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The facsimile of The Rudiments or Principles of the German flute

the first English translation of Principes de la Flute Traversiere ou Flute d'Allemagne (1707) by Jacques Hotteterre Le Romain

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THE FLAUTISTS VADEMECUM

A collection of flute music, texts about flute playing and technical exercises from the 18th Century to the present day connecting to artistic research and music education.
Edited by Anders Ljungar-Chapelon

FACULTY OF FINE AND PERFORMING ARTS | LUND UNIVERSITY SWEDEN



LES TRADITIONS EN MOUVEMENT

Principes de la Flute Traversiere ou
Flute d'Allemagne (1707)

by Jacques Hotteterre Le Romain and
The Rudiments or Principles of the German flute (1729)
the first English translation of Hotteterre's Principes

A comparative study of French flute traditions over 300 years: Transitions and changes of aesthetics, musical expressions, playing techniques and flautistic learning regarding the Traverso, Multi-keyed conical flutes, Ringklappenflöte, and the Boehm-flute

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Pour mes amis Alain Weemaels et Stephen Preston

Preface

The *Flautists Vademecum* presents flute music, texts about flute playing and technical exercises from the 18th Century to the present day, and connects to artistic research which includes research relating to the education of the professional flautist.

The present study on *Principes de la Flute Traversiere ou Flute d'Allemagne* (1707) together with its first English translation *The Rudiments or Principles of the German flute* (1729) by Jacques Hotteterre *Le Romain* (1674-1763) can perhaps add perspectives for anyone interested in the Traverso in the period of the very late 17th Century and the first decades of the 18th Century, and shed light on the interpretation of French music for the Traverso from the above-mentioned period. Further does the study attempt to show how transitions and changes of aesthetics and playing techniques has been realised starting with the Renaissance Traverso, the One-keyed Traverso, Multi-keyed conical flutes, the *Ringklappenflöte* (Boehm, 1832), to the Boehm-flute (Boehm, *Cylinderflöte*, 1847) up to the present day within French flute traditions. The present study is a comparative study, based on perspectives relating to hermeneutics and transitions of aesthetics, musical expression, playing techniques and flautists learning. In addition will for the first time a complete facsimile of *The Rudiments or Principles of the German flute* (1729) be joined as a separate supplement to the present edition. It should be noted that the present study does not discuss the revival of historical performance practice on period instruments in explicit terms from the middle of the 20th Century to the present day. Focus is thus *Principes*, *Rudiments* and how these instruments were described in the first part of the 18th Century, further transitions over time including different transverse flute models up to the present day.

*

In the following I would like to express my thankfulness and gratitude for inspiring and fruitful discussions regarding the Traverso, flute playing, and music when preparing and working on the present study with many friends and colleagues all over the world.
First, my friends the master maker of the Traverso Alain Weemaels (Bruxelles/Belgium), and Traverso virtuoso and researcher Dr. Stephen Preston (Scotland). My dear friend Alain has contributed substantially through our long conversations regarding the development of ideas and aspects on music and Traverso playing and made wonderful Traversi for me during almost forty years. My dear colleague and friend Stephen has since many years been an invaluable partner discussing the 18th Century Traverso, its repertoire, playing techniques, sources, and musical expression.
A special thanks goes to Mr Augustine Ford (England) for generously giving me the authorization to take part of his collection of 18th Century original editions and drawings connecting to Hotteterre.
Further to my friends and colleagues: Professor Frode Thorsen (Recorder virtuoso, Dean for the Faculty of Fine Art, Music and Design, Bergen University/Norway), Gro Sandvik (Solo flautist, Professor emerita, Norway), Odette Ernest Dias (Solo flautist, Titular Professor emerita, University of Brasilia, UnB, Brazil), Gabriella Sjögren (Harpsichordist, specialist in historical tuning systems, Sweden), Professor emeritus Michael Schneider (Recorder virtuoso, conductor, Germany), Professor emeritus Karl Kaiser (Traverso virtuoso, Germany), Dr. Raul Costa d'Avila (Solo flautist, composer, researcher, UFPEL, Brazil), Dr. Antonio Guimaraes (Solo flautist, researcher, Sao Joao del Rey, UFSJ, Brazil), Mr Kotaro Yamaki and the staff of flute makers at *Sankyo Flutes*, Japan. Auguste Germain (Expert of 18th Century and Contemporary textiles and tenth generation of *La Maison Germain*, Lyon, France), Per-Olof Ekström (*Selma Music*, Sweden), Claes-Bertil Nilsson (Score editing, Sweden), Patrick Persson (Photographer, Sweden), Johan Albertén (MediaTryck, Lund, Sweden). My students from all corners of the world in various and inspiring pedagogical contexts while researching Hotteterre's *Principes*, *Rudiments* and learning regarding the Renaissance Traverso, Traverso, Multi-keyed conical flutes, and the Boehm-flute.
Finally, my dear friend Kurt Kutlu Schlarbaum (Double-bass player, manager of *Kammerensemble Cologne*, Germany & Izmir/Turkey) who intensely encouraged me to start performing on the Traverso in the 1980-ties together with giving me many years of rich opportunities to perform and record when playing the Traverso, and my dear friend Bettina Bäß (Recorder virtuoso, Germany), who helped me to get my very first Traverso when I was living in Cologne in the early 1980-ties.
A posthumous thanks goes to my friends and colleagues Peter Lloyd (Solo flautist, Principal flute *London Symphony Orchestra*, Professor at *Royal Northern College of Music*, Manchester), and Alain Marion (Solo flautist, Professor at *Conservatoire National Supérieur de Musique* in Paris) for our long and precious discussions covering decades regarding French flute traditions, playing techniques, flute history, teaching music, aesthetics, the arts, and life.

Hereby I will express my sincere thankfulness to the Lund University (Sweden) and the Dean for the Faculty of Fine and Performing Arts Dr. Sanimir Resic, former Principal Professor Karin Johansson, the current Principal Professor Hans Hellsten, and the Director for the Department of Performance Lars Härstedt Salmonson at Malmö Academy of Music/Lund University, that together has created the generous environment over time for the realisation of the present study and facsimile. Similarly, my thoughts go with warmth to the staff of the Music Library of the Faculty of Fine and Performing Arts/Lund University and its chief librarian Åse Lugnér, the librarians Karin Thoma Savatovic, and Christer Axéll finding possible and impossible sources.

Limhamn (Sweden) and Meyrueis (France), September 2023

Prof Dr Anders Ljungar-Chapelon

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Part I

1 Introduction

La Flûte, cet instrument si doux, si flatteur, si charmant, & qui parloit autrefois au cœur […][1]

D'Aquin de Chateau-Lyon (1752, 147)

The present comparative study has its focus on *Principes de la Flute Traversiere ou Flute d'Allemagne. De la Flute a Bec, ou Flute Douce, et du Haut-Bois, Divisez par Traitez.* first published 1707 in Paris by the Traverso virtuoso, composer, and teacher Jacques Hotteterre *Le Romain* (1674-1763), together with its first English translation *The Rudiments or Principles of the German flute.* published 1729 in London, which now is republished for the first time. This English translation seems to be preserved in very few originals, one in the collections of the *Archives & Special Collections*, *University of Glasgow Library* Scotland, another in the *Library of Congress* in Washington, and one or two in private collections.

In April 1707, and in the Parisian gazette *Mercure Galant* (founded in 1672) was a short announcement of Hotteterre's *Principes de la Flute Traversiere, ou Flute d'Allemagne; de la Flute à Bec, & du Hautbois.* The first sentence in the announcement connects to an *Air Noveau*—its text together with its score—preceding the announcement of Hotteterre's text in the same issue of the gazette which is of interest because it points on the close relation between singing and Traverso playing (see Appendix I). Further that Hotteterre's text could be used for self-studies, and where it could be purchased:

> Les Chansons & les Flutes ayant beaucoup de rapport ensemble, l'article qui suit se trouve bien placé. Mr Hotteterre le Romain, Ordinaire de la Musique du Roy vient de faire imprimer un Livre intitulé, *Principes de la Flute Traversiere, ou Flute d'Allemagne; de la Flute à Bec, & du Hautbois*. Ce livre doit estre utile à ceux qui se plaisent à joüer de ces Instrumens; ils y trouveront des demonstrations & des explications sur toutes les difficultez qui pourroient les embarrasser touchant ces instrumens, ce qui pourra tenir lieu de Maistre à ceux qui ne sont pas en estat d'en avoir. Ce livre se vend chez le sieur Christophe Ballard, ruë saint Jean de Beauvais au Mont-Parnasse, chez le sieur Foucault ruë S. Honoré à la Regle d'Or, & chez l'Auteur, rue Christine. (*Mercure Galant*, 1707, IV: 271-272)[2]

It should be noted that Hotteterre's text discusses mainly the Traverso, and has a shorter section on the Recorder, and brief comments on the Oboe. *Rudiments* is exclusively a translation of Hotteterre's text on the Traverso, and consequently are the sections on the Recorder and Oboe not a part of the present study. Hotteterre's text on the Traverso is the first of its kind for a transverse flute with one key in the European tradition, and thus had—and still has—a unique position within texts explaining playing-techniques, and how a transverse flute function. The style of writing is holding an empirical and detailed level which surpasses many later comparable texts, shedding light on Hotteterre's mastery as a Traverso-player, explanations of playing-techniques, and teaching skills. Hotteterre described Traverso-playing reflecting the last decades of the 17th Century and the beginning of the 18th Century and the three-piece Traverso whereby the so-called *Graz Hotteterre flute* has become almost like a prototype. This model of Traverso had a repertoire of works by flautists like Michel de La Barre (*c.*1675-1745) and Hotteterre writing for their own instrument, together with music by composers such as Marin Marais (1656-1728) and Gaultier de Marseille (*c.*1642-1696). The repertoire by these composers is not virtuosic in a flamboyant manner when compared with later works by for example Michel Blavet (1700-1768) and Pierre-Gabriel Buffardin (1693-1768) but highlights expressive singing moods. The quote above from *Lettres sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV* by Pierre-Louis D'Aquin de Chateau-Lyon (1720-*c.*1796) is perhaps a characterization of how Traverso-music in the early 18th Century was performed by La Barre and Hotteterre:

The Flute, this instrument so sweet, so flattering,
so charming, and which once spoke to the heart […]

D'Aquin de Chateau-Lyon (1752, 147)

---

1. The Flute, this instrument so sweet, so flattering, so charming, and which once spoke to the heart... (D'Aquin de Chateau-Lyon, Pierre-Louis, *Letters sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV*, 1752, 147)
2. As Songs & Flutes relate a lot, the following article is well placed. Mr Hotteterre le Romain, Ordinaire de la Musique du Roy has just printed a Book entitled, *Principes de la Flute Traversiere, ou Flute d'Allemagne; de la Flute à Bec, & du Hautbois*. This book should be useful to those who enjoy playing these Instruments; they will find demonstrations & explanations on all the difficulties which could embarrass them concerning these instruments, which could take the place of Master for those who are not able to have them. This book is sold at le sieur Christophe Ballard, ruë saint Jean de Beauvais au Mont-Parnasse, chez le sieur Foucault ruë S. Honoré à la Regle d'Or, & chez l'Auteur, rue Christine. (*Mercure Galant*, 1707, IV, 271-272)

1.1 Sources, research design, and methodological considerations

The main sources for the present study are the French original edition of *Principes de la Flute Traversiere ou Flute d'Allemagne* (1707) by Jacques Hotteterre *Le Romain* and its first English translation *The Rudiments or Principles of the German flute* (1729). In the following is the French original *Principes de la Flute Traversiere ou Flute d'Allemagne* (1707) called *Principes*, and its first English translation *The Rudiments or Principles of the German flute* (1729) called *Rudiments*.

Principes (1707) is a highly important text and manual regarding the three-piece Traverso of the late 17th Century and the beginning of the 18th Century, and represents a documentation and codification of playing-techniques and oral traditions with roots in the last couple of decades of the 17th Century and the very beginning of the 18th Century. This text was published for the first time in 1707 by the editor Christophe Ballard (1641-1715) in Paris. Because the ground-breaking nature of *Principes* it soon became a well know text which might explain why it was republished several times within a short time by the editors of Ballard in the years 1713, 1720, 1721, 1722, and finally in 1741. Within the present study has the editions of 1707, 1713, 1720, 1722 and 1741 been examined with the help of one original (1722) in a private collection, further due to originals in data bases such as *Bibliothèques National de France* in Paris, and *Library of Congress* Washington D. C., and facsimiles. The conclusion is that mentioned editions generally are identical, apart from a few minor differences discussed in section 1.3 *Principes* and *Rudiments*.

Rudiments is the first complete English translation of *Principes* and thus represents a key text regarding Traverso-playing in England in the first part of the 18th Century. Within the present study has this text been examined with three originals: one in a private collection, one in the collections of *Archives & Special Collections*, *University of Glasgow Library* Scotland, and finally one in the *Library of Congress* in Washington D. C.

The present study is structured in three parts. *Part I* starts with an introduction and contextualisation to the original French text of *Principes* and its English translation *Rudiments* together with a bilingual display of the respective complete texts. *Part II* focuses on extracting Traverso playing-techniques as described and explained in *Principes* and *Rudiments*. *Part III* has *Part II* as its point of departure and discusses transitions and changes of flute techniques and aesthetics within French flute traditions covering 300 years and the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and Boehm-flute. From a methodological perspective is the present study structured around the idea of making a documentation and comparison between the original text of *Principes* and its English translation *Rudiments*, including other versions and translations of the French original published during the 18th Century in France, Holland, England, and Germany. Further to discuss comparable texts, primarily of French origins, regarding the Traverso from the 18th Century in relation to *Principes*, together with French flute pedagogical texts from the 19th up to the 21st Century, including Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. The influence of *Principes* can be directedly traced until the last decades of the 18th Century, and an example is *L'Encyclopédie Méthodique* (1785 & 1788) having sections literally quoted from *Principes*, when explaining essential playing-techniques in the section *Flûte Allemand* ou *Traversière*. In the seventh chapter of the present study—*Transitions and changes of flute techniques and aesthetics within French traditions covering 300 years*—will findings regarding the 18th Century and Traverso playing be discussed in relation to French flute traditions and transitions up to the present day.

An important focus has been to compare fingering-charts as found in *Principes* and *Rudiments* with fingering-charts by Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Roeser (1777) which is identical with Corrette (1735 & 1773), Mussard (1778), an anonymous fingering-chart (*c.*1790) which is identical with Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), Peraut (*c.*1802), and Balleron (1895) all published in Paris. In fact, examined fingering-charts generally suggest the same fingerings, and sometimes with minor differences. This is noteworthy because Hotteterre described a Traverso aiming for playing music of *Le Grand Siècle* by composers such as Lully, De la Barre, Marais, Dornel, Philidor and Hotteterre, whereby for example Devienne, Peraut and Hugot & Wunderlich wrote about a Traverso which is an instrument for sonatas, concertos, and orchestral parts by composers such as Devienne, Mozart, Stamitz, including the early Beethoven. Despite differences regarding musical styles and expressions French Traverso-traditions during the 18th Century up in the 19th Century show homogenous elements regarding transitions of fingerings and playing-techniques when comparing *Principes* with Devienne (*c.*1794), Peraut (*c.*1802), Hugot & Wunderlich (1804), Wunderlich (*c.*1812), Tulou (1851), and Balleron (1895).

In the following are explanations regarding how quotes, pagination, bibliographical data, etcetera has been handled within the present study:

- Pagination in the bilingual section *4 The Rudiments or Principles of the German flute the complete English translation* (1729) *and the original French text* (1707) follows the French and English originals, and is marked within brackets and bold at the end of each page.
- Quotes from *Principes* and *Rudiments* are located as follows: *Chapters* are marked with Roman numerals, and *pages* are marked with Arabic numerals.
- Regarding quotes in French as in other languages is spelling and orthography kept as in the originals, although 18th Century spelling sometimes is a bit adventurous. Official English translations of French, German and other sources including quotes are indicated in the footnotes, if no translation has been available the author of the present study has made the translation in question.
- Bibliographical data of sources and editions are marked within brackets, which facilitates to find the same sources in the reference list in which new editions and facsimiles are annotated. Footnotes include standard bibliographic data regarding sources.
- Personalities mentioned in the text are presented with complete name and birth-dates first time they are mentioned, then generally only mentioned with family name.
- Major keys are always marked with Capital letters (i.e., G = G-major), and minor keys are always marked with small letters (i.e., g = g-minor).
- Music examples from *Principes* and *Rudiments* and other sources are reproduced according to their original notation, including that misprints are not corrected. Octaves and notes are marked in the following manner:



*

The present study is based on a hermeneutical approach, and texts by the following authors has been principal sources and tools for the research process:

Authors	Texts
Anne Dacier (1645-1720)	• *Les Comedies de Terence, Traduites en François, avec des Remarques, par Madame Dacier. Quatriéme Edition, où l'on a mis les Remarques sous le Texte* (1688) • *L'Iliade, Traduite en François, avec des Remarques. Par Madame Dacier* (1711) • *Des causes de la corruption du goust* (1714) • *L'Odyssée, Traduite en François, avec des Remarques. Par Madame Dacier* (1716)
Johann Martin Chladenius (1710-1759)	*Einleitung zur richtigen Auslegung vernüftiger Reden und Schriften* (1742)
Friedrich Ast (1778-1841)	*System der Kunstlehre oder Lehr- und Handbuch der Aesthetik* (1805)
Friedrich Schleiermacher (1768-1834)	*Hermeneutik und Kritik* (posth. 1838)
Wilhelm Dilthey (1833-1911)	*Die Entstehung der Hermeneutik* (1905)
Marcel Proust (1871-1922)	• *Contre Sainte-Beuve* (1908) • *À la recherche du temps perdu* (1913-1927)
Martin Heidegger (1889-1976)	*Der Ursprung des Kunstwerkes* (1935-1936)
Hans-Georg Gadamer (1900-2002)	*Wahrheit und Methode. Grundzüge einer philosophischen Hermeneutik* (1960)

Important backgrounds regarding *Translation*, *Interpretation* and concepts of *Enlarged language* are based on Dacier and Dilthey, models of *Horizon of understanding* as formulated by Gadamer connected to notions on the concept of *Sehe-Punct* (Viewpoint) as formulated by Chladenius, together with a methodology inspired by Schleiermacher, further discussions on what a work of art could be, the origin of the artwork and craftsmanship relating to Ast and Heidegger.

An essential additional source when discussing elements of art, interpretation, and an intuitive approach in relation to research and artistic creation is *Contre Sainte-Beuve* (1908/2016) and *À la Recherche du Temps perdu* (1913-1927/1988) by Marcel Proust. The research process connects directly to Schleiermacher (1838/1977) who developed thoughts regarding the importance of that the researcher thoroughly considers contextual elements that a study of historical documents presupposes.

Schleiermacher's idea was that a basic prerequisite is to place the investigated object—in the present context *Principes* and *Rudiments*—in a reliable historical context, allowing for the approximation of an author's thought-world. When Schleiermacher discussed the hermeneutical circle, it is described as a progression of a step-by-step understanding. The example is that when reading the first sentence in a text, this sentence creates a provisional understanding and context of the text. When further sentences are read, understanding and context concretises, which means that new sentences create new perspectives clarifying the previous incomplete understanding and context. In this manner, new circles are formed with the gradually expanded understanding, which can be resembled to a successive spiral movement that breaks the former circle's circle. A similar explanation of the dynamic regarding the hermeneutical circle is when Gadamer (1960/1990) associates to when learning Latin or Greek of the Antiquity. When learning the languages from the Antiquity it must firstly be learnt how sentences are constructed which happens one step before the sentence can be interpretated. Such a procedure is directed by the expectations of what the previous sentence has indicated, but without precision. The continued interpretation includes gradual adjustments of the achieved understanding like a pendulum movement between the part and the entity like a metamorphosis gradually deepening the understanding in relation to the previous understood and a constant enlargement of the researcher's horizon of understanding. An example of how the hermeneutical circle has been applied in the present study of the Traverso is the analyse of Hotteterre's explanation how to play the note C#1. This note is a half-tone step below the lowest normally playable note D1 on the Traverso, and falls out of the frame for how to play all other notes on the Traverso. Hotteterre gives the following explanation regarding C#1:

[…] on tourne l'Embouchure [Head-joint] en dedans suffisamment pour gagner un demi-Ton […] (V: 17)	[…] by turning the Flute inwards, sufficiently to lower the Sound by half a Note […] (V: 12)

This explanation is interesting in the present context, because playing C#1 stands in close relation to the three positions *Outward—Normal* or *Usual—Inward* of the head-joint as described in *Principes* and *Rudiments*. If the head-joint having a *Normal position* being too much turned inwards, it will be impossible to lower the note D1 a half-tone step downward for reaching C#1. If the head-joint has a *Normal position* too much turned outwards, it is possible to find the C#1 but all other notes will be completely out of tune. In other words: Hotteterre's technique for playing the note C#1 could supposedly be used for calibrating the *Normal* position which is the reference point for the *Inward* and *Outward* positions of the head joint. When applying the hermeneutical circle in this example the first step is to turn the head-joint inwards until C#1 is found, which is an extremely inward position of the head-joint. The second step is that the position for playing C#1 through deduction sheds light on the three positions *Outward—Normal—Inward.* An important tool when activating a hermeneutical approach and the hermeneutical as described above is the concept of extended language, which has been developed gradually since the 18th Century.

Madame Dacier (1688, 1711, 1714, 1716) was an excellent and leading philologist and translator of Latin and Greek of the Antiquity in *Le Grand Siècle* (Burette, 1721; Farnham, 1976; Itty, 2012). Dacier's numerous translations which were published in many editions and re-editions far up into the late 18th Century have long introductions and comments discussing the phenomenon and theory of translation having significant connections to when musicians "translate" a score into sounding music. Furthermore, Dacier discussed ideas with affinity to concepts of *Enlarged language* (Ljungar-Chapelon, 2002, 2003, 2008).

Dilthey (1905/1924) developed ideas and concepts regarding *Enlarged language* to include painting, sculpture, dance, theatre, architecture, and music as being signs of human activity. According to Dilthey is the understanding of human activity including the arts based on the concept of enlarged language (Ljungar-Chapelon, 2008).

*

An important hermeneutic point of departure is how and with which preunderstanding the researched object is observed—in the present study the Traverso—its playing-techniques, repertoire, and learning. In this context is Chladenius important when he focuses on the researchers *Sehe-punkt* which is not based on a historical perspective but from the direct observation of a specific object or event in present time. Chladenius' example are three persons that at the same time are watching a battle from three different places, and how these three positions result in three completely different opinions of what happens.

This observation made in direct present time is necessary, and points on the importance of a contextualisation if the researched object is of historical nature which connects to thoughts developed by Schleiermacher (1838/1977) who stressed the importance of a historical contextualisation aiming for the creation of a reasonable horizon of understanding in relation to the researched object. In the present context has Chladenius' model as regards the *Sehe-punkt* been applied for the study of for example fingering-charts and given explanations as found in *Principes* and *Rudiments*. When aiming for creating Schleiermacher's historical context has several sources been consulted regarding French writings on music, dance, theatre, rhetoric, grammar, philology, philosophy, aesthetics, composers, dictionaries, methods for Musette, Singing, Basse de Viole, Traverso, Harpsichord, Violin, music theory, and art covering the period from the 17th Century to 1800 (Appendix II). This contextualisation has three periods whereby the first start in 1606 with the birth of dramatist and author Pierre Corneille (1606-1684) because when starting so early the sources and personalities mirrors *Le Grande Siècle* which had resonance and importance far into the 18th Century. The second period embraces the life span of Hotteterre (1674-1763). The final and third period reflects the second part of the 18th Century up to 1800 and situates Hotteterre into a context of influence and changes of aesthetics regarding musical expression and the Traverso, and announces transitions to Multi-keyed conical flutes, the *Ringklappenflöte*, and the Boehm-flute.

*

A musical instrument—in the present context the Traverso—is the result of a successive development of transverse flutes which by virtue of its construction, elicits intrinsic possibilities in a sense could be said to "play itself". This could be compared with a maieutic process and Socrates' metaphor that the teacher with questions—in this case the Traverso—asks questions to the Traverso-player and the Traverso "plays its player". In Heidegger's *Der Ursprung des Kunstwerkes–The origin of the work of art* (1935-1936/2005/2002) is a discussion on the origins of artwork and its craftsmanship connecting to this idea.

When studying craftsmanship as discussed in *Principes* and *Rudiments* and thoughts on expressing music with the Traverso this could be connected to Heidegger's ideas regarding a painting of a pair of old worn-out shoes by Vincent van Gogh (1853-1890; *c.*1886, Appendix III). Heidegger's example suggests that the shoes of the peasant women show their inherent functionality in relation to how these shoes are used intuitively as tools when working on the field. In a metaphorical sense, these shoes could be replaced with a Traverso, and how it is used when practicing and performing. Thus, attention is focused on what the instrument Traverso can be used for, how it is used, the essence of its use, its applicability, and on how this can be achieved and realized. Such thoughts and questions have been leading stars for the present study:

Die Bäuerin auf dem Acker trägt die Schuhe. Hier erst sind sie, was sie sind. Sie sind dies um so echter, je weniger die Bäuerin bei der Arbeit an die Schuhe denkt oder sie gar anschaut oder auch noch spürt. Sie steht und geht in ihnen. So dienen die Schuhe wirklich. An diesem Vorgang des Zeuggebrauches muß uns das Zeughafte wirklich begegnen. (Heidegger, 1935/2005, 26–27)	The peasant woman wears her shoes in the field. Here for the first time are they what they are. Only then do they become what they are. They are all the more genuinely so the less the peasant woman thinks of her shoes while she is working, or even looks at them, or is aware of them in any way at all. This is how the shoes actually serve. It must be in this process of usage that the equipmentality of the equipment actually confronts us. (Heidegger, 1935–1936/2002; 13–14)

In *Wahrheit und Methode Grundzüge einer philosophischen Hermeneutik* (1960/1990) by Gadamer is pointed on the importance of that the hermeneutical researcher has a relation not only to the researched object but also to the tradition of the object in question:

> Die Hermeneutik muß davon ausgehen, daß wer verstehen will, mit der Sache, die mit der Überlieferung zur Sprache kommt, verbunden ist und an die Tradition Anschluß hat oder Anschluß gewinnt, aus der die Überlieferung spricht. (Gadamer, 1960/1990, II, 62–63)[1]

1. Hermeneutics must proceed from the assumption that whoever wants to understand is connected to the matter that is discussed in the tradition and has or is gaining a connection to the tradition from which the tradition speaks. (Gadamer, *Wahrheit und Methode Grundzüge einer philosophischen Hermeneutik*, 1960/1990, II, 62–63)

The essence of this idea is that a hermeneutical process regarding understanding must have a direct contact and relation towards the object in question, and to develop a relation to the tradition that speaks from the studied object. Gadamer's idea has been a point of departure for the present study in so far that the Traverso and its playing-techniques and craftsmanship—as described and exemplified in *Principes* and *Rudiments*—has been placed in a large flautistic context reaching far up into the early 21st Century, and in a parallel movement to requirements as described above in relation to Schleiermacher. Further Gadamer's thoughts has a direct connection to the interpretation of scores as a whole and very much so in relation to Hotteterre and his contemporaries.

*

A concluding observation is that the research process as in the present study can't exclusively be dependent on intellectualisations which is a topic discussed in *Contre Sainte-Beuve* (1908) by Proust:

> Non seulement l'intelligence ne peut rien pour nous pour ces résurrections, mais encore ces heures du passé ne vont se blottir que dans des objets où l'intelligence n'a pas cherché à les incarner. (Proust, *Contre Sainte-Beuve*, Preface, 1908)[1]

An intuitive approach as suggested by Proust has been of essential importance and applied when examining for example crucial skills when playing the Traverso as when blowing the airstream searching for the optimal target point against the sharp edge of the blowing-hole on the head-joint called *Le veritable point* in *Principes* (II: 3), and *The true point* (II: 3) in *Rudiments*. The same method and procedure have been applied on the study of historical sources, pedagogical documents such as instrumental methods within the present study.

Additional elements contributing to the research process including sources regarding the design and examinations of acoustical features, intonation, temperaments, and sound colour of the Traverso has been based on research directed by the French acoustician Michèle Castellengo et al. in Paris (1968, 1976, 1978, 1998a, 2015), which has served as guidelines in these fields for the present study.

Original—Copy—Original

> *Se choisir un modèle n'est pas, matériellement parlant, copier ce modèle; c'est suivre la marche du maître qu'on préfère et s'éclairer de son experience.*[2]
>
> Baillot (1834, 8)

The fundamental point of departure for realizing the present study has two components:

a) Access to texts like *Principes*, *Rudiments*, flute methods, and scores of music written for the Traverso covering the late 17th Century, and first part of the 18th Century.

b) Access to top class copies of the three-piece Traverso played in the period of Jacques Hotteterre *Le Romain* and his contemporaries.

Regarding what is mentioned under a) these sources are available through facsimiles, editions, in digitalized libraries such as *Bibliothèque Nationale de France* in Paris, together with helpful collectors giving access to their private collections.

What is mentioned under b) is far more complicated because the few original three-piece Traversi remaining from the very late 17th Century and first part of the 18th Century are fragile, and should better be preserved in museums so that future generations have access to these originals for making measurements and analyses. Further must it be taken into consideration that a wooden wind-instrument being about three hundred years old often have been slightly distorted by time. To copy an original three-piece Traverso—for example the *Graz Hotteterre flute* in the collections of *Landesmuseum Joanneum* in Graz (Austria)—whereby the wood due to its age of more than three hundred years slightly has changed dimensions compared with how the instrument was designed when made around 1700, indulges the Traverso-maker to make important decisions. A possibility is to make a precise copy of the instrument in its present shape, another to calculate what probably were its original dimensions.

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1. Not only can intelligence do nothing for us for these resurrections, but also these hours of the past will only nestle in objects where intelligence has not sought to embody them. (Proust, *Contre Sainte-Beuve*, *Preface*, 1908)

2. Choosing a model is not, materially speaking, copying that model; it's following the path of the master you prefer and learning from his experience. (Baillot, *L'Art de Violon*, 1834, 8)

To make a copy of the present dimensions would make an instrument that is a copy of the original in its present shape, but not necessarily with when it was made, which includes that intonation, sound colour, and response when articulating probably do not essentially correspond to when the instrument was made. When striving for making a copy aiming to correspond as far as possible with the original and its aesthetics when it was made makes it crucial for the Traverso-maker to recalculate dimensions of paramount parameters like for example the bore, shape of the blowing hole, and under-cut of the tone-holes. In this context is Nicolas Boileau-Despréaux (1636-1711) and his translation of Longinus's *Traité du Sublime* (1674/1966) of great interest because it discusses how imitation can be used as a tool for an author. In the twelfth chapter, *De la manière d'imitér*, is described how imitation can serve as a method when writing a text aiming for a sublime result by asking:

> Comment est-ce qu'Homere, auroit dit cela? Qu'auroient fait Plato, Demosthene ou Thucydide même, s'il est question d'histoire, pour écrire ceci en stile sublime? Car ces grands Hommes que nous nous proposons à imiter, se presentant de la sorte à nostre imagination, nous servent comme de flambeau […] (Boileau, *Traité du Sublime*, 1674/1966, 362)[1]

This means that the author should ask himself how Homer, Plato, Demosthenes, or Thucydides would have written if the objective was to do so in a sublime style. This question has direct bearing on when the Traverso-maker copies an instrument like for example the above-mentioned *Graz Hotteterre flute*, and asking questions like: How might the instrument-maker Martin Hotteterre (*c.*1635-1712)—the father of Jacques Hotteterre *Le Romain*—have made the undercut for the blowing hole and the tone-holes, and a wealth of similar questions regarding the bore etcetera. In the following section *6.9.5 Interpretation and translation: Madame Dacier* is a discussion regarding definitions of *Copy and Imitation* (Girard & Beauzée, 1769) which connects to questions regarding an original when being copied, alternatively translated, or used as an object for imitation. As mentioned above is a three-piece Traverso made around 1700 probably in its present condition not exactly corresponding to its original measurements which raises important questions regarding the relation between a copy of the original of the Traverso, because when the original is exactly copied it does probably not corresponds to the original when it was used in let say the early 18th Century. To solve this problem the Traverso-maker needs to make recalculations of the proportions when the instrument was made. Being able to make such recalculations in an adequate way is depending on long experience and knowledge of many original instruments for not risking ending up in a hybrid instrument that might play well, but being too far away from what the original probably have been. The German Renaissance painter and printmaker Albrecht Dürer (1471-1528) did suggest a similar method for developing craftsmanship aiming for artistic freedom based on intense copying of paintings and prints by masters:

> […] er muß van guter Werkleut kunst erstlich viel abmachen, bis daß er ein freie Hand erlangt.[2]
>
> (Dürer in Henkel & Schauerte, 2012, 6)

When the instrument-maker studies an original in combination with careful recalculations of above-mentioned parameters this altogether potentially revel essential parameters and aesthetics which enlightens the studied original as a whole. Such a method connects to above-mentioned Schleiermacher and the necessity of a historic and hermeneutical contextualization of the researched object. To extract parameters and aesthetics in this sense—in relation to painting—is described in *Betrachtungen über die Mahlerey* (1762) by the German art-theoretician Christian Ludwig von Hagedorn (1712-1780), when discussing concept regarding *Nachahmung* (imitation, copying) in relation to in this case the Italian Renaissance painter Raphael (Raffaello Sanzio da Urbino, 1483-1520):

> Ein Künstler, welcher der Vollkommenheit im Ganzen nachstrebet, wird den Raphael nachahmen, nicht wie er war, sondern nach demjenigen Gesichtspunkte, den Raphael niemals verließ […] (Hagedorn, 1762, I: 102)[3]

The method activating parameters extracted from important examples, is not to copy in the sense of a mechanical reproduction, and could metaphorically describe the work of the skilful Traverso maker.

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1. How would Homer have said that? What would Plato, Demosthenes, or even Thucydides have done, if it is a question of history, to write this in sublime style? Because these great men whom we propose to emulate, presenting themselves in this way to our imagination, serve us as a torch […] (Boileau, *Traité du Sublime*, 1674/1966, 362)
2. […] first one must study and copy artwork by masters until a free hand is acquired. (Dürer in Henkel & Schauerte, *Original kopiert!*, 2012, 6)
3. An artist who strives for perfection as a whole will imitate Raphael, not as he was, but from the point of view that Raphael never abandoned […] (Hagedorn, 1762, I: 102)

When so, a new painting—or a Traverso in the present context—is a *recreation* based on extracted parameters and the "copy" becomes metamorphosed into a new original. The result of the above-described study of originals combined with discussed recalculations and an innovative mind are tested when playing on the "copy", following suggestions and explanations to the letter regarding aesthetics of musical expression, positions of the head-joint, embouchure, the airstream, and fingerings as described in *Principes* and *Rudiments* and in the context off the present study. If the result when playing and following aesthetics and mentioned suggestions as explained in mentioned sources feels natural, functional, logical, and easy to realize, it points in the direction that the "copy" probably is rather close to the original as in this case the three-piece Traverso that Hotteterre and his contemporaries used to play on. Having come to this point the "copy" made by the Traverso-maker—the result of a skilful interpretation of an existing original—becomes in its own right a masterpiece, a work of art, and a supreme tool for making music.

All models of Traversi examined within the present study are made by the master-maker of the Traverso Alain Weemaels in Bruxelles. His ideas regarding how to make and design copies including innovative recalculations of measurements of Traversi of the Renaissance and the 18th Century are based on a faithful and exemplary approach to the study of measurements and designs of the original instruments, which due to his exceptional craftsmanship probably comes extremely close to the originals. Thus, the Traversi made by Mr Weemaels fulfils above discussed criteria with large margins.

In the following are impressions, ideas, and approaches regarding original Traversi and their making today expressed by above mentioned Alain Weemaels connecting to the discussion regarding questions concerning the relation between an original and its copy (for an English translation see Appendix XXVI).

COMMENT UN FACTEUR ACTUEL PEUT UTILISER LES INFORMATIONS DES ANCIENS?

LE 18ème SIÈCLE

Il y a encore des flûtes baroques anciennes pratiquement à l'état neuf: elle n'ont presque pas servi!
Évidemment le facteur actuel peut les copier le plus fidèlement possible.

D'autres ont des altérations qu'il faut corriger, au niveau de la perce, des trous de doigts, de l'embouchure.
Ces structures correspondent en principe à ce qui se faisait à leur époque.

Il y a aussi les corps qui ont été raccourcis, on peut évaluer ceci en fonction du diapason de leur époque et ainsi rétablir en copie la bonne longueur.

AVANT 1660

En allant plus loin dans le passé, au 17ème et 16ème siècle les instruments sont souvent encore plus altérés, des déformations, des agrandissements des trous de doigts, des parties manquantes; ici il y a de plus en plus à reconstituer, aidés par des comparaisons avec d'autres facteurs du passé et les proportions de longueur données par Pythagore.

À ma connaissance, il n'existe plus de flûte traversière plus ancienne, tout a disparu malheureusement!
Il reste de l'iconographie et de la sculpture religieuse, romaine aussi, qui témoigne de leur très ancienne existence.

*

Le facteur et les musiciens explorent ensemble le passé. Le premier reconstruit ce qui semble avoir existé et le second le fait revivre, découvrant ensemble un monde passé qu'ils ne connaissent qu'en partie! (ce qu'on nomme archéologie expérimentale)

Alain Weemaels, Septembre, 2023

Finally, *Principes* and *Rudiments* are strong tools due to their design as manuals for self-studies. This design in combination with the experiences and skills as a professional flautist (Boehm-flute and Traverso) of the author of the present study together with the excellent Traversi made by Mr Weemaels, have altogether had an imperative role when analysing and playing through explanations and suggestions as found in *Principes*, *Rudiments* and discussed sources. To conclude, without the excellent Traversi made by Mr Weemaels as described above, the present study would not have been possible to realize.



1.2 Different models of transverse flutes

Les Roseaux de Syrinx, changés en instrument,
Vont moduler des airs sous les doigts d'un Amant.[1]

Dorat (1767, 117)

The Traverso described in *Principes* and *Rudiments* is an instrument in three main pieces: head-joint, middle-joint and foot-joint. The head-joint consists of three parts: the head-joint itself, the decorative *Chapeau* (Crown) and the cork stopper inside the head-joint. The connecting part between the head-joint and the middle-joint is a *Barillet* (Barrel), finally the foot-joint having one key. Typical instruments of this kind can be seen on the well-known engraving of a Traverso-player in *Principes* and *Rudiments* by Bernard Picard (1673-1721; section *6.1*: Fig. 14), the painting *Réunion de Musiciens* (*c.*1710) attributed to the French painter André Bouys (1656-1740; Appendix IV), on the Figures 2, 5, 9, 10, 11, 12, 15, 16, 17, 18, 19, 23, 70, 73, 74, 75, 79, 85, and on a French drawing contemporary to *Principes* (*c.*1705, Fig. 1):

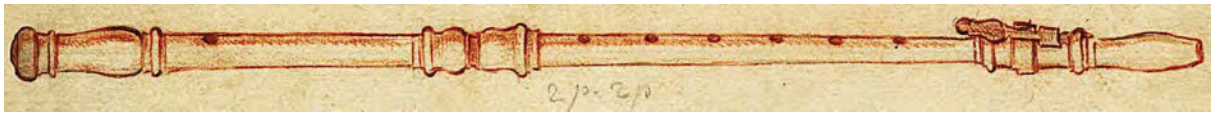


Figure 1 A typical French three-piece Traverso from an anonymous drawing in red chalk with a Traverso, Recorder, Oboe and Bassoon (*c.*1705), on the back of the drawing is the name Dupuis inscribed, who was a wind instrument maker being active in Paris, for the whole drawing see Appendix V. (Private Collection)

The main difference between the Renaissance Traverso having six tone-holes and the Traverso, apart from that the latter has a seventh tone-hole with a key, is the bore, or "the whole in the middle" to speak with Ardal Powell (1994), which for any woodwind instrument is of crucial importance. The Renaissance Traverso is generally having a quasi-cylindrical bore. Without going into precise measurements, the three-piece Traverso has a more complicated bore than the Renaissance Traverso. The head-joint could have designs from quasi-cylindrical to combinations of cylindrical and conical shapes. The bore of the middle-joint is quasi-conical, and the bore of the foot-joint cylindrical, conical, or diabolo-shaped depending on the model in question. Of course, this general shape has over time been the subject for experiments and variations. The main reason for mentioned designs of the bore is linked to the perfection of intonation and sound colour between the three octaves of the Traverso.

An important focus for the present study is the relation between two models of the three-piece Traverso in relation to *Principes* and *Rudiments*. The first model is the possibly only existing original of *Model I*, the so-called *Graz Hotteterre flute*—in the following called *Model I*—in the collections of *Landesmuseum Joanneum* in Graz (Austria). The other Traverso—*Model II*—is a reconstruction realised by Alain Weemaels (Bruxelles) whereby four 19th Century copies after one or several lost and supposed original 18th Century Traversi has been analysed. These instruments are now in museums in La Couture-Boussey (Normandy), Bruxelles, Berlin, and St. Petersburg. It should be mentioned that the Traverso in Berlin and the Traverso in St. Petersburg are thought to possibly be original instruments from the Hotteterre workshop by specialists like Laszewski (1997) and Lerch (2001). The reconstruction of *Model II* was aiming to recreate plausible original proportions as on the presumably lost 18th Century original or originals regarding the blowing-hole, tone-holes and bore. The result is that *Model II* is a wonderful three-piece Traverso being somewhat more flexible and supple than *Model I* (Fig. 2).

- The bore of *Model I* can be described as that the head-joint is cylindrical and toward the side where it connects to the middle-joint with the *Barillet* gets slightly conical, the middle-part is conical, and the foot-joint is cylindrical.
- The bore of *Model II* is generally showing similarities to *Model I* regarding the head-joint and middle-joint, but with the difference that the foot-joint has a diabolo-shaped bore.

As has been shown by scholars such as Powell (1996a, 1996b), and Nivison Roudabush (2017) is the innovation of the three-piece Traverso complex, and important steps were most likely made simultaneously, possibly in interaction, in different countries such as Italy, France, Germany, and the Netherlands.

1. The Reeds of Syrinx, changed into an instrument, Modulates tunes under the fingers of a lover. (Dorat, *La Déclamation théâtrale, poëme didactique en quatre chants, précedé d'un Discours et de notions historiques sur la Danse,* 1767, 117)



Figure 2 Two of the three-piece Traversi used for the present study: on top a copy of *Model I* (A1=392 Hz) made of ivory, underneath a reconstruction of *Model II* (A1=400 Hz) made of *Buis Ondé* (Boxwood), both made by Alain Weemaels, Bruxelles. (Private Collection)

It should be mentioned that the construction of the three-piece Traverso around the middle of the 17th Century sometimes has been understood as an achievement realised in France, and that the Hotteterre dynasty of woodwind makers in La Couture-Boussey (Normandy) mainly created this innovation which seems to be a too simplified explanation regarding the birth of the three-piece Traverso.

*

A further step in modifications of the Traverso took place around 1730 when the middle-joint was divided in two parts having three tone-holes on each part. Still, it should be remembered that later editions of *Principes* published in 1713, 1720, 1722 and 1741 show the same three-piece Traverso in the fingering-charts as in the first edition 1707. Having divided the middle-joint in what is called *Corps de rechanges* had the benefit that the Traverso easier could be adapted to play in different pitches. *Corps de rechanges* were made for both the left-hand joint as for the right-hand joint. An example is that let say the Traverso had its normal pitch being A1=415 Hz, then with a longer *Corp de rechange* of the left-hand joint it is possible to adopt the Traverso to a lower pitch like A1=405 Hz, and with a shorter *Corp de rechange* to a higher pitch like A1=420 Hz. When using different *Corps de rechanges* it includes that the cork-stopper in the head-joint should be adjusted, and if possible, in combination with a foot-joint of the model of *Pied à coulisse* which allows to adapt the length of the foot-joint in relation to the length of used *Corp de rechange*. When using a shorter *Corp de rechange* the cork-stopper should generally be moved further away from the blowing-hole in combination with a shortening of the foot-joint if the Traverso has the mentioned *Pied à coulisse*, and *vice versa* when using a longer *Corp de rechange*. The four-piece Traverso is the instrument described in Traverso methods such as Corrette (1735 & 1773), Quantz (1752), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Tromlitz (1791), Devienne (*c.*1794), Peraut (*c.*1802), Hugot & Wunderlich (1804), and Balleron (1895).

*

In the present study have all fingerings, positions of the head-joint, suggestions regarding the embouchure and airstream as discussed in *Principes* and *Rudiments* been tested by the author of the study. For doing this has two excellent copies of *Model I*, one made of Ivory, and one of Grenadilla A1=392 Hz, together with three equally excellent instruments of the above-described reconstruction *Model II* A1=400 Hz one made of *Buis Ondé* (Boxwood), one of Cocos-wood, and one of Ebony been examined.

In addition, has the following instruments been integrated in the study: a *Basse de Traversière* after a possible Hotteterre-model as described in *L'Encyclopédie Méthodique* (1785 & 1788), copies of originals by the makers Iohannes Hyacintus Rottenburgh (1672-1765), Thomas Stanesby Jr (1692-1754), and August Grenser (1720-1807) representing the middle and late 18th Century (Fig. 3). All instruments have been made by Alain Weemaels in Bruxelles. A general finding is that *Model I*, *Model II*, and below included models show similar features regarding evenness of sound colour, articulation, and intonation, but, of course, with in some cases noticeable variations.

Model	***Basse de Traversière***	**I. H. Rottenburgh**	**I. H. Rottenburgh**	**I. H. Rottenburgh** ***Flûte Tierce***	**Stanesby Jr** ***Flûte d'Amour***	**Grenser**
Pitch A1	392 Hz	400 Hz	415 Hz	415 Hz	415 Hz	430 Hz
Material	Whitebeam	Boxwood	Cocos Wood	Boxwood	Boxwood	Grenadilla

Figure 3 Different models of Traversi used for the present study, together with details regarding material and pitch.

Here impressions and ideas regarding Hotteterre, La Couture-Boussey, historical contexts and flute making by Alain Weemaels (for an English translation see Appendix XXVI).

LE CONTEXTE HISTORIQUE

Jacques Hotteterre *Le Romain* (1674-1763) vient d'une famille de La Couture-Boussey, village situé à environ 80 kilomètres de Paris, au Nord-Ouest. *Couture* signifie culture (des champs) et *Boussey* signifie buis, qui abondaient dans cette région. Au 17ème et 18ème siècle les filatures n'existaient pas encore et la vaisselle en poterie coûtait cher, ce qui créait de la demande pour les tourneurs sur bois, qui étaient très nombreux dans toutes les régions, en rouets, vaisselle en bois et aussi robinets pour les tonneaux (Appendix XXXI). La tradition orale rapporte qu'en 1590 les habitants de Boussey ont récupéré des fifres après *La Bataille d'Ivry* (14 Mars, 1590). Celle-ci a eu lieu en partie à Bousset et il y avait beaucoup de mercenaires Suisses (*Fifres*) et Allemands (*Flûte d'Allemagne*).

Le *Château d'Anet* est aussi voisin de La Couture-Boussey. C'est un château important qui existe encore. Diane de Poitiers (1500-1566), favorite du Roi Henri II (1519-1559) y donnait de grandes fêtes à la renaissance, on suppose quelle choisissait les meilleurs musiciens, dont flûtistes? Les tourneurs locaux ont sans doutes élargi leur production en créant des instrument à vent. En plus il y avait une forte demande en musique au 17ème siècle pour le *Château de Versailles* un peu plus éloigné de La Couture-Boussey. De nombreux tourneurs ont choisi Paris pour échapper à la pauvreté, en répondant à ce nouveau débouché.

DES FLÛTES CYLINDRIQUES DES MERCENAIRES AUX FLÛTES HOTTETERRE

Après environ 60 ans de recherche (depuis 1590?) elle arrive! En 1660 la flûte (Hotteterre sans doute) apparait en concert à Versailles. Les instruments de cette famille de facteurs et de musiciens qui ont survécu sont :

- Hotteterre de *Landesmuseum Joanneum* à Graz (Autriche) au diapason le plus bas serait la plus ancienne (début 18ème siècle?). *Le Modèle I* de l'époque de Louis XIV (règne 1643-1715).
- Les copies du 19ème siècle aux musées de *Le Musée des Instruments à Vent* à La Couture-Boussey, *Musée des Instrument de Musique* à Bruxelles, *Staatliches Institut für Musikforschung* à Berlin, *Museum of Musical Instruments* à St. Petersburg. En les copiant il est bon de remplacer les caractéristiques 19ème siècle par des baroques ce qui donne une flûte avec beaucoup d'agilité et d'équilibre, Rameau et *Modèle II* se conviendraient très bien! C'est l'époque Louis XV (règne 1715-1774).
- La flûte du *Musée de la Musique* de Paris, aussi Louis XV, dont je n'ai pas les plans pourrait donc s'appeler *Model III*.

UN PEU D'ACOUSTIQUE ET DE CONSIDÉRATION D'ATELIER

Les flûtes en bois et le tour à bois forment un couple inséparable (peut-être déjà depuis Rome, début des flûtes cylindriques). Le perçage est ainsi très précis, l'extérieur est ensuite tourné. Les flûtes cylindriques octavient sur une et demi-octave, et plus haut elles quintoient et les doigtés changent. Pour une ténor en Ré par exemple le Mi♭ se fait 6ème trou à demi fermé, ce n'est pas confortable. Les demi-tons se font avec des doigtés de fourche et s'ajustent par l'embouchure qui est très flexible. Les flûtes baroques inaugurent la perce conique (qui existait déjà depuis longtemps pour d'autres instruments à vent) et la clé de Ré#/Mi♭, c'est confortable et l'étendue pour les octaves passe à deux, avec les quintes à la troisième comme pour les cylindriques idem pour le fonctionnement des fourches! Voici un résumé de l'évolution de la flûte traversière par une famille importante de facteurs et joueurs.

A mon tour j'ai exploré ce domaine en recréant des modèles d'avant les Hotteterre et des Hotteterre, j'ai beaucoup de plaisir à les jouer aussi. J'aime beaucoup la Flûte-Boehm aussi dont je joue avec délices mais je n'en construis pas.

