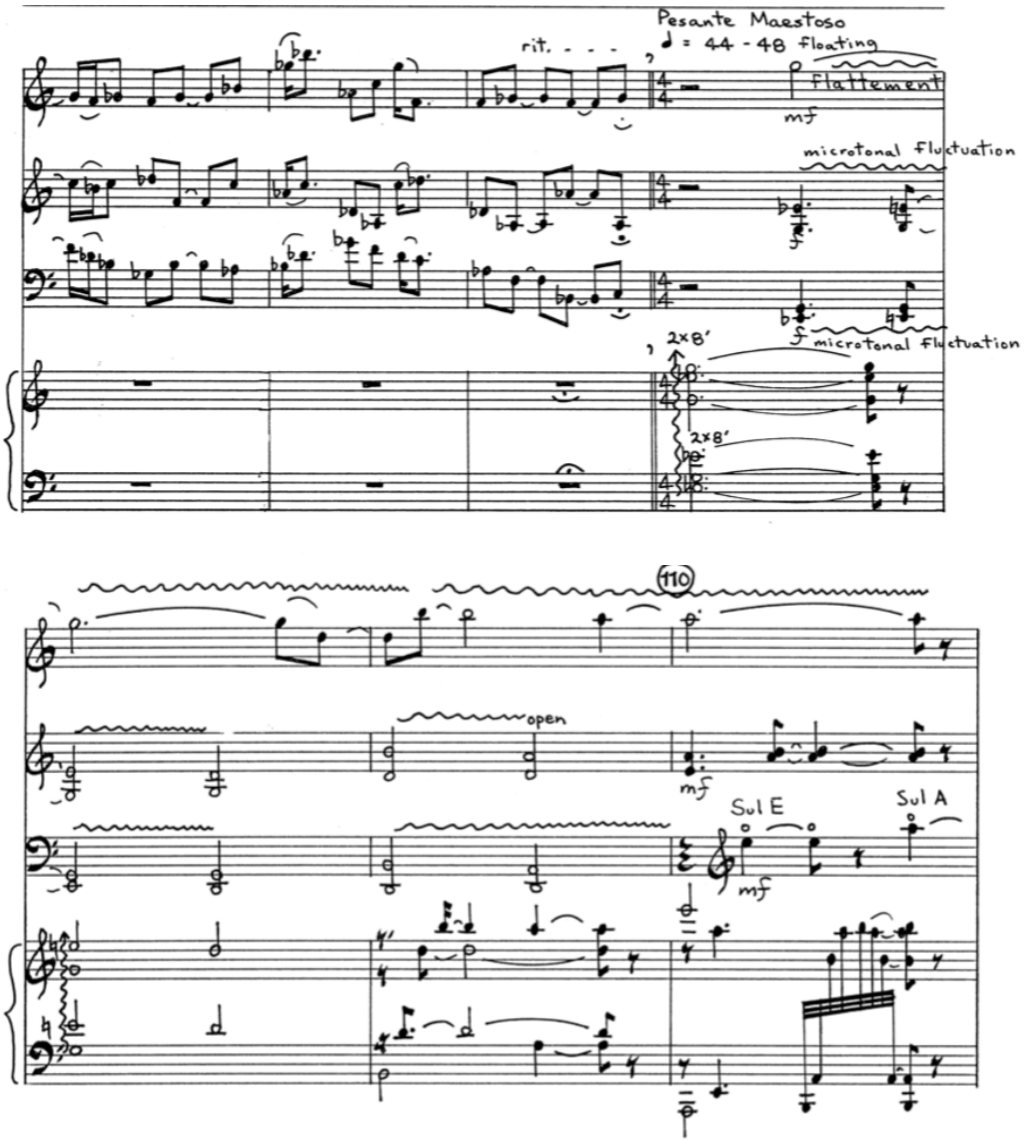

Figure 9 The Celestial Machine by O. Underhill
Audio sample: from *The Celestial Machine* by O. Underhill – Les Coucous Benevoles, Elissa Poole tr.
https://soundcloud.com/matteogemolo/excerpt-from-the-celestial

For Robert Strizich, the employment of *flattement* also seems to be a better fit to the traverso than regular vibrato. In the performance notes of his *Tombeau*, he carefully classifies four different types of *flattement* according to the speed:

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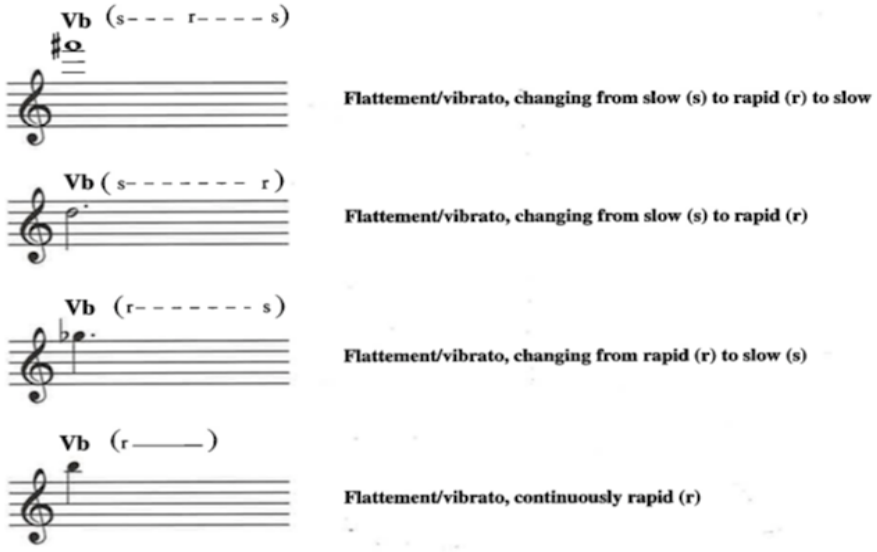

Figure 10 Tombeau by R. Strizich

The importance of this subdivision is central to understand the variety of effects that Strizich wishes to experiment with using this technique. Less concerned than Underhill about its expressive quality, Strizich employs the finger vibrato here as a tacit and approximate means of creating a microtonal soundscape. It is not by chance that Strizich makes copious use of it in the atonal solo flute passages and replaces it with a regular vibrato in the more singing-style passages when the traverso is accompanied by the harpsichord. Nevertheless, while the oscillation of the pitch is strictly controlled in its speed, Strizich completely ignores its amplitude. It is in this ambiguous use of this technique that lies the double meaning that the *flattement* has in the contemporary repertoire:

- on the one hand, due to its expressiveness, it is a reminder of the past where affects could still be played rhetorically by a proper employment of ornaments;
- on the other, a brand new tool to try out new effects on a microtonal level.

Flattement and vibrato: the affects

The employment of flattement or finger vibrato, even in the most atonal pages, can hardly be separated from its expressive function. At the same time, regular vibrato is often replaced by finger vibrato and regarded as a temporary ornament.

The different uses of such techniques can be summed up as follows:

- *sous vibrato*, very slow motion vibrato, to be executed with the contraction of the abdominal wall or the diaphragm. Its controlled and rhythmical nature is in total opposition to the free and expressive traditional vibrato (*Mémoire* by Rens);
- traditional vibrato, to be controlled by the contraction of the abdominal wall, the diaphragm or the throat. Its expressiveness tends to be restricted to fewer episodes and is not widespread as the modern flute technique would suggest (*Mémoire* by Rens, *Anspielungen* by Linde);
- tongue vibrato, a disturbing and noisy tiny fluctuation of the pitch, much closer in effect to flutter tonguing than to the gentler traditional vibrato.
- *flattement* on long and soft notes that creates a meditative and almost imperceptible fluctuation of the pitch (*Anspielungen* by Linde);

- *flattement* on loud notes, with wide amplitude and slow speed to produce an evocative but rather distorted *memento* of a Baroque expressiveness much lost in time (*The Celestial Machine* by Underhill)
- *flattement* with controlled speed to be employed as a tacit and approximate means of generating a microtonal soundscape (*Tombeau* by Strizich).

Conclusion

The range of extended techniques is quite wide and constantly evolving. Techniques such as multiple sonorities, multiphonics, microtones, percussive sounds, whisper tones, jet whistles and singing and playing simultaneously represent valuable resources at the disposal of any composers wishing to enlarge the possibilities of the traverso's sound palette. Nevertheless, the physical differences between the Boehm and the one-keyed flute should always help us to bear in mind that their sonic outcomes are different too. For instance, the whistle tone technique will produce less and much feebler individual partials of notes when applied on the traverso compared to what a modern flute could achieve. This is due to the simple fact that the diameters of finger and mouth-piece holes on the one-keyed flute are much smaller than the ones on the Boehm flute. We will be likewise disappointed to hear the weak percussive sound effects can be produced on the traverso when compared to those obtainable on a modern flute, thanks to its heavy duty material and set of efficient and noisy keys.
Other techniques can be surprisingly efficient on both instruments, such as speaking and playing at the same time. Besides its use in folk and jazz music, one of the first examples of this technique in modern playing can be found in *The Shape of Silence* for modern flute (1969) by American composer and harpsichordist Joyce Mekeel (1931–1997) in which, as described by John Heiss in an article on extended techniques, 'spoken words, sharply enunciated, are used both to articulate and to sustain low-register pitch with a predominantly wind-like sound, which are obtained by blowing rapidly *across* rather than into the blowhole' (Heiss, 1972, p.153).

Later on, in 1988, the same technique was employed by Hans-Martin Linde in *Anspielungen* for the one-keyed flute sharing the same intent as in Mekeel's piece: by pronouncing nasal consonants ('n') in alternation with short syllable ('mo' and 'nu') the flautist is able to create rhapsodic and mumbling effects that help to sustain the low-register pitches.
Nevertheless, the acknowledgment of the different nature of these two instruments is essential to avoid misjudgments. This is the reason why, on one hand, players should be encouraged to experiment with techniques that have been borrowed from the modern flute's contemporary techniques baggage in order to find out how differently they work on an earlier instrument; on the other hand, we should not forget to look back at the past and rehabilitate those techniques that were in used in the Baroque time such as the *flattement* or the different use of enharmonic, diatonic and chromatic scales to produce quarter-tones.
These two ways of considering the traverso's extended techniques could help flautists to stop considering the one-keyed flute as a defective prototype of the modern flute and, instead, to look at it as a different musical instrument with its own features and peculiarities to be fully explored.
Composers such as Jukka Tiensuu, Hans-Martin Linde, Jacqueline Fontyn, Masahiro Arita, Jean-Marie Rens and Doja Cojocaru have proved able to revive the sound possibilities of the

traverso and exploits a certain number of extended techniques without forcing the one-keyed flute to become a caricature of the modern flute.

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