Alain Weemaels, Août, 2023

Regarding the terminology of transverse flutes, Hotteterre used *Flute Traversiere* and *Flute d'Allemagne* on the frontispiece of *Principes*, and in the text alternatively *Flute Traversiere* or *Flute*. On the frontispiece to *Rudiments* its written *German Flute*, and in the text *German Flute* or *Flute*. When discussing different types of transverse flutes in the present study the following terminology is applied, together with a brief characterization of the five basic types of transverse flutes:

- **Renaissance Traverso**: Generally quasi-cylindrical flutes in one piece—bass models were made in two pieces—having 6 tone-holes and no key, with a round relatively small blowing-hole. The tone-holes are relatively small so that they easily can be closed with the fingertips. This model has been in use in Europe for a very long time, possibly as far back as the Antiquity and up to the middle of the 17th Century until the Traverso gradually became the dominant transverse flute from about 1670 and in Paris.
- **Traverso**: Generally, flutes in three or four pieces used from the late 17th Century to the first decades of the 1900th Century, having quasi-cylindrical head-joints, quasi-conical bodies, and quasi-cylindrical or quasi-conical foot-joints, having 7 tone-holes being relatively small so that they easily can be closed with the fingertips and one key for D#/E♭. Generally having a relatively small and round blowing-hole—initially and in the late 17th Century showing similarities to the blowing-hole on the Renaissance Traverso—and in the late 18th Century sometimes a design with an elliptical shape.
- **Multi-keyed conical flute**: Generally conical flutes in three or four pieces which were in use from the very late 18th Century and beginning of 19th Century up to around the late 19th Century, having around 11-17 tone-holes with four to about eleven keys and several levers, and often having an elliptical blowing-hole (Boehm, 1847). The addition of keys was mainly motivated by changing sound-ideal towards evenness of sound, whereby they keys made it possible to avoid some of the quite large number of fork-fingerings (*Doigtés des fourches*) on the Traverso creating a somewhat muted and less brilliant sound quality on notes like G#, A♭, B♭, A#, F and especially so in the first octave. Multi-keyed conical flutes from the first decades of the 19th Century have similarities with the late 18th Century Traverso.
- ***Ringklappenflöte***: A conical flute in three pieces with around 14 tone-holes (C-foot) and a key-mechanism having similarities with the mechanism as later developed for the *Cylinderflöte*. The tone-holes were relatively small compared with the Boehm-flute, and the blowing-hole often having a somewhat larger elliptical design compared with above-described models. Constructed and finalized in 1832 by Theobald Boehm (1794-1881; Boehm, 1847).
- **Boehm-flute:** The *Cylinderflöte* has three pieces, a parabolic head-joint, a cylindrical body divided in a longer middle-joint and a shorter foot-joint, generally altogether having 16 tone-holes (C-foot) or 17 tone-holes (B-foot), a sophisticated key mechanism limiting fork-fingerings to a minimum, combined with that the tone-holes are far bigger due to the mechanism potentially giving this model a larger and stronger sound. The blowing-hole is generally larger and mostly slightly square-shaped with rounded corners, alternatively sometimes having an elliptical shape. Today this is the most often used flute in symphony- and opera-orchestras, constructed and finalized in 1847 by Theobald Boehm in collaboration with Professor Karl Emil von Schafhäutel (1803-1890) at the University in München (Boehm, 1847; 1848; 1871).

When examining and comparing different models of transverse flutes, as in the present study, it is of importance that identified differences are not understood as a Darwinist development from functional to perfection. Each model perfectly represents ideals of its epoch, and changes of constructions are reflections of changes in musical aesthetics over time. An example is that the Renaissance Traverso by no means is an instrument made for playing music modulating through all major and minor keys, whereas the Boehm-flute is a chromatic instrument which is constructed for easily playing in all major and minor keys with an almost perfect evenness of sound colour and timbre. To deduce that the Boehm-flute because of its facility to play in all keys is a "better" and more sophisticated instrument when compared with the Renaissance Traverso would in our opinion be a major mistake.

*

When comparing the Traverso and the Boehm-flute both instruments can play in all keys, with the difference that even with a superior Traverso and an outstanding player it is not possible to realize the same amount of evenness of sound colour and timbre on all notes on the Traverso as on the Boehm-flute. An example is when playing a *Prelude* in b♭-minor (Ex. 1a) from *L'Art de Preluder* (1719, 11) by Hotteterre, compared with when transposing the same *Prelude* to b-minor (Ex. 1b). When playing this *Prelude* on the Traverso there are distinct differences in sound colour and timbre due to that b♭-minor has more fork-fingered notes than b-minor. When played on the Boehm-flute differences between the two keys almost completely disappears due to that this is an instrument constructed for as far as possible avoiding fork-fingerings aiming for a maximal evenness of sound colour.



Example 1a *Prelude Tendrement* in b♭-minor from *L'Art de Preluder* (1719, 11) by Hotteterre. When played in the original key are seven notes played with fork-fingerings (B♭1, B♭2, F1, F2, G♭2, A♭2, C2), compared with three fork-fingered notes (A#1, A#2, E2) when transposed to b-minor.



Example 1b *Prelude Tendrement* in b-minor from *L'Art de Preluder* (1719, 11) transposed to b-minor, having three fork-fingered notes (A#1, A#2, E2).

The reason for these differences regarding evenness of sound colour and timbre in different keys on the Traverso is the principle of fork-fingerings used for flattening a note with a semi-tone downwards through leaving one tone-hole open below the fingering in question, and close the next or several tone-holes, which on the Traverso mostly has the function to flatten notes from the D-major scale with a semi-tone (section *6.3 Fingerings: Doigtés des fourches—Open-fingerings*). Generally, is sound colour and timbre of fork-fingerings somewhat "shadowed" and less brilliant compared with notes played with open-fingerings (i.e., notes not played with fork-fingerings) and especially so in the first low octave (Castellengo, 1998a; Wolfe et al, 2001). When comparing sound colour and timbre when playing in b♭-minor with b-minor the latter key needs three fork-fingered notes, whereas b♭-minor has seven notes played with fork-fingerings which clearly indicates differences in sound-colour and timbre due to the construction of the Traverso. In addition, mentioned fork-fingered notes have a secondary effect because these notes are often played with the *Inward position* of the head-joint for correction of the intonation to be slightly flattened, which effects the sound colour already being somewhat "shadowed" due to the fork-fingering, and in its turn influences character and musical expression. When playing in b-minor is the *Normal position* used for most notes apart from that F#1, F#2 and C#2 needing a somewhat *Outward position* of the head-joint for correcting the intonation to be slightly sharper, together with that A#1 and A#2 needs a slightly *Inward position* of the head-joint to flatten the intonation. But all together has b-minor the character of a more "open" and even sound colour when compared with b♭-minor.

When making the same experiment with a Boehm-flute the differences in sound colour and timbre are almost neglectable, and especially so with a professional player that easily can make the two keys sound virtually identical. It should be noted that within a German context there were a criticism connected to sound colour and general character towards the *Ringklappenflöte* and Boehm-flute that Boehm mentioned in *De la Fabrication et des derniers perfectionnements des flutes* (1848) the French translation of *Über den Flötenbau und die neuesten Verbesserungen desselben* (1847):

> La puissance et l'égalité de son furent précisément les *défauts* qu'on lui [*Ringklappenflöte*] reprochait […] (Boehm, 1848, 10)[1]

Such questioning opinions as mentioned by Boehm regarding loudness and evenness of sound colour and timbre in relation to his innovations of the *Ringklappenflöte* and Boehm-flute points in a direction that aesthetics connected to the Traverso and Multi-keyed conical flutes were influential during the first half of the 19th Century in at least Germany. Considered that the reception and introduction of both the *Ringklappenflöte* and Boehm-flute were fairly earlier in French music life than in Germany could possibly be understood as a search for a sound character being stronger and more equalized than what is possible with a Traverso and Multi-keyed conical flutes. Such endeavours—especially regarding the low register—were clearly expressed in for example *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne.

*

It could be argued that in the context of Hotteterre and music life in Paris around 1719 when playing mentioned *Prelude* on the Boehm-flute essential aspects of musical expression gets lost, because of observed differences connecting to character and musical expression. These two models of transverse flutes—Traverso and Boehm-flute—each having constructions with a variety of inherent possibilities, being the results of an interaction between musical aesthetics and ideals in their respective epochs, are both perfectly well expressing music of their epochs. It could thus be said that the Boehm-flute is not necessarily ideal when playing French Traverso-music from the early 18th Century by Michel de La Barre or Hotteterre, and that the Traverso is not an advantageous choice for playing a typical work for the Boehm-flute such as *Syrinx ou La Flûte de Pan* (1913/1997) by Debussy, even though both examples are possible. Still, it should be noted that the discussion above primarily is in relation to how sound colour and timbre influences musical expression. When it comes to essential elements of musical expression such as phrasing the choice of a Traverso, or a Boehm-flute has no real significance for the skilful musician.

When discussing differences between the Traverso and the Boehm-flute it is of importance to highlight a well-known episode regarding the relations between the sound characteristics of the Boehm-flute compared with the *Ringklappenflöte* during the rehearsals preparing for the premiere of the opera *Parsifal* (1882) by Richard Wagner in Bayreuth 1882 (Karpf, 1985; Mösch, 2009). The orchestra for the *Bayreuther Festspiele* in 1882 was the *Münchner Hoforchester*, and the principal flute in *Parsifal* was played by the German flute virtuoso Rudolf Tillmetz (1847-1915). Tillmetz had been a student of Theobald Boehm (1794-1881) and had during these studies played the Boehm-flute (Tillmetz, *c.*1905/1906; Goldberg, 1906). Before taking a closer look at Tillmetz and the *Parsifal*-episode it would shed light to briefly describe the flautistic environment Wagner was used to in Germany, when he worked with the *Königliche Kapelle* in Dresden 1843-1849. The principal flute in this orchestra was the famous German flute virtuoso Anton Bernhard Fürstenau (1792-1852) that played on Multi-keyed conical flutes in four pieces, made of ebony, having a metal-lined head-joint with an almost round blowing-hole, often with b-foot joint, 8 or 9 keys, and made by the master flute maker Wilhelm Liebel (1793-1871) in Dresden (Karpf, 1985). Contemporary opinions regarding the sound character of Fürstenau's playing was that it was gentle and noble: *Sanft und voll Adel*, but after that the Boehm-flute (after 1847) appeared such a sound-ideal was considered as thin and narrow: *Dünn* (Karpf, 1985, 76). Multi-keyed conical flutes have features and similarities to the late 18th Century Traverso, and especially so due to similarities regarding bore and the size of the tone-holes being relatively small. The sound ideal of Fürstenau seems to have corresponded to what Wagner expected regarding the flute sections in his orchestral scores. A further reference to Multi-keyed conical flute is Wagner's admiration for the outstanding and famous *Orchestre de la Société des Concerts du Conservatoire* in Paris which he in 1839 had heard performing the *9th Symphony* Opus 125 (1824) by Beethoven (Karpf, 1985).

1. The strong sound and evenness of sound colour were precisely *the faults* for which it [*Ringklappenflöte*] was reproached […] (Boehm, *De la Fabrication et des derniers perfectionnements des flutes*, 1848, 10)

The principal flute in this orchestra when Wagner heard the above-mentioned symphony by Beethoven was the famous French flute virtuoso and teacher at the Paris *Conservatoire* (in the following the *Conservatoire*) Jean-Louis Tulou (1786-1865). Tulou was an ardent protagonist of the Multi-keyed conical flute and did not teach or play the *Ringklappenflöte* (1832). To conclude, it seems to be clear that Wagner had heard two of the 19th Century leading virtuoso flautists—Fürstenau in Dresden and Tulou in Paris—both playing on Multi-keyed conical flutes and possibly this had shaped his aesthetics regarding the flute. It should be noted that the all over design of Multi-keyed conical flutes has more in common with the late 18th Century Traverso than with the Boehm-flute, and especially so regarding tonal qualities. Going back to the rehearsals in 1882 of *Parsifal* in Bayreuth, Herman Levi (1839-1900)—the chief-conductor for the premiere of *Parsifal*—apparently spoke with Tillmetz about different sound qualities regarding the Boehm-flute compared with the *Ringklappenflöte*, possibly on the initiative by Wagner. Later Tillmetz retold the outcome of these conversations in his flute method *Anleitung zur Erlernung der Theobald Boehm'schen Cylinder- und Ringklappenflöte* Op. 30 (*c.*1905/1906):

> Als ich im Jahr 1882 in Bayreuth bei den Parsifal-Aufführungen als Orchesterspieler mitwirkte, bemerkte ich, daß Richard Wagner keine Sympathien für die Cylinderflöte [Boehm-flute] zeigte. Er belegte sie nämlich mit dem Namen "Kanonen". Ich entschloß mich daher, weiters noch angeregt durch den kgl. Generalmusikdirektor Hermann Levi, zur Ringklappenflöte konischer Bohrung überzugehen, was ich nicht zu bereuen hatte. […] ganz besonders aber entzückte mich die Weichheit in der Tongebung, die zarte Ansprache und Modulationsfähigkeit sämtlicher Töne. (Tillmetz, *c.*1905/1906, VI)[1]

The impression is that Wagner's, and Levi's, questioning of the Boehm-flute (*Cylinderflöte*) was linked to differences regarding sound qualities compared with Multi-keyed conical flutes and the *Ringklappenflöte*. To choose the *Ringklappenflöte* for the *Parsifal* performances in Bayreuth in 1882 would have been a logical decision in relation to that Wagner appreciated the character of Multi-keyed conical flutes due to his experiences in Dresden and Paris because the tonal character of the *Ringklappenflöte* has more in common with Multi-keyed conical flutes than with the Boehm-flute.

*

Why were never a key like the D#-key added to the Renaissance Traverso? The simple technology for mounting a key or two on a woodwind instrument were used since the Renaissance on woodwind instruments such as Bass-recorders, the Crumhorn and Dulcian as depicted in *Theatrum Instrumentorum* (1620, Book II, Plate IX, Appendix VI) by Michael Praetorius (1571-1621), and on the Bassoon in the early 17th Century in France, and at it seems before the D#-key was introduced on the Traverso (Lescat & Saint-Arroman, 1999). Is it possible that flautists playing the Renaissance Traverso did not think about the possibility to add a key for facilitating playing notes such as D# and E♭ as on the Traverso introduced around the middle of the 17th Century? The fingering for mentioned notes played in the first two octaves on the Renaissance Traverso are made whilst half-covering the sixth tone-hole with the right-hand ring-finger. With practice is the half-covering of the sixth tone-hole done without difficulty, still playing the same notes on a Traverso using the D#-key is far more comfortable. A further aspect is that the sound colour and timbre is veiled with the half-covered fingering compared with when using the D#-key on the Traverso having a clear open sound colour and timbre. Considered that the repertoire for the Renaissance Traverso is far less modulating than the repertoire for the Traverso, possibly flautists in the Renaissance did not feel need for the D#-key, and perhaps enjoyed the special sound colour and timbre of notes such as D# and E♭. It should be noted that the German Traverso virtuoso Johann Joachim Quantz (1697-1773; 1752, I: §. 3 & §. 4) referred to Praetorius and explained that he had a transverse flute—*Querflöte*—being like the Renaissance Traverso as depicted in *Theatrum Instrumentorum*. It is interesting that the *Schweizerpfeife* and similar flutes like the *Fife* having roots in the 15th Century when not even further back is rather like the Renaissance Traverso having six tone-holes, no key, and a quasi-cylindrical bore.

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1. When in the year 1882, I cooperated as orchestral-player in the Parsifal-performances at Bayreuth I observed that Richard Wagner showed no sympathy for the cylindrical-flutes [Boehm-flute], in fact he gave them the name of "cannons". In consequence thereof and of the suggestions made by the Royal General-Music-Director, Hermann Levi, I determined to become a convert to the conically bored ringed-key-flute [*Ringklappenflöte*] and I have not had to deplore this decision. […] But that which especially charmed me [with the *Ringklappenflöte*] was the softness of the tone-quality, combined with ease of production and the capabilities of modulation imparted to the whole compass of tones. (Tillmetz, *Anleitung zur Erlernung der Theobald Boehm'schen Cylinder- und Ringklappenflöte Op. 30*, *c.*1905/1906, VI)

Thus, in a sense it could be supposed that playing on flutes like the *Fife* having pronounced resemblance with the Renaissance Traverso never disappeared and existed—and still exists—parallel to the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute. An example regarding similarities of fingerings when comparing the Renaissance Traverso and the Fife is found in the *Complete Tutor for the Fife* (*c.*1765).

Multi-keyed conical flutes of the 19th Century are interesting instruments in the transition from the Traverso to the *Ringklappenflöte,* and was the flute available for orchestral works by for example Beethoven, Schubert, and Mendelssohn. Even thou the *Ringklappenflöte* was finalized in 1832 it took years before it gradually had been a part of symphony- and opera-orchestras, and the same was the case with the Boehm-flute. The first country to adopt the two new constructions made by Boehm was France, and a crucial date is 1860 when Tulou retired, and Louis Dorus (1812-1896) became his successor as flute teacher at the *Conservatoire* and introduced the Boehm-flute at this institution, and prepared for that the Boehm-flute started to be the standard instrument in French orchestras. The all over design of Multi-keyed conical flutes, especially models from the first decades of the 19th Century, have similarities with the late 18th Century Traverso and could be described as a Traverso mounted with additional keys mainly and initially having the functions to avoid fork-fingerings on notes like G#, A♭, B♭, A#, F, and especially so in the first octave (Castellengo, 1998a). The reason is that mentioned notes in the first octave have distinct differences in sound colour and timbre compared with the surrounding notes because they are played with fork-fingerings. The additional keys probably show an impact of changes in musical expression, possibly towards music and musical expression being more modulating together with aesthetics searching for more evenness of sound colour and timbre. At the same time, it seems to have been a clear intention among flautists and flute makers far up in the 19th Century to attempt a preservation regarding general characteristics of timbre and sound colours as it were on the late 18th Century Traverso adding an ideal towards more evenness of sound quality (Giannini, 1993b). The general construction regarding the bore and relatively small tone-holes being similar as on a Traverso in combination with the added keys made it possible to keep much of the aesthetics from the late 18th Century Traverso, and at the same time facilitate playing in generally all major and minor keys. An important reason why flautists hesitated to adopt the Boehm-flute (*Cylinderflöte*, 1847) in the second half of the 19th Century seems to have been based on a questioning regarding timbre and sound colour of the Boehm-flute as shown above, because its construction had important differences such as the bore and far bigger sizes of the tone-holes compared with the Traverso and Multi-keyed conical flutes (Giannini, 1993b). A question in the present context is if playing-techniques as described in *Principes* and *Rudiments* could be understood as having taken over elements on how French flautists used to play on the Renaissance Traverso until about the middle of the 17th Century? Generally, techniques regarding how to adjust intonation, sound colours, and timbre with help of the embouchure and airstream has similarities to any kind of a transverse flute. When comparing fingerings as shown in *Principes* and *Rudiments* with standard fingering-charts for the Renaissance Traverso as shown by Clark & Markwick (2020) it can be proven that 18 fingerings out of 32 enharmonic fingerings have the same fingerings on both instruments (Appendix VII). In *Dictionnaire Universel* (1690) by Antoine Furetière (1619-1688) under the keyword *La fluste d'Allemand* is a description of a transverse flute corresponding to what today is called Renaissance Traverso as described above:

> La *fluste* d'Allemand, ne s'embouche point par le bout, qui au contraire est bouché d'un tampon, mais on applique la levre inferieure à un trou […] Sa longueur est environ d'un pied. Elle est d'une égale grosseur, & percée de six trous, sans comter celuy de l'embouchure, elle sert de dessus quand il y en a plusieurs dans les parties, ses basses sont doubles ou quadruples en longueur. (Furetière, 1690, *Tome Premier*)[1]

This is an important reference because it points on that the Renaissance Traverso still was an instrument in use during the last decades of the 17th Century in France. In the period of transition from the Renaissance Traverso toward the Traverso in three pieces, such as *Model I* (Model Graz) and *Model II*, playing-techniques and traditions possibly have been reutilized, and maybe reappeared in *Principes*.

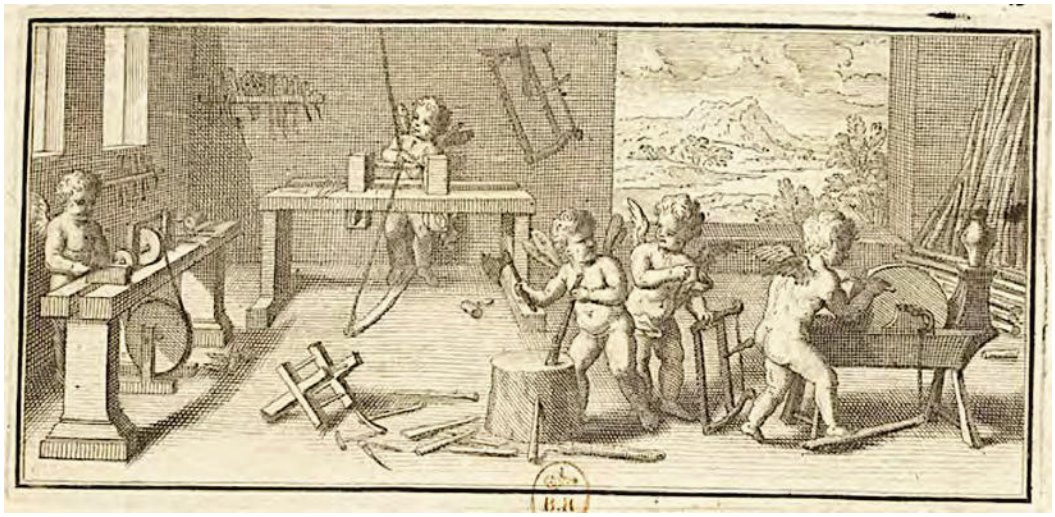
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1. The *fluste* d'Allemand, is not played from its end [like a Recorder], which on the contrary is blocked with a plug […] but one applies the lower lip to a hole [blowing hole] Its length is approximately one foot. Its having an even diameter [conical bore?], with six tone-holes, not counting that of the embouchure [blowing hole], it serves for upper parts when there are several parts, its basses are double or quadruple in length. (Furetière, *Dictionnaire Universel*, 1690, *Tome Premier*)

If yes, this could be compared with how substantial elements and traditions on how to play on conical Multi-keyed flutes during the first half of the 19th Century in France, were reutilized during the transition to the Boehm-flute (1847) in the second half of the 19th Century. Consequently, elements from playing-techniques used on Multi-keyed conical flutes with roots in the early 19th Century can supposedly have survived in playing-techniques for the *Ringklappenflöte*, then in transition to the Boehm-flute, and even up to the present day. Thus, it seems likely that elements of Traverso playing-techniques as explained in *Principes* and *Rudiments*, at least in parts, potentially could be traced back to playing-techniques for the Renaissance Traverso of the late 16th Century and first part of the 17th Century. The same would then, possibly, have bearing on that those skills making a Renaissance Traverso could have been reutilized when making the first generations of the three-piece Traverso, regarding for example the blowing-hole in the head-joint. A detailed discussion on how the Renaissance Traverso was changed, when, where, and why into the three-piece Traverso with one key for D#/E♭ is a subject that goes beyond the format of the present study focusing on *Principes* and *Rudiments*, despite being a rather fascinating subject.

*

Each epoch has musical instruments which corresponds to aesthetics and ideals of their epochs. Key moments are when—due to changes in aesthetics and musical expression—the construction of instruments and their respective playing-techniques changes. *Principes* and *Rudiments* are examples of texts explaining how to handle a construction of a transverse flute in a period when the Renaissance Traverso gradually became replaced with the Traverso in the second half of the 17th Century and early 18th Century. Such transitions include that elements regarding how to make the instruments, their playing-technics and teaching supposedly inherent elements from the past, and in a parallel movement discovers, and develops new playing-techniques, aesthetics of musical expression and ideas, together with what the instrument in question is supposed to express.



A workshop for wood-turning with angels working and preparing wood, sharpening tools, and at the lathe. From the introduction to the first part of *L'Art de tourner Ou De faire en perfection toutes sortes d'ouvrages au tour* (1701) by Charles Plumier (1646-1704).

1.3 *Principes* and *Rudiments*: Manuals for self-studies

> […] *pour s'instruire en particulier & faire quelques progrez par eux-mêmes dans l'absence de ceux de qui ils reçoivent des leçons.*[1]
>
> Borjon de Scellery (1672, *Avertissement*)

Important questions for the understanding of *Principes* and *Rudiments* are *how* to use this text, *which knowledge* is required, *who* might have been the reader that Hotteterre had in mind when writing *Principes*?

Firstly, some reflections regarding the title *Principes de la Flute Traversiere ou Flute d'Allemagne, de la Flute a Bec, ou Flute Douce, et du Haut-Bois. Divisez par Traitez* , and its English translation *The Rudiments or Principles of the German flute*. The main title in the French original is *Principes*, and for the English version—exclusively a translation of the section describing the Traverso—is the main title *Rudiments or Principles*. Starting with the French title, the concept of *Principes* had the same meaning in 17th French as today (Lerond & Dubois & Lagane, 1992). Synonyms are *Règles* (Rules), *Fondements* (Foundations), and *Bases* (Basics) which clearly corresponds to the content of the whole body of *Principes*, as to the section on the Traverso. The French *Principes* corresponds well to the English *Rudiments or Principles*.

The concept of *Traitez* is only found in the title to the French original. When examining the concept of *Traitez* is it of interest to see how this construct was explained in French sources like dictionaries from the late 17th with influence on the early 18th Century, and thus on Hotteterre. In *Dictionnaire françois contenant les mots et les choses: plusieurs nouvelles remarques sur la langue françoise* (1680) by Pierre Richelet (1626-1698) is a definition of *Traiter* [Traitez] through the words *Raissoner*, *Discourir*, and *Parler* (1680, 474). In *Dictionnaire Universel* (1690) by Antoine Furetière (1619-1688), is a definition that corresponds well to Hotteterre:

> *Traitte* [Traitez], se dit aussi d'un sujet sur lequel on écrit. Un cours de Theologie se divise en plusieurs *Traitte* […] La plus-part des Auteurs divisent leurs Livres en *Traitte,* sur plusieurs matiers. (Furetière, 1690, Tome III).[2]

*

To start with *how* to use *Principes* the announcement in *Mercure Galant* (1707, April) indicates that it could be used for self-studies when not having a teacher:

> Ce livre doit estre utile à ceux qui se plaisent à joüer de ces Instrumens; ils y trouveront des demonstrations & des explications sur toutes les difficultez qui pourroient les embarrasser touchant ces instrumens, ce qui pourra tenir lieu de Maistre à ceux qui ne sont pas en estat d'en avoir. (*Mercure Galant*, 1707, IV, 271-272)[3]

Similarly in the *Preface* to *Principes* and *Rudiments* the same suggestion is clearly expressed that it could be used for self-studies:

Préface	*The French Preface*
Ces Regles & ces démonstrations pourront même suppléer au deffaut des Maîtres, pour bien de personnes qui ont naturellement de la disposition à joüer de cet Instrument, & à qui il ne manque que d'en sçavoir les Principes.	*These Rules, and Scales, may supply the want of a Master to a great many who are naturally disposed to play on this Instrument, and want only the first Rudiments.*

An earlier French example of an instrumental method expressively aiming for self-studies is *Traité de la Musette, avec une nouvelle Methode, Pour apprendre de soy-mesme à joüer de cét Instrument facilement, & en peu de temps* (1672) by the lawyer and *Homme de lettres* Charles-Emanuel Borjon de Scellery (1633-1691).

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1. […] to learn privately and make some progress by themselves in the absence of those from whom they receive lessons. (Borjon de Scellery, *Traité de la Musette, avec une nouvelle Methode, Pour apprendre de soy-mesme à joüer de cét Instrument facilement, & en peu de temps,* 1672, *Avertissement*)
2. *Traitté* [Traitez], is also said of a subject on which one writes. A Theology course is divided into several Treatises […] Most Authors divide their Books into Treatises, on several subjects. (Furetière, *Dictionnaire Universel,* 1690, Tome III).
3. This book should be useful to those who enjoy playing these Instruments; they will find demonstrations and explanations on all the difficulties which could embarrass them concerning these instruments, which could take the place of Maestro for those who are not in a condition to have one. (*Mercure Galant*, 1707, IV, 271-272)

In the *Avertissement* is explained how a person wanting to learn how to play the *Musette* will find necessary rules and suggestions in this method for self-studies in the absence of a teacher:

> Les commençans y trouveront des regles & des avis extremement necessaires pour arriver bienttost à la perfection du ieu de cet Instrument, & pour s'instruire en particulier & faire quelques progrez par eux-mêmes dans l'absence de ceux de qui ils reçoivent des leçons. (Borjon de Scellery, 1672, *Avertissement*)[1]

The pedagogical intention regarding self-studies as expressed above points in the direction of a need for this kind of instructive texts and methods in the late 17th and early 18th Centuries, and *Principes* and *Rudiments* seems to be examples of such texts when it comes to learn fundamentals of Traverso playing in the very beginning of the 18th Century. A late 18th Century example is the somewhat fragmentary anonymous *Principes de flute. Pour apprendre à jouer sans Maître* (*c.*1790).

*

Regarding the question *which knowledge* is required—especially so when used for self-studies—the *Preface* in *Principes* clearly points on that Hotteterre was aiming for a reader who is supposed to already be familiar with basic musical notation and terminology:

Préface	The following passage was not translated:
Au reste je ne parle point icy de la valeur des Notes, ny de la Mesure, ce sont des choses qui appartiennent plûtôt à un Traité de Musique, qu à un Traité de Flute.	Besides, I am not speaking here of the value of Notes, nor of Measure, they are things which belong rather to a Treatise on Music, than to a Treatise on Flute.

Finally, *who* might have been the reader that Hotteterre had in mind is probably a person having leisure time and, of course, a serious interest in music—in 18th Century France under the *L'Ancien Régime* such a person was often called a *Connoisseur*—being someone passionately loving music and playing on musical instruments (Weber, 1980). The term could be connected to the well-known German concepts and term of *Kenner* which in a musical context is a person not being a professional musician but having a profound musical knowledge and often playing one or several musical instruments. The *Musikliebhaber* (Forkel, 1777) is a common music lover not having a musical knowledge comparable to the *Kenner*. A *Connoisseur* would in *L'Ancien Régime* often had been an aristocrat, or someone being enough fortunate for having time for developing knowledges about music and skills playing an instrument. In this context is the *Preface* to *Principes* and *Rudiments* possibly giving a clue when connecting to that the Traverso was *à la Mode* and *in Vogue*:

Préface	*The French Preface*
COMME la Flute Traversiere, est un Instrument des plus agréables, & des plus à la mode, j'ay cru devoir entreprendre ce petit ouvrage, pour seconder l'inclination de ceux qui aspirant à en joüer.	*As the* German Flute *is a most agreeable Instrument, and much in Vogue at present, I thought it wou'd not be unacceptable to the Publick, to set forth this little Treatise to further the endeavours of those who desire to play thereon.*

In the *Preface* to the first edition of *Principes* (Ballard, 1707) is an announcement that if the reader wants to learn more about Traverso-playing the reader is welcome to visit Hotteterre at his home, for having private lessons being instructed in how to put *Principes* into practice. In addition, is a recommendation given regarding a suitable repertoire for the more advanced Traverso learners such as Hotteterre's own *Pieces*, songs in the style of *Brunettes*, together with music by Gaultier de Marseille. Regarding the suggested *Pieces* these could possibly have been parts of *Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue Œuvre IIa*, which were published in Paris by Ballard in 1708. Maybe Hotteterre sold copies of these *Pieces* before they were in print?

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1. Beginners will find in it rules & advice extremely necessary to arrive soon at the perfection of playing this Instrument, & to instruct themselves in particular & to make some progress by themselves in the absence of those from whom they receive lessons. (Borjon de Scellery, *Traité de la Musette, avec une nouvelle Methode, Pour apprendre de soy-mesme à joüer de cét Instrument facilement, & en peu de temps*, 1672, *Avertissement*)

Préface	The following passage was not translated:
Ceux qui croiront avoir besoin de Leçons, pour mettre en pratique les Instructions contenuës dans ces Principes, en trouveront chez moy avec les agréments marquez. A l'égard de ceux qui sont plus avancez, je leur prepare quelques suites de Pieces composées exprés pour la Flute. On peut aussi s'exercer sur les *Brunettes*, & principalement sur les *Duo* & *Trio*, de feu Monsieur Gaultier de Marseille, qui viennent d'être mis au jour.	Those who think they need Lessons, to put into practice the Instructions contained in these Principles, will find them in me with the approvals mark. Regarding those who are more advanced, I prepare for them a few suites of Pieces composed expressly for the Flute. We can also practice on the Brunettes, & mainly on the Duo & Trio, of the late Mr. Gaultier from Marseille, which have just been brought to light.

In the *Preface* to the three *Nouvelle Editions* (1720, 1722, 1741) of *Principes*—all published by Ballard like the first edition (1707) —is the text shown above slightly modified regarding the suggested repertoire in an interesting way adding more suggestions including that the *Duo* & *Trio* (1707) by Gaultier de Marseille is recommended for the last time in the 1720 edition:

1720

A l'égard de ceux qui sont plus avancez, je leur ai déjà donné plusieurs Suites de Pieces composée exprès pour la Flûte, dont le Catalogue est à la fin de ce Livre. On peut aussi s'exerces sur les *Brunettes*, les *Parodies*, les *Tendresses Bacchiques*, & la *Clef des Chansoniers*, qui ensemble une espece de Biblioteque en dix Volumes portatifs, & encore sur les *Duo* & *Trio*, de Monsieur Gaultier de Marseille. (*Principes*, 1720, 4)[1]

1722

A l'égard de ceux qui sont plus avancez, je leur ai déjà donné plusieurs Suites de Pieces composée exprès pour la Flûte, dont le Catalogue est à la fin de ce Livre. On peut aussi s'exerces sur les *Brunettes*, les *Parodies*, les *Tendresses Bacchiques*, & la *Clef des Chansoniers*, qui ensemble une espece de Biblioteque en dix Volumes portatifs, & sur les *Concerts Parodiques*. (*Principes*, 1722, 4)[2]

1741

A l'égard de ceux qui sont plus avancez, je leur ai déjà donné plusieurs Suites de Pieces composée exprès pour la Flûte, dont le Catalogue est à la fin de ce Livre. On pourra aussi s'exercer sur les *Brunettes*, les *Parodies*, les *Tendresses Bacchiques*, la *Clef des Chansoniers*, les *Rondes* ou *Chansons à danser*, les *Menuets*, et les *Duo choisis pour la Flûte*, qui forment ensemble une espece de Biblioteque en seize Volumes portatifs. (*Principes*, 1741, 4)[3]

Hotteterre's suggestion to practice on songs such as *Brunettes*, *Brunettes*, *les Parodies, les Tendresses Bacchiques*, points in the direction of the link between singing and Traverso-playing which was expressed in *Mercure Galant* (1707), and the article announcing the first publication of *Principes* with the words: *Les Chansons & les Flutes ayant beaucoup de rapport ensemble* (*Mercure Galant*, 1707, IV, 271). Examples of these songs are found in collections like *Recueil d'Airs Serieux et a Boire de differents Auteurs* (Ballard, 1701), *Brunettes ou petits airs tendres, avec les doubles et la Basse-Continue* (Ballard, 1703, 1704, 1711), *Nouvelles parodies Bachiques mélées de Vaudevilles ou Ronde de Table* (Ballard, 1700-1702; Fig. 4), together with *Airs et Brunettes a deux et trois dessus pour les Flutes Traversieres. Tirez des meilleurs Autheurs, Anciens et Modernes Ensemble les Airs de Mrs. Lambert, Lully De Bousset & Les plus convenables a la Flute Traversiere Seule. Ornez d'Agremens par Mr Hotteterre le Romain* (Hotteterre, *c.*1721), and *Nouveau Recueil de Chansons choisies. Tome IV, auquel on a ajouté des Airs pour la Flûte* (Anonymous, 1729).

It should be noted that when *Principes* was published in 1707 the repertoire of printed music specifically written for the Traverso was in its beginning and rather limited and not much more than *Pieces en Trio pour les Flutes, Violon, & Dessus de Viole & Basso continuo* (1692) by the Basse de Viole virtuoso Marin Marais, together with works by the Traverso virtuoso Michel de La Barre: *Premier Livre des Trio, pour les violons, Flûtes et hautbois* (1694), *Pièces en trio pour les violons, flustes et hautbois, composées*, *Livre Second* (1700), *Pièces pour la Flûte Traversière avec la Basse-Continue Œuvre Quatrième* (1702), *Troisième Livre des Trio pour les violons, flûtes, et hautbois, mélez de Sonates pour la Flûte traversière* (1707).

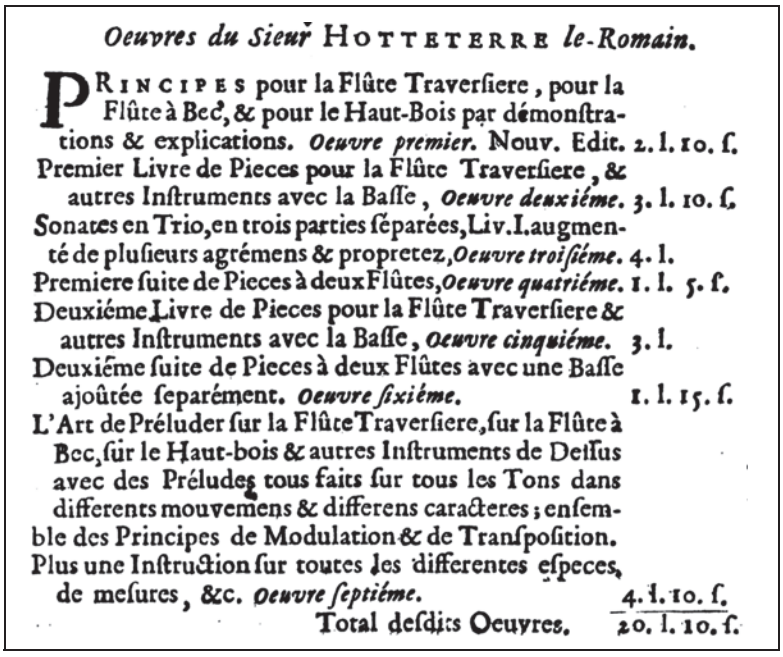
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1. For those who are more advanced, I have already given them several *Suites de Pieces* composed expressly for the Flute, the Catalog of which is at the end of this Book. We can also practice on the *Brunettes*, les *Parodies*, les *Tendresses Bacchiques*, & la *Clef des Chansoniers*, which together is a kind of Library in ten portable Volumes, & again on the *Duo & Trio*, by Monsieur Gaultier de Marseille. (*Principes*, 1720, 4)

2. For those who are more advanced, I have already given them several *Suites de Pieces* composed expressly for the Flute, the Catalog of which is at the end of this Book. We can also practice on the *Brunettes*, les *Parodies*, les *Tendresses Bacchiques*, & la *Clef des Chansoniers*, which together is a kind of Library in ten portable Volumes, & on les *Concerts Parodiques*. (*Principes*, 1722, 4)

3. One can also practice on the *Brunettes*, the *Parodies*, the *Tendresses Bacchiques*, the *Clef des Chansoniers*, the *Rondes* or *Chansons à danser*, the *Minuets*, and the *Duo choisis pour la Flûte*, which together form a kind of Library in sixteen portable Volumes. (*Principes*, 1741, 4)

In the *Preface* to the above mentioned three *Nouvelle Editions* (1720, 1722, 1741) of *Principes* is the announcement for the more advanced Traverso-player of the catalogue at the end of the book including Hotteterre's publications from *Principes* (*Œuvre I*) to *Œuvre VIII Troisieme Suitte de Pieces a deux Dessus, sans Basse Continue. Pour les Flûtes Traversieres, Flûtes a Bec, Haubois, & Muzettes* (1741):



Oeuvres du Sieur HOTTETERRE *le-Romain.*

PRINCIPES pour la Flûte Traverſiere, pour la Flûte à Bec, & pour le Haut-Bois par démonſtrations & explications. *Oeuvre premier.* Nouv. Edit. 2. l. 10. ſ.
Premier Livre de Pieces pour la Flûte Traverſiere, & autres Inſtruments avec la Baſſe, *Oeuvre deuxiéme.* 3. l. 10. ſ.
Sonates en Trio, en trois parties ſéparées, Liv. I. augmenté de pluſieurs agrémens & propretez, *Oeuvre troiſiéme.* 4. l.
Premiere ſuite de Pieces à deux Flûtes, *Oeuvre quatriéme.* 1. l. 5. ſ.
Deuxiéme Livre de Pieces pour la Flûte Traverſiere & autres Inſtruments avec la Baſſe, *Oeuvre cinquiéme.* 3. l.
Deuxiéme ſuite de Pieces à deux Flûtes avec une Baſſe ajoûtée ſeparément. *Oeuvre ſixiéme.* 1. l. 15. ſ.
L'Art de Préluder ſur la Flûte Traverſiere, ſur la Flûte à Bec, ſur le Haut-bois & autres Inſtruments de Deſſus avec des Préludes tous faits ſur tous les Tons dans differents mouvemens & differens caracteres; enſemble des Principes de Modulation & de Tranſpoſition.
Plus une Inſtruction ſur toutes les differentes eſpeces de meſures, &c. *Oeuvre ſeptiéme.* 4. l. 10. ſ.
Total deſdits Oeuvres. 20. l. 10. ſ.

*

In the period around 1700 had the Traverso become to be a cherished instrument, and *Principes* should have been a welcome text for music lovers wanting to learn how to play on this relatively new instrument. Maybe there might be a further aspect connecting to that the Hotteterre dynasty of woodwind instrument makers being famous for their high-class instruments—including the Traverso—would have cherished a text describing how to handle a Traverso of their make. That *Principes* and *Rudiments* is not called a *Méthode* suggests that it rather could be studied as a systematic explanation on how a Traverso functions, not being a typical method that step-by-step starts with the easy systematically proceeding towards the advanced as is the case with Hotteterre's *Méthode pour la Musette. Contenant des Principes, par le moyen desquels on peut apprendre à joüer de cet Instrument de soy-même au défaut de Maître* (1737). In a sense, *Principes* and *Rudiments* could be compared in terms of an empirical explanation describing fundamental playing-techniques for the Traverso, with how the French Encyclopaedists around the middle of the 18th Century described different crafts in detail.

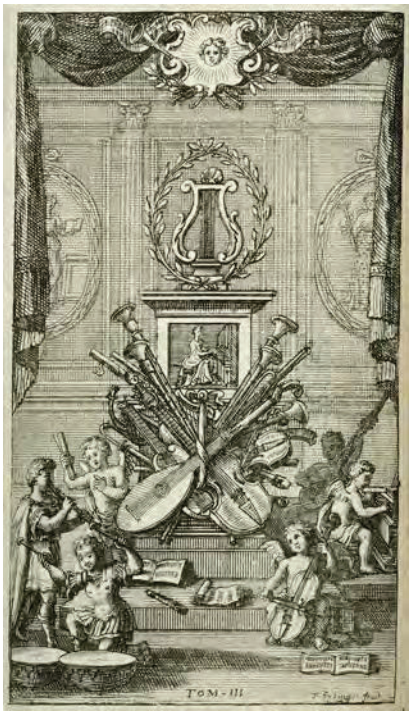


Tome I (1700)



Tome II (1700)

Tome I include several melodies from operas by Lully like *Les Fêtes d'Amour et Bacchus* (1672), *Atys* (1676), *Bellerophon* (1679), also Tome II include melodies from operas by Lully like *Triomphe de l'Amour* (1681), *Amadis* (1684), and *Armide* (1686).



Tome III (1702)

Tome III include melodies from operas like *Alcide* (1693), *Ariane et Bacchus* (1696) by Marais, and *Medée* (1693) by Charpentier.

Figure 4 Frontispieces to *Nouvelles parodies Bachiques mélées de Vaudevilles ou Ronde de Table. Recueillies & mises en ordre par Christophe Ballard, seul Imprimeur de Musique & Noteur de la Chapelle du Roy*, Tome I (1700), Tome II (1700) & Tome III (1702) all published by Christophe Ballard. (Private Collection)

Possibly *Principes* and *Rudiments* could be read as such a craft-describing text at the beginning of *Les Lumières* and the *Age of Enlightenment*. It seems to be clear that Hotteterre's intention when writing *Principes* was to make a text and manual, partly designed for self-studies explaining fundamentals of how to play the Traverso, according to above shown statements found in *Principes* and the announcement of its first publication.

It can thus be deduced that when a person has knowledge regarding musical notation and theory as found in for example *Principes de Musique* (1736) by Montéclair, a copy of *Principes* together with a Traverso the conditions needed—according to Hotteterre—are fulfilled for starting learning and practicing the Traverso also without a teacher. If so, these conditions could, of course, be fulfilled in the beginning of the 18th Century, and today as well. Because *Principes* describes fundamentals of Traverso-playing in detail regarding playing position and posture, fingerings, the embouchure, and control of the airstream for literally every note, together with articulation and an outline of general ornamentation this text is rather instructive. It can thus be concluded that when a person today wants to learn and understand the Traverso as used in France in the beginning of the 18th Century, when fulfilling above mentioned criteria, can use *Principes* in the same manner for self-studies as a contemporary to Hotteterre. If then this person already knows how to play the Boehm-flute, maybe even being a professional flautist, *Principes* is when followed in detail together with already present skills of playing the Boehm-flute an indeed helpful text. Maybe the real difficulty for a flautist of today are not the specific and idiomatic playing technics for the Traverso itself, but rather a question about aesthetics of what a Traverso naturally expresses due to its construction and repertoire. On this point, in a sense—despite strikingly many similarities between the Traverso and the Boehm-flute regarding fingerings, the embouchure, articulation and airstream as shown by Castellengo et al. (1968; 1978)—a flautist of today must emancipate from current aesthetics of the Boehm-flute and let the Traverso itself show how it wants to be played when closely following Hotteterre's explanations and suggestions.

Finally, Hotteterre's *Principes* and his important *L'Art de Preluder* (1719) could be studied as an entity having two parts: a) *Principes* explains fundamentals of Traverso playing, and b) *L'Art de Preluder* develops ideas and skills regarding the art of improvisation giving many examples of *Preludes*, together with musical interpretation, including technical exercises. When these texts are studied together Hotteterre's flautistic and artistic skills in combination with profound pedagogical insights, musical ideas and aesthetics stand out as a milestone within texts on playing on any kind of transverse flute with influences up in the 21st Century. In addition is the self-study design of *Principes* making it stand out as an exception when compared with French pedagogical works and texts for the Traverso by Rippert (1725), Corrette (1735 & 1773), Atys (1758; 1763), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), LaFite (1782), Devienne (*c.*1794), Peraut (*c.*1802), Hugot & Wunderlich (1804), and Balleron (1895) which all *could* be used for self-studies but are more efficient as a methodological path and important collections of material for studies under the tutorship of a teacher. The differences between *Principes* and mentioned authors is that Hotteterre's suggestions and explanations are far more detailed making his text into a strong tool that truly could serve for self-studies, and thus is an outstanding source mirroring Traverso playing in the very beginning of the 18th Century in France.

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At the very end of the complete work *Principes de la Flute Traversiere ou Flute d'Allemagne, de la Flute a Bec, ou Flute Douce, et du Haut-Bois. Divisez par Traitez* is a final comment directed to encourage the reader to take the possibility to visit Hotteterre for private lessons in Paris. In the edition of 1707 is Hotteterre's address *Rue Christine*, and in the 1741 edition *Seine-S. Germain, à l'Hotel d'Arras*:

> *Malgré tous les soins que j'ay pris pour rendre ces Principes intelligibles; si quelqu'un y trouve des difficultez, je me feray toûjours plaisir & honneur de les luy éclarcir, en ma demeure ruë Christine, chez Monsieur Royer.*
> (*Principes*, 1707, 50)[1]

1. Despite all the care I have taken to make these Principles intelligible; if anyone finds any difficulties there, I will always have the pleasure and honour of clarifying them, in my residence on rue Christine, at the house of Monsieur Royer. (*Principes*, 1707, 50)

1.4 *Savoir —Goût*

Soyez vrai, naturel, c'est la première grace,
Et celle qu'on poursuit dégénére en grimace.[1]

Dorat (1767, 136)

Further aspects when using *Principes* and *Rudiments* for self-studies is that it seems that Hotteterre assumes that the reader is familiar to thoughts on aesthetics and concepts regarding *Goût*, together with ideas on the importance of naturalness as a whole and in relation to instrumental playing, which are important subjects in relation to the arts, including music and music making in France.

A contemporary source to Hotteterre discussing *Goût* in relation to music is found in *Essai sur le Bon Goust en Musique* (1732) by the Parisian harpsichordist, composer, author, and music teacher Nicolas Ragot de Grandval (1676-1753). Even though this text was published in 1732, it discusses music and aesthetics which goes back to the last decades of the 17th Century and thus covers the period of the first publication of *Principes*. In this text Grandval gives a definition regarding *Goût*:

> Ainsi donc, le bon Goût est le Sentiment naturel purifié par les Régles; il consiste à sçavoir estimer les choses ce qu'elles valent, & s'y attacher à proportion qu'elles sont estimables. (Grandval, 1732, 7)[2]

Some pages later Grandval suggests how to develop a sense for *Bon Goût* referring to *sentiments naturel*:

> Pour parvenir à ce bon Goût dont il est question, il faut s'accoûtumer à juger; à metre en œuvre les lumieres du sentiments naturel & celles qu'on a acquises, & à former un judgement sur la Musique qu'on entend. (Grandval, 1732, 15)[3]

The combination of *Sentiment naturel* and *Régles* as suggested by Grandval resembles when Hotteterre in the *Preface* explained a method for learning how to play the Traverso, which possibly points on that Hotteterre thought that these ideas could be keys for the understanding of *Goût*:

Preface	*The French Preface*
J'y enseigne aussi comment on doit faire toutes les Cadences sur ces mêmes Tons; & enfin quels sont les agréments nécessaires pour joüer proprement & avec goût. Ces Regles & ces démonstrations pourront même suppléer au deffaut des Maîtres, pour bien de personnes qui ont naturellement de la disposition à joüer de cet Instrument, & à qui il ne manque que d'en sçavoir les Principes.	*Since my principal design was to explain some difficulty which oft beginners much trouble: for by help of this Treatise, a man may thoroughly understand the principals of this Instrument […] and with a rellish: These Rules, and Scales, may supply the want of a Master to a great many who are naturally disposed to play this Instrument, and want only the first Rudiments.*

When Hotteterre wrote about the embouchure he finished with a key statement connecting to the importance of naturalness as a guideline, an essential element regarding concepts of *Goût*:

[…] alors il ne faudroit prendre de mes Regles que ce qui ne seroit pas tout à fait contraire à cette disposition, & il faudroit suivre toûjours ce qui paroître le plus naturel. (II: 4)	The following passage was not translated: […] then it would be necessary to take from my Rules only what would not be entirely contrary to this disposition, and it would always be necessary to follow what appears the most natural.

Above-described concepts regarding *Goût* are representative for French aesthetics and theories vis-à-vis the arts and music in the period of *L'Ancien Régime*. It should be noted that *Rudiments* gives less attention to *Goût*, which possibly points on certain differences between French and English aesthetics during the beginning of the 18th Century.

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1. Be true, natural, it is the first grace, what we search for degenerates into a grimace. (Dorat, *La Déclamation théâtrale, poëme didactique en quatre chants, précedé d'un Discours et de notions historiques sur la Danse,*1767, 136)
2. So, good Taste is the natural feeling purified by Rules; it consists in knowing how to estimate things what they are worth, & to be attached to them in proportion as they are estimable. (Grandval, *Essai sur le Bon Goust en Musique*, 1732, 7)
3. To achieve that good taste in question, one must become accustomed to judging; to use the lights of natural feelings & those we have acquired, & to form a judgment on the Music we hear. (Grandval, 1732, 15)

A later example of what *Goût* might embrace is found in *Dictionnaire de Musique* (1768/1772) by Jean-Jacques Rousseau (1712-1778). Here Rousseau, like Grandval, stresses the importance of naturalness, but also that an intellectual definition of *Goût* could risk becoming a contradiction, thus somewhat elusive in relation to the essence of what *Goût* might represent:

> De tous les dons naturels le *Goût* est celui qui se sent le mieux & qui s'explique le moins; il ne seroit pas ce qu'il est, si l'on pouvoit le définir; car il juge des objets sur lesquels le jugement n'a plus de prise, & sert, si j'ose parler ainsi, de lunettes à la raison. (Rousseau, 1768/1772, Tome I: 371)[1]

The dictionary *Synonymes François, leurs Différentes significations et le choix qu'il en faut faire pour parler avec justesse* (1736) by Gabriel Girard (1677-1748), republished in 1769 in a second edition substantially augmented by Nicolas Beauzée (1717-1789), have definitions regarding *Génie*, *Gout*, and *Savoir* (§74: 105-111) connecting to learning, knowledge, and artistic creation. Even thou this edition was published in 1769 it could probably be understood as reflecting opinions and definitions including the first half of the 18th Century.

> Le *génie* est un pur don de la nature; ce qu'il produit est l'ouvrage d'un moment. Le *goût* est l'ouvrage de l'étude & du temps; il tient à la connoissance d'une multitude de règles ou établies ou suposées; il fait produire des beautés qui ne sont que de convention. (Girard & Beauzée, 1769, §. 74: 105)[2]

The definitions of *Gout* and *Génie* are that *Goût* is the result of studies and knowledge of rules and conventions having consensus character thus having elements of intellectualisation, whereas the concept of *Génie* in 18th Century French is related to spontaneity, instinct, and artistic creation in the moment of action or performance. The definition of *Goût*—connecting to the knowledge of rules and established ideals—could have a relationship to what today often is labelled as "style". An example of how "style" includes a set of ideals is that as late as in the 1970s there were considerable differences in flautistic ideals when comparing a German flautist like the former principal flautist and virtuoso in the *Berliner Philharmoniker* Karlheinz Zöller (1928-2005), the Italian virtuoso Serverino Gazzelloni (1919-1992), and the French virtuoso Jean-Pierre Rampal (1922-2000). Today, about fifty years later these stylistically different flautistic ideals has generally disappeared due to new media and globalisation, which could be understood as a loss of flautistic possibilities from both a technical as a perspective regarding musical expression. When discussing *Goût* in a context of the late 17th Century and first part of the 18th Century we can assume that there were parallel paradigms of rules and established ideals changing over time as exemplified above. An example of such changes is how Hotteterre in *Principes* (1707) described and explained intonation and its relation to the embouchure compared with Mahaut (1759) that will be discussed in section *6.6.7*. Above mentioned Girard-Beauzée connected *Génie*, *Goût*, *Savoir* (1769, 75: 107) to the arts although the three concepts express entirely different ideas but at the same time support each other as a unity:

> Dans les arts il ne faut pas confondre ces trois termes; ils expriment des choses entiérement différentes, mais qui s'entraident & reviennent à l'unité. (Girard & Beauzée, 1769, §. 75: 107)[3]

The definition of *Savoir* or knowledge within the arts is according to Girard & Beauzée a kind of research regarding rules of aesthetics (*Goût*) having relations to artistic spontaneity and creation (*Génie*) and common sense compared with the rules of aesthetics and established conventions, which could be understood as a field of artistic research:

> […] le *savoir* est, dans les arts, la recherche exacte des règles que suivent les artistes, & la comparaison de leur travail avec les loix de la vérité, & du bon sens. (Girard & Beauzée, 1769, §. 75: 107)[4]

An important aspect of theories regarding naturalness and *Goût* are relations or even symbiosis to the idea of suppleness in relation to the physical act of playing the Traverso—or any other instrument and singing—regarding embouchure, the airstream, articulation, fingerings, and tuning systems, in interaction to rules and conventions regarding ornamentation, musical expression, and interpretation.

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1. Of all the natural gifts, taste is the one that scents the best and is the least explained; it would not be what it is, if one could define it; because it judges objects over which judgment no longer has a hold, and serves, if I dare say so, as glasses for reason. (Rousseau, *Dictionnaire de Musique*, 1768/1772, I: 371)

2. *Génie* is a pure gift of nature; what it produces is the work of a moment. […] *Goût* is the work of study and time; it depends on the knowledge of a multitude of rules either established or supposed; he causes beauties to be produced which are only conventional. (Girard & Beauzée, *Synonymes François, leurs Différentes significations et le choix qu'il en faut faire pour parler avec justesse*, 1769, §. 74: 105)

3. In the arts, these three terms [*Génie*, *Gout*, *Savoir*] must not be confused; they experience things entirely different, but which help each other and return to unity. (Girard & Beauzée, 1769, §. 75: 107)

4. […] *savoir* [knowledge] is, in the arts, the exact research of the rules that artists follow, and the comparison of their work with the laws of truth and common sense. (Girard & Beauzée, 1769, §. 75: 107)

A remark pointing on the importance of suppleness in a wider sense within French music in the 17th and 18th Centuries was made by conductor and harpsichordist William Christie when illuminating that playing an instrument or singing, its study, the explosive and unforeseeable moment of performance constantly has, and includes elements of improvisation and unpredictability based on concepts of *Goût* to a degree where it could became necessary for the composer to sometimes insist explicitly on following given conventions:

> La souplesse avant tous. Nous savons que la musique française du XVIIIe siècle a toujours eu ce petit brin cohabitant au point qu'un compositeur peut être oblige de mettre un avertissement en un point de la partition: «Ici, vous jouez notes égales». (Labie, *William Christie Sonate baroque*, 1989, 69)[1]

An example of a search for improvisation and an unforeseeable musical expression with roots in the 17th Century is the art of preluding and the so-called *Prélude non mesuré*. Louis Couperin (*c.*1626-1661) is perhaps one of the first to have established this musical form in France for the harpsichord around 1650. When a *Prélude* was not directedly improvised a special type of notation was developed, whereby the rhythmical flow was not indicated in the conventional manner and thus giving the performer freedom letting the inspiration of the moment be the leading star when performing. Other composers and harpsichordists interested in *Prélude non mesuré* up to the middle of the 18th Century were Jean-Henri d'Anglebert (1629-1691); Nicolas Lebèque (*c.*1631-1702), Élisabeth Jacquet de la Guerre (1665–1729), François Couperin (1668-1733), Louis Marchand (1669-1732), and Jean-Philippe Rameau (1683-1764). Another example of a musician who published collections of music with connection to *Prélude non mesuré* was the Basse de Viole virtuoso Sainte-Colombe (*c.*1640-*c.*1700). One more example of a similar approach regarding spontaneity and a certain irregularity is found in a short comment on tempo and rubato in *L'Art de Preluder* (1719) by Hotteterre. This statement stresses the importance to strive for a musical performance which favours a certain unforeseeable character regarding the flow of time. Perhaps as when thinking a thought without exactly knowing how it will end, and as an important reminder aiming to recreate aspects of when a *Prélude* is improvised:

> Au reste quoy que j'aye mesuré la plupart de ces Préludes, on ne doit pourtant pas s'assujetir a y battre la mesure quand on voudra les joües de memoire. (Hotteterre, 1719, 6)[2]

Above-described ideas and possibilities for individuality and inventiveness towards set rules as explained by Christie (Labie, 1989) is in accordance with aesthetics in the 17th and early French 18th Century and expressed by the important philologue and translator Madame Anne Dacier (1645-1720). When Dacier described her method of translating the model was the virtuosic musician mastering all rules, respecting the score, trying to keep and express its emotion with freedom and nobleness, but every now and then breaking rules and instead innovate, thus creating a new unforeseeable interpretation of the already known (*Avertissement* to *L'Iliade*, 1711). The opposite would be to translate like skilful musicians when singing and playing according to rules, never making mistakes, but risking that the perfection of the performance becomes soulless and just an example of technical mastery.

A somewhat later example discussing the importance of the un-foreseeability and irregularity in the moment of performance is found in *La Déclamation théâtrale, poëme didactique en quatre chants, précedé d'un Discours et de notions historiques sur la Danse* (1767) by Claude-Joseph Dorat (1734-1780):

> […] mais la Nature, en se jouant, éclipse les beautés laborieuses de l'Art. L'irrégularité est quelquefois sublime, & souvent il se glisse de la froideur dans ce qu'on appelle la perfection. (Dorat, 1767, 169)[3]

Perhaps are the above shown examples reminders—not the least within the environment of historical performance practice—that what can be read and deduced from historical sources such as *Principes* and *Rudiments*, Quantz (1752), and Tromlitz (1791) just to give some examples directly linked to the Traverso, generally gives facets of explanations and highly important suggestions but does not necessarily give definite answers. If rules found in sources are followed too strictly and with perfection the performance risk to end up in coldness, due to a lack of spontaneity and poetic expressive moods.

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1. Flexibility above all. We know that French music of the 18th century has always had this little cohabiting strand to the point that a composer may be obliged to put a warning at one point in the score: "Here, you play equally long notes". (Labie, *William Christie Sonate baroque*, 1989, 69)

2. For the rest, although I have measured and given different meter to most of these Preludes, one should not subject oneself to beating time when one wants to play them by memory. (Hotteterre, *L'Art de Preluder*, 1719, 6)

3. […] but when following Nature while performing, eclipses the laborious beauties of Art. Irregularity is sometimes sublime, and often coldness slips into what is called perfection. (Dorat, *La Déclamation théâtrale, poëme didactique en quatre chants, précedé d'un Discours et de notions historiques sur la Danse*, 1767, 169)

Thoughts about how playing-techniques have developed over time involve aspects of aesthetics and *Le Goût*, or taste, as a central idea in the 18th Century. Concepts like *Bon Goût*, *Du naturel dans l'Art*, and *Le Son Naturel* have been significant regarding the development of flautistic craftsmanship, aesthetics and learning since the beginning of the 18th Century. Such ideas have their origins in the second part of the 17th Century and in texts by Boileau (1674), Gallois (1680), Crousaz (1715), Grandval (1732) and Mermet (1746). Girard & Beauzée (1769), who was mentioned earlier, created a typical French 18th Century definition of *Bon Goût* as:

> […] il faut qu'elles (*Bon goût*) soit élégante, finie, travaillée sans le paroître.
>
> (Girard & Beauzée, 1769, II §. 74: 105)[1]

*

To conclude, when *Principes* and *Rudiments* are studied—more than three hundred years after *Principes* went in print for the first time—having an excellent copy of for example a three-piece Traverso of *Model I* or *Model II* in the hands it is a powerful experience to discover how precise and functionally Hotteterre explained fundamentals of Traverso playing. When analysing and practicing Hotteterre's suggestions a wealth of information was found about playing position, the airstream and its speed and direction, *Tonus* in the lips and embouchure, positions of the head-joint, intonation and tuning systems, ornamentation, articulation, shape of the mouth cavity, and of course, a multitude of fingerings all aiming for a supple musical expression combining *Génie* and *Goût*.



1. […] it (*Bon goût*) must be elegant, finished, worked without appearing so. (Girard & Beauzée, *Synonymes François, leurs Différentes significations et le choix qu'il en faut faire pour parler avec justesse*, 1769, II §. 74: 105)

2 Jacques Hotteterre *Le Romain*

Notre bien aimé Jaques Hotteterre, l'un des Musiciens de notre chambre pour la Flûte-traversiere[1]

Louis XIV (*Copie du Priviléges*, January 14, 1712)

Jacques Hotteterre *Le Romain* (1674-1763) is perhaps the most famous member of the Hotteterre-dynasty of woodwind-makers and musicians. However, as with many outstanding musicians of the period we don't have much of biographical data, and it is the same with Jacques Hotteterre. Consequently, we don't know much about his youth, how he started to play the Traverso and other instruments, still have important research since the late 19th Century brought important knowledge into daylight.

2.1 Family, life, and legacy

The Hotteterre-family can be traced back to the early 17th Century and several generations before Jacques Hotteterre. Initially the Hotteterre's lived in the little city La Couture-Boussey in Normandie and the department of Évreux about 80 kilometres west from Paris, which has been a centre for woodwind-instrument making since the beginning of the 17th Century up to the first decades of the 20th Century. The first generation of woodwind instrument makers included Loys de Haulteterre (?-1628) who was working as a *Tourneur de bois* in the beginning of the 17th Century in La Couture-Boussey. The grand-father of Jacques was Jean Hotteterre (*c.*1610-*c.*1692) that seems to have been active in Paris from around 1635, the father of Jacques was Martin Hotteterre (*c.*1635-1712) that as well was active in Paris in the years 1668-1712. Jacques himself seems to have been in Paris his whole life apart from a two years sojourn in Rome the years 1698-1700 (Hilsheimer (2008b). Jacques had several children and among them a son named Jean Baptiste Hotteterre (1732-1770) that like his father was active in Paris (Giannini, 2014).

There seems to have been quite some interest for the Hotteterre-family and its legacy at the end of the 19th Century with publications like *Un Vieil Hôtel du Marais. Notice ornée de vingt gravures, portraits, pieces historiques* (1891) by Adolphe Jullien (1845-1932) which describes one of the impressive houses still to be seen in the Marais-quarters were Jacques Hotteterre lived in Paris. *Les Hotteterre et les Chédeville célèbres joueurs et facteurs de Flutes, Hautbois, Basson et Musettes des XVII*e *et XVIII*e *siècles* (1894) by Ernest Thoinan (1827-1894) gives important biographical information about the Hotteterre's, and *Les Hotteterre: Célèbres joueurs et facteurs de flûtes, hautbois, bassons et musettes des XVIIe et XVIIIe siècles. Nouvelles recherches, supplément à la brochure publiée en 1894 par Ernest Thoinan.* (1912) by Nicolas Mauger with more biographical notes. The important article *La Flûte* by Louis Fleury in *Lavignac Encyclopédie de la Musique* (1925a) is one more source of importance which seems to have drawn information from the three sources mentioned. The memory of the Hotteterre-family has been worshiped since long in La Couture-Boussey and the city has a most interesting *Musée des Instruments à vent*, and a *Brasserie Hotteterre* on *Rue Hotteterre* making a wonderfully tasty *Hotteterre beer* (Fig. 5).

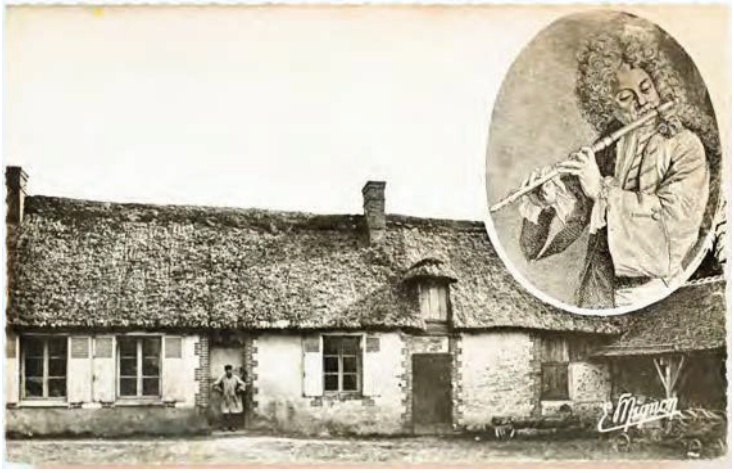


Figure 5 A postcard from around 1950 with *Vieille Maison de Hotteterre*, the old house said to have been owned by the Hotteterre-family in La Couture-Boussey (Normandy), together with a medallion with the engraving by Picard of a Traverso-player as found in *Principes*. (Private Collection)

1. […] Our beloved Jaques Hotteterre, one of the Musicians of our chamber for the Flûte-traversiere […] (*Sonates en Trio pour les Flûtes traversieres, Flûte a Bec, Violons, Hautbois, &c. ŒUVRE III*, *Copie du Priviléges*. Paris, January 14, 1712)

It has often been supposed that Jacques Hotteterre had been in Rome because of the nickname *Le Romain*. In the article *Jacques Hotteterre, le Romains Aufenhalt in Rom 1698-1700* by Gabriele Hilsheimer (2008b) it has finally been confirmed that Hotteterre as a young man stayed two years in Rome from 1698-1700 and was employed as *Mstro* [Maestro] *di flauto* by the roman Marquis Francesco Maria Ruspoli (1672-1731). This is probably the reason why Hotteterre later added *Le Romain* to his name on publications, which was a practice in the beginning of the 18th Century when an artist had spent a longer sojourn in Rome. A second indication that Hotteterre were in Italy many years later, and this time in north-western Italy and Turin is found in *Musique et Musiciens à Turin de 1648 à 1775* (1968) by Marie-Thérèse Bouquet. According to Bouquet, Hotteterre went to Turin for giving Traverso-lessons to the nephew of the canon Angelo Maria Discalzi somewhere in the years 1730 to 1735 (1968, 27).

In 1705 Hotteterre was enrolled as *Hautbois de la Grande Écurie* at the court of King Louis XIV (1638-1715) and in 1717 appointed *Flûte de la Chambre du Roy* as the successor of Traverso virtuoso René Pignon Descoteaux (*c.*1645-1728). Still Hotteterre referred to the latter title already on the frontispiece of *Premier livre de pièces Œuvre IIa* (1708).

Regarding Hotteterre and his relation to the court around King Louis XIV it is of interest that in his *Sonates en Trio pour les Flûtes traversieres, Flûte a Bec, Violons, Hautbois, &c. ŒUVRE III* (1712) is Hotteterre mentioned in the *Copie du Priviléges* dated January 14, 1712, in a most favourable manner:

> […] Notre bien aimé Jaques Hotteterre, l'un des Musiciens de notre chambre pour la Flûte-traversiere, nous a fait exposer qu'il desireroit donner au public divers ouvrages de Musique, tant vocale, qu'instrumentale, et pour les Flûtes-traversieres, a deux, ou plusieurs parties, de sa composition s'il nous plaisoit de luy acorder nos letres de Privilêge, pour la ville de Paris seulement. Nous avon permis et permetons par ces presentes audit Jaques Hotteterre le Romain de faire imprimer et graver le dit ouvrage en telle forme, marge, caractere, con jointement ou separément, et autant de fois que bon lui semblera, et de vendre et debiter par tout notre Royaume pendant le tems de douze années consecutives a compter du jour de la date des presentes. […] fait à Paris, ce 14e Janvier 1712.[1]

In Hotteterre's *Œuvre III* (1712), *IV* (1712), *V* (1715), *IIb* (1715), *VI* (1717), *VII* (1719), the transcription of the Valentine *Sonates* (1721), and *Pièces pour la muzette qui peuvent aussi se jouer sur la flûte* (1722) is this *Copie du Priviléges* always added to the publications. It should certainly be understood as a great honour to be personally mentioned with the following words by the King Louis XIV: *Notre bien aimé Jaques Hotteterre, l'un des Musiciens de notre chambre pour la Flûte-traversiere*. According to the common practice in the 18th Century to dedicate new publications to Kings and members of the court, Hotteterre dedicated his *Œuvre IIa* (1708) and *Œuvre IIb* to Louis XIV (1715), and *Œuvre III* (1712) to *Monseigneur de Duc d'Orleans*—Philippe II Duke of Orléans (1674-1723) who served as the Regent after the death of King Louis XIV in the years 1715-1723—and *Œuvre* V (1715) to Monsieur du Fargis, Chamberlain to the King of France.

In 1728 Hotteterre—at the age of 54—married Élisabeth-Geneviève Charpentier (1690-1782) the daughter of a *Notaire* and advisor to King Louis XV (1710-1774). It seems that Hotteterre approached retirement around 1728, which marks a change of generation regarding French Traverso-players. In 1728 the young Traverso virtuoso Michel Blavet (1700-1768) had published his *Premier Œuvre Contenant Six Sonates pour deux Flutes traversieres sans Basse* which in a sense marks the moment when Blavet became the leading French virtuoso (De Reede, 2022). Illustrious flautists of the older generations such as Philippe Rebillé *dit* Philbert (1639-*c.*1717), René Pignon Descoteaux (*c.*1645-1728), Michel de La Barre (1675-1745) and Hotteterre himself belonged to the first generations of Traverso virtuosi adopting the three-piece Traverso being active at the end of the 17th Century and the first decades of the 18th Century (Sillanoli, 1984). It should be noted that the biographer Evrard Titon du Tillet (1677-1762) in the 1743 edition of *Orchestre de Parnasse* recognized Hotteterre among the most outstanding French musicians. Around 1730 the four-piece Traverso became dominant and new generations of Traverso-players like Blavet, Pierre-Gabriel Buffardin (1693-1768), Pierre-Évrard Taillart (*c.*1715-1781), and later Félix Rault (1738-after 1807) adopted this model.

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1. […] Our beloved Jaques Hotteterre, one of the Musicians of our chamber for the Flûte-traversiere, told us that he would like to give the public various works of Music, both vocal and instrumental, and for the Flutes-traversieres, in two or more parts of its composition, if we would like to grant it our letters of Privilege, for the city of Paris only. We have allowed and hereby allow said Jaques Hotteterre *le Romain* to print and engrave the said work in such form, margin, character, jointly or separately, and as many rights as he sees fit, and to sell and debit by all our Kingdom during the time of twelve consecutive years from of the day of the date hereof. […] made in Paris, this 14th January 1712. (*Sonates en Trio pour les Flûtes traversieres, Flûte a Bec, Violons, Hautbois, &c. ŒUVRE III*)

Quantz did in his *Versuch einer Anweisung die Flöte Traversière zu Spielen* (1752) comment on this change of generations among French Traverso-players and had the opinion that Buffardin and Blavet represented a considerable higher level of playing than La Barre and Hotteterre:

I: §. 6

> Der erste, der sich auf der verbesserten Flöte traversiere, in Frankreich, besonders hervor gethan, berühmt und beliebt gemacht hat, ist derwegen gewißer besonderen Schicksale, merkwürdige Philibert. Hierauf kam: la Barre, und Hotteterre le Romain. Diesen folgeten Buffardin und Blavet; brachten es aber in der Ausübung viel weiter als ihre Vorfahren. (Quantz, I: §. 6, 24)[1]

A further aspect on this change of generations with effect on aesthetics and playing-technique regarding Traverso-playing is that the Italian influences on French music became gradually stronger when approaching the middle of the 18th Century, including the immense impression of the virtuosity as developed by composers and violin virtuoso players such as Arcangelo Corelli (1653-1713) and Antonio Vivaldi (1678-1741). An example regarding interest in Italian music is the announcement in *Mercure de France*, December 1728, of *Six Sonates pour deux Flutes Traversieres, sans Basse. Premier Œuvre* (1728) by the young Traverso virtuoso Michel Blavet (1700-1768). Apart from praising the virtuosity of Blavet, is explained that these *Six Sonates* are explicitly written to familiarise the Traverso loving audience with the Italian musical style:

> Le sieur Blavet, dont la réputation est si connuë, pour avoir poussé la grande exécution de la Flute Allemande à sa derniere perfection, vient de dédier au Prince de Cardigan, six Sonates pour deux Flutes Traversieres, sans Basse, qui sont fort goutées des connoisseurs. L'intention de son Ouvrage est de conduire insensiblement ceux qui joüent de cet Instrument à l'execution de la Musique Italienne, & pour leur donner plus de facilité; ces Sonnates, qui n'ont rien de bien embarassant, sont nottées sur la Clef Françoise. (*Mercure de France*, Décembre 1728, 2896)[2]

For the first generations of Traverso-players in the last decades of the 17th Century and the beginning of the 18th Century the Traverso was still in a phase of development, and possible were playing-techniques and aesthetics to some degree influenced by traditions regarding the Renaissance Traverso. It should be noted that Quantz (1752, I: §. 3 & §. 4) referred to *Theatrum Instrumentorum* (1620, Book II, Plate IX, see Appendix VI) by Michael Praetorius (1571-1621) making some observations regarding the *Querflöte* [Renaissance Traverso] and the *Schweizerpfeife* (Fife):

I: §. 3

> Michael Praetorius nennt diese Flöte, in seinem Theatrum Instrumentorum, welches 1620, zu seiner Zeit, wo noch keine von den itzo daran befindlichen Klappen üblich war, in Wolfenbüttel gedrucket worden: die Querflöte. Dasjenige Instrument aber, welches noch heut zu Tage bey den Soldaten zur Trommel gebrauchet wird, nennet er zum Unterschieden: die Schweizerpfeife. (Quantz, 1752, I: §. 3, 24)[3]

I: §. 4

> Es ist also die Flöte traversiere vor diesem nicht so, wie itzo, beschaffen gewesen. Weil die, zu dem halbem Tone Dis, unentbehrliche Klappe daran fehlete: konnte man darauf nicht aus allen Tonarten spielen. Ich habe selbst eine von dieser Art in Händen, welche in Deutschland, vor ohngefähr sechzig Jahren verfertiget worden, und welche eine Quarte tiefer steht als die gewöhnlichen. Die Franzosen sind die ersten gewesen, welche dieses Instrument, durch Beyfügung einer Klappe brauchbarer gemacht habe, als es bey den Deutschen vor diesem nicht war. (Quantz, 1752, I: §. 4, 24).[4]

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1. In France the first to distinguish himself and to make himself celebrated and popular upon the improved transverse flute was Philibert [Philippe Rebillé *dit* Philbert, 1639-*c.*1717], well known as a result of his singular experiences. After him came la Barre and Hotteterre le Romain. They were followed by Buffardin and Blavet, who greatly excelled their predecessors in the practice of the instrument. (Quantz, Trans. Reilly. 1752/1985, 30).
2. The Sieur Blavet, whose reputation is so well known for having improved the virtuosity of the German Flute to its ultimate perfection, has just dedicated to the Prince of Cardigan, six Sonatas for two Flutes Traversieres, without Bass, which are highly appreciated by connoisseurs. The intention of his [Blavet] work is to imperceptibly lead those who play this Instrument to the execution of Italian Music, & to make it easier for them; these Sonatas, which are not particularly uncomfortable, are notated on the Clef Françoise. (*Mercure de France*, December 1728, 2896)
3. Michael Praetorius, in his *Theatrum Instrumentorum,* published in Wolfenbüttel in 1660, when none of the present keys were used, calls this flute the cross-flute [*Querflöte*]. In contradistinction to it, the instrument still used today among soldiers to accompany the drum is termed the Swiss pipe [*Schweizerpfeife*]. (Quantz, Trans. Reilly. 1752/1985, 29-30).
4. Thus the structure of the transverse flute was formerly not the same as it is now. Since the key indispensable for the semitone D sharp was lacking, one could not play in all tonalities upon it. I myself possess one of this kind, fashioned in Germany about sixty years ago, which is a fourth lower than ordinary flutes. The French, by addition of the key, were the first to make the instrument more serviceable than it had been previously among the Germans. (Quantz, Trans. Reilly. 1752/1985, 30).

From this we can understand that Quantz as a matter of fact did possess a *Querflöte* which apparently was an instrument like the Renaissance Traverso as depicted in *Theatrum Instrumentorum* (1620) by Praetorius. This transverse flute was according to Quantz made around 1690 which points at that this kind of instruments were made and possibly used at the very end of the 17th Century in Germany. Secondly, Quantz' statement makes it trustworthy that the first generations of Traverso-players in France such as Rebillé *dit* Philbert and Descoteaux possible had the opportunity to first-hand knowledge, and perhaps even had experiences of having played on the Renaissance Traverso, being active about 50 years before Quantz started his professional work as a Traverso-player. Thus, it seems probably that a personality like Rebillé *dit* Philbert could have had first-hand knowledge of the Renaissance Traverso considered that he was a teen-ager when Van Eyck published the second volume of *Der Fluyten Lust-Hof* in 1654. A similar possible first-hand knowledge regarding the Renaissance Traverso involves the first generation of the Hotteterre-family of woodwind instrument makers in the first half of the 17th Century. Further, if French flautists—according to Quantz—were the first to adopt the Traverso this directedly points on personalities such as Rebillé *dit* Philbert and Descoteaux, which then indirectly steers on the following generation with personalities as La Barre and Hotteterre.

It is not really surprising that Quantz had first-hand knowledge regarding the Renaissance Traverso, because when the Traverso was introduced in professional music life in Paris and the years around 1680, and in 1681 played in the *Opéra-ballet Le Triomphe de l'Amour* (1681, LWV 59) by Jean-Baptist Lully (1632-1687), it is difficult to imagine that suddenly the Renaissance Traverso and its tradition was abandoned all at once. Possibly there has been a period during the middle and second half of the 17th Century whereby transitions of aesthetics, playing-techniques and instrument-making techniques based on the Renaissance Traverso had taken place when developing the Traverso. In this period were Traverso-players like mentioned Rebillé *dit* Philbert and Descoteaux among the most successful, and for sure leaving important inspiration for upcoming generations of young Traverso-players. It is in this context that Hotteterre's retirement around 1728 should be understood. When Quantz in 1752 stated that Buffardin and Blavet brought Traverso-playing considerably further than Hotteterre and La Barre, he is probably pointing at virtuosic aspects of Traverso-playing as we find them in for example the *Concerto* in a-minor by Blavet, in the *Concertos* by Buffardin in e-minor and f-minor, and later in the *XII Caprices* in *L'Art de la Flûte Traversiere* (*c.*1761) by De Lusse. It should in the present context be noted that Quantz referred to *Principes* and seems to have had first-hand knowledge of this text (1752, I: §. 2, 23).

It has from time to time been uttered that Hotteterre—apart from being a Traverso-virtuoso, author, composer, and teacher—as well was making woodwind instruments. There is only one 18th Century source that supports this opinion that Hotteterre indeed made woodwind instruments such as the Traverso and Musett, and that is the travel diaries by the German lawyer, architect, *Musik Liebhaber,* and *Bürgermeister* of Frankfurt Johann Friedrich Armand von Uffenbach (1687-1769) that visited Hotteterre in Paris. In *Die musikalischen Reisen des Herrn von Uffenbach* (Preussner, 1949) described von Uffenbach his visit in Hotteterre's home in Rue Dauphine in the quarters of Saint-Germain-des Prés in the 6th Arrondissement of today's Paris, on Friday October 25 in 1715:

> […] ging zu Ms hauteterre flute du roy, der mich zwar hofflich in seinem quartier a la rue dauphine aber etwas hochtrabend und vornehm thuend empfing, er führte mich in ein propre gemach und zeigte mir alda viel schöne flutes traverses die er selbst machet und besonders vortheil darin haben will, nachdem brachte er seine musicalischen Werke, davon er 5 mit ziehmlich applaus ediert herbey, wovon eins von der instruction der flute traverse vor 2 livres kauffte, heierauf zeigte er mir ein anderes von ihm verbesserten und curieuses instrument einer musette oder art von dudelsäcken, die aber sich auf all thon stimmen lassen und gar angenehm auch izo alhier mode sind […] er [Hotteterre] spiehlte nebst einem andern musico so das clavier dazu accompagnierte hierauf [Musette] eine Sonate unvergleichlich wohl und gar angenehm, auch mit solc wohl ausstudierten agrements, daß ich nicht genug hören und bewundern konnte […] (Preussner, 1715/1949, 128-129)[1]

1. […] went to Ms hauteterre flute du roy, who happily received me in his quarters a la rue dauphine but somewhat pompously and elegantly, he led me to a proper room and showed me many beautiful flutes traverses that he makes himself and wants to have particular advantage in it, after he brought his musical works, of which he edited 5 with rather applause hereby, of which one of the instruction of the flute traverse bought one for 2 livres, he showed me another curieuse instrument improved by him, a musette or kind of bagpipes, but which can be tuned on all notes and are also very pleasant and a la mode here […] he played along with another musico so the clavier accompanied him [Hotteterre] playing the [Musette] and a Sonate incomparably well and very pleasantly, too with such well-studied agrements that I could not hear and admire enough [...] (Preussner, *Die musikalischen Reisen des Herrn von Uffenbach*, 1715/1949, 128-129)

Despite Uffenbach's statement that Hotteterre was a maker of woodwind-instruments has no instruments been identified that for sure can be said to have been made by Jacques Hotteterre. But perhaps even thou Hotteterre most likely did not literally make woodwind-instruments at the lathe turning wood, Uffenbach should maybe be understood in the sense that Hotteterre had his ideas regarding the design and how to make a Traverso as a Traverso-virtuoso, and thus could give detailed suggestions for the maker at the lathe, and perhaps to his father Martin Hotteterre. If so, it resembles how outstanding flautists today interacts with flute makers. In this context it should be noted that whether in the inventory list at Hotteterre's marriage in 1728, neither in the list made after his death in 1763 are any woodwind-instruments nor tools for woodwind-instrument making listed (Giannini, 1993a).

That Hotteterre played the Musette when Uffenbach visited him is interesting when thinking about that he later wrote his *Méthode pour la Musette Œuvre* X (1737). It seems that Hotteterre was an active Musette-player and in *Mercure de France* (December 1728) is a note about a performance in Paris of the comedy *L'Inconnu* (1704) by Thomas Corneille (1625-1709):

> […] la Comédie de *l'Inconnu*, de Thomas Corneille avec de nouveaux agrémens. […] dans le quatriéme Acte [Scene VI], étoit composé de Bergers & de Bergeres, ayant à leur tête le sieur *Hotteterre*, le Romain en Berger, jouant de la *Musette*, & conduisant la Fête. (*Mercure de France*, Décembre, 1728, 2932 & 2936)[1]

2.2 Composer, author, and teacher

Hotteterre was active as a composer and author of pedagogical works for the Traverso, Recorder, Oboe and Musette, and published these works in a period from 1707 to 1737. The pedagogical works by Hotteterre are *Principes Œuvre I* (1707), *L'Art de Preluder Œuvre VII* (1719), and *Méthode pour la Musette Œuvre X* (1737). In addition, has *1er Livre Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue Œuvre IIa* (1708) and especially its second edition *IIb* (1715) instructive texts regarding interpretation and ornamentation in their respective *Avertissement*. A further example of pedagogical character are the two editions of *Premiere Suitte de Pieces a deux a deux Dessus sans Basse Continue Œuvre IV* both published in 1712, whereby the first edition has far less marked ornaments and the second edition substantially more marked ornamentation together with suggestions regarding rhythm and *Inégale* playing. It is well documented that *Principes* had a strong impact and was republished and translated far up into the second part of the 18th Century. Regarding *L'Art de Preluder* (1719) it is the largest text of its kind when it comes to the Traverso (Bowers, 1971) and could be understood as a musical compliment to *Principes*. Finally, *Méthode pour la Musette* (1737) is an fascinating text because here we can follow the systematic teacher Hotteterre at work, starting with the easy and systematically step by step approaching the more and more advanced levels of Musette-playing. It could be assumed that these pedagogical skills are not isolated to Musette-playing but appliable on Traverso-playing. This supports the thought that *Principes* is not really—as sometimes referred to in the literature—a method but rather a manual explaining how a Traverso functions (Bowers, 1971). As a teacher of the Traverso and Musette Hotteterre seems to have had pupils from the Parisian aristocracy and wealthy world, and been an appreciated well-known teacher (De Reede, 2022).

As a composer Hotteterre is a child of his epoch similarly as La Barre writing *Suites* and *Sonatas* that can be played on different instruments as for example the Traverso, Recorder, Oboe, Violin, Viole, and Musette, still is the impression that Hotteterre's compositions are primarily written for the Traverso. An example is that when playing Hotteterre's compositions on the Recorder this often works better when transposed a third upwards because the Recorder can't play in the lowest register of the Traverso down to D1 (Bowers, 1971).

A list with the pedagogical works and compositions by Hotteterre includes publications with and without opus number, the former are numbered from *I–X*, and seven publications have no opus numbers (Fig. 6). At present are *Œuvres I–VIII* and *X* identified as authorised sources, available in editions, facsimiles, and digitalized by research libraries such as *Bibliothèque National de France* in Paris, and data bases like *IMSLP*. Only *Œuvre IX* is not identified with an authorised source. A proof of that *Œuvre IX* was published is found in *Catalogue des Œuvres du Sr Hotteterre* in *Méthode pour la Musette Œuvre X* in the edition of 1738 published by Ballard in Paris, where *Œuvre IX* has the title *Concert du Rossignol*. In Vester (1985) has *Œuvre IX* the title *Pièces et Sonates pour la flûte allemande: Le Rossignol, trio* referring to a catalogue by Leclerc (1731).

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1. La Comédie de *l'Inconnu,* by Thomas Corneille with new embellishments. […] in the fourth Act, was composed of Shepherds & Shepherdess, having at their head the sieur *Hotteterre*, the Romain as a Shepherd, playing the *Musette*, & leading the festivities. (*Mercure de France*, December, 1728, 2932 & 2936)

Regarding the publications without numbers are four identified and authorised, apart from a collection of transcriptions and supposedly compositions by Tomaso Albinoni (1671-1751) scored for two Traversi and Basso by Hotteterre. According to Vester (1985) are these transcriptions mentioned in a catalogue by Leclerc (1731) under the title *Pièces et Sonates pour la flûte allemande: Trio d'Albinony, ajustez pour la flûte.* Supposedly these transcriptions were based on works by Albinoni such as the *Trio Sonatas* Op. 1 (1694), Op. 3 (1701), and Op. 8 (1722).

Year of publication	*Œuvre*	Works, Hotteterre's titles, and dedications	City of publication	Editor
1707	**I**	*Principes de la Flute Traversiere ou Flute D'Allemagne. De la Flute a Bec, ou Flute Douce, et du Haut-Bois. Divisez par Traitez* Hotteterre's title: *Ordinaire de la Musique de Roy*	Paris	Ballard
1708	**IIa**	*Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue* including *Pieces à deux Flûtes Traversiere* and *Echos Pour la Flûte Traversiere seule. Livre Premier.* Dedication: *Dediées au Roy* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Ballard
1712	**III**	*Sonates en Trio Pour les Flûtes Traversieres, Flûtes a Bec, Violons, Hautbois, &c. Livre Premier* Dedication: *A Son Altesse Royale Monseigneur de Duc 'Orleans* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Foucault
1712	**IVa**	*Premiere Suitte de Pieces a deux Dessus, sans Basse Continue. Pour les Flûtes Traversieres, Flûtes a Bec, Violes &c.* Hotteterre's title: *Ordinaire de la Musique de la Chambre du Roy*	Paris	Foucault
1712	**IVb**	*Premiere Suitte de Pieces a deux Dessus, sans Basse Continue. Pour les Flûtes Traversieres, Flûtes a Bec, Violes &.* This edition includes a large number of ornamentation not found in the first edition of *Œuvre IIa.*	Paris	Boivin
1715	**V**	*Deuxieme Livres des Pieces pour la Flute Traversiere, et autres instruments avec la Basse* Dedication: *Monsieur du Fargis* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Foucault
1715	**IIb**	*1er Livre de Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue Gravée sur l'Imprime, et augmenter de plusieurs agrements, et d'une demonstration de la manière qu'ils se doivent faire; Ensemble une Basse adjoûtée aux Pieces a deux Flutes pages 38. et 40. Nouvelle Edition.* Dedication: *Dediées au Roy* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Foucault
1717	**VI**	*Deuxieme Suitte de Pieces a deux Dessus. Pour les Flûtes Traversieres, Flûtes a Bec, Violes &c. Avec une Baße adjoûtée séparément et sans alteration des Deßus, laquelle on y pourra joindre dans le Concert.* Dedication: *Monsieur du Fargis* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Foucault
1719	**VII**	*L'Art de Preluder sr la Flûte Traversiere sur la Flûte a bec, sur le Haubois et autres Instrumens de Deßus* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Foucault
1721	**No number**	*Sonates à deux dessus par le Sigr. Roberto Valentine Opera Quinta. Accomodées a la Flûte Traversiere par Mr. Hotteterre le Romn. Et ce peuvent executer sur les autres Instrumens de Deßus* Hotteterre's title*: Ordinaire de la Musique de la Chambre du Roy*	Paris	Boivin
***c.*1721**	**No number**	*Airs et Brunettes a Deux et Trois Dessus pour les Flutes Traversieres. Tirez des meilleurs Autheurs, Anciens et Modernes Ensemble les Airs de Mrs. Lambert, Lully De Bousset & Les plus convenables a la Flute Traversiere Seule. Ornez d'Agremens par Mr Hotteterre le Romain*	Paris	Boivin
1722	**VIII**	*Troisieme Suitte de Pieces a deux Dessus Pour les Flûtes Traversieres, Flûtes a Bec, Haubois & Muzettes. Œuvre VIII* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Boivin
1722	**No number**	*Une Suitte de Pieces par Accords Par Mr. Hotteterre le Romain.* In *Pièces pour la Muzette Qui peuvent aussi se jouer sur la Flûte, sur le Haut-bois, &. Par Mr. Jean Hotteterre Le Romain* Hotteterre's title: *Flûte de la Chambre du Roy*	Paris	Boivin
1723	**No number**	*Sonates a Deux Dessus par le Sigr. Francesco Torelio Recueillies et accomodées au gout de la Flûte Traversière par Mr. Hotteterre, le Romn. Et se peuvent executer sur les autres Instrumens de Dessus Opera prima.* Hotteterre's title: *Ordinaire de la Musique de la Chambre du Roy*	Paris	Boivin
1737	**X**	*Méthode pour la Musette. Contenant des Principes, par le moyen desquels on peut apprendre à joüer de cet Instrument de soy-même au défaut de Maître* Hotteterre's title: *Ordinaire de la Musique de la Chambre du Roy*	Paris	Ballard

Figure 6 List of identified compositions and pedagogical works by Hotteterre.

In *Les Hotteterre et les Chedeville* (1894) by Thoinan are transcriptions mentioned of works by Albinoni made by Hotteterre which probably could be the same as the ones mentioned by Vester (1985):

> Jacques Hotteterre arrangea encore pour la flûte des sonates de violon d'Abinoni; mais nous n'avons pas les titres de ces morceaux (Thoinan, 1894, 43)[1]

In the monumental thematic catalogue *Flauto Traverso und Flauto Dolce in den Triosonaten des 18. Jahrhunderts. Ein thematisches Verzeichnis. Band 1-4*. (2007) by Gronefeld are these transcriptions not mentioned. Regarding the publications without numbers: *Airs et Brunettes* (*c.*1721), *Sonates à deux dessus par le Sig Roberto Valentine* (1721), *Suitte de pièces par accords par M. Hotteterre le Romain* (1722), *Sonates a deux dessus par le Sig Torelio Francesco* (1723) are all available in editions, facsimiles, and digitalized by research libraries.



1. Jacques Hotteterre also arranged violin sonatas by Abinoni for the flute; but we don't have the titles of these pieces. (Thoinan, *Les Hotteterre et les Chedeville*, 1894, 43

3 *Principes*: Translations

The present study is, as already mentioned, the result of an attempt to make a close reading of Hotteterre's *Principes* together with a comparison between the first French edition (1707) and *Rudiments* the first English translation of *Principes* being announced October 25, 1729, in Daily Post, London:

> *The Rudiments or Principles of the German flute. Explaining after and easy Method every thing necessary for a learner thereon, to a greater nicety than has been ever taught before. Wrote in French by the Sieur Hotteterre le Romain; Musician Ordinary to the late French King; & faithfully translated into English. To which is added a Collection of Familiar Airs for Examples.*

Very few originals of this edition are preserved, one belongs to the collections of the *Archives & Special Collections*, University of Glasgow, another to the *Library of Congress* in Washington, and finally one or two in private collections.

The complete text of *Principes* is structured with a *Preface* and nine chapters, and *Rudiments* follows the same structure (Fig. 7). In the *Preface* has Hotteterre explained the outline of *Principes* and the same explanation is found in *The French Preface* at the beginning of *Rudiments*. Some short passages were not translated probably because they encouraged if someone would like to visit Hotteterre in his home in Paris for having private lessons and instructions regarding ornamentations and purchasing his compositions for the Traverso:

Preface	The following passage was not translated:
Ceux qui croiront avoir besoin de Leçons, pour mettre en pratique les Instructions contenuës dans ces Principes, en trouveront chez moy avec les agréments marquez. A l'égard de ceux qui sont plus avancez, je leur prepare quelques suites de Pieces composées exprés pour la Flute. On peut aussi s'exercer sur les *Brunettes*, & principalement sur les *Duo* & *Trio*, de feu Monsieur Gaultier de Marseille, qui viennent d'être mis au jour.	Those who think they need Lessons, to put into practice the Instructions contained in these Principles, will find them in me with the approvals mark. Regarding those who are more advanced, I am preparing for them a few suites of Pieces composed expressly for the Flute. You can also practice on the Brunettes, & mainly on the Duo & Trio, of the late Monsieur Gaultier from Marseille, which have just been brought to light.

At the end of *Rudiments* are twenty-six tunes added by the editor Walsh, all in comfortable keys like D- and G-major together with g- and a-minor, and finally a list of Traverso compositions and transcriptions by composers such as Georg Friedrich Handel (1685-1759), Jean-Baptiste Loeillet (1680-1730), Johann Christian Schickard (*c.*1682-1762), and Robert Valentine (*c.*1671-1747) all published by the editor Walsh in London. In comparison there are no examples of tunes in *Principes*, apart from that Hotteterre in the *Preface* suggested the reader to play *Suites en Duo & Trio* (1707) by Gaultier de Marseille (1643-1696), *Brunettes*, *Rondes*, and his own compositions. The fingering-charts *A SCALE of all the Notes and Half Notes of the GERMAN FLUTE Musically and Tabulatory*, and *A SCALE of all the Beats or Shakes* are the same as in *Principes* just with some rare misprints. In *Principes* are all fingering-charts and music examples notated with *French violin clef* (G is fixed at the bottom line of the staff), whereas *Rudiments* throughout uses the standard *Treble clef*. *Principes* is as already mentioned the first instructive and detailed manual of its kind for a transverse flute within the European tradition, thus *Principes* had—and has—a unique position within texts discussing playing-techniques and principles on how a transverse flute function, making *Rudiments* to an import document regarding Traverso-playing in England during the first half of the 18th Century.

It has not been possible to identify *who* has made the English translation of *Principes*, but future research might possibly shed light on this question. A speculation is that maybe the composer, harpsichordist, and organist Peter Prelleur (1705-*c.*1758) could have made the translation of *Rudiments*. In Prelleur's *Modern Musick-Master or The Universal Musician* (1731) is the chapter on the Traverso having a structure rather similar to *Rudiments* including that all examples regarding articulation and ornamentation are exactly the same as in *Rudiments* (Fig. 7). What perhaps point in the direction that Prelleur could have made the translation of *Principes* is that wordings in the *Modern Musick-Master* (1731) is literally the same or very similar when compared with *Rudiments* and that he was working in London. Further that Prelleur probably was a Frenchman by birth (Alexander Hyatt King, *Nachwort* in the facsimile of Prelleur 1731), which could explain the high quality of the translation from French to English.

Principes	*Rudiments*
PRÉFACE	**THE FRENCH PREFACE**
TRAITÈ DE LA FLUTE TRAVERSIERE.	**A Treatise of the GERMAN FLUTE.**
CHAPITRE PRÉMIER De la situation du Corps, & de la position des Mains.	**CHAP. the 1st.** Of the Situation of the Body, and placing the hands.
CHAPITRE II. De l'Embouchure	**CHAP. the 2d.** Of filling the GERMAN FLUTE
CHAPITRE III. Premiere explication de la premiere Planche sur les Tons naturels.	**CHAP. the 3d.** The Explication of the first Scale of the Natural Tones.
CHAPITRE IV. Prémiere explication de la deuxiéme Planche sur les Cadences naturelles.	**CHAP. The 4th.** The Explanation of the SCALE of Cadences, or Shakes.
CHAPITRE V. Seconde explication de la Prémiere Planche sur les Diézis & les Bemols	**CHAP. the 5th.** The 2d. Explanation of the first SCALE of Flats & Sharps.
CHAPITRE VI. Seconde Explication de la seconde Planchesur les Cadences.	**CHAP. the 6th.** [For the better understanding some Characters commonly us'd in Musick, and over some of the dots in the Tablature of the 2d. Scale]
CHAPITRE VII. Remarques sur quelques demi-Tons, & sur quelque Cadences.	**CHAP. the 7th.** Remarks on some Semitones, and some Cadences.
CHAPITRE VIII. Des coups de Langue, Ports-de-voix, Accents & doubles Cadences sur la Flute Traversiere & autres Instrument à vent.	**CHAP. the 8th.** Of the double Cadences, Accents, Port-de-voix, and tongueing the German Flute and other Instruments.
CHAPITRE IX. Des Flattements ou Tremblements Mineurs, & des Battements.	**CHAP. the 9th.** Of the softening of Notes, or the lesser Shakes, and of the Beats.
Suggestions to practice *Brunettes*, *Rondes*, and Hotteterre's own compositions	**A Collection of Familiar Airs for Examples**

Figure 7 Structure of the nine chapters in *Principes*, compared with *Rudiments*.

*

Rudiments is as mentioned above a complete and faithful translation of *Principes*, but just two years later was the above mentioned *Modern Musick-Master or The Universal Musician* (1731) by Prelleur published, having a longer section entitled *The Newest Method for Learners on the German Flute* which generally and regarding content is like a new somewhat shortened version of *Rudiments*. In addition, has Prelleur's text a short section *On Time* explaining basic knowledge regarding meter on musical notation. Anyhow, *The Newest Method for Learners on the German Flute* is without any doubt based on *Rudiments,* which becomes clear when, as mentioned above, the structure, order of chapters, wordings which generally is the same or very similar, identical music examples and in the same order together with the same fingerings-charts as in *Rudiments*. At the end of Prelleur's text on the Traverso is—as in *Rudiments*—a collection of eighteen tunes similar and sometimes the same as in *Rudiments*, together with fifteen opera arias adapted for the Traverso which are not a part of *Rudiments*. These arias are taken from *Rodelinda* (1725), *Otho* (1723), *Rhadamistus* (1720), *Siroe* (1719), *Parthanope* (1730), *Ptolomy* (1728), and *Dramma per musica Ormisda* (1730) all by Handel.

About fifteen years later was *The complete tutor for the German flute, containing the best and easiest instructions for learners to obtain a proficiency. Translated from the French. To which is added a choice collection of ye most celebrated Italian, English & Scotch tunes, curiously adapted to that instrument* (*c.*1746) published by John Simpson in London. This text is like a modified and shortened version of *The Newest Method for Learners on the German Flute* (1731) by Prelleur, including an unmistakably resemblance with *Rudiments*. There are some differences between Simpson and Prelleur, and one important is that the engraving of a Traverso-player in Simpson is playing a four-piece Traverso indicating that the three-piece Traverso probably was coming out of fashion in England in the years around 1750 (Fig. 8). Simpson's text generally follows *Rudiments* on many points, including explanations of fingerings in text, referring to fingering-charts which probably have been the same or similar to the ones in *Rudiments* and Prellleur (1731). The copy of Simpson been available for the present study is the copy in the collections of *Library of Congress* (Washington) which unfortunately does not include mentioned fingering-charts. In addition is in *Chapter VIII* a section *Examples of the Time* being very similar to Prelleur's section *On Time* explaining basics regarding meter, musical notation, and how the *Treble clef* functions, together with explanations regarding sharps and flats.



Figure 8 To the left the engraving of a Traverso-player with a three-piece Traverso from *The Newest Method for Learners on the German Flute* (1731) by Prelleur. To the right a Traverso-player with a four-piece Traverso from *The complete tutor for the German flute, containing the best and easiest instructions for learners to obtain a proficiency* (*c.*1746) by Simpson.

As in *Rudiments*, and Prelleur (1731) has Simpson (*c.*1746) added a collection of twenty-seven popular tunes: two *Minuets* by Francesco Geminiani (1687-1762) and opera arias and melodies by Handel from operas like *Parthenope* (1699), *Richard* (1719), *Ariadne in Crete* (1734), *Alcina* (1735), the cantata *Apollo and Daphne* (1709-1710), and *Water Music* (1717), the latter in a duet version. In addition is at the end of Simpson's text *A Dictionary Explaining such Greek, Latin, Italian and French Words as generally occur in Musick*. In addition is at the end of Simpson's text *A Dictionary Explaining such Greek, Latin, Italian and French Words as generally occur in Musick*. It should be noted that the similarity between *Rudiments*, Prelleur (1731), and Simpson (*c.*1746) when making a comparison between structure, music examples, explanations regarding articulations and ornamentation indicates a strong influence of *Principes* in England up to about the middle of the 18th Century.

A parallel to the melodies and tunes added at the end of *Rudiments*, Prelleur (1731), and Simpson (1746) is found in *The Musical Entertainment* (1737-1739) by the English engraver and print-maker George Bickham Jr. (*c.*1706-1771). This wonderful work was published in two volumes including all in all 200 engravings of songs with beautiful vignettes, whereby each song has a flute part (Appendix XXX), which probably is to be understood as written for the Traverso, although it could be played on a Violin, Recorder, or an Oboe. These songs represent a repertoire for music lovers and house concerts, and could be understood as an English parallel to when Hotteterre suggested to practice on songs such as *Brunettes*, *Brunettes*, *les Parodies, les Tendresses Bacchiques*, as found in collections like *Recueil d'Airs Serieux et a Boire de differents Auteurs* (Ballard, 1701), *Brunettes ou petits airs tendres, avec les doubles et la Basse-Continue* (Ballard, 1703, 1704, 1711), *Nouvelles parodies Bachiques mélées de Vaudevilles ou Ronde de Table* (Ballard, 1700-1702).

*

The text of *Principes* is short, compact, and consists of 8556 words on 34 pages, and *Rudiments* consists of 7093 words on 24 pages. Two short passages of all together 321 words are omitted in *Rudiments*, together with a different layout which explains that *Rudiments* has 10 pages less than *Principes*. The shortness of *Principes* mirrors a tradition regarding instructive texts within French flute-traditions from Hotteterre and far up in the 20th Century, when comparing with Traverso methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Devienne (*c.*1794), 19th Century methods such as Tulou (1851) and Altès (1880), the 20th Century and Taffanel & Gaubert (1923/1958), including the many publications by Marcel Moyse. Comparable texts from the German spoken part of Europe such as Quantz (1752), Tromlitz (1791), Fürstenau (1844), and Schmitz (1955) are by far considerably longer.

Examples are *Versuch einer Anweisung die Flöte Traversière zu Spielen—Essai d'une Methode pour Apprendre à jouer de la Flute Traversiere* by Quantz (1752) with 334/336 pages, *Gründliche Violinschule* (1756) by Leopold Mozart with 268 pages, and *Ausführlicher und Grundlicher Unterricht die Flöte zu Spielen* by Tromlitz (1791) with 376 pages. A possible reason why there is such a difference could perhaps be explained with that Quantz, Mozart and Tromlitz discusses music education in a far broader context which is not the case with *Principes, Rudiments* and above-mentioned French texts. This sheds light on French traditions concentrating on explanations of principles and rudiments of a craft. For a detailed documentation of *Rudiments*, Prelleur (1731), and Simpson (1746) see the compliment to the present study: *Facsimile of The Rudiments or Principles of the German flute* (1729) *the first English translation of Principes de la Flute Traversiere ou Flute d'Allemagne* (1707) *by Jacques Hotteterre Le Romain.*

Apart from *Rudiments* (1729), Prelleur (1731), and Simpson (*c.*1746) there are two well-known 20th Century English translations of *Principes*:

- *Principles of the Flute, Recorder, and Oboe*, by Hotteterre (1968/1983). Translated, with an introduction and notes by Paul Marshall Douglas, based on *Principes* (1728a) published in Amsterdam in French by Éstienne Roger. As Douglas writes in the introduction he does not explicitly refer to *Rudiments* (1729), Prelleur (1731), and Simpson (*c.*1746).
- *Principles of the Flute, Recorder & Oboe*, by Hotteterre (1968). Translated and edited by David Lasocki, based on the first French edition of *Principes* (1707), and consulting several historical sources in footnotes such as editions by Roger-Hotteterre (1728a), *Rudiments* (1729), Prelleur (1731), Maier (1732 & 1741), Corrette (1735 & 1773), Simpson (*c.*1746), Quantz (1752), and Tromlitz (1791).

a) Selected list of 18th Century editions of the complete text or fragments of *Principes* published in Amsterdam, Erfurt, and London in French together with translations to Dutch, English and German

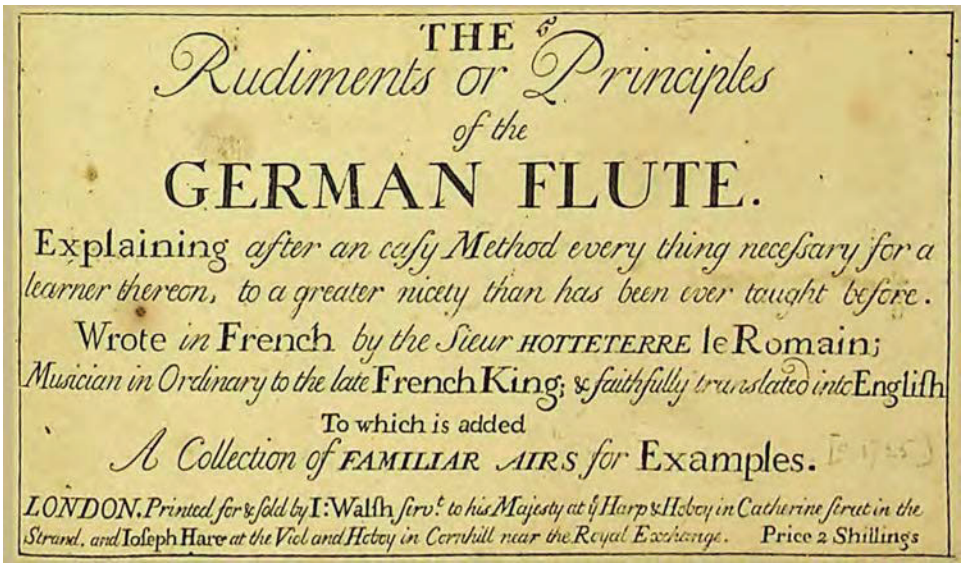
Year of publication	Title and language	Place of publication	Editor
1728a	*Principes de la Flute Traversiere* The complete text in French	Amsterdam	Éstienne Roger
1728b	*Grond-Beginselen Over de Behandeling van de Dwars-Fluit*, Complete translation to Dutch	Amsterdam	Le Cene
1729	*The Rudiments or Principles of the German flute. Explaining after and easy Method every thing necessary for a learner thereon, to a greater nicety than has been ever taught before. Wrote in French by the Sieur Hotteterre le Romain; Musician Ordinary to the late French King; & faitfully translated into English. To which is added a Collection of Familiar Airs for Examples.* Complete translation to English	London	Walsh
1731	**Prelleur** *The Newest Method for Learners on the German Flute* Including long sections very similar to *Rudiments*	London	Cluer
1738/1762	**Johann Philipp Eisel** *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe*, in *Musicus Autodidacticus* Free translation to German of some sections and fragments, including an engraving of a Traverso-player which clearly is under influence from the famous engraving by Bernard Picard (1673-1721) as found in *Principes.*	Erfurt	Funcken
***c.*1746**	**Simpson** *The complete tutor for the German flute, containing the best and easiest instructions for learners to obtain a proficiency. Translated from the French. To which is added a choice collection of ye most celebrated Italian, English & Scotch tunes, curiously adapted to that instrument* Including sections similar to *Rudiments* (1729) and Prelleur (1731)	London	Simpson

b) Selected list of 20ths and 21st Century editions and complete translations of *Principes* to German and English

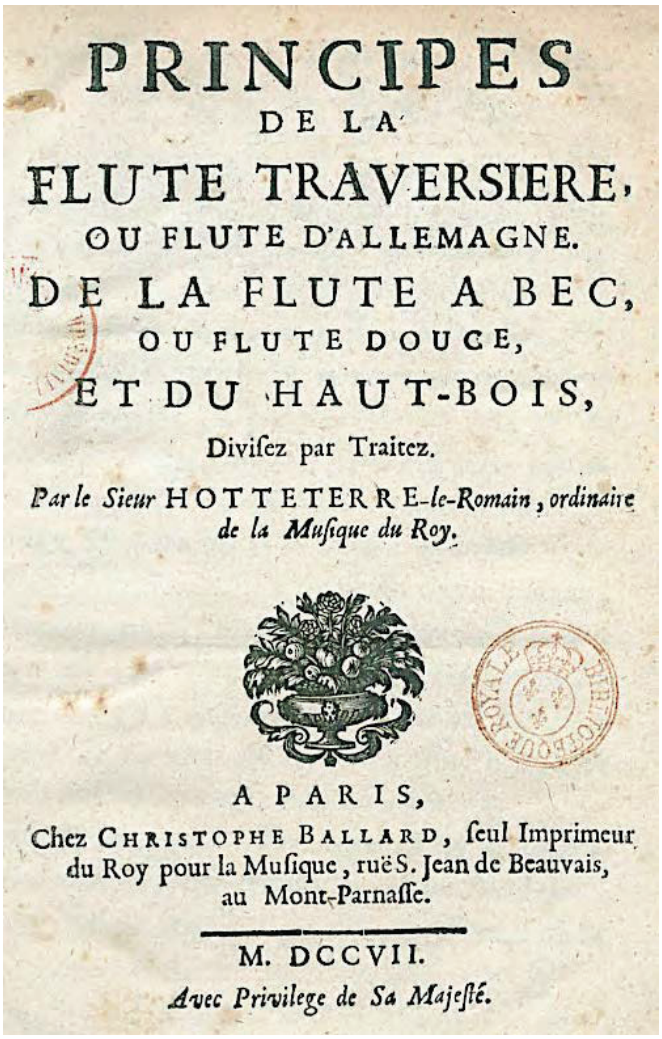
Year of publication	Title and language	Place of publication	Editor
1728a **1941/1965/ 1958**	*Principes de la Flute Traversiere* Published in French by Estienne Roger in Amsterdam, Translated to German, by Hans Joachim Hellwig in collaboration with Gustav Scheck. Facsimile.	Kassel	Bärenreiter
1707 **1968**	*Principles of the Flute, Recorder & Oboe* Translated to English, with an introduction and notes by David Lasocki.	London	Barrie & Rockliff, The Cresset Press
1728a **1968/1983**	*Principles of the Flute, Recorder and Oboe* Translated to English, with an introduction and notes by Paul Marshall Douglas.	New York	Dover
1707 **2014**	*Principes de la Flûte* Translated to German, with an introduction, comments, and notes by Karl Kaiser.	Magdeburg	Walhall



4 *The Rudiments or Principles of the German flute* the complete English translation (1729) and the original French text (1707)



THE
Rudiments or Principles
of the
GERMAN FLUTE.
Explaining after an eaſy Method every thing neceſsary for a learner thereon, to a greater nicety than has been ever taught before.
Wrote in French by the Sieur HOTTETERRE le Romain;
Muſician in Ordinary to the late French King; & faithfully translated into Engliſh
To which is added
A Collection of FAMILIAR AIRS for Examples.
LONDON. Printed for & ſold by I: Walſh ſerv.t to his Majeſty at ỹ Harp & Hoboy in Catherine ſtreet in the Strand, and Joſeph Hare at the Viol and Hoboy in Cornhill near the Royal Exchange. Price 2 Shillings



PRINCIPES
DE LA
FLUTE TRAVERSIERE,
OU FLUTE D'ALLEMAGNE.
DE LA FLUTE A BEC,
OU FLUTE DOUCE,
ET DU HAUT-BOIS,
Diviſez par Traitez.
Par le Sieur HOTTETERRE-le-Romain, ordinaire de la Muſique du Roy.
A PARIS,
Chez CHRISTOPHE BALLARD, ſeul Imprimeur du Roy pour la Muſique, ruë S. Jean de Beauvais, au Mont-Parnaſſe.
M. DCCVII.
Avec Privilege de Sa Majeſté.


Page 1.
B. Picart fe 1707

PRÉFACE

COMME la Flute Traversiere, est un Instrument des plus agréables, & des plus à la mode, j'ay cru devoir entreprendre ce petit ouvrage, pour seconder l'inclination de ceux qui aspirent à en joüer. J'ose me flater que mon travail ne sera pas tout à fait indigne de la curiosité de ceux qui ont du goût pour cet Instrument, puisque mon principal but, est de leur applanir les prémieres difficultez, qui coûtent ordinairement le plus de peine. On pourra donc s'instruire des Principes de la Flute Traversiere par le secours de ce Traité. J'y donne des démonstrations, pour faire tous les Tons naturels, Diéziz *&* Bemols; *avec une explication de la maniere dont il faut les ajuster. J'y enseigne aussi comment on doit faire toutes les Cadences sur ces mêmes Tons; & enfin quels sont les agréments nécessaires pour joüer proprement & avec goût. Ces Regles & ces démonstrations pourront même suppléer au deffaut des Maîtres, pour bien de personnes qui ont naturellement de la disposition à joüer de cet Instrument, & à qui il ne manque que d'en sçavoir les Principes. On trouvera aussi un Traité de la Flute à Bec ou Flute Douce: outre une comparison de la Flute Traversiere & du Haut-Bois, laquelle pourra servir de Méthode pour apprendre à joüer de ce dernier Instrument. Au reste je ne parle point icy de la valeur des Notes, ny de la Mesure, ce sont des choses qui appartiennent plûtôt à un Traité de Musique, qu'à un Traité de Flute.*

Ceux qui croiront avoir besoin de Leçons, pour mettre en pratique les Instructions contenuës dans ces Principes, en trouveront chez moy avec les agréments marquez. A l'égard de ceux qui sont plus avancez, je leur prepare quelques suites de Pieces composées exprés pour la Flute. On peut aussi s'exercer sur les *Brunettes*, & principalement sur les *Duo* & *Trio*, de feu Monsieur Gaultier de Marseille, qui viennent d'être mis au jour.

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THE FRENCH PREFACE.

As the German Flute is a most agreeable Instrument, and much in Vogue at present, I thought it wou'd not be unacceptable to the Publick, to Set forth this little Treatise to further the endeavours of those who desire to play thereon; And I flatter my self, that my labour won't be entirely unworthy the curiosity of those who have a taste for this Instrument; Since my principal design was to explain some difficulty which oft beginners much trouble: for by the help of this Treatise, a man may thoroughly understand the principals of this Instrument. I have here laid down a Scale, shewing the way of playing all the Notes, Natural, Flat, and Sharp, with the manner of adjusting them exactly. I have also shew'd all the Shakes on the said Notes; likewise all the Graces necessary in playing properly, and with a rellish: These Rules, and Scales, may supply the want of a Master to a great many who are naturally disposed to play on this Instrument, and want only the first Rudiments.

[1]

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The following section is not translated:
Those who think they need Lessons, to put into practice the Instructions contained in these Principles, will find them in me with the approvals mark. Regarding those who are more advanced, I am preparing for them a few suites of Pieces composed expressly for the Flute. You can also practice on the Brunettes, & mainly on the Duo & Trio, of the late Monsieur Gaultier from Marseille, which have just been brought to light.

TRAITÉ
DE LA FLUTE TRAVERSIERE.

CHAPITRE PRÉMIER.

De la situation du Corps,
& de la position des Mains.

COMME IL EST NECESSAIRE pour arrive à la perfection des exercices dans lesquels on veut réüssir, de joindre autant qu'il est possible la bonne grace à l'habilité; je commenceray ce Traité par une explication de la posture où l'on doit être, en joüant de la Flute Traversiere.

Soit que l'on joüe debout ou assis, il faut tenir le Corps droit, la Tête plus haute que basse, un peu tournée vers l'Epaule gauche, les Mains hautes sans lever les Coudes ni les Epaules, le Poignet gauche plié en dedans, & le Bras gauche proche du Corps.

Si l'on est debout, il faut être bien campé sur ses jambes, le Pied gauche avancé, le Corps posé sur la Hanche droite; le tout sans aucune contrainte. On doit sur tout observer de ne faire aucun mouvement du Corps ni de la Tête, comme plusieurs font en battant

(1)

la mesure. Cette attitude étant bien prise, est fort gracieuse, & ne prévient pas moins les yeux, que le son de l'Instrument flâte argréablement l'oreille.

A l'égard de la position des Mains, on en peut voir cy-devant une Demonstration qui sera plus instructive que tout ce que je pourrois écrire sur ce sujet. On apprendra par cette Figure, qu'il faut mettre la Main gauche *A.* en haut; Tenir la Flute entre les Pouce & le premier Doigt *B.* Plier le Poignet en dessous; Arranger les Doigts ensorte que le premier & le deuxiéme soient un peu arrondis, & le troisiéme plus alongé.

Pour ce qui regarde la Main droite, *C.* Il faut tenir les Doigts presque droits, le Poignet un peu plié en dedans, le Pouce vis-à-vis le Doigt du quatriéme trou, ou un peu plus bas; Le petit Doigt posé sur la Flute, entre le sixiéme trou & la moulure de la pate, (on voit tout cela demontré par la Figure.) Il faut tenir la Flute presque droite, un peu en baissant vers la patte *D.*

A Treatise of the
GERMAN FLUTE.

CHAP. the 1st.
Of the Situation of the Body, and placing the hands.

As a gracefull posture, in playing on this Instrument, no less engages the Eyes of the beholders, than it's agreeable Sound does their Ears; I shall therefore begin this Treatise, by describing one proper to use in playing thereon. Whether you are Sitting, or Standing, the Body must be erect, the head rather rais'd, than inclin'd, and somewhat turn'd to the left Shoulder, the hands high, without raising the Elbows, or Shoulders, the left wrist bent inwards, and the left Arm close to the Body. If you play standing, stand firm with ye left foot a little advanc'd, and rest the weight of your Body on the right leg, and all without any constraint, and observe never to make any motion with the Body, or head, as some do in beating Time.

As for the placing of the hands, you may observe the foregoing Cut, which will be more instructive than any thing I can write on that Subject. You may observe by this figure, that the left hand A, is plac'd uppermost, hold the Flute between the thumb, and first finger B. bend the wrist downwards, place ye fingers so, as that the first and 2d. may be somewhat arch'd, and the 3d. straighter; as for the right hand, ye fingers are to be held almost straight, the wrist a little bent inward, the thumb over against the 4th. hole, or a little lower, the little finger between the 6th. hole and the bottom piece D. You see all this demonstrated by the figure, the Flute must be held almost straight, only a little inclin'd towards ye lower part D.

(2)

CHAPITRE II.

De l'Embouchure.

Quoique biens des Gens soient persuadez que l'Embouchure ne se peut enseigner par regles; cependant il y en a quelques-unes qui facilitent extrêmement la recherche que l'on peut faire. Les avis d'un bon Maître, joints à la demonstration, peuvent épargner beaucoup de peine & de difficulté à ceux qui cherchent cette Embouchure.

Je feray donc ici l'un & l'autre autant qu'il se pourra **(2)**

sur le papier. Quant à la demonstration, on la voit dans la Figure qui est au commencement de ce Livre.

A l'égard des avis, il ne me sera pas plus difficile de les écrire que de les donner de vive voix; ce que je feray le plus intelligiblement qu'il me sera possible.

On connoîtra par cette démonstration de quelle maniere on doit disposer les Levres; Il faut qu'elles soient jointes l'une contre l'autre, excepté dans le milieu où l'on doit former une petite ouverture pour le passage du vent: On ne les avancera point, au contraire on les retirera du coin de la Bouche, afin qu'elles soient unies & applaties. Il faut placer l'embouchure vis-à-vis de cette petite ouverture; souffler d'un vent moderé, appuyer la Flute contre les Levres, & la tourner sans cesse en dedans ou en dehors; jusqu'à ce qu'on ait trouvé le veritable point.

Pour observer toutes ces Regles il sera bon de se mettre devant un Miroir, (précaution qui sera d'un grand secours.) Il ne faudra point songer d'abord à placer aucun Doigt, mais souffler seulement dans l'Embouchure tout à vuide, & chercher à en tirer du son. Ensuite on placera les Doigts de la Main d'enhaut, l'un aprés l'autre, & on restera sur chaque ton; en réïterant le souffle plusieurs fois, afin de s'en bien assurer: aprés quoy l'on placera les Doigts de la Main d'enbas, dans le même ordre que ceux d'enhaut. Les Commençants ne s'obstineront point trop à faire le premier ton qui est tout bouché; parce qu'il ne se peut faire qu'en bien bouchant tous les trous: ce qui est plus difficile que l'on ne pense, à moins qu'on n'ait un peu de pratique.

Lorsque l'on sera parvenu à bien emboucher la Flute, on pourra commencer à chercher la connoissance des **(3)**

Tons. Pour cet effet on regardera la Planche premiere des Tons & Semitons, & on lira le Chapitre suivant.

CHAP. the 2d.
Of filling the GERMAN FLUTE.

Altho a great many are of opinion, that the filling of the Flute cannot be taught by Rules, but must be acquir'd by practice; there are nevertheless, some Rules that may very much facilitate the finding out the method; the Instructions of a good Master, together with shewing his manner of blowing into it, may serve ye learner much time, and trouble, in acquiring of it. I shall therefore do both at present, as far as possible by writing, as to the manner of blowing into it, you may observe the foregoing figure, by which you may observe, after what manner the lips are to be disposed, they ought to be joyn'd close together except just in their middle, where a little opening is form'd for the passage of the wind, the lips must not pout out, but rather be contracted toward the corners of the mouth; So that they may be smooth and even; let the hole of the Flute be plac'd just opposite to this opening of the lips, and resting the Flute upon the under lip, blow moderately, turning the Flute outward, or inward, till you find the true point.

To observe all these Rules, 'twill not be amiss to sit opposite a Looking-glass, which will prove of some advantage, you must not think of placing your fingers at first, but practice only blowing into the Flute, all the holes being open, 'till you are able to fill it and bring out a right tone, then place the fingers of the left hand in order, one after another, and blow three, or four times to each Note, till you are well assur'd of ye truth of the tone, then put down the fingers of the right hand in like manner; Beginners need not much trouble themselves to fill the first Note, which is all the holes stopt, because it can't be done without

(3)

all the holes be perfectly stopt, which is more difficult than one wou'd immagine, till they have had a little practice. When you have thoroughly arriv'd at filling the Instrument, then proceed to learn your Scale, or Gamut of all the tones, & half tones, as you'll find it set down hereafter, and read ye following Chapter.

Aureste quelques Regles que j'aye prescrites, tant pour l'Embouchure que pour la positions des Mains; Il ne faut pourtant les observer avec exactitude, qu'autant qu'on ne se trouvera pas une disposition tout à fait contraire. Par exemple, si une Personne se trouvoit avoir les Levres disposées de maniere, qu'il luy fut plus difficile d'emboucher la Flute, en les unissant, & en les applatissant, qu'en avançant celle d'enhaut; alors il ne faudroit prendre de mes Regles que ce qui ne seroit pas tout à fait contraire à cette disposition, & il faudroit suivre toûjours ce qui paroîtroit le plus naturel. De même à l'égard des Mains, il y a quelques Personnes qui placent celle d'en-haut autrement que je ne l'ay démontré; c'est à dire qui tiennent le Poignet en dehors (faisant l'arc) & la Flute appuyée sur le bout du Pouce; Cette situation de main n'empêche pas que l'on ne puisse bien joüer, mais elle n'est pas si naturelle ni si gracieuse, outre que la Flute n'est pas si bien appuyée. Il y en a d'autres, qui, faute d'avoir eu des principes, posent la main gauche en-bas, la droite en-haut, tiennenat la Flute à gauche; Je ne condamneray pas absolument cette position de main, puisque l'on peut joüer aussi-bien de cette maniere que d'une autre, & qu'il y auroit de la difficulté à en vouloir prendre une differente: mais ceux qui n'ont point encore contracté ces mauvaises habitudes doivent se donner de garde d'y tomber.

(4)

The following suggestions are not mentioned in the English translation.

CHAPITRE III.

Premiere explication de la premiere Planche sur les Tons naturels.

CEtte Planche represente deux choses principales.

1°. Les Notes de Musique démontrées sur les cinq lignes paralelles, en la maniere qu'on le voit au haut de la même Planche & distinguées par les noms. *Ré, Mi, Fa*, &c.& par *D-E-F.* &c. J'ay mis ces noms de deux manieres pour la commodité des Etrangers qui se servent ordinairement des Lettres.

La Clef de *G. Ré, Sol*, ou de *Sol*, que l'on voit au commencement des cinq lignes, est la plus en usage pour les pieces de Flute; Elle donne son nom à la premiere ligne sur laquelle elle est posée, & c'est ce qui apprend à connoître celuy de toutes les Notes, selon l'ordre qui est observé dans cette Démonstration.

2°. Elle contient une Tablature qui sert à expliquer la maniere de faire chacune de ces Notes sur la Flute, en bouchant plus ou moins de trous; cette Tablature est démontrée par les sept lignes paralelles, lesquelles répondent aux sept trous de la Flute.

On voit sur chacune de ces lignes un nombre de Zeros blancs & noirs, par lesquels on connoît si le trou qui répond à chacune de ces lignes doit être ouvert ou fermé, pour faire tel ou tel ton. On conçoit aisement que les Zeros noirs représentent les trous qui doivent être fermez, & les blancs ceux qui doivent être ouverts. Par exemple, au dessous de la premiere Note qui est le *Ré*, on voit sept Zeros noirs, sur la ligne perpendiculaire

(5)

décrite par des petits points; Il est aisé de comprendre que cela represente les sept trous de la Flute bouchez, les six premiers, avec les Doigts, & le septiéme bouché naturellement avec la Clef, ce qui fait ce Ton. L'on procedera de même pour tous les autres, ainsi que je l'explique ensuite plus intelligiblement.

On peut donc découvrir par cette Planche toute l'étenduë de la Flute Traversiere; c'est à dire tous les Tons naturels *Diéziz* & *Bemols*. Cette étenduë consiste en deux Octaves & quelques Tons. La premiere Octave est comprise depuis la premiere Note jusqu'à la treiziéme. La seconde Octave est renfermée depuis la Note treiziéme jusqu'à la Note vingt-cinquiéme; Cette seconde Octave se fait presque tout, ainsi que la premiere pour ce qui regarde la positions des Doigts. Il n'y a que la maniere d'emboucher la Flute qui en fait la difference, outre quelques changemens de Doigts sur certain Tons, comme on le verra démontré dans la Tablature. J'ay distingué les Tons naturels

CHAP. the 3d.
The Explication of the first Scale of the Natural Tones.

This Scale represents two Principal things, (Viz.) first the Notes of musick plac'd on 5 paralell lines, as you see in the upper part of the Scale, and distinguish'd by the Letters **D**. **E**. **F**. & c. The **G-sol-re-ut** Cliff, which is set down at the beginning of these 5 lines, is most in use, for Flute musick, it gives its name to the 2d. line on which 'tis plac'd, by which we find the place of every other Note, according to ye order set down in this Scale. Secondly, a Tablature, which shews how to stop each Note upon the Flute, this has 7 paralell lines, which represent the 7 holes on the Flute; you may observe on these 7 lines a parcell of little round black and white dotts, which shew whether the holes answering those lines are to be stopt, or open, the black dotts signifie those holes stopt, and the white ones those which ought to be open, to give such and such a Tone.

You may by this Scale discover the whole compass of the German Flute, (Viz.) all Notes Natural, Sharp, or Flat, this compass consists of two Octaves, and some few Notes, from the first Note to the thirteenth contains the first Octave, and from the thirteenth to the 25th. contains the 2d. Octave, this 2d. Octave is stopt much after the same manner of the first, except in some few Notes, so that there is nothing but the manner of blowing, makes the difference, as you may observe by the Scale. I have distinguish'd the Natural tones by white

(4)

Notes, or Minums, and the Flats and Sharps, by black Notes, or Crotchets; let beginners trouble themselves at first with the natural Notes only, till they are somewhat more advanc'd. You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend, and all those holes must be perfectly stopt that are markt with the black dotts. You may observe by this Scale, that the first Note **D**, is all the holes stopt, the next is **E**, and is play'd by unstopping the 6th hole, as appears by the white dott on the 6th. line, you must strike every Note with the tongue, as if you pronounc'd the Syllable ***tu***. **F**, is made by unstoping the 5th. hole, and stoping again the 6th. this tone ought to be adjusted by the manner of blowing, Viz. by turning the Flute inward, to flatten it, because the Sharp is made on the same hole, as we find it in the Explication of the Flats and Sharps, you must remember to place the little finger between the 6th. hole, and the moulding of the bottom piece, as I told you before, which serves to hold the Instrument Steddy.

par des Notes blanches, & les *Diézis* & *Bemols* par des Notes noires. Ce que j'ay fait pour la commodité de ceux qui n'ayant aucune teinture de ces principes, ne doivent pas entreprendre d'abord trop de difficultez; Ils se contenteront donc de faire les Tons naturels, sans avoir égard aux autres, jusqu'à ce qu'ils soient un peu plus avancez. Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas; & qu'on doit bien boucher tous les trous marquez dans la Tablature, par les Zeros noirs.

On connoîtra donc de quelle maniere se doit faire **RÉ.** la Note *Ré*, par les sept Zeros noirs qui sont au dessous, comme je viens de l'expliquer. Ce Ton étant fait, on passera au *Mi* naturel, qui est la

MI. troisiéme Note, & qui se

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fait en débouchant le sixiéme trou; ce que l'on connoît par l'*0* ouvert, que j'appelle aussi Zero blanc, qui est sur la sixiéme ligne de la Tablature. Il faut donner un coup de langue à chaque Ton; c'est à dire, articuler le vent; comme si l'on vouloit prononcer bas cette sillabe, *Tu*.

FA. Le *Fa*, se fait en débouchant le cinquiéme trou, & en rébouchant le sixiéme. Ce ton veut être ajusté avec l'embouchure, en tournant la Flute en dedans pour le baisser, parce qu'il est naturellement un peu haut à cause que le *Diéziz* se fait sur le même trou: comme nous le verrons dans l'explication des *Diézis* & des *Bemols*. Il faut se souvenir de mettre le petit Doigt entre le sixiéme trou & la moulure de la patte, comme je l'ay observé dans le deuxiéme Chapitre.

SOL. Le *Sol*, se fait en levant toute la main d'enbas & laissant le petit Doigt à l'endroit que je viens de marquer. Ce petit Doigt doit toûjours rester à cette place à moins que l'on ait besoin pour toucher sur la Clef. On observera de bonne heure de ne pas beaucoup lever les Doigts, & de les laisser tomber bien à plomb sur les trous.

Comme on a été obligé de tourner l'embouchure en dedans pour le *Fa*, il faut la remettre dans son premier point pour le *Sol*.

LA. Le *La*, se fait en débouchant le troisiéme trou. Il faut alors mettre le sixiéme Doigt entre le cinquiéme & sixiéme trou, ce qui ne sert (aussi-bien que la situation du petit Doigt) que pour tenir la Flute en état, & ce qui est néanmoins important pour la liberté des Doigts; Il faut augmenter le vent, peu à peu, à mesure que l'on monte.

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SI. Le *Si* se fait, en débouchant le deuxiéme trou.

UT. L'*Ut*, en débouchant le premier, & en rébouchant le deuxiéme & le troisiéme.

G, by raising all the fingers of the lower hand, and keeping the little finger where I told you, you must not raise the fingers high, and let them fall plump on the holes, as you were obliged to turn the Flute inward for **F**, you must restore it to its former Situation for **G-sol-re-ut**. **A** is play'd by unstopping the 3d. hole, you must then place the 6th. finger between the 5th. and 6th. hole, to hold the Flute ye firmer. **B** is play'd by unstopping the 2d. hole. **C** by unstopping the first, and stopping the 2d. and 3d. **D** by stopping all the holes, except the first, blow pretty strong, but not too strong, least you sound an Octave higher than you ought. **E** by opening the 6th. hole and stopping the first, and blowing stronger, continuing **(5)**

to encrease the wind, also in the following Notes. **F**, by opening the 5th. hole and stopping the 6th. you must also here turn the Flute a little inward, as I told you before in **F** below. **G**, by unstopping the 4th. and 6th. holes, and returning the Flute outward, to its former situation. I must here inform beginners, that as they ascend on this Instrument, they will find the filling it the more difficult, therefore to sweeten the high Notes, and fill them more easily, you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing, by little, and little. **A** is play'd by opening the 3d. hole. **B** by opening the 2d. hole. **C** by opening the first hole and stopping the 2d. 4th. and 5th. this tone is somewhat difficult to adjust, for there are some Flutes whereon 'tis high, on others 'tis low, the method then to lower it is by turning the Flute somewhat inwards, if that wont suffice, you must also stop half the 6th. hole without any other alteration, or else make it as I shew in my Scale (Note the 35th.) on the contrary of this tone be already too flat, as I make it the first time (Note the 2d.) you must observe to stop only the 3d. 5th. and 6th. holes. **D** is play'd by stopping all ye holes except the first, you must force the wind a little more, and close the lips. **E** by opening the 3d. 4th. & 7th. holes, and stopping all the rest; observe the 7th. hole is open'd by pressing the little finger on the key, you must continue also to blow strong. The tones above **E-la-mi** are forc'd tones, and are seldom us'd, however since sometimes they happen in Preludes, I shall shew you such as I cou'd discover, yet you must not Plague your self with them at first, till you are further advanc'd, nor will it be necessary during the **(6)**

first days to ascend higher then **G-sol-re-ut**, which is the 18th. Note, unless you find them very easy to fill, then you may ascend higher, but with discretion,

RÉ. Le *Ré*, en bouchant tous les trous, excepté le premier. On doit pour lors augmenter le vent; ensorte que le son soit aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il ne faut.

MI. Le *Mi*, se forme, en débouchant le sixiéme trou, en rébouchant le premier, & en soûtenant le vent toûjours en peu ferme; ainsi que dans les Tons suivants.

FA. Le *Fa* se fait, en débouchant le cinquiéme trou, & en rébouchant le sixiéme. Il faudra tourner encore sur ce Ton, l'embouchure de la Flute en dedans.

SOL. Le *Sol* se forme, en débouchant le quatriéme & le sixiéme trou, sans rien changer à l'égard des autres: On doit pour lors remettre l'embouchure dans sa situation.

☞ On nous permettra d'observer icy pour les Commençants, qu'à mesure qu'ils monteront sur cet Instrument ils en trouveront l'embouchure plus difficile; Ainsi pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent peu à peu.

LA. Le *La* se fait, en débouchant le troisiéme trou, & en soûtenant toûjours le vent.

SI. Le *Si*, en débouchant le deuxiéme trou.

UT. L'*Ut* se forme, en debouchant le premier trou, & en rébouchant le deuxiéme, le quatriéme & le cinquiéme. Ce Ton est un peu délicat à ajuster, car il y a des Flutes où il est haut, & d'autres où il est bas. L'expedient dont on peut se servir pour le baisser, c'est d'adoucir & de

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tourner la Flute en dedans. Si cela ne suffit pas, il faut boucher le sixiéme trou à demi sans rien changer aux autres: ou bien le faire comme je l'ay démontré dans ma Tablature, (Note trente-cinquiéme.) Au contraire, si l'on remarque que ce Ton soit trop bas, en le faisant de la prémiere maniere que je l'ay expliqué, on observera de ne boucher que le troisiéme, le cinquiéme & le sixiéme trou.

RÉ. Le *Ré* se fait, en bouchant tous les trous, excepté le prémier. Il faut forcer un peu le vent, & serrer les Levres.

MI. Le *Mi* en débouchant le troisiéme, le quatriéme & le septiéme trou, & en bouchant tous les autres. Remarquez que le septiéme trou se débouche, en appuyant le petit Doigt sur la Clef. Il faut continuër à forcer le vent.

otherwise you'll give your self much trouble to little purpose, because you must fill your low Notes perfectly well, before you can fill the others. **F-fa-ut in altissimo** for the most part cannot be blown, however, I have found some Flutes on which I cou'd blow it after the following manner, however, you must not expect to find it indifferently on all Flutes, no more then the shakes, or Cadences which proceed from it; 'tis play'd by stopping at once the first 2d. and 4th. and half the 5th. & opening the 3d. 6th. and 7th. and blowing very Sharp; yet I have not inserted it in my Scale, by reason 'tis not a Note on which we may depend. **F-fa-ut Sharp** is made easier, you must stop all the holes except ye 2d.

G-sol. is made by stopping the first and 3d. holes, and opening all the rest; we might find Notes yet higher than these, but they are so forced, and so useless, that I wou'd not advice any one to trouble himself about 'em.

Tons Forcez

Les Tons au dessus du *Mi*, sont des Tons forcez & ne peuvent entrer naturellement dans aucune Piece; cependant comme on ne laisse pas d'en glisser toûjours quelques uns dans le Prélude, je mettray icy ceux que j'ay pû découvrir. Au reste, il ne faut point s'obstiner à les vouloir trouver dans les commencements, c'est une peine que l'on doit s'épargner jusques à ce qu'on soit fort avancé. Il sera même à propos, pendant les premiers jours, de ne point passer le *Sol*, qui est la Note dix-huitiéme, à moins que l'on ne se trouvât une grande facilité à emboucher. Alors on pourroit monter plus haut, mais avec discretion, autrement ce seroit se donner beaucoup de peine sans se procurer aucun avancement, parcequ'il faut absolument commencer par bien former les Tons bas, avant que de faire les autres.

FA. Le *Fa* naturel ne se peut presque point faire tout au haut de la Flute; je l'ay neanmoins trouvé sur quelques-unes, en la maniere que je vais l'expliquer, mais il ne fau-

droit point s'opiniâtrer à le chercher indifferemment sur toutes sortes de Flutes, non plus que les Cadences qui en procédent; car ce seroit vouloir tenter l'impossible. Il se fait en bouchant tout à fait le premier, le deuxiéme, le quatriéme trou, en bouchant le cinquiéme seulement à moitié; en débouchant le troisiéme, le sixiéme & le septiéme; & en donnant le vent fort aigu. Au reste, je ne l'ay point démontré dans ma prémiere Planche, parcequ'il n'est pas proprement un Ton sur lequel on puisse compter.

FA#. Le *Fa Diézis* se fait plus aisément: Il faut boucher tous les trous, excepté le deuxiéme.

SOL. Le *Sol* se fait, en bouchant le prémier & le troisiéme trou, & en débouchant tous les autres.

On pourroit trouver encore quelque Tons au dessus de ceux là, mais ils sont si forcez & si peu utiles que je ne conseille à personne de se donner la peine de les chercher.

CHAPITRE IV.

Prémiere explication de la deuxiéme Planche sur les Cadences naturelles.

Après avoir parcouru tous les Tons naturels, je vais parler des Cadences ou Tremblements qui se font sur ces mêmes Tons, & j'en vais proposer tous les exemples, marquez aussi par une Tablature dans la seconde Planche. J'ay mis tout de suite les Tons & les semi-Tons, ainsi que dans la premiere Planche, mais je ne parcourray d'abord que les Cadences des Tons naturels, comme j'ay déja fait pour les Tons simples: On les verra distinguées de même par des Notes blanches.

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Pour faire concevoir ce que c'est que Cadence à ceux qui n'en auroient aucune idée, on peut la définir, une agitation de deux sons éloignez d'un Ton ou d'un demi-Ton l'un de l'autre, & battus plusieurs fois de suite. On la commence par le Son superieur, on la finit par l'inferieur, & on ne luy donne que la prémiere articulation : C'est le Doigt qui l'a continuë.

La prémiere Cadence de nôtre Tablature, qui est celle du *Ré* enbas, se fait en débouchant dabord le sixiéme trou, avant même que de soufler, afin de la prendre du *Mi*, qui est le Son superieur. On donne le coup de langue sur ce *Mi*, & on frappe ensuite plusieurs fois sur le sixiéme trou, sans reprendre haleine, & sans donner d'autre coups de langue. Enfin le Doigt qui a tremblé, doit rester sur le même trou pour finir la Cadence. Le nombre des coups que l'on doit frapper, ne se regle que par la valeur de la Note. Sur tout il faut observer de ne se point presser de battre la Cadence, mais au contraire la suspendre, environ la moitié de la valeur de la Note, principalement dans les mouvements graves, comme je le démontre par la Tablature des Cadences. Le moins que l'on puisse frapper sur les Cadences breves, c'est trois coups de Doigt, comme sur les Noires, dans la mesure à 2. & 3. temps legers.

Il seroit superflu d'expliquer toutes les Cadences l'une après l'autre, puisque l'on en voit une Démonstration assez intelligible dans la seconde Planche, & que l'on doit sçavoir déja tous les Tons dont elles sont composées. On se servira donc pour toutes ces Cadences des mêmes Regles que j'ay données pour la prémiere, & l'on observera exactement les differentes positions de mains, que l'on voit démontrées par la Tablature.

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Je dois seulement distinguer la Cadence de l'*Ut* naturel, parcequ'en effet elle est differente des autres. Il faut la commencer en bouchant tous les trous excepté le prémier; trembler sur le

CHAP. the 4th.
The Explanation of the SCALE of Cadences, or Shakes.

After having run through the Natural Notes, I shall now treat of the Cadences, or Shakes, which are usually made on those Notes, I have laid down all the examples of them in the 2d. Scheme, and there shew'd by Tablature, how they are to be perform'd: least some shou'd not known what a Shake is, I'll give them a definition of it, (Viz.) Tis an agitation or mixture of two Sounds together, distant from each other but the space of a Tone or Semitone, and several times beat upon after you begin with the Superior Note, and end with the

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lower and you give it but the first articulation, 'tis the finger continues it. The first Shake in ye Scale, which is on **D** below, is made by opening the 6th. hole, before you blow, in order to take it from **E-la-mi**, which is the next Note above, you tip this Note with your tongue, and then shake your finger several times upon the 6th. hole, without takeing breath or tongueing the 2d. Note: in short, the finger which you Shake must rest upon the hole, to end the Shake, the number of shakes you make with the finger is determin'd only by the measure of the Note, on which you shake, you must not press the shaking too quick, but rather suspend it about half the value of measure of the Note, especially in grave movements, as I shew in the Scale of Shakes, the fewest beats you can well give with the finger are three, as on Crotchets in the movement of two & three, 'twould be needless to explain all the shakes one after another, since you have a demonstration intelligible enough in the Scale and since you ought already to know all the Notes which compose them, you must observe then the same rules throughout all the shakes, as I gave you for ye first. I ought only to distinguish the Shake on **C natural**, because in effect it differs from ye rest, you must begin it, by stopping all the holes but the first, then blow, and after shake the finger on the 4th. hole, & end by raising the finger you shook with, which is contrary to what you observe in all other shakes: as to the shake on **C in alt** (Note the 23d.) 'tis very difficult to adjust, and is not much in use, you may see in the Scale that the **D** which precedes it is stopt after an Extraordinary manner, you must Shake on the 4th. and 5th. holes at the same time, and cover half the 6th. hole, you may also perform this Shake

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by shaking on the 3d. and 6th. holes all at once, then all the holes ought to be stopt except the first, and you must in ending this shake raise the finger wherewith you shook, we commonly soften this

quatriéme, après avoir soûtenu le port-de-voix; & finir en levant le Doigt qui a tremblé; ce qui est prendre le contrepied de ce que l'on doit observer dans les autres Cadences. A l'égard de la Cadence de l'*Ut* en haut (Note vingt-troisiéme) elle est fort difficile à ajuster, & est même fort peu en Usage. On voit dans la Tablature que le *Ré* qui la précede se fait d'une maniere extraordinaire. Il faut trembler sur le quatriéme & sur le cinquiéme trou en même temps, & avancer un peu le Doigt sur le sixiéme trou. On peut encore faire cette Cadence, en tremblant sur le troisiéme & sur le sixiéme trou tout à la fois: Alors tous les trous doivent être bouchez, excepté le prémier, & l'on doit, en finissant la Cadence, relever les Doigts qui ont tremblé: On fait souvent sur ce Ton un flâtement, au lieu d'une Cadence.

Lorsqu'on aura apris toutes les Cadences naturelles, on pourra essayer à joüer quelques petits Airs faciles, pour s'accoûtumer peu à peu aux Tons, & pour se fortifier dans l'embouchure. On pourra même passer à cet exercice, dès qu'on aura sçeu trouver les Tons simples de la prémiere Planche. En ce cas il faudra chercher les Cadences dans la seconde Planche, à mesure que l'on en aura affaire; ce qui chargera moins la memoire. Je donne dans le Chapitre sixiéme une autre explication sur les Cadences.

Note instead of shaking it. I give in the 6th. Chapter a further Explication of the Shakes or Cadences.

CHAPITRE V.

Seconde explication de la Prémiere Planche sur les Diézis *& les* Bemols.

Lorsque l'on se sera fortifié dans l'embouchure sur les Tons naturels, on pourra commencer à faire les *Diézis* & les *Bemols*: Mais comme il y a plusieurs de ces demi-Tons, qu'il faut ajuster par le moyen de l'embouchure, je vais les expliquer chacun en particulier.

RÉ. On commencera par le *Ré* naturel, (Note prémiere,) afin d'enchaîner les Tons naturels avec les *Diézis* & les *Bemols*, & d'accoûtumer de bonne heure l'oreille à en faire la difference.

RÉ#. On fera ensuite le *Ré Diézis*, en mettant le petit Doigt sur la Clef, pour déboucher le septiéme trou.

MI. FA. Le *Mi* & le *Fa* naturel se feront, comme je l'ay marqué cy-devant, dans l'explication des Tons naturels. Si l'on me demande pourquoy il n'y a point de *Diézis* entre ces deux Notes, je repondray que c'est parcequ'il n'y a qu'un demi-Ton de l'une à l'autre, Par cette raison, lorsqu'il se trouve un *Diézis* sur le *Mi*, on se sert du Fa naturel,

Mi#. ce qui fait l'effet ordinaire du *Diézis*, qui est de hausser la Note d'un demi-Ton. Il faut se souvenir de tourner l'embouchure en dedans : ce qui se doit faire en baissant un peu la tête.

FA#. Le *Fa Diézis* se forme en débouchant le sixiéme & le septiéme trou, & en laissant le cinquiéme débouché comme il l'étoit déja. J'explique cela de cette maniere afin que l'on connoisse qu'il ne faut point remettre les Doigts à chaque Ton, & qu'il les faut lever tout de suite,

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comme il est marqué par la Tablature. Pour ajuster ce Ton, on doit tourner la Flute en dehors, & lever un peu la tête. Par ces termes, tourner la Flute, ou tourner l'embouchure, on doit entendre la même chose.

Je n'expliqueray plus la position des Doigts, car je suppose que l'on connoît présentement assez la Tablature pour n'avoir plus besoin d'explication: je parleray seulement de la maniere d'ajuster les Tons.

Comme on a tourné la Flute en dehors, pour

SOL. ajuster le *Fa Diézis*, il faut la remettre dans sa situation ordinaire pour le *Sol* naturel, après quoy

SOL#. l'on fera le *Sol Diézis*, & l'on tournera la Flute en dedans pour l'ajuster.

LA. On la remettra dans sa situation pour le *La*

LA#. naturel, & on la tournera en dedans pour le *La Diézis*: On peut encore baisser ce-demi Ton, en ajoûtant quelques Doigts, ce que j'ay démontré dans la Planche des Cadences.

CHAP. the 5th.

The 2d. Explanation of the first SCALE of Flats & Sharps.

When you are well vers'd in filling the Natural tones, you may begin with those call'd Flat, and Sharp, but as there are many of these Semitones that are adjusted by the manner of blowing into the Flute, I shall explain each in particular. I begin with **D Natural**, the first Note, in order to link all the Natural Notes with ye Flats, and Sharps, that the Ear may be early accusom'd to distinquish their difference. **D Sharp** is made by pressing the little finger on the key, to open the 7th. hole; **E** and **F Natural** are made as I told you already, in describing the Natural Notes; the reason why there is no sharp between these two Notes is because they are but a Semitone distant from each other, for this reason when you find a Sharp on **E-la-mi**, you play it as **F Natural**, which has the same effect as a Sharp, which is to raise a Note half a tone higher, you must remember to turn the hole of the Flute inward, which is done by inclining the head a little. **F Sharp** is made by opening the 6th. and 7th. holes, and leaving the 5th. stopt, as it was before; I explain it after this manner, that you may know that you must not replace all the fingers at every Note, and that you must raise them successivly, as mark't in the Tablature of the Scale, to adjust this Tone, you must turn the Flute outwards, & raise the head a little. I shall say no more of the placing of the fingers, because I suppose by this time you

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throughly understand the Tablature of the Scale, which will sufficiently inform you therein, I shall speak only of adjusting the Tones. As you turn the Flute outward to adjust **F Sharp**, so you must restore it to its usual Situation for **G Natural**, after which you make **G Sharp** and turn the Flute inward to adjust it you restore it to its Situation for **A-la-mi-re Natural**, and turn it inward for **A Sharp**, you may also make this Semitone somewhat lower, by adding some fingers as I have shew'd in the Scale of shakes, you restore again its usual Situation for **B** and **C Natural**, there is no Sharp between **B** and **C** for the same reason as I gave you speaking of **E** and **F**, you must therefore make use of **C Natural** for **B Sharp**, you must turn the Flute as much outward as possible for **C Sharp**, you must return it for **D Natural**, and **Sharp**, which posture also serves for **E** and **F Natural**, you must adjust **F Sharp**, **G Natural**, and **Sharp** as I shew'd you in their octaves below, I shall shew in the 7th. Chapter some other way of making this last, but this being the most Simple, I shew it first, you return the Flute for **A.la.mi.re Natural**, and turn it inward for **A Sharp**,

SI. UT. On la remettra pour le *Si* & l'*Ut* naturel: Il n'y a point de *Diézis* entre ces deux Notes, par la même raison que j'ay expliqué parlant de *Mi* & du *Fa*: On se servira donc de l'*Ut* naturel pour faire le **SI#.** *Si Diézis*.
UT#. On tournera ensuite la Flute en dehors, le plus qu'on pourra pour l'*Ut Diézis*.
RÉ RÉ#. On la remettra pour le *Ré* naturel &
MI FA. *Diézis* : Et l'on fera tout suite le *Mi* & le *Fa* naturel. Il n'y a qu'un demi-Ton entre ces deux Notes, comme je l'ay expliqué, en traitant de celles d'en bas.
FA#. On ajustera le *Fa Diézis*, le *Sol* naturel &
SOL. *Diézis*, comme je l'ay démontré parlant
SOL#. de leur Octave en bas. J'expliqueray au Chapitre septiéme quelqu'autre maniere de faire ce dernier, mais celle-cy étant la plus simple, nous commencerons par l'apprendre.
LA. On remettra la Flute pour le *La* naturel:
LA#. Et on la tournera en dedans pour le *La Diézis*. **(14)**

SI. UT. On la remettra pour le *Si* & l'*Ut* naturel:
UT#. Et on la tournera en dehors pour l'*Ut Diézis*. J'expliqueray encore ce demi-Ton de quelqu'autre maniere au Chapitre VII.
RÉ. On remettra la Flute pour le *Ré* naturel &
RÉ#. *Diézis*, à moins qu'ils ne fussent trop bas, comme ils le sont à quelques Flutes: En ce cas il faudroit la tourner toûjours en dehors. Ces Tons hauts sont difficiles à ajuster; il faut pour cela de l'oreille & de la pratique.
MI. On doit aussi tourner l'embouchure en dehors pour le *Mi*, & bien soûtenir le vent.

J'ay expliqué cy'devant le *Fa Diézis*, & le *Sol* naturel tout en haut, ainsi il seroit superflu d'en parler encor icy. Passons donc tout de suite aux *Bemols*, lesquels se raportent presque tous aux *Diézis*: avec cette difference, que ce qui sert de *Bemol* pour une Note, sert de *Diézis* pour sa Note inferieure, & cela par la raison que le *Bemol* baisse la Note d'un demi-Ton, & que le *Diézis* la hausse d'un demi-Ton: Les Cadences en sont aussi toutes differentes comme on le peut voir dans la Planche des Cadences. Je ne parleray plus des Tons, naturels, neanmoins il sera bon de les faire tout de suite, comme ils sont dans la prémiere Planche, & de les ajuster comme je l'ay expliqué ci'devant.
MI♭. L'on voit donc, par la Tablature, que le *Mi Bemol*, se raporte au *Ré Diézis*.
RÉ♭. Le *Ré Bemol*, se pourroit faire aussi comme l'*Ut Diéziz*: mais il est plus parfait de la maniere que je le démontre dans la Tablature.

you return it for **B** & **C Natural**, and turn it outward for **C Sharp**. I shall also explain this Semitone another way in the 7th. Chapter. **D Sharp**, you return it for **D Natural** and **Sharp**, unless it be too low, as it is on some Flutes; in this case you must always turn it outward; these high Tones are difficult to adjust, you must chiefly rely on your Ear and Practice. You must also turn the Flute outward for **E-la-mi**, and blow pretty Sharp. I have already treated of **F Sharp** and **G Natural in Altissimo**, therefore 'twou'd be needless to repeat it here, let us now proceed in order to the Flats which answer almost all to the Sharps, with the difference, that what is Flat to one Note

(10)

is a Sharp to the next Note below it, because a Flat lowers a Note, by half a Tone, and a Sharp raises a Note half a Tone, the Shakes thereon are intirely different, as you may see by the Scale. I shall say no more of the Natural Notes, however, 'twill be proper to play them after one another, as they are in the first Scale, & adjust them as I have already taught. You see then by the Scale **E Flat**, and **D Sharp** are the same. **D Flat** may be made as **C Sharp**, but 'tis more perfect to play it as I shew in the Scale. **B Flat** is play'd as **A Sharp**, you must turn the Flute outwards, which makes some difference between **B Flat**, and **A Sharp** you must on some Flutes open the 7th. Hole to facilitate this Note.
A Flat is play'd as **G Sharp**. **G Flat** may also be play'd as **F Sharp**, but 'tis more perfect to play it as I shew in the Scale, to adjust it, you must turn the Flute very much inwards; this Semitone is seldom used, 'tis never found but in Notes very Chromatick, on which they never Compose Musick for this Instrument. **E Flat** is play'd as **D Sharp**, you must turn the Flute outwards. **D Flat**, as **C Sharp** one can't turn the Flute too much outwards to adjust this Tone. **B Flat** as **A Sharp**. **A Flat** as **G Sharp**, but you must not turn the Flute so much inwards. **G Flat** is different from **F Sharp**, as well as its octave; you ought to adjust it the same way by turning the Flute inwards: A great many don't make this difference. **E-la-mi Flat**, as **D Sharp**. When I compare a Flat and Sharp together, you must understand the two Neighbouring Notes of the same octave, and not compare the one **in alt**, to the other below, as when I say **E Flat**, which is the last Note but one is play'd like **D Sharp**, I mean **D Sharp** (the 2d. Note & c.] You need not much plague your self at first about this nicety of adjusting these Semitones, as I have shew'd by turning the Flute in or out, till you are a pretty way

(11)

SI♭. Le *Si Bemol*, se fait comme le *La Diézis*: Il faut tourner la Flute en dehors, ce qui fait quelque difference du *Si Bemol* au *La Diézis*, & il faut à quelques Flutes déboucher le septiéme trou pour faciliter ce Ton.

LA♭. Le *La Bemol*, se forme comme le *Sol Diézis*.

(**15**)

SOL♭. Le *Sol Bemol*, pourroit aussi se faire comme le *Fa Diéziz*, mais il est plus parfait comme je le démontre dans la Tablature: Pour l'ajuster il faut tourner la Flute beaucoup en dedans. Ce demi-Ton est fort peu usité, & ne se rencontre que dans des Tons fort chromatiques, sur lesquels on ne compose guere pour cet Instrument.

MI♭. Le *Mi Bemol*, se fait comme le *Ré Diézis*. Il faut tourner la Flute en dehors.

RÉ♭. Le *Ré Bemol*, comme l'*Ut Diézis*. On ne sçauroit tourner la Flute trop en dehors, pour ajuster ce demi-Ton.

SI♭. Le *Si Bemol*, comme le *La Diézis*.

LA♭. Le *La Bemol*, comme le *Sol Diézis*. Il ne faut pas tant tourner la Flute en dedans.

SOL♭. Le *Sol Bemol*, est different du *Fa Diézis* aussi bien que son Octave. On doit l'ajuster de même en tournant la Flute en dedans. Plusieurs personnes ne font point cette difference.

MI♭. Le *Mi Be*mol, comme le *Ré Diézis*.

Lorsque je compare en *Bemol* avec un *Diézis*, on conçoit bien que c'est entre les deux Notes qui sont à peu prés au même degré. Par exemple, je dis que le *Mi Bemol* (Note penultiéme,) se fait comme le *Ré Diézis*, j'entens le *Ré Diézis* (Note deuxiéme,) & ainsi des autres.

Quelques observations que j'aye fait sur la justesse des demi-Tons, en faisant tourner la Flute en dedans ou en dehors, on ne doit pas pour cela s'embarrasser de cette délicatesse dans les commencemens, où l'on ne fait, pour ainsi dire, qu'ébaucher. On se contentera donc alors, d'acquerir la pratique de l'embouchure & des Doigts: après quoy l'on pourra s'exercer sur ces raffinemens qui sont essentiels pour la perfection & que l'on ne peut posseder qu'avec le temps.

UT#. Je n'ay point démontré l'*Ut Diézis* tout enbas, dans ma **(16)**

Tablature, parce que ce demi-Ton, ne se faisant que par artifice, n'a point de position de main particuliere. On le fait comme le *Ré*, (Note premiere) en bouchant tous les trous; on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton; & l'on fait le tremblement comme sur le *Ré*.

advanc'd in Practice, and then 'twill be proper to observe it, to attain to a perfection on this Instrument, which will require some time. I have not in the Scale shew'd **C Sharp**, the lowest Note of all, because this Semitone requires no particular placing of the fingers, different from **D** the first Note, but is play'd by Artifice, (Viz.) by turning the Flute inwards, sufficiently to lower the Sound by half a Note, and 'tis shook upon **D**, the first Note.

CHAPITRE VI.

Seconde Explication de la seconde Planche sur les Cadences.

Pour l'intelligence des Signes que l'on voit auprés des Notes de Musique, & sur quelqu'uns des *0*. de la Tablature dans la second Planche, j'en donneray icy une explication.

1°. La liaison qui embrasse les deux Notes de



Musique, faite de la maniere que l'on voit icy marque qu'il ne faut donner qu'un coup de langue pour les deux Notes. Il se donne sur la prémiere qui ne sert que de préparation ou de port-de-voix à la Cadence, & l'on continuë le même vent, sans reprendre haleine jusqu'à la fin de la Cadence; ce que j'ay déja expliqué ailleurs. La petite Croix qui est au dessus signifie que c'est sur cette Note qu'il faut trembler.

2°. Le trait qui joint les deux *0*, de la Tablature marque de quel trou vient le tremblement, & sur lequel il se termine. On connoîtra par là les tremblements empruntez; c'est à dire, qui ne s'achevent pas sur le même trou, où l'on fait le port-de-voix. Par exemple

(17)

celuy du *Ré*, pris du *Mi Bemol*, se commence du *Mi Bemol*, en mettant le petit Doigt sur la Clef, & il s'acheve du *Mi* naturel, en tremblant du sixiéme Doigt sur le sixiéme trou, & laissant reboucher le septiéme. On voit aussi un trait frisé sur le second Zero, pour marquer que c'est sur ce trou qu'il faut trembler.

La Cadence du *Mi* naturel, prise du *Fa Diézis*, est de cette espece. On la commence en débouchant le cinquiéme, le sixiéme & le septiéme trou pour faire le *Fa Diézis*, qui luy sert de port-de-voix; & on l'acheve en rebouchant le cinquiéme, & en tremblant sur le quatriéme, ce qui éloigne le son superieur, & marque davantage la Cadence; au lieu qu'en tremblant sur le cinquiéme, elle ne feroit pas assez d'effet. Il faut observer de relever le petit Doigt de dessus la Clef lorsque l'on tremble, parceque cela hausseroit le *Mi*, & le rendroit faux, ce qui est démontré par la Tablature.

Je donneray aussi une explication de la difference des *Diéziz* & des *Bemols*, par les Cadences naturelles. Par exemple le *Mi Bemol*, & le *Ré Diézis* simples se font de même maniere, mais on voit que la Cadence du *Mi Bemol*, est prise du *Fa* naturel, & que celle du *Ré Diézis*, est prise du *Mi* naturel; la prémiere est d'un Ton entier, & l'autre d'un demi-Ton, ce qui en fait toute la difference: il en est ainsi de toutes les autres.

CHAP. the 6th.

For the better understanding some Characters commonly us'd in Musick, and over some of the dotts in the Tablature of the 2d. Scale, I shall here give an Explication of them. First the little curve line over, or under ye heads of two, or more Notes, commonly call'd a Slur, and markt as you see in this Example on ye right hand;



Signifies, that you must only tip the first of them with your tongue, which here serves only as a preparation, (or what in French is call'd a Port de voix) to the Cadence, or Shake, and you are to continue ye same wind, without drawing your breath, to the end of the Cadence, or Shake, as I have already shew'd you, the little cross above the 2d. Note shews that 'tis on this Note you must Shake, the Slur which joyns two dotts in the Tablature, shews from which hole you take the Shake, and on which it ends. You may thereby see ye borrow'd Shakes (ie) those Shakes that don't end on the same hole where you make the Port de voix, which hereafter I shall call a Sigh, as for example, that of **D** taken from **E la-mi Flat**, begins from **E-la-mi Flat**, by putting the little finger on the key, and ends from **E-la-mi Natural**, in shaking with the 6th. finger on the 6th. hole, and leaving the 7th. stopt; you may also see the Slur curled on the 2d. dott, which shews that 'tis on this hole you must Shake. **(12)**

The Shake on **E-la-mi Natural**, taken from **F Sharp**, is of this kind, 'tis begun by opening the 5th. 6th. and 7th. holes, to make **F Sharp**, which serves it as a sigh, or Port de voix, and 'tis ended by stopping the 5th. & shaking on the 4th. which removes the Superior Tone further off, and shews the Cadence more, instead of shaking on ye 5th. which wou'd not be sufficient; you must observe to raise the little finger from off the key, when you shake, because that wou'd heighten the **E-la-mi**, and render it false, as shwe'd in the Tablature. I shall also give an Explication of the difference of the Flats, and Sharps, by the Natural Shakes, as for example, **E la-mi Flat**, & **D Sharp**, are stopt alike, yet you see the shake on **E Flat** is taken from **F Natural**, and that of **D Sharp** is taken from **E Natural**, the first is a whole Notes distance, the 2d. of a Semitone only, which makes all ye difference, 'tis the same in all the other Notes. You must observe, that the shakes are not always markt in pieces of Musick as I have describ'd them here, they are only markt with a little cross, thus **+** or thus **=** there is no mark for the Sigh, or Port de voix, but

Il faut remarquer que les Cadences ou tremblements ne sont pas toûjours marquez dans les Pieces de Musique, comme je les décris icy. On marque seulement la petite Croix faite de cette maniere **+** Il n'y a rien qui marque le port-de-voix, mais il ne faut pas laisser de le faire, & d'observer, tout ce que j'ay expliqué la dessus.

Il y a quelques Tons hauts où l'on ne peut pas faire de **(18)**

Cadences. J'ay démontré celles qui se peuvent faire, mais on remarquera qu'on pratique rarement celles qui passent le *Si* en haut; (Note vingt-deuxiéme.)

Au reste je n'ay point parlé de la maniere d'ajuster les Cadences; Ce ne seroit qu'une répetition de ce que j'ay déja expliqué touchant les Tons simples, vû que ces Cadences sont composées de ces mêmes Tons. Je diray seulement qu'il y en a quelques unes qu'il faut commencer en tournant l'embouchure en dedans, & finir en tournant l'embouchure en dehors: telle est la Cadence du *Fa Diézis*, prise du *Sol Diéziz*; parceque les deux Tons qui la composent, doivent estre ajustez differement. Il y en a d'autres où il faut observer tout le contraire, ce que l'on connoîtra par les explications que j'ay données sur tous les Tons, Chapitre III. & V.

Avec ces explications, & les démonstrations que l'on voit dans la seconde Planche, on pourra facilement aprendre à faire toutes les Cadences. Il s'en trouve quelques unes qui se commencent, en bouchant le trou sur lequel on doit trembler, & qui se finissent, en debouchant ce même trou; Telle est la Cadence de l'*Ut*, (Note onziéme) dont j'ay déja parlé au Chapitre IV. On connoîtra cette difference par l'arrangement des Zeros: dans celles-cy le Zero noir précede le Zero blanc, ce qui est le contraire des autres.

you must never omit doing it, and observe what I have said thereon.

There are some high Tones on which one can't shake, I have shew'd those which can be shook, but you must observe that those above **B in alt** (Note the 23d.) are seldom practis'd. I have not yet spoke of the manner of adjusting the Cadences, or Shakes, this wou'd be but a repetition of what I have already said concerning the Simple Notes, since that these Cadences are Compos'd of the same Notes, I shall only tell you, that there are some of them which must be begun by turning the Flute inwards, and ended by turning it out; Such is the shake on **F Sharp**, taken from **G Sharp**, because the two Tones which compose this Shake are to be differently adjusted; **(13)**

there are others in which you must observe the quite contrary, which you'll know by the Explication already given on all the Notes, Chap. ye 3d. & 5th. By these Explications, and the demonstrations given in the 2d. Scale, You may easily learn all the Shakes, you'll find some which are begun by stopping the hole on which you ought to shake, and which ends in opening the same hole, Such is the Shake on **C**, (the 11th. Note) of which I have already spoke, Chap. the 4th. you may know this difference by the dotts in this example of **C**, the black dott goes before the white one, which is contrary to the rest.

CHAPITRE VII.

Remarques sur quelques demi-Tons, & sur quelques Cadences.

Pour ne rien obmettre, je parleray ici de quelques demi-tons, & de quelques Cadences qui se peuvent faire differemment de la maniere dont je les ay démontrées. **(19)**

Je commenceray par le *Sol Diézis* enhaut, (Note dix-neuviéme,) quoique je l'aye démontré dans ma Tablature de la maniere la plus simple. Mais comme il est un peu haut en le faisant de cette prémiere façon, on se sert de plusieurs moyens pour le rendre plus bas.

1°. Après avoir bouché le prémier, le second & le quatriéme trou (comme on le voit dans la Tablature) on bouche encore le sixiéme trou, & l'on débouche le septiéme par le moyen de la Clef. Cette maniere est assez en usage, & mesme quelques personnes font la Cadence du quatriéme & du sixiéme Doigt en même tems; mais elle n'est pas bien articulée, parcequ'il est difficile qu'une Cadence faite de deux Doigts si éloignez l'un de l'autre puisse estre bien distincte. Je serois donc d'avis que l'on empruntât toûjours la Cadence du second Doigt, comme je l'ay démontrée dans la planche des Cadences; en l'ajustant par le moyen de l'embouchure, c'est à dire en la tournant en dedans: Il faut aussi observer de ne pas beaucoup lever le Doigt en tremblant.

2°. On bouche le prémier, le second, & le quatriéme trou, & ensuite la moitié du cinquiéme, mais avec discretion. Cette maniere est un peu moins embarassante que l'autre, parcequ'elle n'occupe que deux Doigts de la main d'en bas, lesquels étant voisins agissent avec plus d'intelligence. La Cadence se prend toûjours du second Doigt, en tournant aussi la Flute en dedans. Il y a certains passages où l'on doit faire ce demi-Ton, comme je l'ay démontré dans la Tablature, & cela pour éviter une trop grand difficulté.

Ce que j'ay dit du *Sol Diézis*, se rapporte aussi au *La Bemol*, (Note trente-neuviéme,) excepté la Cadence qui est differente, comme on le voit à la planche des Cadences.

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La Cadence de l'*Ut Diézis* enhaut, (Note vingt-quatriéme) se peut faire aussi de plusieurs manieres. J'en donneray icy l'explication, aussi bien que de quelques autres, plûtôt pour satisfaire la curiosité que pour en préscrire un frequent usage ; car ces Cadences ne se font pas sur toutes sortes de Flutes avec la même facilité.

La prémiere maniere se pratique en bouchant le deuxiéme & le troisiéme trou, & en tremblant sur le quatriéme & sur le sixiéme en même temps:

CHAP. the 7th.
Remarks on some Semitones, and on some Cadences.

To omit nothing, I shall treat here of some Semitones, and some Shakes that may be play'd after different ways to what I have here shew'd; I shall begin with **D Sharp in alt** [*this is a misprint and should be* ***G Sharp***], (Note the 19th.) altho' I have shew'd in ye Scale the most Simple manner of playing it, but as 'tis a little too sharp, when made after that manner, there are several ways used to flatten it. First having stopt the 1st. 2d. and 4th. holes, as you see in the Tablature, you must stop also the 6th. hole, and open the 7th. with the little finger, this way is frequently used, and some shake thereon with the 4th. and 6th. fingers at the same time, but 'tis not well articulated, because 'tis difficult for a Shake made by two fingers so distant from each other to be very distinct; I am therefore of opinion, that one shou'd always borrow the Shake from the 2d. finger, as I have shew'd in the Scale of Cadences, by adjusting it by turning the Flute inwards; you must also observe not to raise the finger high in shaking; 2dly. you stop the first 2d. and 4th. holes, and afterwards, the half of the 5th. but with discretion, this way is some- **(14)**

what easier than the other, because it only employs two fingers of the lower hand, which being close together; shakes more intelligibly; the shake is always taken from the 2d. finger in turning the Flute also inwards, there are certain passages where one ought to make this Semitone as I have shew'd in the Tablature, and that to avoid a very great difficulty. What I have said on **G Sharp**, may also serve for **A Flat**, (Note the 39th.) except the Shake, which is different, as you see in the Scale of Shakes. The Shake on **C Sharp in alt**, (Note the 24th.) is also made after different manners, which I shall here explain, as well as some others, more to satisfie your curiosity, than to prescribe a constant use thereof, for these Sorts of Shakes are not found on all Flutes with ye same facility. The first way is perform'd by stopping the 2d. and 3d. holes, and shaking on the 4th. & 6th. at ye same time, all the other holes ought to be open, and the 7th. also, and the fingers wherewith you shake must rest upon their holes in finishing the Shake. The 2d. way is by stopping all the holes except the first, and the fifth, you must shake on the 6th. hole, ending with the finger off: you may also shake on the key, and observe the same thing. **C Sharp** without a shake, may also be play'd by stopping the 3d. and 4th. holes, and leaving the rest open, **D Flat** is made the same way. I shall also observe concerning the Shake on **B Natural above**, (Note the 22d.) that it may be play'd by stopping the

Tous les autres trous doivent être débochez, même le septiéme. Il faut aussi que les Doigts qui ont tremblé, restent sur leur trous en finissant la Cadence.

La seconde maniere est de boucher tous les trous, excepté le prémier, & le cinquiéme. Il faut trembler sur le sixiéme trou, & le laisser débouché en finissant la Cadence : On peut encore trembler sur la Clef, & observer la même chose.

L'*Ut Diézis* sans tremblement se peut faire aussi en bouchant le troisiéme & le quatriéme trou, & en laissant les autres débouchez. Le *Ré Bemol* se fait de même.

Je remarqueray encore touchant la Cadence du *Si* naturel enhaut, (Note vingt-deuxiéme) que l'on peut la faire en bouchant les trois trous de la main d'en bas, & en tremblant à l'ordinaire sur le prémier trou. Elle se fait aisement de cette manière: mais elle est un peu trop haute; il faut donc tourner l'embouchure en dedans pour l'ajuster. Celle du *Si Bemol* en haut, (Note trente-septiéme) se peut faire en bouchant le deuxiéme trou à moitié, & en tremblant sur le prémier trou: On la pratique encore en tremblant sur le prémier & sur le troisiéme trou, en même temps; laissant tous les autres débouchez. Mais elle n'est pas bien naturelle de cette maniere.

(21)

La Cadence de *La Diézis* (Note vingt-uniéme) se peut faire en bouchant tous les trous, excepté le troisiéme & le septiéme. Il faut trembler sur le deuxiéme trou, & tourner l'embouchure en dedans.

Celle du *Ré* naturel tout enhaut (Note vingt-cinquiéme) prise du *Mi Bemol*, se peut faire aussi sur le cinquiéme & sur le sixiéme trou en même temps: en tenant les trois prémiers bouchez, & en débouchant le quatriéme & le septiéme: On doit forcer le vent & laisser les Doigts en l'air en finissant la Cadence. Il y a quelques Flutes où il faut déboucher le premier trou.

Je diray encore touchant l'*Ut* naturel d'en bas, (Note onziéme Planche prémiere) qu'il y a quelques personnes qui le font en bouchant le second, le quatriéme & le cinquiéme trou. Mais cette maniere ne me paroît pas bonne, parcequ'en le faisant ainsi il n'est pas assez éloigné de son *Diézis*, & le demi-Ton ne se trouve pas juste.

3 holes of the lower hand, and shaking as usually on the first hole, 'tis easily made after this manner, but 'tis a little too sharp, to remedy which, turn the Flute inwards to adjust it. That of **B in alt Flat**, (Note ye 37th.) may be made by stopping half the 2d. hole, and shaking on the first, the shaking on the first and 3d. hole at the same time is also practisd, leaving all the other holes open, but this way is not

(15)

very natural. The Shake on **A Sharp**, (Note ye 21st.) may be made by stopping all the holes except the 3d. & 7th. you must shake on the 2d. hole, and turn the Flute inward. That of **D Natural in altissimo**, (Note ye 25th.) taken from **E Flat**; may be also made on the 5th. and 6th. holes, at the same time keeping the 3 first stopt, and opening the 4th & 7th. you ought to force the wind, and end the shake with the fingers off; there are some Flutes on which you must open the first hole. I shall further observe concerning **C Natural below**, (Note the 11th. of the first Scale) that some make it by stopping the 2d. 4th. and 5th. holes, but I don't approve of this way, because in making it thus, 'tis not far enough distant from its Sharp, and the Semitone is found false.

CHAPITRE VIII.

Des coups de Langue, Ports-de-voix, Accents & doubles Cadences sur la Flute Traversiere & autres Instruments à vent.

Aprés avoir expliqué la maniere de faire les Tons & Semi-Tons avec toutes leurs Cadences, il nous reste encor à parler des coups de Langue & des agréments qui sont absolument necessaires pour la perfection du jeu. Ces agréments consistent en Ports-de-voix, Accents, double Cadences, Flâtements, Battements, & c.

(22)

Je commenceray par une explication de tous les coups de Langue articulez, & coulez, desquels je donneray plusieurs exemples, comm'aussi des Ports-de-voix, des Accents & des doubles Cadences, ce qui pourra servir pour tous les Instruments à vent; Ensuite j'expliqueray la maniere de faire les Flâtements & les Batements, sur la Flute Traversiere.

Pour rendre le jeu plus agréable, & pour éviter trop d'uniformité dans les coups de Langue, on les varie en plusieurs manieres ; Par example on se sert de deux articulations principales; Sçavoir, *Tu* & *Ru*. Le *Tu* est le plus en usage, & l'on s'en sert presque par tout; comme sur les Rondes, les Blanches, les Noirs, & sur la plus grande partie des Croches: car lorsque ces dernieres sont sur la même ligne, ou quelles sautent, on prononce *Tu*. Lorsqu'elles montent ou descendent par degrez conjoints, on se sert aussi du *Tu*, mais on l'entremêle toûjours avec le *Ru*, comme l'on peut voir dans les Exemples cy-aprés, où ces deux articulations se succedent l'une à l'autre.

Prémier Exemple.

Mesure à Deux-temps.



Deuxiéme Exemple.

Autre Mesure à Deux-temps.



(23)

On doit remarquer que le *Tu*, *Ru*, se reglent par le nombre des Croches. Quand le nombre est impair on prononce *Tu Ru*, tout de suite comme l'on voit au prémier Exemple. Quand il est pair on prononce *Tu*, sur les deux prémieres Croches, ensuite *Ru* alternativement, comme l'on voit dans le deuxiéme Exemple.

On fera bien d'observer que l'on ne doit pas toûjours passer les Croches également & qu'on

CHAP. the 8th.
Of the double Cadences, Accents, Port-de-voix, and tongueing the German Flute and other wind Instruments.

After having explaind the manner of making all the Notes, and half Notes, with the shakes thereon, it now remains that we should say something of tongueing, and other Graces, that are absolutely necessary to well playing; these Gracings consist of Port-de-voixs, Accents, double Cadences, Sweetnings, and beats, &c. I shall begin by explaining the articulate, and Slur'd Notes, of which I'll give many examples, as also of the Sighs, or Port-de-voix, the Accents, and double Cadences, will serve for all wind Instruments, afterward I'll explain the Sweetning, and Beating of Notes on the German Flute. To render the playing more agreeable, and to avoid too great a uniformity in tongueing, 'twill be proper to vary it after different manners, as for example, we use two principal articulations, Viz. *Tu*, and *Ru*, the *Tu* is most in use, and is used in all cases, as to Semibreves, Minums,

(16)

Crotchets, and to the greatest number of Quavers, for when these last are on the same line, or such as leap, you pronounce *Tu*, when they ascend or descend by degrees and joyn'd, we use also *Tu*, but intermixes *Ru* with it, as you may observe by the following examples, where these two Syllables do succeed each other.

EXAMPLES.

Common time



You must observe that *Tu Ru* are regulated by the number of the Crotchets, when the number is odd, you pronounce *Tu Ru* alternatively, as you see in the first example, when the Quavers are even, you pronounce *Tu* to the two 1st. then *Ru* alternatively, as you see in the second example. You must observe that Quavers are not always to be play'd equally, but that you must in certain movements make one long, and one short, which is also regulated by their number when they are even. You make the first long, the second short, and so on when they are odd, you do quite the reverse, that is called pointing; the movements in which 'tis most commonly used is Duple, or Common Time. Triple Time and Jigg Time or 6/4 You must pronounce *Ru* on the Note

doit dans certaines Mesures, en faire une longue & une breve; ce qui se regle aussi par le nombre. Quand il est pair on fait la prémiere longue, la seconde breve, & ainsi des autres. Quand il est impair on fait tout le contraire; cela s'appelle pointer. Les Mesures dans lesquelles cela se pratique le plus ordinairement, sont celle à Deux-temps, celle du triple simple, & celle de six pour quatre.

On doit prononcer *Ru*, sur la Note qui suit la Croche quand elle monte ou descend par degrez conjoints.

Exemple.

Triple simple.



Autre Exemple.

Six pour quatre.



(**24**)

Il y a aussi certains Mouvemens où l'on ne se sert que du *Tu*, pour les Croches.

Exemple.



Autre Exemple.



Autre Exemple.



On prononce *Tu* sur toutes ces Croches, & l'on ne se sert du *Ru*, que sur les doubles Croches ; C'est que les Croches supposent des Noirs, & les Doubles Croches des Croches simples, dans ces sortes de mouvemens, aussi-bien que dans les Mesures de 6/8 12/8 & 9/8. Il faut aussi dans ces Mesures passer les Croches également, & pointer les Doubles Croches.

On se sert du *Ru* sur les doubles Croches; suivant les Regles que j'ay données pour les Croches simples: On s'en sert même plus frequemment: car soit que ces Doubles Croches soient sur la même ligne, soit qu'elles sautent, on ne laisse pas de le faire.

(25)

which follows the Quaver when it ascends, or descends by one step only.

(17)

EXAMPLES.

Triple Time.



There are also certain Movements where you only use *Tu* for the Quavers, as for example.

EXAMPLES.



You pronounce *Tu* on all these Quavers, and you don't use *Ru*, but on the Semiquavers, 'tis because in these movements a Quaver is to be suppos'd a Crotchet, and a Semiquaver a Quaver, that is, held as long in playing, as well as in those of 6/8 12/8 and 9/8 you must also in these movements pass the Quavers equally, and point the Semiquavers. You use *Ru* on the Semiquavers according to the Rules I gave of the Quavers, and more frequently, for you don't omit it whether they are on the same line, or whether they Skip. **(18)**

EXAMPLE.



Although these Rules are General, they admit of some Exceptions in certain Cases, as you may see by these

EXAMPLES.

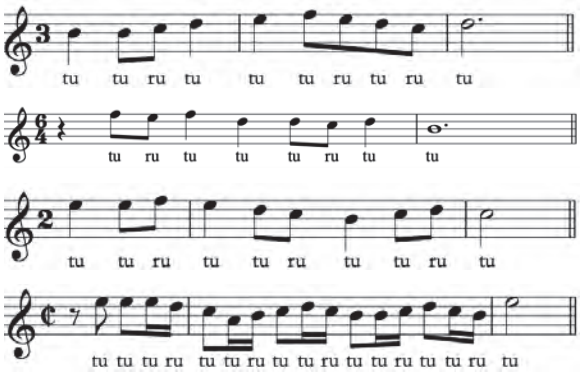


Exemples.



Quoique ces Regles soient générales, elles admettent cependant quelques exceptions, dans certains passages, comme on le peut voir icy.

Exemples.



On conçoit qu'il faut prononcer *Tu*, *Ru*, sur les deux premieres Croches simples ou doubles, au nombre pair; ce qui se pratique frequemment lorsqu'il se trouve deux Croches entremêlées avec des Noirs; ou bien deux doubles Croches, avec de Croches simples. Cela se fait

(26)

pour un plus grand adoucissement, & c'est le goût qui en décide. On doit donc consulter ce même goût, lorsque les coups de Langue paroîtront rudes en les faisant de la maniere que je les ay expliquez dans les premiers Exemples, & l'on doit s'arrester à ce qui semblera le plus agréable à l'Oreille, sans avoir égard à l'arrangement des Notes, n'y aux differens mouvemens. On observera seulement de ne point prononcer *Ru* sur les Tremblements; ny sur deux Notes de suite, parceque le *Ru* doit toûjours être mêlé alternativément avec le *Tu*.

Dans la Mesure du Triple double, on prononce *Tu*, *Ru*, entre les Noires, & *Ru* sur la Blanche qui est précedée d'une Noire, en montant ou en descendant, par degrez conjoints

Exemple.

Triple double.





You understand that you must pronounce *Tu Ru* on the two first Quavers, or Semiquavers of an even number, which is frequently practis'd when two Quavers are intermixt with Crotchets, or else two Semiquavers with Quavers, 'tis done for a greater Sweetning, and 'tis the Relish of the Ear that must decide it, you ought therefore to Consult the Ear, for when the tongueing appears harsh, when done as I advise in the first examples, then use the way which shall seem most agreeable, without respecting the ranging of the Notes, or the different movements. **(19)**

You must only observe never to pronounce *Ru* on a shake, nor on two Successive Notes, because *Ru* ought always to be intermixt alternatively with *Tu*. In Triple Time of 3/2 you pronounce *Tu Ru* between the Crotchets and *Ru* to ye Minums that are preceded by a Crotchet, in ascending, or descending by one Notes distance, as for example.



We may then say that all Triple Time is like the single Triple Time, and that in double Triple Time, (i.e.) 3/2 the Minums are to be accounted Crotchets, and the Crotchets Quavers, & c. for which reason, you point Crotchets in this movement according to the Explication I gave you of Quavers; 'twill be proper to observe, that tipping with the Tongue ought to be more, or less articulate, according to the Instrument on which you play, for 'tis soften'd on the German Flute, more distinct on the Common Flute, and very Strong on the Hautboy.

Of Sliding, or Slurring.

Slurring is when two, or more Notes are pass'd over with only one tip with the Tongue, which is markt by a Curve line, over, or under the heads of the Notes.

EXAMPLES.



(20)

Nous pourrons donc avancer que tous les Triples se rapportent au triple simple, & nous pourrons dire que dans le Triple double, les Blanches supposent des Noires, & les Noires des Croches; c'est pourquoy il faut pointer les Noires dans cette Mesure, suivant l'explication que j'ay donnée plus haut, au sujet des Croches.

Il sera bon de remarquer que les coups de Langue doivent être plus ou moins articulez, selon l'Instrument dont on joüe; Par exemple on les adoucit sur la Flute Traversiere. On les marque davantage sur la Flute à Bec, & on les prononce beaucoup plus fortement sur le Haut-Bois.

(27)

Des Coulez.

Il faut encore faire attention aux Coulez. Ce sont deux ou plusieurs Notes passées d'un même coup de Langue, ce qui est marqué au dessus ou au dessous des Notes par des liaison.

Exemples.



Du Port-de-voix, & du Coulement.

Le Port-de-voix est un coup de Langue anticipé d'un degré, au dessous de la Note sur laquelle on le veut faire. Le Coulement est pris un degré au dessus, & ne se pratique guere que dans les intervales de Tierces en descendant.

Exemple.



(**28**)

Exemple.



Ces petites Notes qui marquent les Port-de-voix, & les Coulements, ne sont comptées pour rien dans la Mesure; on les articule neanmoins, & on coule les Notes principales. Souvent on joint les battements avec les Port-de-voix, comme on le peut voir cy'devant au troisiéme & quatriéme. On apprendra à connoître les battements dans le Chapitre IX.

Of the Port-de-voix and Slide.

The Port-de-voix is a tipping with the Tongue, anticipated by one Note below the Note on which we design to make it, the Slide is taken a Note above, and is never practisd but in descending to a third.

EXAMPLES.

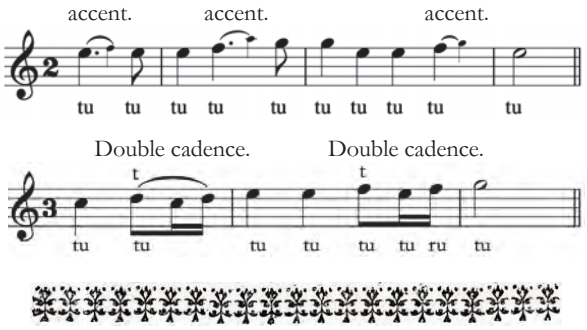


These little Notes which denote the Port-de-voix, and Slides, are accounted as nothing in the Time, you Tongue them nevertheless, and Slide the Principal Notes, we often joyn a beat with the Port-de-voix, as you may see above in the 3d. and 4th. Chap. You shall be taught the beats in the 9th. Chapter.

Of the Accents, and double Cadences.

The Accent is a Sound borrowed from the end of some Note to give them a greater expression. The double Cadence is an ordinary Shake follow'd by two Semiquavers Slur'd or tipt.

EXAMPLE.



(21)

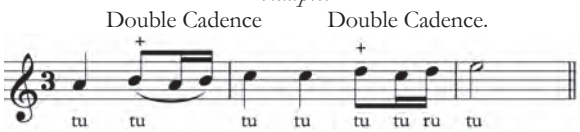
Des Accents, & des doubles Cadences.

L'Accent est un son que l'on emprunte sur l'extremité de quelques Tons, pour leur donner plus d'expression. La double Cadence est un tremblement ordinaire, suivy de deux Doubles Croches, coulées ou articulées.

Exemple.



Exemple.



(29)

CHAPITRE IX.

Des Flattements ou Tremblements Mineurs, & des Battements.

Le Flattement ou Tremblement Mineur, se fait presque comme le tremblement ordinaire: Il y a cette difference, que l'on releve toûjours le Doigt en le finissant; excepté sur le *Ré*; De plus on le fait sur des trous plus éloignez, & quelques-uns sur le bord ou l'extremité des trous ; Il participe d'un son inferieur ce qui est le contraire du tremblement.

Le Battement se fait en frappant une ou deux fois de suite, & le plus vite qu'on peut sur le trou toûjours plein, ou tout bouché, & le plus proche du ton où l'on veut le faire. On doit encore relever le Doigt en finissant le Battement, excepté sur le *Ré*, comme je l'expliqueray cy-après; Il participe aussi d'un son inferieur.

Pour commencer par le flattement du *Ré* naturel en bas, suivant l'ordre de la premiere Planche; je diray qu'il ne se peut faire que par artifice. Comme l'on ne peut se servir d'aucun Doigt pour le faire, (puisqu'ils 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 flattement ordinaire. Pour ce qui est du Battement, il n'y en peut point avoir.

Le flattement du *Ré Diézis*, ou *Mi Bemol*, se fait comme celuy du *Ré* naturel. Le Battement se forme sur la Clef avec le petit Doigt, & il y doit rester appuyé. **(30)**

Le flattement du *Mi* naturel, se fait sur le bord du sixiéme trou. Le battement se forme sur le même trou plein.

Les flattements & les battements du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou; Sçavoir les flattements sur le bord du trou, & les battements sur le trou plein.

Le flattement du *Sol* naturel se peut faire de deux manieres : Sçavoir sur le bord du quatriéme trou, ou sur le cinquiéme trou plein. Le battement se fait sur le quatriéme trou.

Le flattement du *Sol Diézis* ou *La Bemol*, se forme sur le bord du troisiéme trou. Le battement sur le même trou.

Le flattement du *La* naturel, se fait sur le quatriéme trou plein, ou sur le bord du troisiéme. Le battement sur le troisiéme.

Le flattement du *La Diézis*, ou *Si Bemol*, se forme sur le sixiéme trou plein. Le battement sur le même trou, ou sur le deuxiéme, quand il est précedé d'un port-de-voix.

Le flattement du *Si* naturel, se fait sur le troisiéme trou plein. Le battement sur le deuxiéme.

Le flattement de l'*Ut* naturel, se forme sur le quatriéme trou plein. Le battement sur le

CHAP. the 9th.

Of the softening of Notes, or the lesser Shakes, and of the Beats.

The softening, or lesser shake, is made almost like the usual shake, there is this difference, that you always end with the finger off, except on **D-la-sol-re**, for the most part they are made on holes more distant, and some on the edge, or half the hole only, it participates of a lower Sound, which is contrary to the Shake.

The Beat is the hitting once or twice as quick as we can, full on the hole, and as near the Note we beat upon as possible, we ought also to end a Beat with the finger off, except on **D**, as I shall shew hereafter, it also partakes of a lower Tone. To begin with the Sweet'ning, or softening of **D** the first Note in order, I say it can't be done but by artifice, because tis the lowest Note, and you have no finger left unemploy'd to do it withall; 'tis therefore done by shaking the Flute, which imitates a usual softening, as for the Beat, this Note has none for the same reason. The softening of **D Sharp**, or **E-la-mi Flat** is done as **D Natural**, the Beat is made upon the key with the little finger, ending with it on. The softening of **E-la-mi Natural**, is made on the edge of the 6th. hole, the Beat on the same hole full. The softening, and Beat on **F Sharp**, and **Natural**, are made on the 5th. hole, Viz. the Beat full on the hole, the other on the edge. The softening of **G Natural** may be perform'd two ways, Viz. on the edge of the 4th. hole, or full upon the 5th. the Beat is made on the 4th. hole. **G Sharp**, or **A Flat** is soften'd on the edge of the 3d. hole. the Beat on the 3d. hole full. The softening of **A Natural** is on the 4th. hole full, or on the edge of the 3d. hole, the Beat upon the 3d. hole. The softening of **A Sharp**, or **B Flat** is upon the 6th. hole full. **(22)**

the Beat upon the same hole, or on the 2d. when 'tis preceded by a Port-de-voix. The softening of **B Natural**, is made on the 3d. hole full, the Beat upon the 2d. The softening of **C Natural**, is made on the 4th. hole full, the Beat on the 4th. & 5th. at the same time, or on the first, when 'tis preceded by a Port-de-voix. The softening of **C Sharp**, or **D Flat** is made on the 2d. hole full, the Beat upon the first. The softening of **D Natural**, is made on the 2d. hole full it differs from the rest in its beginning and ending with the finger on, you must observe not to raise the finger high, the Beat is made on the 4th. hole, when you play in a Natural key, and upon the 2d. & 3d. at the same time, when you play in a key where **C** is **Sharp**, the holes ought also to be stopt as well in beginning as ending it. The Softening **D Sharp** or **E Flat** is made on the first hole, which ought to remain stopt, before, and after, the Beat is

quatriéme & le cinquiéme trou en même temps, ou sur le premier quand il est précedé d'un Port-de-voix.

Le flattement du l'*Ut Diézis*, ou *Ré Bemol*, se fait sur le deuxiéme trou plein. Le battement sur le premier.

Le flattement du *Ré* naturel, se forme sur le deuxiéme trou. Il est different des autres, en ce qu'il faut tenir le trou bouché en le commençant, & en le finissant. **(31)**

On doit observer de ne pas beaucoup lever le Doigt. Le battement se fait sur le quatriéme trou, quand on joüe dans un ton naturel, & sur le deuxiéme & troisiéme en même temps, quand on joüe dans un ton où l'*Ut* est *Diézis*. Il faut que les trous soient aussi bouchez en commençant, & en finissant.

Le flattement du *Ré Diézis* ou *Mi Bemol*, se forme sur le premier trou, lequel doit rester bouché avant & après. Le battement se fait sur la Clef, pour le *Mi Bemol*, de la maniere que je l'ay expliqué, en parlant de celuy d'en bas. Quant au *Ré Diézis*, il se fait sur le deuxiéme & le troisiéme trou en même temps. Le premier trou doit étre débouché, & il faut réboucher le deuxiéme & le troisiéme trou, en finissant le battement.

Les flattements & battements depuis ce ton jusqu'au *La Diézis* ou *Si Bemol*, se font comme à leurs Octaves en bas. Le flattement de ce dernier, se forme sur le bord du quatriéme trou. Le battement se peut faire sur le même trou, ou bien sur le deuxiéme, principalement quand il est précedé d'un port-de-voix.

Le flattement de l'*Ut* naturel, se fait en deux manieres; Sçavoir sur le sixiéme trou, ou sur le troisiéme. Le battement se forme de méme, & aussi sur le premier trou quand il est précedé d'un port-de-voix.

Le flattement du *Ré* naturel, se fait sur le deuxiéme trou, ainsi qu'à son Octave. Le battement se forme sur le deuxiéme & sur le troisiéme trou en même temps.

Le flattement du *Ré Diézis* ou *Mi Bemol*, se fait aussi comme à son Octave. Le battement se forme de méme, ou bien sur le cinquiéme & le sixiéme trou en même temps. On doit tenir le quatriéme, & le septiéme débouchez, & on doit remettre les Doigts en finissant. **(32)**

Le flattement du *Mi* naturel se forme sur le bord du troisiéme trou. Le battement sur le même trou plein.

Je laisse les Tons au dessus, comme étant trop forcez; il ne faudra même faire quelques-uns de ces derniers, que lorsque l'on sera fort avancé.

made upon ye key for **E-la-mi**, after the manner I shew'd you in speaking of it below, as to **D Sharp**, 'tis Beat upon the 2d. & 3d. holes at the same time, the first hole ought to be open, and you must stop the 2d. & 3d. in ending the Beat. The softenings, and Beats between this Note and **A Sharp**, or **B Flat**, are made as their Octaves below, the softening of this last is made on the edge of the 4th. hole, the Beat may be made on the same hole, or else on the 2d. especially when 'tis preceded by a Port-de-voix. The softening of **C Natural** is made two ways, Viz. on the 6th. hole, or on the 3d. the Beat is made on ye same, and also on the first, when tis preceded by a Port-de-voix. The softening of **D Natural** is made on the 2d. hole, as its Octave, the Beat is made on the 2d. & 3d. holes at the same time. The softening of **D Sharp**, or **E-la-mi Flat**, is done as its Octave, the Beat is made the same way, or else on the 5th. & 6th. holes at once, you must hold the 4th. & 7th. holes open, and replace your fingers in ending. The softening of **E-la-mi Natural** is made on the edge of the 3d. hole, the **(23)**

Beat on the same hole full. I shall omit the Notes higher than this, because they are too much forced, nor must you make some of these till you are pretty far advanced. These Graces are not commonly set down in all pieces of Musick, but in such only as Masters write for their Scholars, as in the following example.

EXAMPLE.



Yet 'twou'd be hard to teach a method of knowing exactly all the Notes whereon the Graces are to be play'd, what can be said in generall thereupon, is, that the softenings are frequently made on long Notes, as on Semibriefs, *A*, on Minums, *B*, and on pointed Crotchets, *C* & c. the Beats are made more commonly on the short Notes, as on Crotchets *D* in light movements, and on Quavers, in movements where they pass equally, we can give no certain Rules for placing these Graces; 'tis the Ear, and practice which must teach you to use them in proper time, rather than Theory, what I wou'd advise you to, is to play for some time such pieces of Musick only, as have these Graces markt, thereby to accustome your self by little, and little, to use them to such Notes as they agree best with.

FINIS

(**24**)

Ces agréments ne se trouvent pas marquez dans toutes les pieces de Musique, & ne le sont ordinairement que dans celles que les Maîtres écrivent pour leurs Ecoliers; voicy de quelle maniere.

Exemple.

Flattement Battement



Au reste il seroit difficile d'enseigner à connoître précisement tous les endroits où l'on doit les placer en joüant; ce que l'on peut dire la dessus en général, c'est que les Flatements se font frequemment sur les Notes Longues: comme sur les Rondes *A*, sur les Blanches *B*, sur les Noires pointées. *C*, & c. Les Battements se font plus ordinairement sur les Notes Breves: comme sur les Noires simples *D*, dans les mouvements legers; & sur les Croches, dans les Mesures où elles se passent également. On ne peut guere donner de Regles plus certaines de la distribution de ces agréments, c'est le goût & la pratique, qui peuvent apprendre à s'en servir

(33)

à propos, plûtôt que la Theorie. Ce que je puis conseiller; c'est de joüer pendant quelque temps sur des Pieces ou tous les agréments soient marquez, afin de s'accoûtumer peu à peu à les faire sur les Notes où ils réüssissent le mieux.

Fin du Traité de la Flute Traversiere.

(34)


Note (t) is the Mark for a Shake
25
Minuet de Paris
Grano's Trumpet Minuet

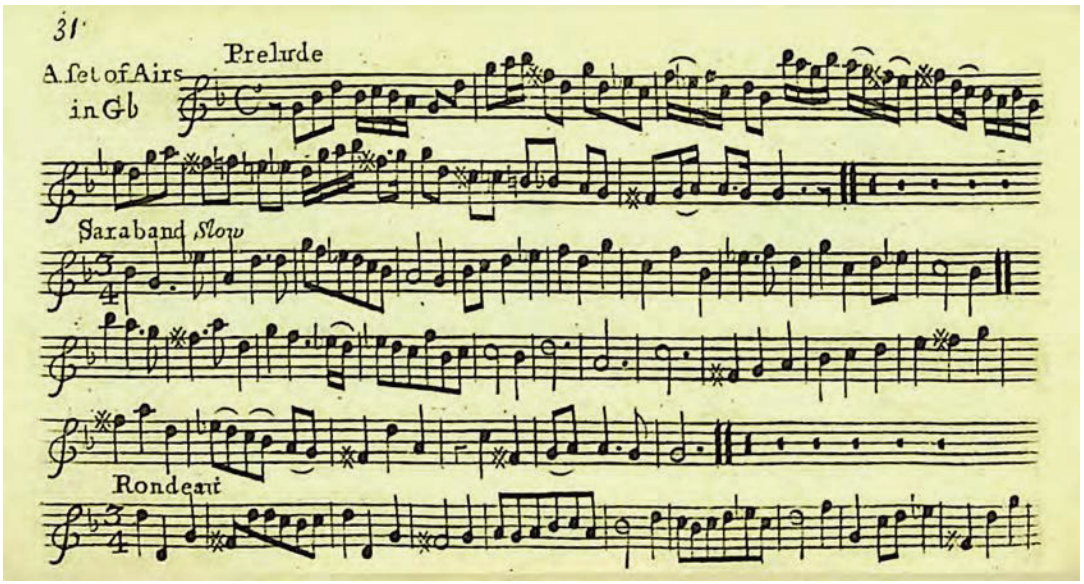

The King of Frances Minuet
26
Tanta Tanto
Minuet


A Trumpet Minuet
27
Minuet
Minuet


Prelude
28
A set of Aires in G
Gavot

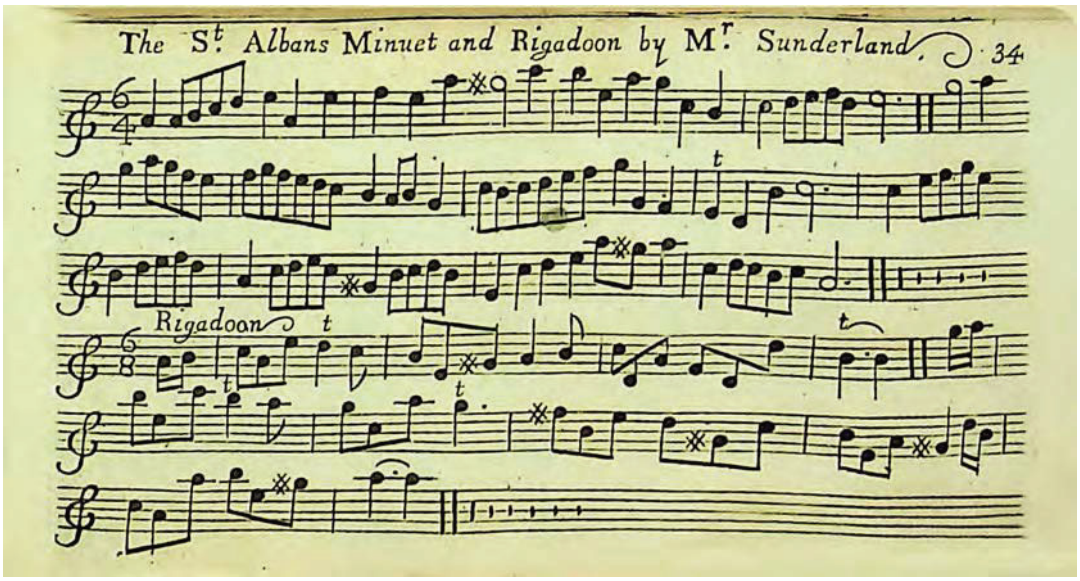

Saraband Slow
29
Boree
DC


Jigg
30
Minuet


31
A set of Airs in Gb
Prelude
Saraband Slow
Rondeau


32
D.C.
Minuet


33
Minuet
Minuet


The S.t Albans Minuet and Rigadoon by M.r Sunderland. 34
Rigadoon


Minuet
35


An Opera Aire
36
Da Capo
Capt. Bells march by M.r Carry

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5 *Principes* and *Rudiments*: Fingering-charts

The fingering-charts in *Principes* and *Rudiments* are essential sources revealing a wealth of knowledge in relation to embouchure, *Tonus* in the lips, speed and direction of the airstream, positions of the head-joint (*Outward–Normal–Inward*), and intonation. The attempt in the present study has been to make a close reading of these fingering-charts together with Hotteterre's suggestions regarding every note in the chromatic scale from C#1 to G3, *Tremblements–Shakes*, *Flattement-Softening of Notes, or the lesser Shakes*, and *Battements-Beats* together with a comparison between the first edition of *Principes* (1707), and *Rudiments* (1729).

To make a study of the fingering-charts in *Principes* and a comparison with fingering-charts in *Rudiments* could be likened with studying the building blocks or alphabet of the three-piece Traverso, its possibilities and aesthetics. The study of these fingering-charts sheds light on expressive intonation, possible temperaments and tuning systems, together with nuances, sound-colours, and timbre all aiming for musical expression. The fingerings for *Tremblements–Shakes* and *Flattement–Softening* gives ideas on conceptions of the intervals in question, which sometimes goes beyond the half- and whole-tone intervals, and in other cases results in micro-intervals.

The first chapter of *Principes* and *Rudiments* gives a clear outline regarding a favourable playing position for the arms, wrists, hands, and finger-action:

[…] les Mains hautes sans lever les Coudes ni les Epaules, le Poignet gauche plié en dedans, & le Bras gauche proche du Corps. (I: 1)	[…] the hands high, without raising the Elbows, or Shoulders, the left wrist bent inwards, and the left Arm close to the body. (I: 2)
[For the left hand] Plier le Poignet en dessous; Arranger les Doigts, ensorte que le premier & le deuxiéme soient un peu arrondis, & le troisiéme plus alongé. (I: 2)	[For the left hand] bend the wrist downwards, place ye fingers so, as that the first and 2d. may be somewhat arch'd, and the 3d. straighter. (I: 2)
[For the right hand] Il faut tenir les Doigts presque droits, le Poignet un peu plié en dedans, le Pouce vis-à-vis le Doigt du quatriéme trou, ou un peu plus bas. (I: 2)	[For the right hand] ye fingers are to be held almost straight, the wrist a little bent inward, the thumb over against the 4th. hole, or a little lower. (I: 2)

Hotteterre has an important suggestion regarding the general finger-action, which when respected contributes largely to a smooth and efficient finger technique:

On observera de bonne heure de ne pas beaucoup lever les Doigts, & de les laisser tomber bien à plomb sur les trous. (III: 7)	[…] you must not raise the fingers high, and let them fall plump on the holes […] (III: 5)

To understand Hotteterre's fingering-charts it is necessary not only to study which of the seven tone-holes that should be open or closed, how to position the head-joint, the speed and direction of the airstream, but to include essential suggestions and explications on how to position the ring-finger and little-finger of the right-hand developing a method of a supporting finger-technique aiming for flexibility and suppleness for both hands and fingers, and indirectly for the embouchure:

Le petit Doigt posé sur la Flûte, entre le sixiéme trou & la moulure de la pate. (I: 2)	[…] the little finger between the 6th. hole and the bottom piece D. (I: 2)
Il faut alors mettre le sixiéme Doigt entre le cinquiéme & sixiéme trou, ce qui ne sert (aussi-bien que la situation du petit Doigt) que pour tenir la Flûte en état, & ce qui est néanmoins important pour la liberté des Doigts. (III: 7)	[…] you must then place the 6th. finger between the 5th. and 6th. hole, to hold the Flute ye firmer. (III: 5)

The use of the D#-key is slightly less frequent in *Principes* and *Rudiments* compared with later Traverso methods such as Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761) and Devienne (*c.*1794), although the trill-charts in *Principes* and *Rudiments* uses the D#-key more than as in the fingering-charts for the chromatic scale. When comparing the fingerings in *Principes* and *Rudiments* with fingering-charts for the three-piece Traverso by Rippert (1725), *Grund-beginsel over de Behandeling van der Dvars-Fluit* (1728b), Prelleur (1731), and *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe* (1738 & 1762) by Eisel it is interesting to see that *Principes* seems to have been a reference source for almost all notes in the complete chromatic scale (Appendix VIII). In addition, it exists one more fingering-chart for a three-piece Traverso by Maier (1732 & 1741) having a foot-joint with two keys making it possible to play C1 (Appendix IX).

In the following are all Hotteterre's fingerings numerically notated, and fingers of both hands are thus given the numbers shown below following how the fingers are numbered in *Principes* and *Rudiments*:

Left hand	Right hand
0 = no finger 1 = fore-finger 2 = middle-finger 3 = ring-finger	0 = no finger 4 = fore-finger 5 = middle-finger 6 = ring-finger 7 = little-finger [/6] = ring-finger placed on the Traverso, between the tone-holes of E and D [/7] = little-finger placed on the Traverso, between the tone-hole for D and the D#-key

- An indicated finger should always be pressed down.
- When fingerings are marked including [/6], [/7] or [/6+/7] this is to be understood as suggestions based on Hotteterre's explanations in *Chapter III* in relation to achieve a stable playing position of the Traverso with the help of the above-mentioned supporting finger-techniques.
- Fingers of the left hand are indicated at the left side of the slash, fingers of the right hand at the right side of the slash. An example is the fingering for G1: 123/0 [/7], whereby the little-finger of the right-hand is placed directly on the tube of the Traverso between the tone-hole for D and the D#-key as described by Hotteterre.
- Half covered tone-holes are marked large and bold. The amount of how much a half-covered tone-hole should be covered depends on the used Traverso and the embouchure of the Traverso-player.
- It should be noted that the left-hand thumb has an important function making supple movements when rolling the Traverso in- or outward.
- Standard fingerings from *Principes* are marked with bold, alternative fingerings not bold, fingerings from the chart for trill-fingerings, and *Chapitre VII* are marked with italics.
- Standard fingerings from *Rudiments* are marked with bold, alternative fingerings not bold, fingerings from the chart for trill-fingerings, and *Chapter VII* are marked with italics.
- Fingerings for *Tremblements*, *Flattement* and *Battements* are marked with bold, and the finger or fingers executing are marked within brackets.

Described fingerings in *Echelle de tous les tons et Semitons* and *A. SCALE of all the Notes and Half Notes of the GERMAN FLUTE Musically and Tabulatory* (Fig. 9 & 10) are considered as standard fingerings and thus marked with large bold figures.

When comparing the fingering-chart *Planche 1ere* in *Principes* with *Plate 1* in *Rudiments* only four notes—G♭1, G♭2, D♭3, and D#3—show different standard fingerings. It seems that the fingerings in *Rudiments* for the notes A♭2 and G3 are to be understood as misprints.

Some alternative fingerings are described in the *Chapters III*, *V* and *VII*, further does *Echelle de toutes les Cadences ou tremblements de la Flute Traversiere–A SCALE of all the Beats or Shakes* show a multitude of fingerings for several notes such as A#1, C2, E#2, G#2, A♭2, A#2, B♭2, B2, B#2, C3, C#3, D♭3, and D3. Examples of mentioned fingerings from the fingering-charts for trills have been added to section *5.1 Fingerings for the Chromatic Scale C#1-G3*, because these fingerings can be used for refining intonation and facilitating difficult passages. Further does these alternative fingerings shed light on the multitude of possible fingerings on a Traverso, and can be used as sources for further experimentations. When comparing fingerings for trills in *Principes* and *Echelle de tous les Echelle de toutes les Cadences ou tremblements* with *Rudiments* and *A SCALE of all the Beats or Shakes* as in section *5.2 Fingerings for Tremblements—Shakes* both fingering-charts shows throughout the same fingerings with the exception for the trill C#2-B#1. It should be noted that fingering-charts and explanations as found in *Principes* regarding fingerings as shown in the first edition of 1707, are the same in later editions published by Ballard in Paris.

5.1 Fingerings for the Chromatic Scale C#1-G3

In the following are all fingerings shown from *Echelle de tous les tons et Semitons de la Flute Traversiere par musique et par tablature—A SCALE of all the Notes and Half Notes of the GERMAN FLUTE Musically and Tabulatory* (Fig. 9 & 10), including examples of fingerings with comments and suggestions from *Chapter III*, *V* and *VII*. Further has a selection of fingerings from *Echelle de toutes les Cadences ou tremblements de la Flute Traversiere—A SCALE of all the Beats or Shakes* (Fig. 11 & 12) been added as examples of how trill-fingerings can be used for facilitating intonation and difficult passages. It should be noted that E#1, E#2, B#1 and B#2 are not shown in the fingering-charts below (Fig. 9 & 10) but in the trill-fingerings charts. In *Chapter V* are also fingerings given for E#1, and B#1. Fingerings from *Echelle de toutes les Cadences ou tremblements de la Flute Traversiere—A SCALE of all the Beats or Shakes* are marked with italics. Aiming for facilitating a comparison regarding different fingerings described is the reason why mentioned additional fingerings are added to the documentation of fingerings for the Chromatic scale C#1-G3 as shown below.

Both fingering-charts below (Fig. 9 & 10) starts on D1 and goes upwards following the diatonic C-major scale, and adding all notes with sharps up to G3. When giving the fingerings for notes having flats both fingering-charts starts with F#3 then following the diatonic C-major scale downwards adding all notes with flats down to D1.



Figure 9 *Planche 1ere* the chromatic fingering-chart from *Principes* (1707/1722) (Private Collection)

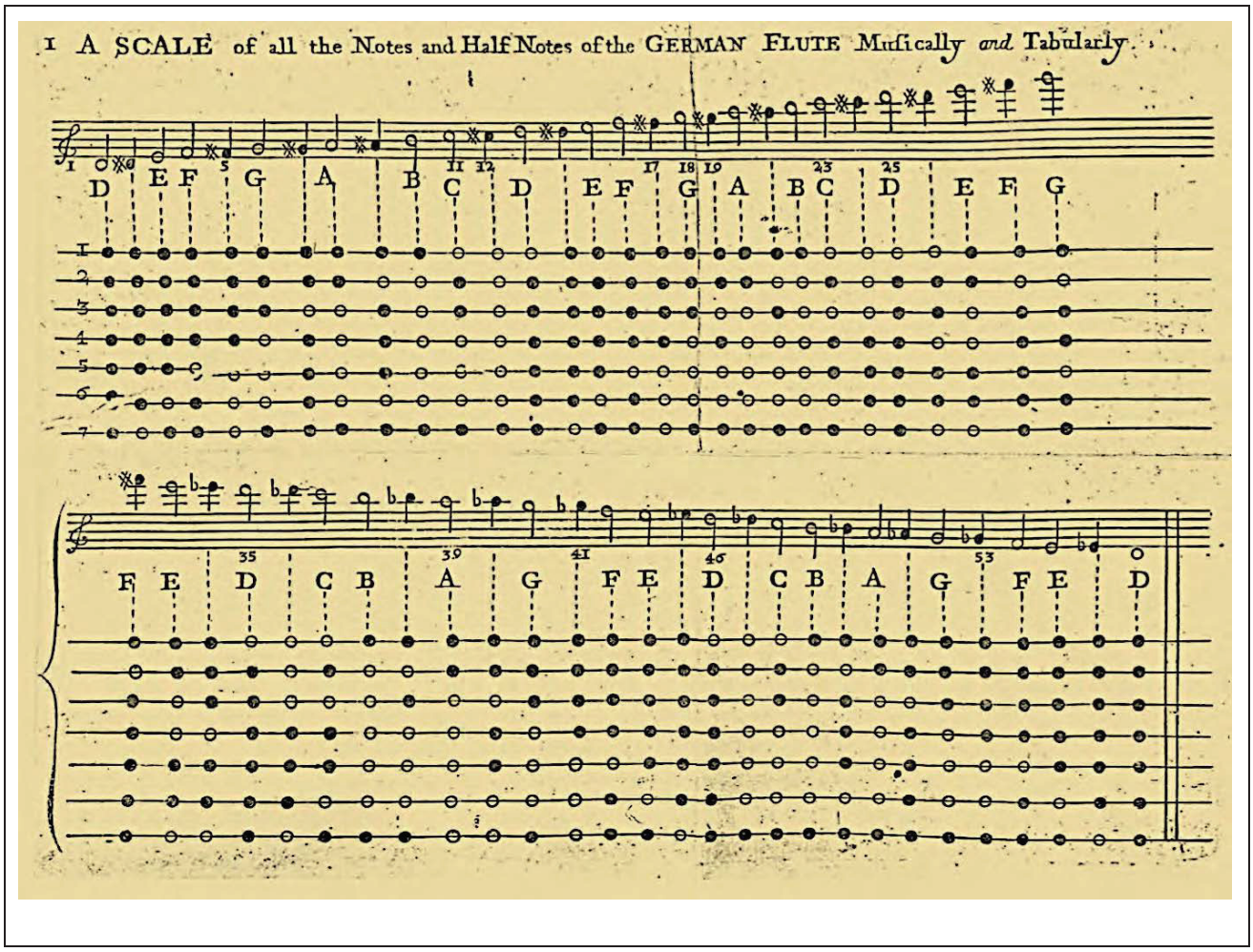


Figure 10 *Plate 1ᵉ* the chromatic fingering-chart from *Rudiments* (1729). (Private Collection)

Principes **Fingering-chart**	*Principes* Suggestions regarding the three head-joint positions, the airstream, and additional fingerings	*Rudiments* **Fingering-chart**	*Rudiments* Suggestions regarding the three head-joint positions, the airstream, and additional fingerings
Ut Diézis 1 	Je n'ay point démontré l'*Ut Diézis* enbas, dans ma Tablature, parce que ce-demi-Ton, ne faisant que part artifice, n'a point de position de main particuliere, On le fait comme le *Ré*, (Note premiere) en bouchant tous les trous; on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton; & l'on fait le tremblement comme sur le *Ré*. (V: 16-17) **Tourne la Flute en dedans** **123/456** [/7]	**C#1** 	I have not in the Scale shew'd **C Sharp**, the lowest Note of all, because this Semitone requires no particular placing of the fingers, different from **D** the first Note, but is play'd by Artifice (Viz.) by turning the Flute inwards, sufficiently to lower the Sound by half a Note, and 'tis shook upon **D**, the first Note. (V: 12) **Inward position** **123/456** [/7]
Ré 1 	Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas & qu'on doit bien boucher tous les trous marquez dans la Tablature, par les Zeros noirs. (III: 6) **[Situation ordinaire]** **123/456** [/7]	**D1** 	You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend, and all those holes must be perfectly stopt that are markt with the black dotts. (III: 5) **[Normal position]** **123/456** [/7]
Ré Diézis 1 	On fera ensuite le *Ré Diézis*, en mettant le petit Doigt sur la Clef, pour déboucher le septiéme trou. (V: 13) **[Situation ordinaire]** **123/4567**	**D#1** 	**D sharp** is made by pressing the little finger on the key, to open the 7th. hole (V: 9) **[Normal position]** **123/4567**
Mi Bemol 1 	Le *Mi Bemol*, se fait comme le *Ré Diézis*. (V: 16) **[Tourne la Flute en dehors]** **123/4567**	**E♭1** 	**E Flat**, which is the last note but one is play'd like **D Sharp** (the 2d. Note) (V: 11) **[Outward position]** **123/4567**

Mi 1 	*Mi* naturel, qui est la troisiéme Note, & qui se fait en débouchant le sixiéme trou […] (III: 6-7) **[Situation ordinaire]** **123/45** [/7]	**E1** 	[…] the next is **E**, and is play'd by unstoping the 6th. hole […] (III: 5) **[Normal position]** **123/45** [/7]
Mi Diézis 1 	[…] lorsque'il se trouve un *Diezis* sur le *Mi*, on se sert du *Fa naturel* […] Il faut se souvenir de tourner l'embouchure en dedans: ce qui se doit faire en baissant un peu la tête. (V: 13) **Tourne la Flute en dedans** **123/46** [/7]	**E#1** 	[…] when you find a **Sharp** on **E-la-mi**, you play it as **F Natural** […] you must remember to turn the Flute inward, which is done by inclining the head a little. (V: 9) **Inward position** **123/46** [/7]
Fa 1 	Ce ton veut être ajusté avec l'embouchure, en tournant la Flute en dedans pour le baisser, parce qu'il est naturellement un peu haut à cause que le *Diézis* se fait sur le même trou […] Il faut se souvenir de mettre le petit Doigt entre le sixiéme trou & la moulure de la patte, comme je l'ay observé dans le deuxiéme Chapitre. (III: 7) **Tourne la Flute en dedans** **123/46** [/7]	**F1** 	[…] this tone ought to be adjusted by the manner of blowing, Viz. by turning the Flute inward, to flatten it, because the Sharp is made on the same hole […] you must remember to place the little finger between the 6th. hole, and the moulding of the bottom piece, as I told you before, which serves to hold the Instrument Steddy. (III: 5) **Inward position** **123/46** [/7]
Fa Diézis 1 	Pour ajuster ce Ton, on doit tourner la Flute en dehors, & lever un peu la tête. Par ces termes, tourner la Flute, ou tourner l'embouchure, on doit entendre la même chose. (V: 13-14) **Tourne la Flute en dehors** **123/47**	**F#1** 	[…] you must turn the Flute outwards, & raise the head a little. (V: 9) **Outward position** **123/47**

Sol Bemol 1 	Le *Sol Bemol*, est different du *Fa Diéziz* aussi bien que son Octave. On doit l'ajuster de même en tournant la Flute en dedans. Plusieurs personnes ne font point cette difference. (V: 16) **Tourne la Flute en dedans** **123/56**	**G♭1** 	**G Flat** is different from **F Sharp**, as well as its octave; you ought to adjust it the same way by turning the Flute inwards: A great many don't make this difference. (V: 11) **Inward position** **123/47** *Here Rudiments follows the general explanation in Principes regarding how to play* **G♭1,** *but the fingering-chart in Rudiments show the standard fingering for* **F#1**.
Sol 1 	Le *Sol*, se fait en levant toute la main d'enbas & laissant le petit Doigt à l'endroit que je viens de marquer. Ce petit Doigt doit toûjours rester à cette place à moins que l'on n'en besoin pour toucher sur la Clef. On observera de bonne heure de ne pas beaucoup lever les Doigts, & de les laisser tomber bien à plomb sur les trous. Comme on a été obligé de tourner l'embouchure en dedans pour le *Fa*, il faut la remettre dans son premier point. (III: 7) **Situation ordinaire** Comme on a tourné la Flute en dehors, pour ajuster le *Fa Diézis*, il faut la remettre dans sa situation ordinaire pour le *Sol naturel*, (V: 14) **Situation ordinaire** **123/0** [/7]	**G1** 	**G**, by raising all the fingers of the lower hand, and keeping the little finger where I told you, you must not raise the fingers high, and let them fall plump on the holes, as you were obliged to turn the Flute inward for **F**, you must restore it to its former Situation for **G-sol-re-ut**. (III: 5) **Normal position** As you turn the Flute outwards to adjust **F Sharp**, so must you restore it to its usual Situation for **G Natural** (V: 10) **Normal position** **123/0** [/7]
Sol Diézis 1 	[…] l'on on tournera la Flute en dedans pour l'ajuster. (V: 14) **Tourne la Flute en dedans** **12/456** [/7]	**G#1** 	[…] turn the Flute inward to adjust it […] (V: 10) **Inward position** **12/456** [/7]
La Bemol 1 	Le *La Bemol*, se forme comme le *Sol Diézis*. Il ne faut pas tant tourner la Flute en dedans. (V: 16) **Tourne la Flute en dedans** **12/456** [/7]	**A♭1** 	**A Flat** as **G Sharp**, but you must not turn the Flute so much inwards. (V: 11) **Inward position** **12/456** [/7]

La 1 	Il faut alors mettre le sixiéme Doigt entre le cinquiéme & sixiéme trou, ce qui ne sert (aussi-bien que la situation du petit Doigt) que pour tenir la Flute en état, & ce qui est néanmoins important pour la liberté des Doigts; Il faut augmenter le vent, peu à peu, à mesure que l'on monte. (III: 7) **[Situation ordinaire]** On remettre la Flute dans sa situation pour le *La naturel* (V: 14) **Situation ordinaire** **12/0** [/6+/7]	**A1** 	[…] you must then place the 6th. finger between the 5th. and 6th. hole, to hold the Flute ye firmer. (III: 5) **[Normal position]** […] you restore it to its Situation for **A-la-mi-re Natural** (V: 10) **Normal position** **12/0** [/6+/7]
La Diézis 1 	[…] on la tournera en dedans pour le *La Diézis*: On peut encore baisser ce-demi Ton, en ajoutant quelques Doigts, ce que j'ay démontré dans la Planche des Cadences. (V: 14) **Tourne la Flute en dedans** **13/45** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *13/4567*	**A#1** 	[…] turn it inward for **A Sharp**, you may also make this Semitone somewhat lower, by adding some fingers as I have shew'd in the Scale of shakes (V: 10) **Inward position** **13/45** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *13/4567*
Si Bemol 1 	Le *Si Bemol*, comme le *La Diézis* (V: 16) **Tourne la Flute en dedans** **13/45** [/6+/7]	**B♭1** 	**B Flat** is play'd as **A Sharp** (V: 11) **Inward position** **13/45** [/6+/7]
Si 1 	On la remettra pour le *Si* & l'*Ut naturel* […] (V: 14) **Situation ordinaire** **1/0** [/6+/7]	**B1** 	[…] you restore again its usual Situation for **B** and **C Natural** […](V: 10) **Normal position** **1/0** [/6+/7]

Si Diézis 1 	On se servira donc de l'*Ut naturel* pour faire le *Si Diézis*. (V: 14) **[Situation ordinaire]** **23/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Situation ordinaire]** *23/4*	**B#1** 	[…] you must therefore make use of **C Natural** for **B Sharp**, (V:10) **[Normal position]** **23/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Normal position]** *23/45* *It should be noted that the trill-fingering for* **B#1** *in Rudiments is different when compared with the trill-chart in Principes.*
Ut 2 	On la remettra pour le *Si &* l'*Ut naturel*. (V: 14) **Situation ordinaire** **23/0** [/6+/7] Je diray encore touchant l'*Ut naturel* d'en bas, (Note onziéme Planche prémiere) qu'il y a quelques personnes qui le font en bouchant le second, le quatriéme & le cinquiéme trou. Mais cette manière ne me paroît pas bonne, parcequ'en le faisant ainsi il n'est pas assez éloigné de son *Diézis*, & le demi-Ton ne se trouve pas juste. (VII: 22) **[Situation ordinaire]** 2/45 [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *23/56*	**C2** 	[…] you restore again its usual Situation for **B** and **C Natural** (V: 10) **Normal position** **23/0** [/6+/7] I shall further observe concerning **C Natural** below, (Note the 11th. of the first Scale) that some make it by stopping the 2d. 4th. and 5th. holes, but I don't approve of this way, because in making it thus, 'tis not far enough distant from its Sharp, and the Semitone is found false. (VII: 16) **[Normal position]** 2/45 [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *23/56*
Ut Diézis 2 	On tournera ensuite la Flute en dehors, le plus qu'on pourra pour l'*Ut Diézis*. (V: 14) **Tourne la Flute en dehors** **0/0** [/6+/7]	**C#2** 	[…] you must turn the Flute as much outward as possible for **C Sharp** (V: 10) **Outward position** **0/0** [/6+/7]
Ré Bemol 2 	Le *Ré Bemol*, comme l'*Ut Diézis*. On ne sçauroit tourner la Flute trop en dehors, pour ajuster ce demi-Ton. (V: 15) **Tourne la Flute en dehors** **0/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *0/4567*	**D♭2** 	**D Flat**, as **C Sharp**, one can't turn the Flute too much outwards to adjust this Tone. (V: 11) **Outward position** **0/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *0/4567*

Ré 2 	On doit pour lors augmenter le vent; ensorte que le son soit aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il faut. (III: 8) **[Situation ordinaire]** On la remettra pour le *Ré naturel* (V: 14) **Situation ordinaire** **23/456** [/7]	**D2** 	[…] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5) **[Normal position]** […] you must return it for **D Natural** (V: 10) **Normal position** **23/456** [/7]
Ré Diézis 2 	On la remettra pour le *Ré naturel* & *Diézis*. (V: 14) **Situation ordinaire** **123/4567**	**D#2** 	[…] you must return it for **D Natural**, and **Sharp**, (V: 10) **Normal position** **123/4567**
Mi Bemol 2 	Le *Mi Bemol*, se fait comme le *Ré Diézis*. Il faut tourner la Flute en dehors. (V: 16) **Tourne la Flute en dehors** **123/4567**	**E♭2** 	**E Flat** is play'd as **D Sharp**, you must turn the Flute Outwards. (V: 11) **Outward position** **123/4567**
Mi 2 	[…] soutenant le vent toûjours un peu ferme; ainsi que dans les Tons suivants. (III: 8) **[Situation ordinaire]** **123/45** [/7]	**E2** 	[…] blowing stronger, continuing to encrease the wind, also in the following Notes. (III: 5-6) **[Normal position]** **123/45** [/7]

Mi Diézis 2 	*Planche 2me Echelle de toutes les Cadenzes ou tremblements de la Flute Traversiere* **[Tourne la Flute en dedans]** **123/46** [/7]	**E#2** 	*All the Trills or Shakes on the Transverse Flute (Plate 2)* **[Inward position]** **123/46** [/7]
Fa 2 	Il faudra tourner encore sur ce Ton, l'embouchure de la Flute en dedans. (III: 8) **Tourne la Flute en dedans** **123/46** [/7]	**F2** 	[…] yu must also here turn the Flute a little inward, as I told you before in **F** below. (III: 6) **Inward position** **123/46** [/7]
Fa Diézis 2 	On ajustera le *Fa Diézis*, le *Sol naturel* & *Diézis*, comme je l'ay démontré parlant de leur Octave en bas. (V: 14) **[Tourne la Flute en dehors]** **123/47**	**F#2** 	[…] you must adjust **F Sharp**, **G Natural**, and **Sharp** as I shew'd you in their octaves below […] (V: 10) **[Outward position]** **123/47**
Sol Bemol 2 	Le *Sol Bemol*, pourroit aussi se faire comme le *Fa Diézis*, mais il est plus parfaite comme je le démontre dans la Tablature : Pour ajuster, il faut tourner la Flute beaucoup en dedans. Ce demi-Ton est fort peu usité, & ne se rencontre que dans des Tons fort chromatiques, sur lesquels on ne compose guere pour cet Instrument. (V: 16) **Tourne la Flute en dedans** **123/567** [/7]	**G♭2** 	**G Flat** may also be play'd as **F Sharp**, but' tis more perfect to play it as I have shew in the Scale, to adjust it you must turn the Flute very much inwards; this Semitone is seldom used, 'tis never found but in Notes very Chromatic, on which they never Compose Musick for this Instrument. (V: 11) **Inward position** **123/47** [/7] *It should be noted that the standard fingering for* **G♭2** *is different in Rudiments and its fingering-chart when compared with the fingering in Principes.*

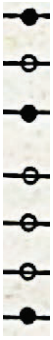
Sol 2 	On doit pour lors remettre l'embouchure dans sa situation. On nous permettra d'observer icy pour les Commençants, qu'à mesure qu'ils monteront sur cette Instrument, ils en trouveront l'embouchure plus difficile; Ainsi pour adoucir les Tons hauts & les former plus facilement, ils auront soins de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent peu à peu. (III: 8) **Situation ordinaire** […] comme je l'ay démontré parlant de leur Octave en bas. (V: 14) **[Situation ordinaire]** **123/0** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *123/7*	**G2** 	[…] returning the Flute outward, to its former situation. I must here inform beginners, that as they ascend on this Instrument, they will find the filling it the more difficult, therefore to sweeten the high Notes, and fill them easily, you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing, by little, and little. (III: 6) **Normal position** […] as I shew'd you in their octaves below (V: 10) **[Normal position]** **123/0** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *123/7*
Sol Diézis 2 	[…] comme je l'ay démontré parlant de leur Octave en bas. (V: 14) **[Tourne la Flute en dedans]** **12/4** [/7] Je commenceray par le *Sol Diézis* enhaut, (Note dix-neuviéme,) quoique je l'aye démontré dans ma Tablature de la maniere la plus simple. Mais comme il est un peut haut en le faisant de cette prémiere façon, on se sert de plusieurs moyens pour le rendre plus bas. 1°. Après avoir bouché le premier, le second & le quatriéme trou, (comme on le voit dans la Tablature) on bouche encore le sixiéme trou, & l'on débouche le septiéme par le moyen de la Clef. […] en l'ajustant par le moyen de l'embouchure, c'est à dire en la tournant en dedans : Il faut aussi observer de ne pas beaucoup lever le Doigt en tremblant. 12/467 2°. On bouche le premier, le second, & le quatriéme trou, & ensuite la moitié du cinquiéme, mais avec discretion. […] en tournant aussi la Flute en dedans. Il y a certains passages où l'on doit faire ce demi-Ton, comme je l'ay démontré dans la Tablature, & cela pour éviter une trop grande difficulté. (VII: 20) 12/4**5** [/7]	**G#2** 	[…] as I shew'd you in their octaves below (V: 10) **[Inward position]** **12/4** [/7] I shall begin with **D Sharp in alt** [*this is a misprint and should be* **G Sharp**], (Note the 19th.) altho I have shew'd in ye Scale the most simple manner of playing it, but as 'tis a little too sharp, when made after that manner; there are several ways used to flatten it. First having stopt the 1st. 2d. and 4th. holes, as you see in the Tablature, you must stop also the 6th. hole, and open the 7th. with the little finger, this way is frequently used […] 12/467 2dly. you stop the first, 2d. and 4th. holes, and afterwards the half of the 5th. but with discretion […] in turning the Flute also inwards, there are certain passages where one ought to make this Semitone as I have shew'd in the Tablature, and that to avoid a very great difficulty. (VII: 14-15) 12/4**5** [/7]

La Bemol 2 	Le *La Bemol*, se forme comme le *Sol Diézis*. (V: 15) **[Tourne la Flute en dedans]** Ce que j'ay dit du *Sol Diézis*, se rapporte aussi au *La Bemol*, (Note trente-neuviéme). (VII: 20) **[Tourne la Flute en dedans]** **12/4** [/7] 12/4**5** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *12/467*	**A♭2** 	**A Flat** is play'd as **G Sharp**. (V: 11) **[Inward position]** What I said on **G Sharp**, may also serve for **A Flat**, (Note the 39th.) (VII: 15) **[Inward position]** **12/457** 12/4**5** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *12/467* *It should be noted that the standard fingering for* **A♭2** *as shown in the fingering-chart in Rudiments probably is a misprint because it does not give the intended note* **A♭2**.
La 2 	[…] en soûtenant toûjours le vent. (III: 8) **[Situation ordinaire]** On remettra la Flute pour le *La naturel* (V: 14) **Situation ordinaire** **12/0** [/6+/7]	**A2** 	**A** is play'd by opening the 3d. hole. (III: 6) **[Situation ordinaire]** […] you return the Flute for **A-la-mi-re Natural** (V: 10) **Normal position** **12/0** [/6+/7]
La Diézis 2 	[…] on la tournera en dedans pour le *La Diéziz*.(On peut encore baisser ce-demi Ton, en ajoutant quelques Doigts, ce que j'ay démontré dans la Planche des Cadences. V: 14) **Tourne la Flute en dedans** **13/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Tourne la Flute en dedans]** *12/4567*	**A#2** 	[…] and turn it inwards for **A Sharp**, you must turn the Flute outwards, you may also make this Semitone somewhat lower, by adding some fingers as I have shew'd in the Scale of shakes (V: 11) **Inward position** **13/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Inward position]** *12/4567*

Si Bemol 2 	Le *Si Bemol*, se fait comme le *La Diézis*: Il faut tourner la Flute en dehors, ce qui fait quelque difference du *Si Bemol* au *La Diézis,* & il faut à quelques Flutes déboucher le septiéme trou pour faciliter ce Ton. (V: 15) **Tourne la Flute en dehors** **13/0** [/6+/7] 13/7 *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Tourne la Flute en dehors]** *12/4567* *12/5*	**B♭2** 	**B Flat** is played as **A Sharp**, you must turn the Flute outwards, which makes some difference between **B Flat** and **A Sharp** you must on some Flutes open the 7th. hole to facilitate this Note. (V: 11) **Outward position** **13/0** [/6+/7] 13/7 *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Outward position]** *12/4567* *12/5*
Si 2 	On la remettra pour le *Si* & *Ut naturel*. (V: 15) **Situation ordinaire** **1/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *1/7* *1/456*	**B2** 	[…] you restore again its usual situation for **B** and **C Natural** (V: 10) **Normal position** **1/0** [/6+/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *1/7* *1/456*
Si Diézis 2	*Additional fingerings from Fingering-charts for trills and Chapter VII* **[Tourne la Flute en dehors]** *2/4567* *23/4567*	**B#2**	*Additional fingerings from Fingering-charts for trills and Chapter VII* **[Outward position]** *2/4567* *23/4567*

Ut 3  	L'*Ut* se forme, en debouchant le premier trou, & en rébouchant le deuxiéme, le quatriéme & le cinquiéme. **2/45** [/6+/7] Ce Ton est un peu délicat à ajuster, car il y a des Flutes où il est haut, & d'autres où il est bas. L'expedient dont on peut se servir pour le baisser, c'est d'adoucir & de tourner la Flute en dedans. Si cela ne suffit pas, il faut boucher le sixiéme trou à demi sans rien changer aux autres: 2/456 […] ou bien le faire comme je l'ay démontré dans ma Tablature, (Note trente-cinquiéme.) **2/4567** Au contraire, si l'on remarque que ce Ton soit trop bas, en le faisant de la prémiere maniere que je l'ay expliqué, on observera de ne boucher que le troisiéme, le cinquiéme & le sixiéme trou. (III: 8-9) 3/56 [/7] **Situation ordinaire** ou **Tourne la Flute en dedans** On la remettra pour […] le *Ut naturel* (V: 15) **Situation ordinaire** *Additional fingerings from Fingering-charts for trills and Chapter VII* *23/4567*	**C3** 	**C** by opening the first hole and stopping the 2d. 4th. and 5th. **2/45** [/6+/7] […] this tone is somewhat difficult to adjust, for there are some Flutes whereon 'tis high, on others 'tis low, the method then to lower it is by turning the Flute somewhat inwards, if that wont suffice, you must also stop the 6th. hole without any other alteration, or else make it as I shew in my Scale (Note the 35th.) 2/456 […] on the contrary if this tone be already too flat, as I make it the first time (Note the 2d.) [should be note 23] you must observe to stop only the 3d. 5th. and 6th. holes. (III: 6) 3/56 [/7] **Normal position** or **Inward position** *It should be noted that Rudiments do not indicate that the sixth hole should be only partly covered as explained in Principes.* […] you return it for […] **C Natural** (V: 10) **Normal position** *Additional fingerings from Fingering-charts for trills and Chapter VII* *23/4567*
Ut Diézis 3 	Et on la tournera en dehors pour *l'Ut Diézis*. (V: 15) **Tourne la Flute en dehors** **0/4567** L'*Ut Diézis* sans tremblement se peut faire aussi en bouchant le troisiéme & le quatriéme trou, & laissant les autres débouchez. (VII: 21) **[Tourne la Flute en dedans]** 3/47 *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Tourne la Flute en dehors]** *0/46* *23/47*	**C#3** 	[…] and turn it outward for **C Sharp**. (V: 10) **Outward position** **0/4567** **C Sharp** without a shake, may also be play'd by stopping the 3d. and 4th. holes, and leaving the rest open, **D Flat** is made the same way. (VII: 15). **[Inward position]** 3/47 *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Outward position]** *23/46* *23/47*

Ré Bemol 3 	Le *Ré Bemol,* se pourroit faire aussi comme l'*Ut Diézis*: mais il est plus parfait de la manière que je démontre dans la Tablature. (V: 15) **Tourne la Flute en dehors** **23/467** 0/4567 L'*Ut Diézis* sans tremblement se peut faire aussi en bouchant le troisiéme & le quatriéme trou, & laissant les autres débouchez. Le *Ré Bemol* se fait de même. (VII: 21) **[Tourne la Flute en dedans]** 3/47	**D♭3** 	**D Flat** may be made as **C Sharp**, but 'tis more perfect to play it as I shew in the Scale. (V: 11) **Outward position** **0/4567** **C Sharp** without a shake, may also be play'd by stopping the 3d, and 4th. holes, and leaving the rest open, **D Flat** is made the same way. (VII: 15) **[Inward position]** 3/47 *It should be noted that the standard fingering for* **D♭3** *is different in Rudiments and its fingering-chart when compared with the fingering in Principes.*
Ré 3 	Il faut forcer un peu le vent, & serrer les Levres. (III: 9) **[Situation ordinaire]** **23/456** [/7] **23/46** On remettre la Flute pour le *Ré naturel* & *Diézis,* à moins qu'ils ne fussent trop bas, comme ils le sont à quelques Flutes: En ce cas, il faudroit la tourner toûjours en dehors. Ces Tons hauts sont difficiles à ajuster; il faut pour cela de l'oreille & de la pratique. (V: 15) **Situation ordinaire** ou **Tourne la Flute en dehors** *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Tourne la Flute en dehors]** *23/7*	**D3** 	[…] you must force the wind a little more, and close the lips. (III: 6) **[Normal position]** **23/456** [/7] […] you return it for **D Natural** and **D Sharp**, unless it be too low, as it is on some Flutes; in this case you must always turn it outward; these high Tones are difficult to adjust, you must chiefly rely on your Ear and Practice. (V: 10) **Normal position** or **Outward position** *Additional fingerings from Fingering-charts for trills and Chapter VII* **[Outward position]** *23/7* *23/46*
Ré Diézis 3 	On remettre la Flute pour le *Ré naturel* & *Diézis,* à moins qu'ils ne fussent trop bas, comme ils le sont à quelques Flutes: En ce cas, il faudroit la tourner toûjours en dehors. Ces Tons hauts sont difficiles à ajuster; il faut pour cela de l'oreille & de la pratique. (V: 15) **Situation ordinaire** ou **Tourne la Flute en dehors** **123/567**	**D#3** 	[…] you return it for **D Natural** and **D Sharp**, unless it be too low, as it is on some Flutes; in this case you must always turn it outward; these high Tones are difficult to adjust, you must chiefly rely on your Ear and Practice. (V: 10) **Normal position** or **Outward position** **23/567** *It should be noted that the standard fingering for* **D#3** *is different in Rudiments and its tablature when compared with Principes.*

Mi Bemol 3 	*Mi Bemol,* se raporte au *Ré Diéziz.* (V: 15) **[Situation ordinaire** ou **Tourne la Flute en dehors]** *Mi Bemol*, On doit forcer le vent […] (VII: 22) **[Tourne la Flute en dehors]** **123/567**	**E♭3** 	**E Flat**, and **D Sharp** are the same (V: 11) **[Normal position** or **Outward position]** **E Flat** […] you ought to force the wind (VII: 16) **[Outward position]** **123/567**
Mi 3 	Remarquez que le septiéme trou se débouche, en appuyant le petit Doigt sur la Clef. Il faut continuër à forcer le vent. (III: 9) **[Tourne la Flute en dehors]** On doit aussi tourner l'embouchure en dehors pour le *Mi,* & bien soûtenir le vent. (V: 15) **Tourne la Flute en dehors** **12/567**	**E3** 	[…] observe the 7th. hole is open'd by pressing the little finger on the key, you must continue also to blow strong. (III: 6) **[Outward position]** You must also turn the Flute outward for **E-la-mi**, and blow pretty Sharp. (V: 10) **Outward position** **12/567**
Fa 3	[…] en donnant le vent fort aigu. Au reste, je ne l'ay point démontré dans ma prémiere Planche, parcequ'il n'est pas proprement un Ton sur lequel on puisse compter. (III: 9-10) **[Situation ordinaire]** **12/457**	**F3**	[…] and blowing very Sharp; yet I have not inserted it in my Scale, be reason 'tis not a Note on which we may depend. (III: 7) **[Normal position]** **12/457**
Fa Diézis 3 	Le *Fa Diézis* se fait plus aisement: Il faut boucher tous les trous excepté le deuxiéme. (III: 10) **[Situation ordinaire]** **13/456** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *13/45*	**F#3** 	**F-fa-ut Sharp** is made easier, you must stop all the holes except ye 2d. (III: 7) **[Normal position]** **13/456** [/7] *Additional fingerings from Fingering-charts for trills and Chapter VII* *13/45*
Sol 3 	Le *Sol* se fait, en bouchant le prémier & le troisiéme trou, & en débouchant tous les autres. (III: 10) **[Situation ordinaire]** **13/0** [/7] *In the text Hotteterre explained that all tone-holes apart from the first and third should be opened which could be understood as that the* **D#-sharp key** *should be opened as well, but in the fingering-chart is the fingering 13/0 given which is more functional.*	**G3** 	**G-sol**. is made by stopping the first and 3d. holes, and opening all the rest. (III: 7) **[Normal position]** **13/46** [/7] *Here Rudiments follows Principes and that the* **D#-sharp key** *should be opened when playing* **G3**. *The fingering for* **G3** *as shown in Rudiments possibly could be understood as a misprint.*

5.2 Fingerings for *Tremblements—Shakes* based on *Echelle de tous les Echelle de toutes les Cadences ou Tremblements de la Flûte Traversiere—A SCALE of all the Beats or Shakes* including comments and suggestions from *Chapter IV* and *VI* (Fig. 11 & 12)

Il seroit superflu d'expliquer toutes les Cadences l'une après l'autre, puisque l'on voit une Démonstration assez intelligible dans la second Planche, & que l'on doit sçavoir déja tous les Tons dont elles sont composées. On se servira donc pour ces Cadences des mêmes Regles que j'ay données pour la prémiere, l'on observera exactement les differentes positions de mains, que l'on voit démontrées par la Tablature. (IV: 11)	[…] 'twould be needless to explain all the shakes one after another, since you have a demonstration intelligible enough in the Scale and since you ought already to know all the Notes which compose them, you must observe then the same rules throughout all the shakes, as I gave you for ye first […] (IV: 8)
Au reste je n'ay point parlé de la maniere d'ajuster les Cadences; Ce ne seroit qu'une répetition de ce que j'ay déja expliqué touchant les Tons simples, vû que ces Cadences sont composes de ces mêmes Tons. Je diray seulement qu'il y en a quelques unes qu'il faut commencer en tournant l'embouchure en dedans, & finir en tournant l'embouchure en dehors: telle est la Cadence du *Fa Diézis*, prise du *Sol Diéziz*, parceque les deux Tons qui la composent, doivent estre ajustez differemment. Il y en a d'autres où il faut observer tout le contraire, ce que l'on connoîtra par les explications que j'ay données sur tous les Tons, Chapitre III & V. Avec ces explications, & les démonstrations que l'on voit dans la seconde Planche, on pourra facilement aprendre à faire toutes les Cadences. (VI: 19)	I have not yet spoke of the manner of adjusting the Cadences, or Shakes, this wou'd be but a repetition of what I have already said concerning the Simple Notes, since that these Cadences are Compos'd of the same Notes, I shall only tell you, that there are some of them which must be begun by turning the Flute inwards, and ended by turning it out; such is the shake on **F Sharp**, taken from **G Sharp**, because the two Tones which compose this Shake are to be differently adjusted; there are others in which you must observe the quite contrary, which you'll know by the Explication already given on all the Notes, Chap. ye 3d. & 5th. By these Explications, and the demonstrations given in the 2d. Scale, You may easily learn all the Shakes, you'll find some which are begun by stopping the hole on which you ought to shake, and which ends in opening the same hole, Such is the Shake on **C**, (the 11th. Note) of which I have already spoke, Chap. the 4th. you may know this difference by the dotts in this example of **C**, the black dott goes before the white one, which is contrary to the rest. (VI: 13-14)

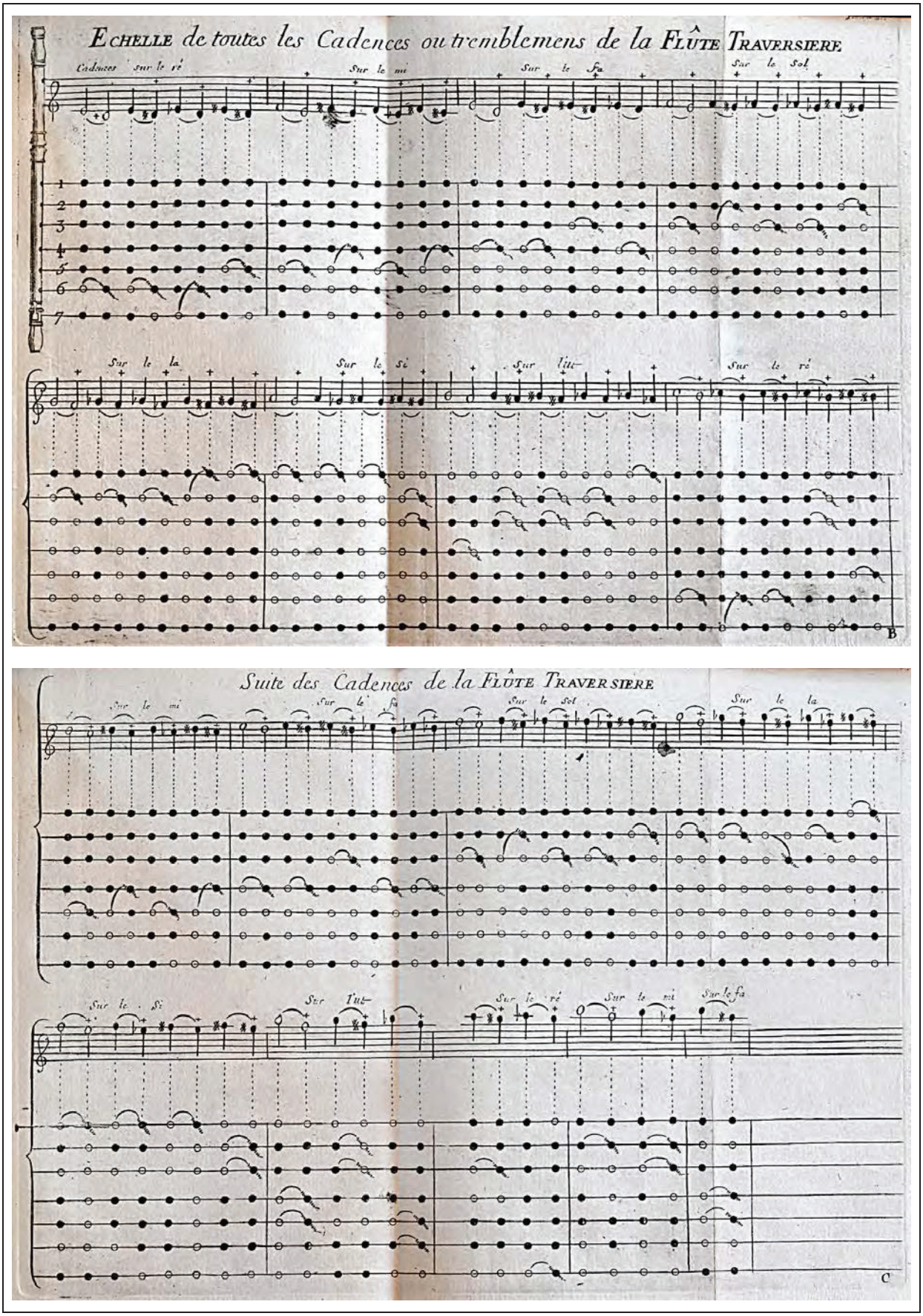


Figure 11 *Planche 2me* with the fingering-chart with all *Cadences ou tremblemens* from *Principes* (1707/1722). (Private Collection)

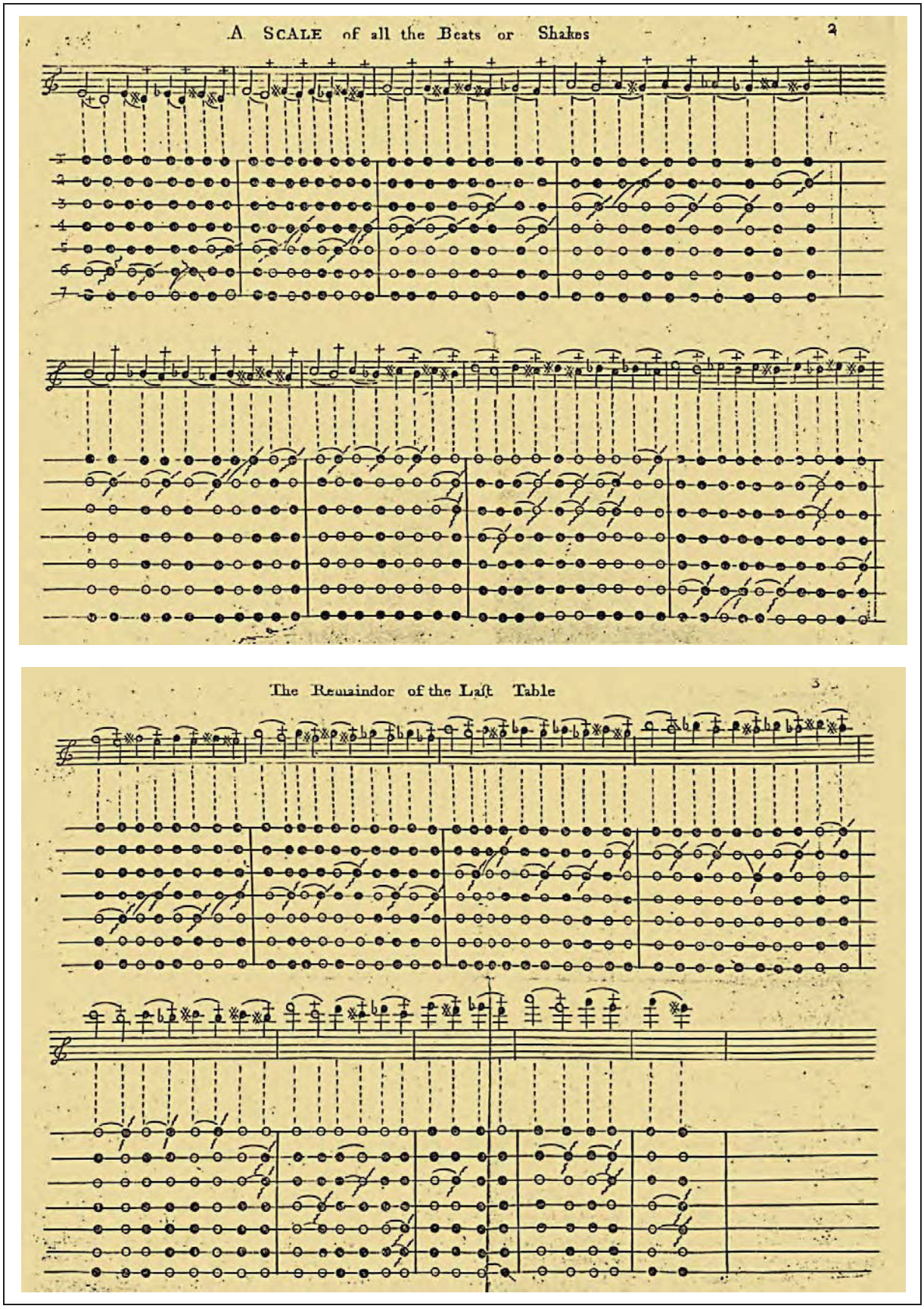
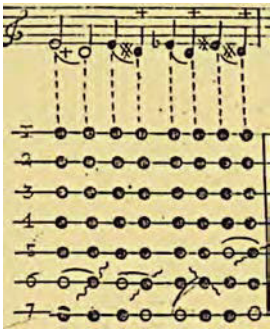
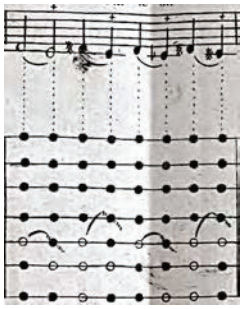
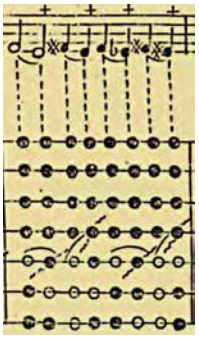


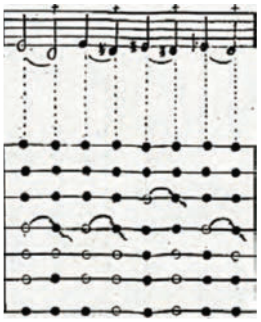
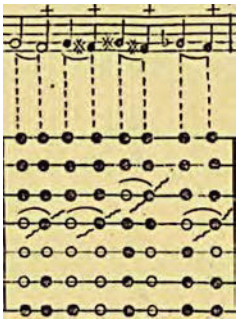
Figure 12 The fingering-chart *Plate 2* from *Rudiments*: *A SCALE with all the Beats and Shakes* (1729). (Private Collection)

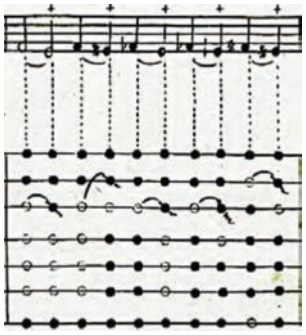
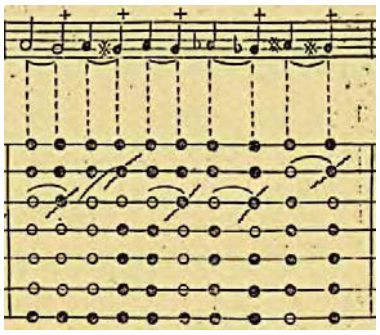
Principes	*Rudiments*

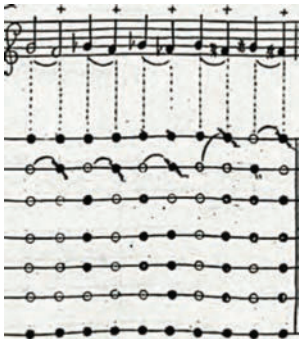
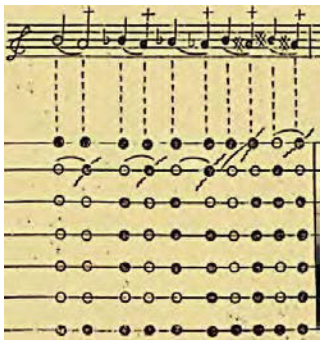
Cadences sur le Ut Diézis 1		**Shakes on C#1**	
Je n'ay point démontré l'*Ut Diézis* enbas, dans ma Tablature, parce que ce-demi-Ton, ne faisant que part artifice, n'a point de position de main particuliere, On le fait comme le *Ré*, (Note premiere) en bouchant tous les trous; on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton; & l'on fait le tremblement comme sur le *Ré*. (V: 16-17)		I have not in the Scale shew'd **C Sharp**, the lowest Note of all, because this Semitone requires no particular placing of the fingers, different from **D** the first Note, but is play'd by Artifice (Viz.) by turning the Flute inwards, sufficiently to lower the Sound by half a Note, and 'tis shook upon **D**, the first Note. (V: 12)	
Ré-Ut Diézis	123/456 **123/45(6)** **Tourne la Flute en dedans**	**D1-C#1**	123/456 **123/45(6)** **Inward position**
Ré Diézis-Ut Diézis	123/4567 **123/45(6)7** **Tourne la Flute en dedans**	**D#1-C#1**	123/4567 **123/45(6)7** **Inward position**

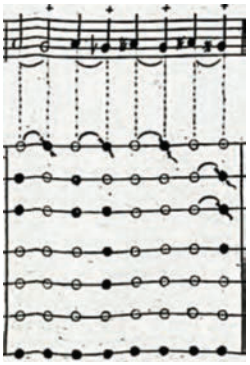
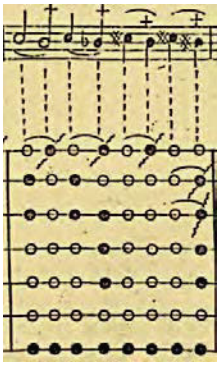
Cadences sur le Ré 1, Ré Diézis 1		**Shakes on D1, D#1**	
			
Mi-Ré	123/45 **123/45(6)** **Situation ordinaire**	**E1-D1**	123/45 **123/45(6)** **Normal position**
Mi-Ré Diézis	123/45 **123/45(6)7** **Situation ordinaire**	**E1-D#1**	123/45 **123/45(6)7** **Normal position**
Mi Bemol-Ré	123/4567 **123/45(6)** **Situation ordinaire**	**E♭1-D1**	123/4567 **123/45(6)** **Normal position**
Mi Diézis-Ré Diézis	123/46 **123/4(5)67** **Tourne la Flute en dedans**	**E#1-D#1**	123/46 **123/4(5)67** **Inward position**

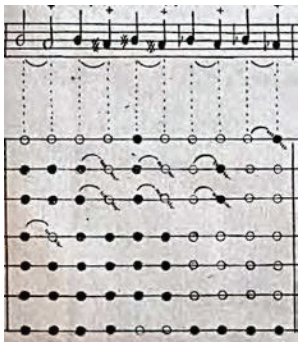
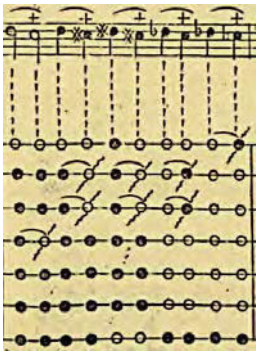
Cadences sur le Mi 1, Mi Bemol 1, Mi Diézis 1		Shakes on E1, E♭1, E#1	
			
Fa-Mi	123/46 **123/4(5)** **Tourne la Flute en dedans**	**F1-E1**	123/46 **123/4(5)** **Inward position**
Fa Diézis-Mi	123/47 **123/(4)5** **Tourne la Flute en dedans**	**F#1-E1**	123/47 **123/(4)5** **Inward position**
Fa-Mi Bemol	123/46 **123/4(5)67** **Tourne la Flute en dedans**	**F1-E♭1**	123/46 **123/4(5)67** **Inward position**
Fa Diézis-Mi Diézis	123/47 **123/(4)6** **Tourne la Flute en dedans**	**F#1-E#1**	123/47 **123/(4)6** **Inward position**

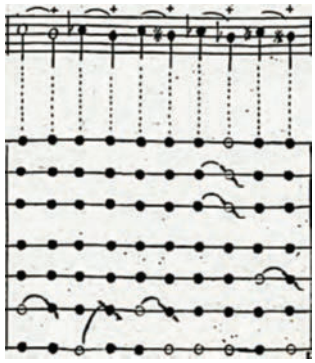
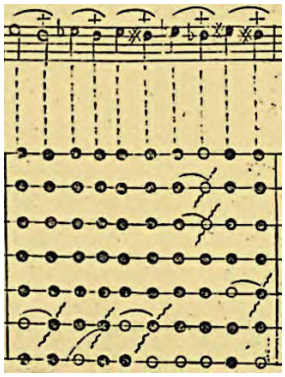
Cadences sur le Fa 1, Fa Diézis 1		Shakes on F1, F#1	
			
Sol-Fa	123/0 **123/(4)6** **Situation ordinaire**	**G1-F1**	123/0 **123/(4)6** **Normal position**
Sol-Fa Diézis	123/0 **123/(4)7** **Tourne la Flute en dehors**	**G1-F#1**	123/0 **123/(4)7** **Outward position**
Sol Diézis-Fa Diézis	12/456 **12(3)/47** **Tourne la Flute en dedans**	**G#1-F#1**	12/456 **12(3)/47** **Inward position**
Sol Bemol-Fa	123/56 **123/(4)6** **Tourne la Flute en dedans**	**G♭1-F1**	123/56 **123/(4)6** **Inward position**

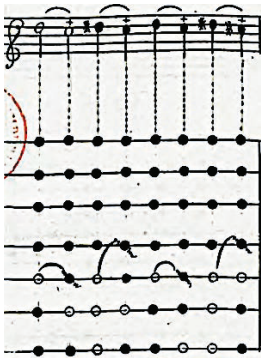
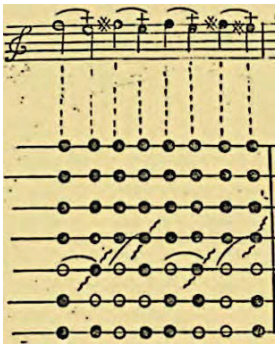
Cadences sur le Sol 1, Sol Diézis 1, Sol Bemol 1 		Shakes on G1, G#1, Gb1 	
La-Sol	12/0 **12(3)/0** **Situation ordinaire**	**A1-G1**	12/0 **12(3)/0** **Normal position**
La-Sol Diézis	12/0 **1(2)/456** **Tourne la Flute en dedans**	**A1-G#1**	12/0 **1(2)/456** **Inward position**
La Bemol-Sol	12/456 **12(3)/0** **Tourne la Flute en dedans**	**Ab1-G1**	12/456 **12(3)/0** **Inward position**
La Bemol-Sol Bemol	12/456 **12(3)/56** **Tourne la Flute en dedans**	**Ab1-Gb1**	12/456 **12(3)/56** **Inward position**
La Diézis-Sol Diézis	13/4567 **1(2)/456** **Tourne la Fluteen dedans**	**A#1-G#1**	13/4567 **1(2)/456** **Inward position**

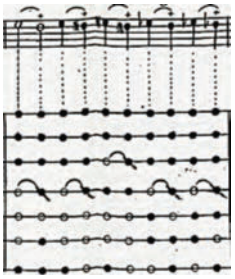
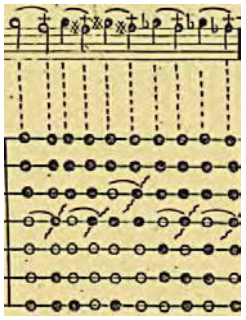
Cadences sur le La 1, La Bemol 1, La Diézis 1 		Shakes on A1, Ab1, A#1 	
Si-La	1/0 **1(2)/0** **Situation ordinaire**	**B1-A1**	1/0 **1(2)/0** **Normal position**
Si Bemol-La	13/45 **1(2)/0** **Tourne la Flute en dedans**	**Bb1-A1**	13/45 **1(2)/0** **Inward position**
Si Bemol-La Bemol	13/45 **1(2)/456** **Tourne la Flute en dedans**	**Bb1-Ab1**	13/45 **1(2)/456** **Inward position**
Si-La Diézis	1/0 **(1)3/456** **Tourne la Flute en dedans**	**B1-A#1**	1/0 **(1)3/456** **Inward position**
Si Diézis-La Diézis	23/4 **(1)3/456** **Tourne la Flute en dedans**	**B#1-A#1**	23/4 **(1)3/456** **Inward position**

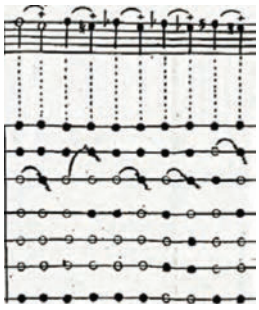
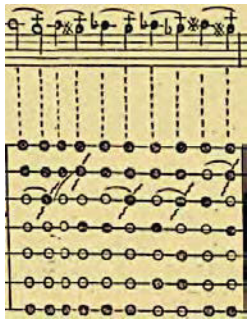
Cadences sur le Si 1, Si Bemol 1, Si Diézis 1 		Shakes on B1, B♭1, B#1 	
Ut-Si	23/0 **(1)/0** **Tourne la Flute en dedans**	**C2-B1**	23/0 **(1)/0** **Inward position**
Ut-Si Bemol	23/0 **(1)3/45** **Tourne la Flute en dedans**	**C2-B♭1**	23/0 **(1)3/45** **Inward position**
Ut Diézis-Si	0/0 **(1)/0** **Tourne la Flute en dehors**	**C#2-B1**	0/0 **(1)/0** **Outward position**
Ut Diézis-Si Diézis	0/0 **(23)/4** **Tourne la Flute en dehors**	**C#2-B#1**	0/0 **(23)/45** **Outward position**

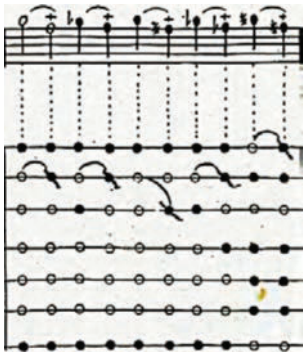
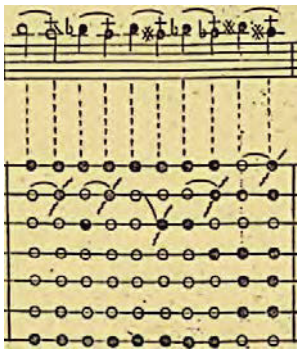
Cadences sur le Ut 2, Ut Diézis 2, Ut Bemol 2 		Shakes on C2, C#2, C♭2 	
Ré-Ut	23/456 **23/(4)56** **Situation ordinaire**	**D2-C1**	23/456 **23/(4)56** **Normal position**
Ré-Ut Diézis	23/456 **(23)/456** **Situation ordinaire**	**D2-C#2**	23/456 **(23)/456** **Normal position**
Ré Diézis-Ut Diézis	123/4567 **(23)/4567** **Tourne la Flute en dehors**	**D#2-C#2**	123/4567 **(23)/4567** **Outward position**
Ré Bemol-Ut	0/0 **(23)/0** **Tourne la Flute en dehors**	**D♭2-C2**	0/0 **(23)/0** **Outward position**
Ré Bemol-Ut Bemol	0/0 **(1)/0** **Tourne la Flute en dehors**	**D♭2-C♭2**	0/0 **(1)/0** **Outward position**

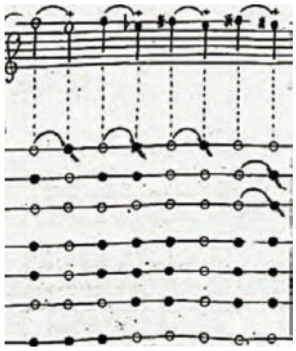
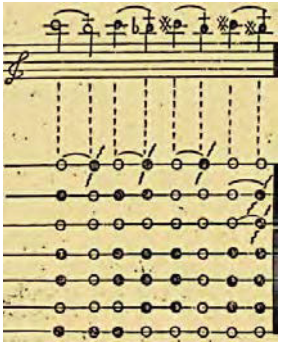
Cadences sur le Ré 2, Ré Diézis 2, Ré Bemol 2		Shakes on D2, D#2, Db2	
			
Mi-Ré	123/45 **123/45(6)** **Situation ordinaire ou Tourne la Flute en dehors**	**E2-D2**	123/45 **123/45(6)** **Normal position or Outward position**
Mi Bemol-Ré	123/4567 **123/45(6)** **Tourne la Flute en dedans**	**Eb2-D2**	123/4567 **123/45(6)** **Inward position**
Mi-Ré Diézis	123/45 **123/45(6)7** **Situation ordinaire**	**E2-D#2**	123/45 **123/45(6)7** **Normal position**
Mi Bemol-Ré Bemol	123/4567 **(23)/4567** **Tourne la Flute en dehors**	**Eb2-Db2**	123/4567 **(23)/4567** **Outward position**
Mi Diézis-Ré Diézis	123/46 **123/4(5)67** **Tourne la Flute en dedans**	**E#2-D#2**	123/46 **123/4(5)67** **Inward position**

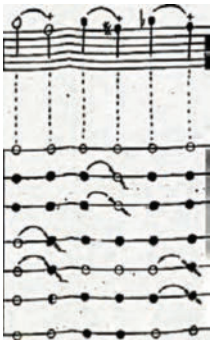
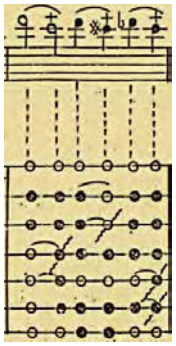
Cadences sur le Mi 2, Mi Bemol 2, Mi Diézis 2		Shakes on E2, Eb2, E#2	
			
Fa-Mi	123/46 **123/4(5)** **Tourne la Flute en dedans**	**F2-E2**	123/46 **123/4(5)** **Inward position**
Fa Diézis-Mi	123/47 **123/(4)5** **Tourne la Flute en dedans**	**F#2-E2**	123/47 **123/(4)5** **Inward position**
Fa-Mi Bemol	123/46 **123/4(5)67** **Tourne la Flute en dedans**	**F2-Eb2**	123/46 **123/4(5)67** **Inward position**
Fa Diézis-Mi Diézis	123/47 **123/(4)6** **Tourne la Flute en dedans**	**F#2-E#2**	123/47 **123/(4)6** **Inward position**

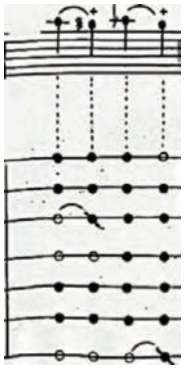
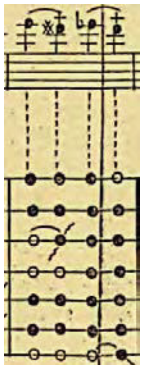
Cadences sur le Fa 2, Fa Diézis 2, Fa Bemol 2 		Shakes on F2, F#2, Fb2 	
Sol-Fa	123/0 **123/(4)6** **Situation ordinaire**	**G2-F2**	123/0 **123/(4)6** **Normal position**
Sol-Fa Diézis	123/0 **123/(4)7** **Situation ordinaire**	**G2-F#2**	123/0 **123/(4)7** **Normal position**
Sol Diézis-Fa Diézis	12/4 **12(3)/47** Il faut commencer en tournant l'embouchure en dedans ; & finir en tournant l'embouchure en dehors (VI : 19)	**G#2-F#2**	12/4 **12(3)/47** Begin by turning the Flute inwards, and ended by turning it out; Such is the Shake on **F Sharp**, taken from **G Sharp** (VI: 13)
Sol Bemol-Fa	123/567 **123/(4)6** **Tourne la Flute en dedans**	**Gb2-F2**	123/567 **123/(4)6** **Inward position**
Sol Bemol-Fa Bemol	123/567 **123/(4)5** **Tourne la Flute en dedans**	**Gb2-Fb2**	123/567 **123/(4)5** **Inward position**

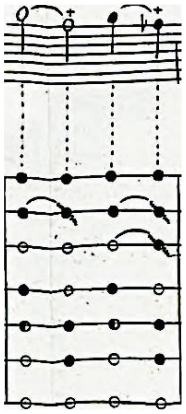
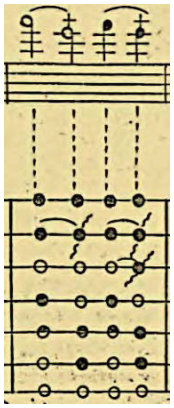
Cadences sur le Sol 2, Sol Diézis 2, Sol Bemol 2 		Shakes on G2, G#2, Gb2 	
La-Sol	12/0 **12(3)/0** **Situation ordinaire**	**A2-G2**	12/0 **12(3)/0** **Normal position**
La-Sol Diézis	12/0 **1(2)/4** **Tourne la Flute en dedans**	**A2-G#2**	12/0 **1(2)/4** **Inward position**
La Bemol-Sol	12/4 **12(3)/0** **Tourne la Flute en dedans**	**Ab2-G2**	12/4 **12(3)/0** **Inward position**
La Bemol-Sol Bemol	12/467 **12(3)/567** **Tourne la Flute en dedans**	**Ab2-Gb2**	12/467 **12(3)/567** **Inward position**
La Diézis-Sol Diézis	13/0 **1(2)/4** **Tourne la Flute en dedans**	**A#2- G#2**	13/0 **1(2)/4** **Inward position**

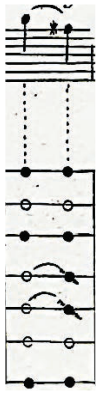
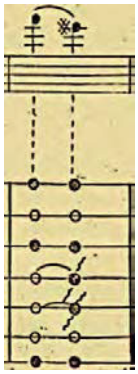
Cadences sur le La 2, La Diézis 2, La Bemol 2 		Shakes on A2, A#2, A♭2 	
Si-La	1/0 **1(2)/0** **Situation ordinaire**	**B2-A2**	1/0 **1(2)/0** **Normal position**
Si Bemol-La	13/0 **1(2)/0** **Tourne la Flute en dedans**	**B♭2-A2**	13/0 **1(2)/0** **Inward position**
Si-La Diézis	1/0 **1(3)/0** **Situation ordinaire**	**B2-A#2**	1/0 **1(3)/0** **Normal position**
Si Bemol-La Bemol	13/0 **1(2)/4** **Tourne la Flute en dedans**	**B♭2-A♭2**	13/0 **1(2)/4** **Inward position**
Si Diézis-La Diézis	2/4567 **(1)2/4567** **Situation ordinaire**	**B#2-A#2**	2/4567 **(1)2/4567** **Normal position**

Cadences sur le Si 2, Si Bemol 2, Si Diézis 2 		Shakes on B2, B♭2, B#2 	
Ut-Si	2/45 **(1)/0** **Tourne la Flute en dedans**	**C3-B2**	2/45 **(1)/0** **Inward position**
Ut-Si Bemol	2/45 **(1)2/4567** **Situation ordinaire**	**C3-B♭2**	2/45 **(1)2/4567** **Normal position**
Ut Diézis-Si	0/4567 **(1)/7** **Situation ordinaire**	**C#3-B2**	0/4567 **(1)/7** **Normal position**
Ut Diézis-Si Diézis	0/4567 **(23)/4567** **Tourne la Flute en dedans**	**C#3-B#2**	0/4567 **(23)/4567** **Inward position**

Cadences sur le Ut 3, Ut Diézis 3		Shakes on C3, C#3	
			
Ré-Ut	23/7 **23/(45)67** **Situation ordinaire**	**D3-C3**	23/7 **23/(45)67** **Normal position**
Ré-Ut Diézis	23/46 **(23)/46** **Situation ordinaire**	**D3-C#3**	23/46 **(23)/46** **Normal position**
Ré Bemol-Ut	23/467 **23/4(56)7** **Situation ordinaire**	**Db3-C3**	23/467 **23/4(56)7** **Normal position**

Cadences sur le Ré 3, Re Diézis 3		Shakes on D3, D#3	
			
Mi-Ré Diézis	12/567 **12(3)/567** **Tourne la Flute en dehors**	**E3-D#3**	12/567 **12(3)/567** **Outward position**
Mi Bemol-Ré	123/4567 **23/456(7)** **Situation ordinaire**	**Eb3-D3**	123/4567 **23/456(7)** **Normal position**

Cadences sur le Mi 3, Mi Bemol 3		Shakes on E3, E♭3	
			
F-Mi	12/4**5**7 **1(2)/567**	**F3-E3**	12/4**5**7 **1(2)/567**
Fa-Mi Bemol	12/4**5**7 **1(23)/567**	**F3-E♭3**	12/4**5**7 **12(3)/567**

Cadence sur le Fa Diézis 3		Shake on F#3	
			
Sol-Fa Diézis *It should be noted that the notation of the notes G3-F#3 is not correct in the fingering-chart, but the fingerings given easily makes a perfect trill G3-F#3.*	13/0 **13/(45)** **Situation ordinaire**	**G3-F#3** *It should be noted that the notation of the notes G3-F#3 is not correct in the fingering-chart, but the fingerings given easily makes a perfect trill G3-F#3.*	13/0 **13/(45)** **Normal position**

Trills and concepts regarding semi-tone and whole-tone intervals

In *Principes* and *Rudiments* is about eighty fingerings indicated for trills having the standard interval of a semi-tone or a whole-tone, whereby some trills have several alternative fingerings. Regarding the intervals generated by given fingerings some fingerings does not sound with the distinct intervals of the semi-tone or whole-tone step sometimes being wider, sometimes narrower, and in some cases generates microtonal intervals. The German Traverso virtuoso Karl Kaiser has described this phenomenon in an enlightening manner:

> Bei den Trillern favorisiert Hotteterre durchwegs große Trillerintervalle, ein Umstand, der für „moderne" Ohren häufig zunächst sehr fremd klingt. Abgesehen von den Fällen, bei denen es gar keine Alternative gibt, hängt die Präferenz für (zu) große Trillerintervalle damit zusammen, dass bei Trillern der Grundton dominant sein sollte. […] Mit „modernen" Ohren müssten es aber kleine oder große Sekunden sein. Abgeschwächt wird diese exotisch anmutende Spielweise durch sehr kleine Fingerbewegungen und Pianospiel, wodurch die Exzentrik der Tonkombinationen diskret gemildert wird. (Kaiser, 2014, 51)[1]

An enlightening example are the trills E♭1-D1 and E♭2-D2 which are easily played with a perfect half-tone interval on the three-piece as on a four-piece Traverso due to the D#-key and the fingering 123/456(7) in both octaves, still the fingering given in *Principes* and *Rudiments* are for both octaves 123/45(6). The fingering suggested by Hotteterre generates an interval almost close the whole-tone step D-E in both octaves even when turning the head-joint in the *Inward*-position. When comparing fingerings for mentioned two trills in *Principes* and *Rudiments* with later fingering-charts such as Corrette (1735 & 1773), Mahaut (1759), and Bailleux (1765) is the same fingerings shown. Whereas De Lusse (*c.*1761) gives the fingering 123/456(7) for E♭1-D1, and 23/456(7) for E♭2-D2 which generates a perfect half-tone step E♭-D in both octaves. Devienne (*c.*1794) gives the same fingering 23/456(7) for E♭2-D2 which generates a perfect half-tone step (Appendix XXII). Interestingly enough is the trill E♭3-D3 when played with the fingerings as found in *Principes* and *Rudiments* giving a perfect half-tone interval, although it would be possible to make a trill having an interval resembling the two lower octaves. Generally, most trills in the high register are easy to play with half- and whole-tone intervals with the fingerings given in *Principes* and *Rudiments*. Anyhow, the conclusion drawn by Kaiser (2014) that fingerings for trills as found in *Principes* does not necessarily aim for perfect semi-tone or whole-tone intervals definitely makes sense. Further that a change of aesthetics has taken place in the second part of the 18th Century, possibly influenced by an endeavour to "normalize" trills as to how they sound on a harpsichord and the violin, which was a one of the reasons to gradually add more keys, and the culmination was the construction of the Boehm-flute in 1847.

*

Regarding the following three trills based on the whole-tone interval they tend to sound like a too wide whole-tone step when using the fingerings including suggested positions of the head-joint as explained in *Principes* and *Rudiments* (Fig. 13).

Trills indicated as a whole-tone step	Fingerings	Head-joint position	Sounding like a too wide whole-tone step
F#1-E1	123/47 **123/(4)5**	**Inward position**	**F#1 very sharp-E1**
G#1-F#1	12/456 **12(3)/47**	**Inward position**	**G#1 very sharp-F#1**
F#2-E2	123/47 **123/(4)5**	**Inward position**	**F#2 very sharp-E2**

Figure 13 Trills in whole-tone steps tending to sound like a too wide whole-tone step.

1. For the trills, Hotteterre consistently favours large trill-intervals, a circumstance that often initially sounds strange to "modern" ears. Apart from the cases where there is no alternative, the preference for (too) large trill intervals are related to the fact that trills should be dominated by the main note. […] But with "modern" ears it should not be semi-tone or whole-tone intervals. This seemingly exotic way of playing is softened by very small finger movements and playing in soft nuances, which discreetly softens the eccentricity of the tone combinations of the trills. (Kaiser, *Jacques Martin Hotteterre Principes de la Flûte Paris 1707 kommentierte Übersetzung mit Grifftabellen für Traverso, Blockflöte und Oboe*, 2014, 51).

Among trills in semi-tone steps are twelve in reality—when using the fingerings given in *Principes* and *Rudiments*—sounding close to almost a whole-tone interval also when using *Out-* or *Inward*-positions of the head-joint as suggested by Hotteterre (Fig. 14):

Trills indicated as a semi-tone interval	**Fingerings**	**Head-joint position**	**Sounding close to a whole-tone interval**
E♭1-D1	123/4567 **123/45(6)**	**Normal position**	**E1-D1**
F1-E1	123/46 **123/4(5)**	**Inward position**	**F#1-E1**
F#1-E#1	123/47 **123/(4)6**	**Inward position**	**G1-E#1**
G♭1-F1	123/56 **123/(4)6**	**Inward position**	**G1-F1**
A♭1-G1	12/456 **12(3)/0**	**Inward position**	**A1-G1**
A1-G#1	12/0 **1(2)/456**	**Inward position**	**A#1-G#1**
E♭2-D2	123/4567 **123/45(6)**	**Inward position**	**E2-D2**
F#2-E#2	123/47 **123/(4)6**	**Inward position**	**G2-E#2**
A♭2-G2	12/4 **12(3)/0**	**Inward position**	**A2-G2**
A2-G#2	12/0 **1(2)/4**	**Inward position**	**A#2-G#2**
B♭2-A2	13/0 **1(2)/0**	**Inward position**	**B2-A2**
C3-B2	2/45 **(1)/0**	**Inward position**	**C#3-B2**

Figure 14 Trills in semi-tone intervals sounding close to whole-tone intervals.

5.3 Additional fingerings for *Tremblement—Shakes* for A2-G#2, C#3-B2, C3-B♭2, B2-A#2, D3-C#3, and E♭3-D3 as described in *Chapter VII*

Notes	*Principes*	*Rudiments*	Fingerings
La-Sol Diézis **A2-G#2**	1°. Après avoir bouché le prémier, le second & le quatriéme trou, (comme on le voit dans la Tablature) on bouche encore le sixiéme trou, & l'on débouche le septiéme par le moyen de la Clef. Cette maniere est assez en usage, & mesme quelques personnes font la Cadence du quatriéme & du sixiéme Doigt en même tems; mais elle n'est pas bien articulée, parcequ'il est difficile qu'une Cadence faite de deux Doigt si éloignez l'un de l'autre puisse estre bien distincte. Je serois donc d'avis que l'on empruntât toûjours la Cadence du second Doigt, comme je l'ay démontrée dans la planche des Cadences; en l'ajustant par le moyen de l'embouchure, c'est à dire en la tournant en dedans: Il faut aussi observer de ne pas beaucoup lever le Doigt en tremblant. (VII: 20) **Tourne la Flûte en dedans**	First having stopt the 1st. and 2. holes, as you see in the Tablature, you must stop also the 6th. hole, and open the 7th, with the little finger, this way is frequently used, and some shake thereon with the 4th. and 6th. fingers at the same time, but 'tis not well articulated, because 'tis difficult for a Shake made by two fingers so distant from each other to be very distinct; I am therefore of opinion, that one shou'd always borrow the Shake form the 2d. finger, as I have shew'd in the Scale of Cadences, by adjusting it by turning the Flute inwards; you must also observe not to raise the finger high in shaking. (VII: 14) **Inward position**	12/67 **12/(46)7** 12/0 **1(2)/4**
	2°. On bouche le prémier, le second, & le quatriéme trou, & ensuite la moitié du cinquiéme, mais avec discretion. Cette maniere est un peu moin embarassante que l'autre, parcequ'elle n'occupe que deux Doigt de la main d'en bas, lesquels étant voisins agissent avec plus d'intelligence. La Cadence se prend toûjours du second Doigt, en tournant aussi la Flûte en dedans. Il y a certains passages où l'on doit faire ce demi-Ton, comme je l'ay démontré dans la Tablature, & cela pour éviter une trop grande difficulté. (VII: 20) **Tourne la Flûte en dedans**	2dly. you stop the first 2d. and 4th. holes, and afterwards, the half of the 5th. but with discretion, this way is somewhat easier than the other, because it only employs two fingers of the lower hand, which being close together; shakes more intelligibly; the shake is always taken from the 2d. finger in turning the Flute also inwards, there are certain passages where one ought to make this Semitone as I have shew'd in the Tablature, and that to avoid a very great difficulty. (VII: 14-15) **Inward position**	12/0 **1(2)/45**
Ut Diézis- **Si naturel** **C#3-B2**	Je remarqueray encore touchant la Cadence de *Si* naturel enhaut, (Note vingt-deuxiéme) que l'on peut la faire en bouchant les trois trous de la main d'en bas, & en tremblant à l'ordinaire sur le prémier trou. Elle se fait aisement de cette manière: mais elle est un peu trop haute; il faut donc tourner l'embouchure en dedans pour l'ajuster. (VII: 21) **Tourne la Flûte en dedans**	I shall also observe concerning the Shake on **B Natural above**; (Note the 22d.) that it may be play'd by stopping the 3 holes of the lower hand, and shaking as usually on the first hole, 'tis easily made after this manner, but 'tis a little too sharp, to remedy which, turn the Flute inwards to adjust it. (VII: 15) **Inward position**	0/456 **(1)/456**
Ut-Si Bemol **C3-B♭2**	Celle du *Si Bemol* en haut, (Note trente-septiéme) se peut faire en bouchant le deuxiéme trou à moitié, & en tremblant sur le prémier trou: On la pratique encore en tremblant sur le prémier & sur le troisiéme trou, en même temps; laissant tous les autres débouchez. Mais elle n'est pas bien naturelle de cette maniere. (VII: 21) **[Tourne la Flûte en dedans]**	That of **B in alt Flat**, (Note ye 37th.) may be made by stopping half the 2d. hole, and shaking on the first, the shaking on the first and 3d. hole at the same time is also practisd, leaving all the other holes open, but this way is not very natural. (VII: 15-16) **[Inward position]**	2/45 **(1)2/0** 2/45 **(13)/7**

Si-La Diézis **B2-A#2**	La Cadence du *La Diézis* (Note vingt-uniéme) se peut faire en bouchant tous les trous, excepté le troisiéme & le septiéme. Il faut trembler sur le deuxiéme trou, & tourner l'embouchure en dedans. (VI: 22) **Tourne la Flûte en dedans**	The Shake on **A Sharp**, (Note ye 21st.) may be made by stopping all the holes except the 3d. & 7th. you must shake on the 2d. hole, and turn the Flute inward. (VII: 16) **Inward position**	1/0 **1(2)/4567**
Ré-Ut Diézis **D3-C#3**	La prémiere maniere se pratique en bouchant le deuxiéme & le troisiéme trou, & en tremblant sur le quatriéme & sur le sixiéme en même temps: Tous les autres trous doivent être débochez, même le septiéme. Il faut aussi que les Doigts qui ont tremblé, restent sur leur trous en finissant la Cadence. La seconde maniere est de boucher tous les trous, excepté le prémier, & le cinquiéme. Il faut trembler sur le sixiéme trou, & le laisser débouché en finissant la Cadence: On peut encore trembler sur la Clef, & observer la même chose. (VII: 21) **[Situation ordinaire]**	The first way is perform'd by stopping the 2d. and 3d. holes, and shaking on the 4th. & 6th. at ye same time, all the other holes ought to be open, and the 7th. also, and the fingers wherewith you shake must rest upon their holes in finishing the Shake. The 2d. way is by stopping all the holes except the first, and the fifth, you must shake on the 6th. hole, ending with the finger off: you may also shake on the key, and observe the same thing. (VII: 15) **[Normal position]**	23/456 **23/(46)7** 23/46 **23/4(6)** 23/46 **23/46(7)**
Mi Bemol-Ré **E♭3-D3**	Celle du *Ré* naturel tout enhaut (Note vingt-cinquiéme) prise du *Mi Bemol*, se peut faire aussi sur le cinquiéme & sur le sixiéme trou en même temps: en tenant les trois prémiers bouchez, & en débouchant le quatriéme & le septiéme: On doit forcer le vent & laisser les Doigts en l'air en finissant la Cadence. Il y a quelques Flutes où il fait déboucher le premier trou. (VII: 22) **[Situation ordinaire]**	That of **D Natural in altissimo**, (Note ye 25th.) taken from **E Flat**, may be also made on the 5th. and 6th. holes, at the same time keeping the 3 first stopt, and opening the 4th. & 7th. you ought to force the wind, and end the shake with the fingers off; there are some Flutes on which yu must open the first hole. (VII: 16). **[Normal position]**	123/567 **123/(56)7**

5.4 Fingerings for *Flattement—Softening*

Le Flattement ou Tremblement Mineur, se fait presque comme le tremblement ordinaire: Il y a cette difference, que l'on releve toûjours le Doigt en le finissant; excepté sur le *Ré*; De plus on le fait sur des trous plus éloignez, & quelques-uns sur le bord ou l'extremité des trous; Il participe d'un son inferieur ce qui est le contraire du tremblement. (IX: 30)	The softening, or lesser shake, is made almost like the usual shake, there is this difference, that you always end with the finger off, except on **D-la-sol-re**, for the most part they are made on holes more distant, and some on the edge, or half the hole only, it participates of a lower Sound, which is contrary to the Shake. (IX: 22)

The French term *Flattement* connects to the late 17th Century and the expression *Flatter*, which was used to express *Faire plaisir* (to please), *Toucher* (to touch, to be emotionally touched), and *Séduire* (to seduce; Lerond & Dubois & Lagane, 1992). Girard & Beauzée (1769) gave an example of how the term could be used as: […] *on flate la personne du côté du cœur* (Tome I: §. 197: 241), to please or touch a person's heart.

Regarding *Flattement* and *Softening* there are no fingering-charts in *Principes* or *Rudiments*, but in *Chapter IX* in both *Principes* and *Rudiments* are textual explanations for generally all notes in the chromatic scale from D1 to E3. In the fingering-chart below has these explanations been extracted and the fingerings in question are marked as in the fingering-charts for all notes and trills. In the following is each note in question notated with its standard fingering and underneath the fingering for its *Flattement–Softening* in bold, and the finger making the *Flattement* and *Softening* is marked within brackets. Fingerings for *Flattement* and *Softening* are indicated with two different techniques in *Principes* and *Rudiments*, a) cover the tone-hole in question on its side, and b) cover the tone-hole completely:

a) *sur le bord – on the edge*
b) *trou plein – hole full*

The micro-interval generated by a *Flattement* and *Softening* is influenced by the amount of closed or half-closed tone-holes below the note in question, and its speed is mastered as when playing a trill. When partly covering the tone-hole in question as marked in the finger-chart gives the Traverso-player a possibility to influence the size of the micro-interval. Thus, it is up to the Traverso-player to decide the width of the micro-interval created by *Flattement* and *Softening* in relation to the character of the played piece. Further is an approximative micro-interval marked in connection to each fingering having an amplitude from about –20 to –50 Cent below the main note in question. The notes D2, D3, D#2/E♭2, D#3/E♭3 are exceptions because fingerings for these notes creates micro-intervals upward from the main note with a considerable smaller deviation of about +10 to +15 Cent. When measuring the approximative micro-interval has five three-piece Traversi been examined (see Fig. 2), *Model I*: one made of Ivory and one of Grenadilla (A1=392 Hz), *Model II*: one of *Buis Ondé* (Boxwood), one of Cocos wood, and one of Ebony (A1=400Hz).

Whether *Principes* nor *Rudiments* have comments on how to position the head-joint in the three positions *Outward—Normal—Inward*, thus it seems coherent to initially use the same positions as described in the chapters on all notes and trills, and these positions are in the following marked within square brackets.
Flattement and *Softening* should be understood as an ornament (see 6.7 *Des Agrémens*: Ornamentation), and could perhaps be characterized as a finger-vibrato generally oscillating a micro-interval downwards from the note in question (Gärtner, 1974). Explications and suggestions in *Principes* and *Rudiments* regarding *Flattement* and *Softening* could be summarized as:

- *Flattement* and *Softening* is an embellishment heightening the already inherent expressions or *Affects* of a piece.
- The effect of *Flattement* and *Softening* resembles a vibrato when defined as a regular oscillation and undulation of a micro-interval (amplitude) and speed in relation to a given note.
- *Flattement* and *Softening* should be used on almost all longer notes according to Hotteterre (1715, *Œuvre IIb*).
- *Tremblement Mineur* and *Lesser shake* are synonyms for *Flattement* and *Softening* used in *Principes* and *Rudiments* which points on that the playing technique for *Flattement* and *Softening* has similarities as when playing a trill (*Tremblement*).
- The speed and microtonal deviation (amplitude) of a *Flattement* and *Softening* should be adapted to the character of the played piece in question.
- *Flattement* and *Softening* generates generally a microtonal deviation downwards from a given note.

Note	*Principes*	*Rudiments*	Fingerings	Approximated deviations in Cent
Ré **D1**	[…] le flattement du *Ré* naturel en bas […] on ébranle la Flûte avec la main d'enbas, ensorte que l'on puisse imiter par ce moyen le flattement ordinaire. (IX: 30) **[Situation ordinaire]**	Softening of **D** […] 'tis therefore done by shaking the Flute, which imitates a usual softening (IX: 22) **[Normal position]**	123/456 **123/456**	**–40**
Ré Diézis/ Mi Bemol **D#1/E♭1**	Le flattement du *Ré Diézis*, ou *Mi Bemol*, se fait comme celuy du *Ré naturel.* (IX: 30) **[Situation ordinaire ou Tourne la Flute en dehors]**	The softening of **D Sharp**, or **E- la-mi Flat** is done as **D Natural** (IX: 22) **[Normal or Outward position]**	123/4567 **123/4567**	**–40**
Mi **E1**	Le flattement du *Mi* naturel, se fait sur le bord du sixiéme trou. (IX: 31) **[Situation ordinaire]**	The softening of **E-la-mi Natural**, is made on the edge of the 6th. hole (IX: 22) **[Normal position]**	123/45 **123/45(6)**	**–40**
Fa **F1**	Les flattements […] du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou; Sçavoir les flattements sur le bord du trou (IX: 31) **[Tourne la Flûte en dedans]**	The softening […] on **F Sharp**, and **Natural**, are made on the 5th. hole […] on the edge (IX: 22) **[Inward position]**	123/46 **123/4(5)6**	**–45**
Fa Diézis **F#1**	Les flattements […] du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou; Sçavoir les flattements sur le bord du trou (IX: 31) **[Tourne la Flûte en dehors]**	The softening […] on **F Sharp**, and **Natural**, are made on the 5th. hole […] on the edge (IX: 22) **[Outward position]**	123/47 **123/4(5)7**	**–40**
Sol **G1**	Le flattement du *Sol* se peut faire de deux manieres: Sçavoir sur le bord du quatriéme trou, ou sur la cinquiéme trou plein. (IX: 31) **[Situation ordinaire]**	The softening of **G Natural** may be perfom'd two ways, Viz. on the edge of the 4th. hole, or full upon the 5th. (IX: 22) **[Normal position]**	123/0 **123/(4)** 123/0 **123/(5)**	**–30** **–30**
Sol Diézis/ La Bemol **G#1/A♭1**	Le flattement du *Sol Diézis* ou *La Bemol*, se forme sur le bord du troisiéme trou. (IX: 31) **[Tourne la Flûte en dedans]**	**G Sharp**, or **A Flat** is soften'd on the edge of the 3d. hole (IX: 22). **[Inward position]**	12/456 **12(3)/456**	**–15**
La **A1**	Le flattement du *La* naturel, se fait sur le quatriéme trou plein, ou sur le bord du troisiéme. (IX: 31) **[Situation ordinaire]**	The softening of **A Natural** is on the 4th. hole full, or on the edge of the 3d. hole. (IX: 22) **[Normal position]**	12/0 **12/(4)** 12/0 **12(3)/0**	**–30** **–40**
La Diézis/ Si Bemol **A#1/B♭1**	Le flattement du *La Diézis*, ou *Si Bemol*, se forme sur le sixiéme trou plein. (IX: 31) **[Tourne la Flûte en dedans]**	The softening of **A Sharp**, or **B Flat** is upon the 6th. hole full. (IX: 22) **[Inward position]**	13/45 **13/45(6)**	**–45**
Si **B1**	Le flattement du *Si* naturel, se fait sur le troisiéme trou plein. (IX: 31) **[Situation ordinaire]**	The softening of **B Natural**, is made on the 3d. hole full (IX: 23) **[Normal position]**	1/0 **1(3)/0**	**–40**
Ut **C2**	Le flattement du l'*Ut* naturel, se forme sur le quatriéme trou plein. (IX: 31) **[Situation ordinaire]**	The softening of **C Natural**, is made on the 4th. hole full. (IX: 23) **[Normal position]**	23/0 **23/(4)**	**–30**
Ut Diézis/ Ré Bemol **C#2/D♭2**	Le flattement de l'*Ut Diézis*, ou *Ré Bemol*, se fait sur le deuxiéme trou plein. (IX: 31) **[Tourne la Flûte en dehors]**	The softening of **C Sharp**, or **D Flat** is made on the 2d. hole full. (IX: 23) **[Outward position]**	0/0 **(2)/0**	**–40**
Ré **D2**	Le flattement du *Ré naturel*, se forme sur le deuxiéme trou. Il est different des autres, en ce qu'il faut tenir le trou bouché en le commençant, & en le finissant. On doit observer de ne pas beaucoup lever le Doigt. (IX: 31-32) **[Situation ordinaire]**	The softening of **D Natural**, is made on the 2d. hole full it differs from the rest in its beginning and ending with the finger on, you must observe not to raise the finger high. (IX: 23) **[Normal position]**	23/456 **(2)3/456**	**+15**

Mi Bemol/ Ré Diézis **Eb2/D#2**	Le flattement du *Ré Diézis* ou *Mi Bemol*, se forme sur le premier trou, lequel doit rester bouché avant & après. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	The Softening **D Sharp** or **E Flat** is made on the first hole, which ought to remain stopt, before, and after. (IX: 23) **[Normal or Outward position]**	123/4567 **(1)23/4567**	**+10**
Mi **E2**	Le flattement […] depuis ce ton jusqu'au *La Diézis ou Si Bemol*, se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	The softenings, and Beats between this Note and **A Sharp**, or **B Flat**, are made as their Octaves below, the softening of this last is made on the edge of the 4th. hole. (IX: 23) **[Normal position]**	123/45 **123/45(6)**	**–40**
Fa **F2**	Le flattement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dedans]**	The softenings […] are made as their Octaves below (IX: 23) **[Inward position]**	123/46 **123/4(5)6**	**–50**
Fa Diézis **F#2**	Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Tourne la Flûte en dehors]**	The softenings […] are made as their Octaves below (IX: 23) **[Outward position]**	123/47 **123/4(5)7**	**–40**
Sol **G2**	Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Situation ordinaire]**	The softenings […] are made as their Octaves below (IX: 23) **[Normal position]**	123/0 **123/(4)** 123/0 **123/(5)**	**–40** **–45**
Sol Diézis/ La Bemol **G#2/Ab2**	Le flattement […] se font comme à leurs Octaves en bas [third hole half covered] (IX: 32) **[Tourne la Flûte en dedans]**	The softenings […] are made as their Octaves below [third hole half covered] (IX: 23) **[Inward position]**	12/4 **12(3)/4**	**–45**
La **A2**	Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Situation ordinaire]**	The softenings […] are made as their Octaves below (IX: 23) **[Normal position]**	12/0 **12/(4)** 12/0 **12(3)/0**	**–50** **–40**
La Diézis/ Si Bemol **A#2/Bb2**	Le flattement de ce dernier [*La Dièzis* & *Si Bemol*] ce forme sur le bord du quatriéme trou. (IX: 32) **[Tourne la Flûte en dedans ou Tourne la Flute en dehors]**	The softening this last [**A Sharp**, **B Flat**] is made on the edge of the 4th. hole (IX: 23) **[Inward or Outward position]**	13/0 **13/(4)**	**–40**
[Si] **[B2]**	No suggestion in *Principes* [… se fait aussi comme à son Octave] **[Situation ordinaire]**	No suggestion in *Rudiments* […as their Octaves below] **[Normal position]**	1/0 **[1/(3)]**	**–45**
Ut **C3**	Le flattement de l'*Ut* naturel, se fait en deux manieres; Sçavoir, sur le sixiéme trou, ou sur le troisiéme. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dedans]**	The softening of **C Natural** is made two ways, Viz. on the 6th. hole, or on the 3d. (IX: 23) **[Normal or Inward position]**	2/45 **2/45(6)** 2/45 **2(3)/45**	**–40** **–15**
[Ut Diézis] **[C#3]**	No suggestion in *Principes* [… se fait aussi comme à son Octave] **[Tourne la Flûte en dehors]**	No suggestion in *Rudiments* […as their Octaves below] **[Outward position]**	0/4567 **[(2)/457]**	**–50**
Ré **D3**	Le flattement du Ré naturel, se fait sur le deuxiéme trou, ainsi qu'à son Octave. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	The softening of **D Natural** is made on the 2d hole, as its Octave. (IX: 23) **[Normal or Outward position]**	23/456 **(2)3/456**	**+20**
Ré Diézis/ Mi Bemol **D#3/Eb3**	Le flattement du Ré Diéziz ou Mi Bemol, se fait aussi comme à son Octave. (IX: 32). **[Situation ordinaire ou Tourne la Flûte en dehors]**	The softening of **D Sharp**, or **E-la-mi Flat**, is done as its Octave. (IX: 23) **[Normal or Outward position]**	123/567 **(1)23/567**	**+10**
Mi **E3**	Le flattement du *Mi* naturel, se forme sur le bord du troisiéme trou. (IX: 33) **[Tourne la Flûte en dehors]**	The softening of **E-la-mi Natural** is made on the edge of the 3d. hole. (IX: 23) **[Outward position]**	12/567 **12(3)/567**	**–30**

5.5 Fingerings for *Battement—Beat*

Le Battement se fait en frappant une ou deux fois de suite, & le plus vite qu'on peut sur le trou toûjours plein, ou tout bouché, & le plus proche du ton où l'on veut le faire. On doit encore relever le Doigt en finissant le Battement, excepté sur le *Ré*, comme je l'expliqueray cy-après; Il participe aussi d'un son inferieur. (IX: 30)	The Beat is the hitting once or twice as quick as we can, full on the hole, and as near the Note we beat upon as possible, we ought also to end a Beat with the finger off, except on **D**, as I shall shew hereafter, it also partakes of a lower Tone. (IX: 22)

Regarding *Battement–Beat* there are no fingering-charts in *Principes* or *Rudiments*, but in *Chapter IX* are textual explanations for generally all notes in the chromatic scale from D#1 to E3. In the fingering-chart below has these explanations been extracted and the fingerings in question are marked as in the fingering-charts for all notes and trills. In the following is each note in question notated with its standard fingering and underneath the fingering for its *Battement–Beat* in bold, and the finger or fingers making the *Battement–Beat* is within brackets.

Whether *Principes* nor *Rudiments* have any comments on how to position the head-joint in the three positions *Outward—Normal—Inward*, thus it seems coherent to use the same positions as described in the chapters on all notes and trills, and these positions are in the following marked within square brackets.

Note	*Principes*	*Rudiments*	Fingerings
Ré Diézis/ Mi Bemol **D#1/Eb1**	Le Battement se forme sur la Clef avec le petit Doigt, & il y doit rester appuyé. (IX: 30) **[Situation ordinaire ou Tourne la Flute en dehors]**	The Beat is made upon the key with the little finger, ending with it on. (IX: 22) **[Normal or Outward position]**	123/4567 **123/456(7)**
Mi **E1**	*Mi* naturel […] Le battement se forme sur le même trou [sixiéme trou] trou plein. (IX: 31) **[Situation ordinaire]**	Beat on **E-la-mi Natural**, is made on the same hole full [6th. […] (IX: 22) **[Normal position]**	123/45 **123/45(6)**
Fa **F1**	[…] les battements du *Fa naturel* & du *Fa Diézis* se font sur le cinquiéme trou […] sur le trou plein. (IX: 31) **[Tourne la Flûte en dedans]**	[the Beat] **F Sharp**, and **Natural**, are made on the 5th. hole, Viz. the Beat full on the hole (IX: 22) **[Inward position]**	123/46 **123/4(5)6**
Fa Diézis **F#1**	[…] les battements du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou […] les battements sur le trou plein. (IX: 31) **[Tourne la Flûte en dehors]**	The […] Beat on **F Sharp**, and **Natural**, are made on the 5th. hole, Viz. the Beat full on the hole (IX: 22) **[Outward position]**	123/47 **123/4(5)7**
Sol **G1**	Le battement se fait sur le quatriéme trou [plein]. (IX: 31) **[Situation ordinaire]**	**G Natural** […] the Beat is made on the 4th. hole. (IX: 22) **[Normal position]**	123/0 **123/(4)**
Sol Diézis/ La Bemol **G#1/Ab1**	Le battement sur le mème trou [troisiéme trou; plein] (IX: 31) **[Tourne la Flûte en dedans]**	**G Sharp**, or **A Flat** […] the Beat on the 3d. hole full. (IX: 22) **[Inward position]**	12/456 **12(3)/456**
La **A1**	Le battement sur le troisiéme [trou, plein]. (IX: 31) **[Situation ordinaire]**	[…] the Beat upon the 3d. hole. (IX: 22) **[Normal position]**	12/0 **12(3)/0**
La Diézis/ Si Bemol **A#1/Bb1**	Le battement sur le même trou [le sixiéme plein], ou sur le deuxiéme, quand il est précedé d'un port-de-voix. (IX: 31) **[Tourne la Flûte en dedans]**	The Beat upon the same hole [6th.] or on the 2d. when 'tis is preceded by a Port-de-voix. (IX: 22) **[Inward position]**	13/45 **13/45(6)** 13/45 **1(2)3/45**
Si **B1**	Le battement sur le le deuxiéme. (IX: 31) **[Situation ordinaire]**	[…] the Beat upon the 2d. (IX: 23) **[Normal position]**	1/0 **1(2)/0**
Ut **C2**	Le battement sur le quatriéme & le cinquiéme trou en même temps, ou sur le premier quand il est précedé d'un Port-de voix. (IX: 31) **[Situation ordinaire]**	[…] the Beat on the 4th. & 5th. At the same time, or on the first, when 'tis preceded by a Port-de voix (IX: 23) **[Normal position]**	23/0 **23/(45)** 23/0 **(1)23/0**
Ut Diézis/Ré Bemol **C#2/Db2**	Le battement sur le premier. (IX: 31) **[Tourne la Flûte en dehors]**	[…] the Beat upon the first. (IX: 23) **[Outward position]**	0/0 **(1)/0**

Ré **D2**	Le battement se fait sur le quatriéme trou, quand on jouë dans un ton naturel, & sur le deuxiéme & troisiéme en même temps, quand on jouë dans un ton où l'*Ut* est *Diezis*. Il faut que les trous soient aussi bouchez en commençant, & en finissant (IX: 32) **[Situation ordinaire]**	[…] the Beat is made on the 4th. hole, when you play in a Natural key, and upon the 2d. & 3d. at the same time, when you play in a key where **C** is **Sharp**, the holes ought also to be stopt as well in beginning as ending it. (IX: 23) **[Normal position]**	23/456 **23/(4)56** 23/456 **(23)/456**
Mi Bemol/ **Ré Diézis** **E♭2/D#2**	Le battement se fait sur la Clef, pour le *Mi Bemol*, de la manière que je l'ay expliqué, en parlant de celuy d'en bas. Quant au *Ré Diezis*, il se fait sur le deuxiéme & le troisiéme trou en même temps. Le premier trou doit être débouché, & il faut réboucher le deuxiéme & le troisiéme trou, en finissant le battement. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	[…] the Beat is made upon ye key for **E-la-mi**, after the manner I shew'd you in speaking of it below, as to **D Sharp**, 'tis Beat upon the 2d. & 3d. holes at the same time, the first hole ought to be open, and you must stop the 2d. & 3d. in ending the Beat. (IX: 23) **[Normal or Outward position]**	123/4567 **123/456(7)** 123/4567 **(23)/4567**
Mi **E2**	Le battement […] depuis ce ton jusqu'au *La Diézis ou Si Bemol*, se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	The [Beat] of **E-la-mi Natural**, is made on […] the 6th. […] hole full. (IX: 23) **[Normal position]**	123/45 **123/45(6)**
Fa **F2**	Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dedans]**	[…] the Beat as their Octaves below (IX: 23) **[Inward position]**	123/46 **123/4(5)6**
Fa Diézis **F#2**	Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dehors]**	[…] the Beat as their Octaves below (IX: 23) **[Outward position]**	123/47 **123/4(5)7**
Sol **G2**	Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	[…] the Beat as their Octaves below (IX: 23) **[Normal position]**	123/0 **123/(4)0**
Sol Diézis/ **La Bemol** **G#2/A♭2**	Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dedans]**	[…] the Beat as their Octaves below (IX: 23) **[Inward position]**	12/4 **12(3)/4**
La **A2**	Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	[…] the Beat as their Octaves below (IX: 23) **[Normal position]**	12/0 **12(3)/0**
La Diézis/Si Bemol **A#2/B♭2**	Le battement se peut faire sur le même trou [quatriéme trou], ou bien sur le deuxiéme, principalement quand il est précedé d'un port-de-voix. (IX: 31). **[Tourne la Flûte en dedans ou Tourne la Flute en dehors]**	The Beat on the same hole [4th.] or else on the 2d. especially when 'tis is preceded by a Port-de-voix. (IX: 22). **[Inward or Outward position]**	13/0 **13/(4)** 13/0 **1(2)3/0**
[Si] **[B2]**	No suggestion in *Principes* **[Situation ordinaire]**	No suggestion in *Principes* **[Normal position]**	1/0 **[1(2)/0]**
Ut **C2**	Le battement se forme de même [sixiéme trou], & aussi sur le premier trou quand il est précedé d'un port-de-voix. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dedans]**	[…] the Beat is made on ye same [6th. hole], and also on the first, when tis preceded by a Port-de-voix. (IX: 23) **[Normal or Inward position]**	2/45 **2/45(6)** 2/45 **(1)2/45**
[Ut Diézis] **[C#3]**	No suggestion in *Principes* **[Tourne la Flûte en dehors ou Tourne la Flute en dedans]**	No suggestion in *Rudiments* **[Outward or Inward position]**	0/4567 **[(1)/4567]**
Ré **D3**	Le battement se forme sur le deuxiéme & sur le troisiéme trou en même temps. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dehors]**	[…] the Beat is made on the 2d. & 3d. holes at the same time. (IX: 23) **[Normal or Outward position]**	23/456 **(23)/456**
Ré Diézis/ **Mi Bemol** **D#3/E♭3**	Le battement se forme de même [comme à son Octave] ou bien sur le cinquiéme & le sixiéme trou en même temps. On doit tenir le quatriéme, & le septiéme débouchez, & on doit remettre les Doigts en finissant. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dehors]**	[…] the Beat is made the same way [as its Octave], or else on the 5th. & 6th. holes at once, you must hold the 4th. & 7th. holes open, and replace your fingers in ending. (IX: 23) **[Normal or Outward position]**	123/567 **123/(56)7**
Mi **E3**	Le battement sur le même trou plein [troiséme trou]. (IX: 33) **[Tourne la Flûte en dehors]**	[…] the Beat on the same hole full [3d. hole] (IX: 24)**[Outward position]**	12/567 **12(3)/567**

Conclusions regarding fingerings

- A general finding is that an in-depth study of *Principes* and *Rudiments* and given standard fingerings, fingerings for trills, *Flattement*, *Battement*, and a multitude of alternative fingerings, combined with detailed suggestions in relation to given fingerings regarding the three head-joint positions, the embouchure and the *Tonus* in the lips, and the airstream enables the Traverso-player to develop a profound knowledge, understanding, and playing skills of the three-piece Traverso and its possibilities.
- The distance between the finger and its tone-hole has direct effects on intonation and sound colour. And as explained in *Principes* and *Rudiments* the general suggestion regarding the distance between fingers and tone-holes is described as:

On observera de bonne heure de ne pas beaucoup lever les Doigts (III: 7)	[…] you must not raise the fingers high (III: 5)

- If the finger in question is rather close to its tone-hole it has a flattening effect including a tendency to "shadow" the sound colour, and vice-verse. This phenomenon is used for tuning trills. An example is the trill C2-B1 which is played starting with the standard fingering for C2 23/0 then changing to the standard fingering for B1 1/0 and making the trill with the left-hand forefinger (1). When making the trill as described B1 (**1**)/0 this fingering results in the intervals B1 and C#2 (C#2 0/0). For making the trill C2-B1 with its fingering (**1**)/0 as shown in *Principes* and *Rudiments* giving the semi-tone step C2-B1 the solution is to lift the left-hand fore-finger (1) very little and benefitting from the flattening effect mentioned above, combined with the *Inward position* of the head-joint as suggested by Hotteterre. When studying the fingering-charts for trills in *Principes* and *Rudiments* there are quite some examples whereby the distance between the finger and its tone-hole is as a technique for refining intonation and sound colour.
- The use of the D#-key is an interesting subject when studying fingering-charts of the whole18th Century from *Principes* and *Rudiments* to the method by Devienne (*c.*1794). Hotteterre suggested a rather limited use of the D#-key (Appendix XXI) and only for the notes D#1/E♭1, F#1, D#2/E♭, F#2/G♭2, B#2, C#3/D♭3, E♭3, E3, and F3. In later methods like Mahaut (1759), De Lusse (*c.*1761), and Devienne (*c.*1794) is the D#-key used far more frequently. It should be noted that when the use of the D#-key is limited regarding the single notes in *Principes* and *Rudiments* its use is far more frequent when playing trills.
- *Principes* and *Rudiments* suggested to use what could be called a "supporting finger-technique". This finger-technique has two elements a) how to use the right-hand little-finger (7) and b) the right-hand ring-finger (6). Regarding the right-hand little-finger it should be placed on the tube of the Traverso and close to the D#-key and generally stay in this position until the D#-key is used. The right-hand ring-finger is suggested to be placed between the fifth and sixth tone-holes on the tube of the Traverso, and on all notes from A1-C#2, A2-C3, and when it is comfortable as for example on G1 and G2. The reason for this "supporting finger-technique" is to stabilize the Traverso which is necessary when using the three head-joint-positions *Outward—Normal—Inward*, and because of that the stability created by the D#-key is absent when it is used on so few notes. Further, stabilizing the Traverso with this "supporting finger-technique" avoids that the Traverso will be held with the playing fingers more than necessary. This technique was generally abandoned in all later 18th Century Traverso methods, possibly because the use of the D#-key became far more frequent according to given fingering-charts. The use of the D#-key strongly contributes to stabilizing the Traverso. It should be mentioned that a kind of "supporting finger-technique" was explained by Mahaut (1759, 10-11) for facilitation several passages including B♭1, B♭2, C#3, D3, F3, and F#3. Devienne also gave examples regarding the B♭1, B♭2, and F#3 in the section *Genre de traits où les positions du Si bemol et du Fa diéze doivent être changées pour la facilité de l'éxécution* (*c.*1794, 4) aiming for facilitating certain combinations of intervals and scales.

Part II

6 Traverso playing-techniques as described in *Principes* and *Rudiments*

> *Il faut aussi que le geste soit réglé, & qu'il y ait de la grace dans tous les mouvemens du corps*[1]
>
> Quintilien (1718/1752, Tome I: 153)

This chapter show an attempt to extract essential playing-techniques for the Traverso as described in *Principes* and *Rudiments* while systematically examine how Hotteterre discusses aspects on posture, embouchure, articulation, speed of the airstream (ribcage, breathing muscles, and diaphragm), and intonation. In this context are the detailed fingering-charts found in *Principes* and *Rudiments* of essential importance, because in them Hotteterre not only gives a fingering or more for a given note, but in addition important suggestions regarding the speed and direction of the airstream and the position of the head-joint which altogether sheds light on the embouchure, intonation, and resonance in the mouth and throat cavities, searching for an expressive, flexible, and elegant sound quality. From a scientific point of view has the resonance of mentioned oral cavities significance, although their effects on the spoken or sung voice is stronger (Coltman, 1973; Ljungar-Chapelon, 1990). It could be expected that *Principes* and *Rudiments* described and condensed current traditions and opinions regarding Traverso playing in France covering the late 17th Century and the early 18th Century, as seen through the eyes of Hotteterre including his own experiences, knowledge, and ideas as a Traverso-player. Considered that *Principes* and *Rudiments* is the first publication of its kind for the Traverso it is difficult to distinguish when Hotteterre connects to established traditions alternatively makes references to his personal experiences. Possibly could *Principes* and *Rudiments* be understood as a continuation of traditions regarding French Traverso playing and its predecessors such as Philippe Rebillé *dit* Philbert (1639-*c.*1717) and René Pignon Descoteaux (*c.*1645-1728), in combination with Michel de La Barre (*c.*1675-1744) who possible could have been a student of Descoteaux, and of course Hotteterre himself.

Hotteterre and mentioned Traverso-players were active in the same Parisian musical environments as virtuosi and composers like Jean-Philippe Rameau (1683-1764), André Danican Philidor « L'ainé » (1652-1730, Traverso, Oboe, Violin), Marin Marais (1656-1728, Basse de Viole), Robert de Vizée (*c.*1660-*c.*1733, Théorbe and Guitar), François Couperin (1668-1733, Harpsichord and Organ), Antoine Forqueray (1672-1745, Basse de Viole), François Duval (*c.*1672-1728, Violin), and Alarius (pseudonym for Hilaire Verlog, *c.*1684-1734, Viole da Gambe).

In the preface to *Concerts Royaux* (1722) by François Couperin is described how he and some of the musicians mentioned above on Sundays used to perform *Concerts de la Chambre* for the King Louis XIV in the years 1714–1715, which gives a glimpse of the settings and environments in which the Traverso was heard in the beginning of the 18th Century in France:

> Les pieces qui suivant sont d'une autre Espéce que celles que J'ay données jusqu'a present. Elles conviennent non seulement, au Clavecin; mais aussy au violon, a la flute, au hautbois, a la viole, et au Basson. Je les avois faites pour les petits Concerts de chambre, ou Loüis quatorze me faisoit venir presque tous les dimanches de l'année. Ces pieces étoit Executées par Messieurs Duval, Philidor, Alarius, et Dubois: J'y touchois le clavecin. Si elles sont autant du goût du Public, qu'elles ont été aprouvées du feu Roy; J'en ay suffisament pour en donner dans la suite quelques volumes complets. Je les ay rangées par Tons, et leur ay conserué pour titre ceûy sous lequel elles etoint connües a la Cour en 1714, et 1715. (Couperin, 1722)[2]

1. The gesture must also be regulated, and there must be grace in all body movements […] (Quintilien, *L'Institution de L'Orateur*. Traduit par M. L'Abbé Nicolas Gedoyn (1677–1744), 1718/1752, Tome I: 153)

2. The pieces which follow are of another Species than those which I have given so far. They are suitable not only for the harpsichord, but also on violin, flute, oboe, viol, and bassoon. I had done them for the Concerts de la chambre, where Louis Quatorze invited me to come Almost every Sunday of the year. These pieces were performed by Messrs. Duval, Philidor, Alarius, and Dubois: I touched the harpsichord there. If they are as much to the taste of the public as they were approved by the late King; I have enough of them to give a few complete volumes in the following. I have arranged them by Tonalities, and have kept for them the title under which they were known to the Court in 1714 and 1715. (Couperin, *Concerts Royaux*, *Preface*, 1722)

6.1 Playing position

In *Principes* and *Rudiments* and its first chapter—*De la situation du Corps, & de la positions des Mains–Of the Situation of the Body, and placing the hands*—Hotteterre gives important guidelines on playing positions regarding the whole body. It should be notated that these guidelines are literally quoted in *L'Encyclopédie Méthodique* (1785 & 1788), which points on that Hotteterre's text was influencing Traverso playing in France throughout the late 18th Century:

COMME IL EST NECESSAIRE pour arriver à la perfection des exercices dans lequels on veut réüssir, de joindre autant qu'il est possible la bonne grace à l'habilité; je commenceray ce Traité par une explication de la posture où l'on doit être, en joüant de la Flute Traversiere. Soit que l'on joüe debout ou assis, il faut tenir le Corps droit, la Tête plus haute que basse, un peu tournée vers l'Epaule gauche, les Mains hautes sans lever les Coudes ni les Epaules, le Poignet gauche plié en dedans, & le Bras gauche proche du Corps. Si l'on est debout, il faut être bien campé sur ses jambes, le Pied gauche avancé, le Corps posé sur la Hanche droite; le tout sans aucune contrainte. On doit sur tout observer de ne faire aucun mouvement du Corps ni de la Tête, comme plusieurs font en battant la mesure. (I: 1)	As a gracefull posture, in playing on this Instrument, no less engages the Eyes of the beholders, than it's agreeable Sound does their Ears; I shall therefore begin this Treatise, by describing one proper to use in playing thereon. Whether you are Sitting, or Standing, the Body must be erect, the head rather rais'd, than inclin'd, and somewhat turn'd to the left Shoulder, the hands high, without raising the Elbows, or Shoulders, the left wrist bent inwards, and the left Arm close to the Body. If you play standing, stand firm, with ye left foot a little advanc'd, and rest the weight of your Body on the right leg, and all without any constraint, and observe never to make any motion with the Body, or head, as some do in beating Time. (I: 2)

Together with physical and technical suggestions and explications on posture Hotteterre stresses the importance of an elegant appearance for both the ears as for the eyes:

Cette attitude étant bien prise, est fort gracieuse, & ne prévient pas moins les yeux, que le son de l'Instrument flâte argréablement l'oreille. (I: 2)	As a gracefull posture, in playing on this Instrument, no less engages the Eyes of the beholders, than it's agreeable Sound does their Ears. (I: 2)

Hotteterre's suggestions on posture and playing position were intended to be combined with the engraving of a Traverso-player by the French artist Bernard Picard (1673-1721), found in the beginning of *Principes*. This engraving is possibly a portrait of Hotteterre himself in his early thirties but has not been possible to confirm (Fig. 15).

Suggestions that the elbows should not be raised, in combination with an examination of Picard's almost photographic engraving, shows that especially the left arm and elbow becomes a low position relatively close to the chest. Such a position of the left arm and elbow initiates a playing position whereby the head-joint of the Traverso generates almost no pressure on the under lip and the lower jaw, because the Traverso rest on the knuckle of the left-hand forefinger, which facilitates a supple approach regarding the embouchure. Such a flexible position is necessary when making the three head-joint positions *Outward—Normal—Inward* possible, extensively discussed by Hotteterre in the fingering-charts as being the basic technique for embouchure and intonation. If the head-joint has a too firm pressure on the lower lip, chin, and lower jaw Hotteterre's embouchure technique with the positions *Outward—Normal—Inward* does not function.

When Hotteterre discusses playing position and posture standing as shown above, this is an explication of important interest:

Si l'on est debout, il faut être bien campé sur ses jambs, le Pied gauche avancé, le Corps posé sur la Hanche droite; le tout sans aucune contrainte. (I: 2)	[…] stand firm, with ye left foot a little advanc'd, and rest the weight of your Body on the right leg […] (I: 2)

Insisting on that the Traverso-player has an asymmetrical playing position of feet and legs has its origin in that the Traverso—as any transverse flute—like the violin, requires an asymmetrical playing position for the development of an unconstrained and ergonomically comfortable position.



Figure 15 Engraving of a Traverso-player in *Principes* (1707/1722) by Picard (1673-1721), possibly a portrait of Hotteterre. (Private Collection)

Hotteterre described how to arrange wrists, hands, and fingers in an idiomatic manner regarding the development of a supple and elegant technique, which in combination with and enlargement of the earlier mentioned almost photographic engraving by Picard is rather instructive (Fig. 16):

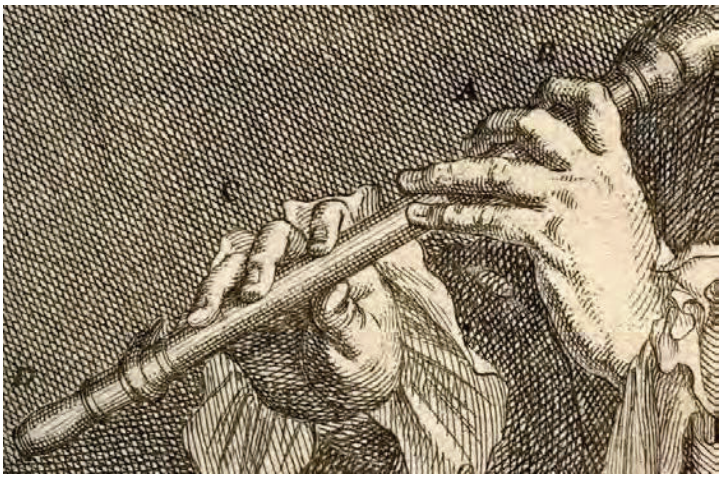


Figure 16 *You may observe by this figure, that the left-hand A, is plac'd uppermost, hold the Flute between the thumb, and first finger B. bend the wrist downwards, place ye fingers so, as that the first and 2d. may be somewhat arch'd, and the 3d. straighter; as for the right hand, ye fingers are to be held almost straight, the wrist a little bent inward, the thumb over against the 4th. hole, or a little lower* (1729, I: 2) Detail from the engraving of a Traverso-player in *Principes* (1707/1722) by Picard. (Private Collection)

A l'égard de la position des Mains, on en peut voir cy-devant une Demonstration qui sera plus instructive que tout ce que je pourrois écrire sur ce sujet. On apprendra par cette Figure, qu'il faut mettre la Main gauche *A.* en haut; Tenir la Flute entre le Pouce & le premier Doigt *B.* Plier le Poignet en dessus; Arranger les Doigts ensorte que le premier & le deuxiéme soient un peu arrondis, & le troisiéme plus alongé. Pour ce qui regarde la Main droite, *C.* Il faut tenir les Doigts presque droits, le Poignet un peu plié en dedans, le Pouce vis-à-vis le Doigt du quatriéme trou, ou un peu plus bas; Le petit Doigt posé sur la Flute, entre le sixiéme trou & la moulure de la pate, (on voit tout cela demontré par la Figure.) Il faut tenir la Flute presque droite, un peu en baissant vers la patte *D.* (I: 2)	As for the placing of the hands, you may observe the foregoing Cut, which will be more instructive than anything I can write on that Subject. You may observe by this figure, that the left hand *A*, is plac'd uppermost, hold the Flute between the thumb, and first finger *B.* bend the wrist downwords, place ye fingers so, as that the first and 2d. may be somewhat arch'd, and the 3d. straighter; as for the right hand, ye fingers are to be held almost straight, the wrist a little bent inward, the thumb over against the 4th. hole, or a little lower, the little finger between the 6th. hole and the bottom piece *D.* You see all this demonstrated by the figure, the Flute must be held almost straight, only a little inclin'd towards ye lower part *D.* (I: 2)

To understand Hotteterre's fingering-charts it is necessary not only to study which of the seven tone-holes that should be open or closed, how to position the head-joint in its three positions, the speed of the airstream (ribcage, breathing muscles, and diaphragm), but include how to position the ring-finger and little-finger of the right hand. In this connection Hotteterre explained two techniques as shown above, both aiming for flexibility and suppleness:

Le petit Doigt posé sur la Flute, entre le sixiéme trou & la moulure de la pate […] (I: 2)	[…] the little finger between the 6th. hole and the bottom piece *D* […] (I: 2)
Il faut alors mettre le sixiéme Doigt entre le cinquiéme & sixiéme trou, ce qui ne sert (aussi-bien que la situation du petit Doigt) que pour tenir la Flûte en état, & ce qui est néanmoins important pour la liberté des Doigts. (III: 7)	[…] you must then place the 6th. finger between the 5th. and 6th. hole, to hold the flute ye firmer […] (III: 5)

According to Hotteterre the little-finger of the right hand should be placed *on* the Traverso, between the tone-hole for D and the D#-key ensuring a balanced support of the Traverso, which in the present fingering-charts is marked [/7]. This technique is generally applied except when the little-finger is not used for pressing down the D#-key. In addition, Hotteterre draws attention to that the ring-finger of the right hand should be placed *on* the Traverso, between the tone-holes of E and D, starting from A in the first octave, which in the present fingering-charts is marked [/6]. This technique should be used for all notes where it makes sense, and when the ring-finger of the right hand is not part of a fingering. When connections between fingerings gets complicated because of rapid passages this manner of using the ring-finger and little-finger of the right hand can be understood in a pragmatic sense and is not necessarily maintained.

In relation to the little-finger of the right hand is a detail on the well-known painting *Réunion de Musiciens* (*c.*1710, Appendix IV) —attributed to the French painter André Bouys (1656-1740) —regarding how to mount the foot-joint of interest. The painting show an almost photographic depiction of a three-piece Traverso made of ivory. When looking closely to the foot-joint and how it is mounted slightly inward in a comfortable playing position for the little-finger of the right hand it could be understood as a reference (Fig. 17).



Figure 17 Detail of the foot-joint on the ivory Traverso from the painting *Réunion de Musiciens* (*c.*1710) by André Bouys. (*Musée des Beaux-Arts de Dijon*, France)

It should be noted that Hotteterre's technique how to hold and balance the Traverso possibly is linked to the construction of the three-piece Traverso, having a relatively heavy head-joint with a large crown and tendency to slightly tilt the Traverso towards the left side. When the Traverso around 1720-1730 (Quantz, 1752) was divided into four pieces (the middle-joint was divided in two parts), in combination with a somewhat lighter head-joint due to a smaller crown, perhaps influenced that the technique using the ring-finger of the right hand for support were abandoned. To conclude, the playing position described in *Principes* and *Rudiments* regarding arms, wrists, and fingers, in combination with how to use the ring-finger and little-finger of the right hand as support, all-together naturally creates an unconstrained playing position including reduced pressure against the lower-lip and chin. This indicates that Hotteterre suggested and explained a technique increasing the flexibility of the lips, and lower jaw, and all-together facilitating the technique of adjusting intonation with the technique of turning the Traverso in the three positions *Inwards— Normal— Outwards* which is frequently described in *Principes* and *Rudiments*. When following Hotteterre's suggestions and explanations regarding positions of the arms, hands, and fingers makes the Traverso resting in the left hand as on a ball-joint needing just a minimum of effort in combination with that the right arm in a supple manner stabilizes the Traverso. Suggestions on posture and playing position having similarity to *Principes* and *Rudiments* is found in *Méthode pour la Musette* (1737) by Hotteterre:

> Le Corps aussi ne sçauroit être trop ferme; car, outre l'avantage de la bonne grace, il en résulte beaucoup plus de facilité. L'on aura encore attention à ne point faire de grimaces, ce qui arrive quelquefois; c'est pourquoy il sera bon d'étudier de tems en tems devant un Miroir. (Hotteterre, 1737, 5)[1]

Here Hotteterre gave the suggestion on how to develop *Bonne grace–Graceful posture* with the help of sometimes using a mirror. Such a recommendation can be traced to sources on rhetoric as *L'Eloquence de la chaire et du barreau, selon les principes les plus solides de la Rhétorique sacrée et profance* (1689) by l'Abbé Etienne Dubois de Bretteville (1650-1688):

> Pour regler le Gest, on se sert quelquefois d'un grand miroir, où l'on voit la disposition du corps, & tous ses mouvemens. (Bretteville, 1689, 484)[2]

In relation to posture and playing position it should be noted that Hotteterre does not comment on breathing in direct terms in *Principes*, but in indirect terms and in connection to posture and playing position which will be discussed in the following. In the present context is a drawing by Antoine Watteau (1684-1721) of a Traverso-player shown from different angles of interest because it is contemporary to Hotteterre and depicts a three-piece Traverso as described in *Principes* (Fig. 18).



Figure 18 *Two Studies of a Flutist and a Study of the Head of a Boy* by Antoine Watteau (*c.*1716-1717). Observe that the Traverso-player is playing on a three-piece Traverso. (*Paul Getty Museum*, Los Angeles)

1. The body cannot be too firm; for, besides the advantage of good grace, it results in much more ease. We will also be careful not to make grimaces, which sometimes happens; that is why it will be good to study from time to time before a Mirror. (Hotteterre, *Méthode pour la Musette*, 1737, 5)
2. To adjust the posture of the body, we sometimes use a large mirror, where we see the disposition of the body, & all its movements. (Bretteville, *L'Eloquence de la chaire et du barreau, selon les principes les plus solides de la Rhétorique sacrée et profance*, 1689, 484)

Considered that aesthetics regarding concepts of *Grâce*, *Bonne grace* and *Gracieux* had an important role within the arts and music in France during the 17th and 18th Centuries—and consequently for Hotteterre and contemporary musicians—aspects and comments on *Bonne grace* will be discussed in relation to *Principes* and *Rudiments*. A text from the Renaissance having strong influences throughout Europe is *Il Libro del Cortegiano* (1528) by Baldassare Castiglione (1478-1529), a model for manners and courtier ideals for centuries to come, included thoughts regarding *Bonne grace*. In a French translation published 1690—*Le parfait courtisan et la dame de cour. Traduction nouvelle de l'italien du Comte Baltasar Castiglione*—is a passage discussing definitions and examples of what *Bonne grace* might be:

> Je trouve une régle générale [regarding *Bonne grace*], qui me semble y devoir conduire mieux qu'aucune autre, & c'est d'éviter dans toutes les actions, comme un dangereux écueil, l'affectation, mais usant au contraire d'un certain dédain qui cache l'artifice, & qui fait paroître, qu'on fait les choses, sans presque y penser. C'est de-là, je pense, que naît la bonne grace, parce que chacun se persuade que les actions importantes sont accompagnées de grandes difficultez: de-la vient que, si on y remarque de la facilité à les faite, on en conçoit de l'admiration. Et au contraire, n'avoir la connoissance des choses qu'avec force, &, comme on dit, les tirer par les cheveux, c'est ce qui donne mauvaise grace aux actions, & qui rend peu estimables, quelques grandes qu'elles soient, les personnes qui les font. (Castiglione, 1528/1690, 61)[1]

Castiglione's emphasis on that *Bonne grace* is characterized by that any action—even if difficult and complicated—should be uncontrived, effortless, and realized in a spontaneous intuitive mood without thinking and calculating *sans presque y penser*, are hallmarks which connects to *Principes* and *Rudiments*, further to Rameau (1752; 1754, 1760), and French 18th Century texts on rhetoric, theatre, dance, and manners as will be discussed in the following. Castiglione's book was influencing the whole of Europe for centuries, and professional music life in the period of Hotteterre were in many respects directedly connected to the aristocracy, the court, and the French Kings, it seems to be within reach that mentioned ideals regarding *Bonne grace* directedly and indirectly might have been influential within the arts and music.

When looking for a late French 17th Century definition on *Bonne Grace* is *Dictionnaire Général et Curieux: Contenant les principaux mots, et les plus usitez en la langue Françoise, leurs Définitions, Divisions, & Etymologies* (1684) by Cesar de Rochefort (1630-1690) a noteworthy source, and when searching for *Bonne Grace* is the reference made to *Beauté*.

> Les anciens Philosophes n'ont point mis de difference entre grace, & la beauté, puis que tout ce qui est beau est aussi agreable […] On appelle la grace cette sorte d'air ou qualité exterieure qui naist de la figure, de la couleur, & du mouvement des parties, cette qualité est appellée diversement, les uns la nomment la mine, la contenance; les autres le port; & le geste, la mine appartient au visage, le geste aux bras, l'air, la grace, & la contenance à tout le corps, le port marque le mouvement. (Rochefort, 1684, 30)[2]

Another and later example of a definition when a posture becomes *Gracieux* is found in *Essai sur Le Beau* (1763/1770) by Hotteterre's contemporary Yves Marie André (1675-1764). A posture is *gracieux* when it is straight, natural, effortless, and with a certain pleasant cheerfulness:

> […] que demande un port gracieux? Un maintien droit sans affection, une attitude aisée, une contenance gai & modeste, une démarche ferme sans pesanteur, & légere sans précipitation, une certaine flexibilité d'organes […] (André, 1763/1770, 313)[3]

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1. I have discovered a universal rule [regarding *Bonne grace*] which seems to apply more than any other in all human actions or words: namely to steer away from affections at all costs, as if it were a rough and dangerous reef, and (to use perhaps a novel word for it) to practice in all things a certain nonchalance which conceals all artistry and makes whatever one says or does seem uncontrived and effortless. I am sure that grace springs especially from this, since everyone knows how difficult it is to accomplish some unusual feat perfectly, and no facility in such things excites the greatest wonder; whereas, in contrast, to labour at what one is doing and, as we say to make bones over it, shows an extreme lack of grace and causes everything, whatever its worth, to be discounted. (Castiglione, *Le parfait courtisan et la dame de cour. Traduction nouvelle de l'italien du Comte Baltasar Castiglione*, 1528/1690, 61)

2. The philosophers of the Antiquity did not make any difference between grace, & beauty, since everything that is beautiful is also pleasant […] We call grace this kind of character or external quality, which is born from the appearance, from the colour, and of the movement of the parts, this quality is variously called, some call it mine, expression; others the posture; & gesture, the mine belongs to the face, the gesture to the arms, the air, the grace, & the attitude to the whole body, the appearance marks the movement. (Rochefort, *Dictionnaire Général et Curieux: Contenant les principaux mots, et les plus usitez en la langue Françoise, leurs Définitions, Divisions, & Etymologies*, 1684, 30)

3. […] what does a graceful port require? A straight posture without affection, an easy attitude, a cheerful & modest countenance, a firm gait without heaviness, & light without haste, a certain flexibility of organs to easily take on all the suitable airs […] (André, *Essai sur Le Beau,* 1763/1770, 313)

A definition of *Grâce* contemporary to Hotteterre, is found in *Synonymes François, leurs Différentes significations et le choix qu'il en faut faire pour parler avec justesse* (1769) by earlier mentioned Girard & Beauzée:

> Les *grâces* naissant d'une politesse naturelle accompagnée d'une noble liberté: c'est un vernis qu'on répand dans le discours, dans les actions, dans le maintien; & qui fait qu'on plaît jusque dans les moindres choses. Les *agréments* viennent d'un assemblage de traits fins que l'humeur & l'esprit animent; ils l'emportant souvent sur ce qui est plus régulièrement beau. Il semble que le corps soit plus susceptible de *grâces*; l'esprit, d'*agréments*. L'on dit d'une personne, qu'elle marche, danse, chante avec *grâce*; & que sa conversation est pleine d'*agréments*. (Girard & Beauzée, 1769, Tome I §. 54: 74)[1]

To high-light a natural and effortless approach toward playing a transverse flute within French aesthetics can be traced back at least to the Renaissance. An example is the French musician and theorist Philibert Jambe de Fer (*c.*1515-*c.*1566), who was active in Lyon between 1553 and 1564. In his *Epitome musical* (1556/2005), a treatise on music and several instruments including the Renaissance Traverso—*La fleutte d'alleman*—Jambe der Fer points on the importance of an aesthetic and playing technique being enjoyable, simple, and natural:

> […] le plus plaisant, facile & naturel […] (Jambe de Fer, 1556/2005, 47/220)[2]

Grace, *Bonne grace* and *Gracieux* reflects aesthetics which were described in French texts on rhetoric, acting, dance, singing, instrumental playing, as in relation to good manners in society in the 17th Century and 18th Century. Further are aesthetics linked to *Bonne grace* connected to the idea of naturalness. When making definitions of *Bonne grace* synonyms could be *Être agréable* (being pleasant, pleasurable, Lerond, Dubois & Lagane, 1992), *Aisance* (ease), *Élégance* (elegant), *Gracieuse* (graceful), *Libre* (freely), *Naturelle, Noble*, and *Souplesse* (Schulthess, 1907). Sometimes negations have been used to describe *Bonne grace* with phrases such as *Sans raideur* (without stiffness), *De ne point faire de grimaces, n'y de postures ridicules* (not to make faces, no ridiculous postures) and *Éviter toute crispation*, *sans la moindre contraction* (avoid contortion, without the slightest contraction or stiffness).

An important aspect of playing position and posture as suggested in *Principes* and *Rudiments* is that the Traverso-player should not make unnecessary body movements when playing:

On doit sur tout observer de ne faire aucun mouvement du Corps ni de la Tête, comme plusieurs font en battant la mesure. (I: 1-2)	[…] and observe never to make any motion with the Body, or head, as some do in beating Time. (I: 2)

This suggestion should not be understood as that the Traverso-player has to take a stance like a statue, but rather that when a balanced posture and playing position is found it centres the body, resembling how a ballet dancer centres the body. Hotteterre's suggestion connects directedly to a common 18th Century tradition in France regarding body movements while singing and playing a music instrument. An example is found in *Code de Musiques Pratique* (1760/2004) by Jean-Philippe Rameau. Here is explained that unnecessary body movements when singing risk to harm the beauty of sound, a loss of flexibility, resulting in *Chevrottement* or quavering of the voice like a goat:

> Il faut bien prendre garde sur-tout de ne mettre aucun agent de moitié avec le sentiment qui le guide ; plusieurs marquent souvent ce sentiment par un mouvement de tête, de main, de corps même, mouvement dont l'agent se ressent au point que la beauté du son & la flexibilité de la vois y perdent considerablement, & c'est encore de-là que nâit le chevrottement. (Rameau, *Code de Musiques Pratique* 1760/2004, 20/97)[3]

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1. The graces are born of a natural politeness accompanied by a noble freedom: it is a varnish that one spreads in the speech, in the actions, in the maintenance; & which makes us please even in the smallest things. The embellishments (*agréments*) come from an assembly of fine lines that the mood & the spirit animate; they often prevail over what is more regularly beautiful. It seems that the body is more susceptible to graces, the spirit of pleasure. It is said of a person that walks, dances, sings gracefully; & that the conversation is full of embellishments. (Girard & Beauzée, *Synonymes François, leurs Différentes significations et le choix qu'il en faut faire pour parler avec justesse,* 1769, Tome I §. 54: 74)

2. […] the most pleasant, easy, and natural playing […] (Jambe de Fer, *Epitome musical*, 1556/2005, 47/220)

3. We must be very careful, above all, not to put any agent in a bad light with the feeling that guides him [the performer]; several often mark this feeling by a movement of the head, of the hand, even of the body, movement which the agent feels to the point that the beauty of the sound & the flexibility of the voice lose considerably, & it is still from there the *chevrottement* (quavering) is born. (Rameau, *Code de Musiques Pratique*, 1760/2004, 20/97)

The main topic in this passage is the voice, but the same obstacles occur for the Traverso-player when making exaggerated body movements having negative effects regarding beauty, flexibility, and intonation of the Traverso sound, including the risk to fall into a sonority having an uncontrolled *chevrottement*. Another important text by Rameau on how to develop *Bonne grace* is *Réflexions de M. Rameau sur la manière de former la voix, & d'apprendre la Musique, & sur nos facultés en general pour tous les Arts d'exercice* (1752/2004). Here Rameau discusses how a grimace, a tension somewhere in the body, a tense hand, an open hand being too tense, too sprawling, too stretched, or bent fingers or an involuntary movement detracts from the sense of natural suppleness. In short, one must practice until all these faults are no longer present:

> […] une grimace, une contrainte dans quelque partie du corps que ce soit, une main trop serrée, trop ouverte, des doigts trop pressés, trop écartés, trop allongés, trop courbés, le corps déplacé, un mouvement involontaire; enfin mille moyens s'offrent pour faire sentir & appercevoir qu'on n'est pas encore au point désiré pour le bon exercice de la voix comme de l'instrument: & de pareils indices doivent engager à se rechercher jusqu'à ce qu'ils ne se présentent plus. (Rameau, 1752/2004, 95-96/215)[1]

Rameau's thoughts on *Bonne grace* points at that this is an essential element in the art of dance, which then is taken as a model for the musician. According to Rameau it is correct when a dance-master first engages in teaching movements and steps with the aim that movements and steps should be performed without paying attention to the movements in question. This first step creates conditions for developing a natural and intuitive comfort of movements which is an application of *Bonne grace*. Rameau's suggestions that the art of dance, its learning, and development can serve as a model for singers as well as for instrumentalists, and draws attention to the importance of flexibility aiming to avoid unnecessary tensions:

> Comme la bonne grace est un des principaux objets de la danse, c'est avec raison que le bon Maître n'y occupe dabord son écolier que des mouvemens & des pas, jusqu'à ce qu'il en posséde tellement la pratique, qu'il ne soit plus obligé d'y porter son attention, lorsqu'il s'agit de lui prescrire les moyens de se procurer cette bonne grace. (Rameau, 1752/2004, 96/215)[2]

When Hotteterre and French early 18th Century instrumental methods together with Rameau stressed the importance of *Bonne grace* it could be asked if the same aesthetics were relevant for the later part of the 18th Century. Possibly is one answer found in the last revision of *Principes* published in 1765 by the Parisian violinist and editor Antoine Bailleux (*c.*1720–*c.*1801). This edition literally followed the original text of *Principes* (1707), which sheds light on the importance of that the Traverso-player developed a playing position embracing an appearance of elegance and *Bonne grace* throughout the 18th Century. In addition is Bailleux's revision interesting because it included short treatises and fingering-charts for the clarinet and bassoon, together with a *Recueil d'Ariettes choisies dans les plus beaux Operas Comiques, Menuets et autres jolis airs ajustés pour deux Flutes traversieres Violons, ou pardessus de Viole.*

An example mirroring the early 19th Century and thoughts on *Bonne grace* is the influential flute method by Berbiguier (1818), which in its section *De la position de la Flûte* similarly as Hotteterre stresses the importance of gracefulness and nobleness:

> Il est certain qu'une attitude noble et gracieuse prévient singulièrement en faveur de l'exécutant. (Berbiguier, 1818, 27)[3]

1. [...] a grimace, a constraint in any part of the body whatsoever, a hand too tight, too open, fingers too pressed, too far apart, too stretched, too curved, the body moved with an involuntary movement; lastly, a thousand means are available to make us feel and perceive that we are not yet at the point desired for the proper exercise of the voice as of the instrument; and such indices must engage to search for each other until they do not show up anymore. (Rameau, *Réflexions de M. Rameau sur la manière de former la voix, & d'apprendre la Musique, & sur nos facultés en general pour tous les Arts d'exercice*, 1752/2004, 95- 96/215)

2. As bonne grace is one of the fundamental matters of dance, it is with good reason that the good Master firstly instructs his pupil only about motions and steps, until he has developed so much skill, that he is no longer obliged to pay attention to them when it comes to instructing the ways of acquiring bonne grace. (Rameau, 1752/2004, 96/215)

3. It is certain that a noble and graceful attitude is singularly prejudicial in favour of the performer. (Berbiguier, *Nouvelle Méthode pour la Flûte*, 1818, 27)

Déhanchement—Contrapposto* and *Bonne Grace

The playing position and posture as suggest in *Principes* and *Rudiments* has direct resemblance with the position of *Déhanchement* or *Contrapposto* when using its Italian term, having deep roots in sculpture and art of the Antiquity far up through the Renaissance and the 18th Century. Prominent examples are sculptures such as *Apollo di Belvedere* a Roman copy of a Greek original from about 320 BC, and *David* (1501-1504) by Michelangelo (1475-1564) being an influential example from the Italian Renaissance (Appendix X).

Examples with closeness to Hotteterre is found in the output of the earlier mentioned French painter Antoine Watteau, who made several paintings and drawings of Traverso-players, which play on the three-piece Traverso like *Model I* and *Model II* (Fig. 18, 19, 75). Further examples of *Déhanchement–Contrapposto* is found in the treatise on singing in *The Modern Musick-Master or the Universal Musician* (1731) by earlier mentioned Peter Prelleur being contemporary to *Rudiments*, and the painting *Blue Boy* (1779) by the English painter Thomas Gainsborough (1727-1788; Appendix X).

It could be questioned if Hotteterre intentionally developed ideas on playing position as described in *Principes* and *Rudiments* having thought of *Déhanchement–Contrapposto* as a model. But as mentioned above, the Traverso is favouring an asymmetrical playing position due to ergonomically reasons and naturally steer towards a stance having resemblance to *Déhanchement–Contraposto*. Possibly Hotteterre was familiar with the ideas of *Déhanchement–Contrapposto* based on how singers and actors often used this position and having been exposed to artworks from the Antiquity and art created in France during Hotteterre's lifetime.



Figure 19 A drawing and study of a Traverso-player and two women (*c.*1706-1716), by Antoine Watteau (1684-1721). Observe how the Traverso-player has […] *the left foot a little advanc'd, and rest the weight of your Body on the right leg* […] exactly as suggested in *Principes* and *Rudiments* (1707/1729, I: 2). (*British Museum,* London)

Déhanchement–Contrapposto is a posture admitting perfect stability, enhancing a supple contact between the head-joint, the chin, and lower lip altogether creating an ideal flexibility for the embouchure. In *Le Traité de Chant et Mise en Scène Baroques* (1997) by Michel Verschaeve, is discussed how Hotteterre's playing position has connection to ideals of *Déhanchement* (French *Hanche* for Hip).

Texts on rhetoric's such as Dinouart (1761) explained that the Actor and Singer carries the weight of the body at one of the two legs, which results in a certain sway when alternating, being of decisive importance for the Actor and Singer aiming for creating contrasts and gracefulness:

> […] se soutenir alternativement, tantôt sur une hanche, tantôt sur une autre […] (Dinouart, 1761, 217)[1]

It should be noted that the position of *Déhanchement*—apart from being an elegant posture and ergonomically favourable position in the manner as described in *Principes* and *Rudiments*—shapes the balance and centres the body. If one stands with the feet next to each other, such a position easily ends up in imbalance when for example moving the arms—or playing the Traverso—while *Déhanchement* and its asymmetrical position as suggested in *Principes* and *Rudiments*, creates a balance in the body between movement and rest:

> […] stand firm with ye left foot a little advanc'd, and rest the weight of your Body on the right leg […] (Rudiments, I: 2)

A typical example of *Déhanchement* is found in *The Modern Musick Master or the Universal Musician* (1731) and the section *An Introduction to Singing* by Prelleur (Fig. 20):



Figure 20 Singer showing the position of *Déhanchement* in *The Modern Musick-Master* by Prelleur (1731).

An example of suggestions regarding posture having affinity to *Déhanchement* is found in *Traité de la Viole* (1687) by Jean Rousseau (1644-1699), who had been a student of the composer and Basse de Viole virtuoso Jean de Sainte-Colombe (*c.*1640-*c.*1700). In the chapter *La Maniere de placer la Viole*, Rousseau described playing position and posture when playing the Viole, showing similarities with *Déhanchement* regarding how to position legs and feet:

> La pointe des pieds doit estre tournée en dehors, particulierement la point du pied gauche, qui doit estre plus tournée en dehors que celle du pied droite & avancer un peu plus en devant; & il faut que les deux pieds soient à plat, & jamais ne les coucher ny l'un ny l'autre sur le costé, ny lever le talon. (Rousseau, 1687, 28)[2]

Considered that Rousseau's *Traité* was published only twenty years before *Principes* (1707), possibly Hotteterre could have known about this text.

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1. […] lean alternately, sometimes on one hip, sometimes on the other […] (Dinouart, *L'Eloquence du corps ou l'Action du Prédicateur,* 1761, 217)

2. The tips of the feet should be turned outwards, especially the point of the left foot, which should be turned out more than that of the right foot & step forward a little more; & both feet must be flat, & never lay them downside by side, nor lift the heel. (Rousseau, *Traité de la Viole*, 1687, 28)

Dance and *Bonne grace*

Connecting to dance as Jean-Philippe Rameau did makes it appealing to examine how a dance-master being contemporary to Hotteterre as Pierre Rameau (1674-1748) explained the basic position on how to stand with *Bonne grace* as described in *Le Maître à Danser* (1725; Fig. 21):

> […] comme il est essentiel de sçavoir se poser le corps dans une situation gracieuse […] Il faut avoir la tête droite sans être gêné, les épaules en arriere (ce qui fait paroître la poitrine large & et donne plus de grace au corps) les bras pendans à côté de soi, les mains ni ouverte ni fermées, la ceinture ferme, les jambes étenduës, & les pieds en dehors: j'ai tâché de donner à cette Figure l'expression possible, afin qu'en la voïant on puisse se poser le corps tel qu'il doit être. Je lui ai donné une attitude prêt à marcher [Fig. 15], c'est pourquoi elle a le pied gauche devant, & le pied droit prêt à partir, soit pour faire un pas en avant ou à côté, parce que le corps étant posé sur le gauche, par ce moïen le droit doit agir facilement; j'espere que prenant toutes ces précautions on ne tombera pas dans le ridicule d'être gêné ou roide, ce que l'on doit éviter, ni même d'affection; la bienséance ne demandant que ce beau naturel & cet air aisé que la danse seule est capable de procurer. (Pierre Rameau, 1725, 2-3)[1]

As can be seen it is of essential nature to find a graceful position and of similar importance for the dancer, and in the present context for the Traverso-player. The description regarding posture as explained and suggested by Hotteterre resembles how the dance-master Rameau explained the starting position for the dancer. A similarity is that the head should be kept straight, although the head must be slightly turned to the left due to the asymmetrical position when playing the Traverso. When Rameau points on that the arms should be quite close to the body—*les bras pendans à côté de soi*—this connects to when Hotteterre suggests that the Traverso-player should not raise shoulders nor elbows—*sans lever les Coudes ni les Epaules*.



Figure 21 The illustration to the explanation on how to stand in a graceful position of *Déhanchement* as described by Pierre Rameau (1725).

Both Hotteterre and Rameau described the starting position similarly, and as being ready to start walking—*Je lui ai donné une attitude prêt à marcher*—which connects to the position *Déhanchement*, creating a balance in the body between movement and rest. Descriptions and suggestions as formulated by the dance-master Rameau and the Traverso-player Hotteterre has resemblance to how Jean-Philippe Rameau discussed posture and *Bonne grace*.

1. […] as it is essential to know how to pose the body in a graceful position […] You must have your head straight without being embarrassed, your shoulders back (which makes your chest appear large & and gives more grace to your body) the arms dangling at one's side, the hands neither open nor closed, the belt firm, the legs extended, and the feet outwards: I have tried to give this Figure the possible expression, so that in it seeing, we can pose the body as it should be. I gave the body a position as ready to walk, which is why the left foot is in the front, & the right foot ready to go, either to take a step forward or to the side, because the body being placed on the left, by this means the right must act easily; I hope that taking all these precautions we will not fall into the ridicule of being embarrassed or stiff, which we must avoid, or even of affection; propriety requiring only that beautiful naturalness and that air of ease that dancing alone is capable of providing. (Pierre Rameau, *Le Maître à Danser*, 1725, 2-3)

Singing, breathing, *crescendo*, *diminuendo*, and *Bonne grace*

In *Le Traité de Chant et Mise en Scène Baroques* (1997) by Werschaeve is a discussion regarding singing and acting of opera-singers and actors in the period of Hotteterre. Considered that singing since long has been a model for instrumental players, it seems reasonable to assume that Hotteterre was a part of this tradition. If so, it could be reasoned that Hotteterre described common fundamentals for a natural function of breathing when discussing posture and playing position.

Texts discussing singing and wind playing from the 17th and 18th Centuries does not generally comment on function and technique of breathing in anatomical or bio-mechanical terms. Still, there are some instructive texts which sheds light on singing technique, and thus indirectly on Traverso-playing. Possibly Traverso-players such as Descoteaux, Rebillé *dit* Philbert, La Barre, Hotteterre, Blavet, and Buffardin where well informed regarding singing techniques, which possibly influenced their playing, ideas, and methods when teaching the Traverso. One such source is *L'Art du Chant* (1755) by Antoine Bérard (1710-1772)—a reference when it comes to French singing mirroring the first half of the 18th Century—which has an explanation on the singers breathing (*Chapter IV*) which is interesting in relation to Traverso-playing:

> Pour bien inspirer il faut élever & élargir la Poitrine de telle sorte que le ventre se gonfle: par cet artifice on remplira d'air toute la cavité du Poumon: pour bien expirer il faut faire sortir l'air intérieur avec plus ou moins de force, avec plus ou moins de volume, selon le caractère du Chant. (Bérard, 1755, IV: 25)[1]

Bérard continues and compares how a singer uses the air when expiring with how a bow and the hand handles the bow making the sound on a string instrument:

> L'air est comme l'archet, la Poitrine & les Poumons font les fonctions de la main qui fait mouvoir l'archet. (Bérard, 1755, IV: 18)[2]
>
> […] l'air contenu dans le Poumon que nous appellerons Air intérieur, doit être regardé comme l'archet qui imprime du movement aux cordes vocales […] (Bérard, 1755, V: 21)[3]

Connecting to the idea that the airstream when singing is like the bow when playing on a string instrument, has a direct relation to that the airstream when playing generally on any kind of a transverse flute. In contexts of the Boehm-flute has the airstream sometimes been compared with the interaction between the bow and the string when playing the violin (Taffanel & Gaubert, 1923/1958; Ljungar-Chapelon, 2008; 2020). In *Die Flöte und das Flötenspiel* (1871/1980) Boehm explained the resemblance between how sound is generated on a stretched violin-string and the air-column inside the tube of the flute:

> Die von dem Flötenrohre umschlossene Luftsäule ist füglich mit einer gespannten Violin-Seite zu vergleichen. Wie die Saite mittelst des Bogens in die transversalen Schwingungen und hie-durch zum Tönen gebracht wird, so werden auch die longitudinalen Schwingungen der Luft-Säule der Flöte durch das Anblasen erregt. (Boehm, 1871, 18)[4]

Considered that similarities regarding the embouchure and related techniques are bigger than the differences between for example the Traverso and Boehm-flute (Castellengo et al., 1978) it seems reasonable to assume that similar ideas as explained by Boehm regarding the air-column inside the flute and a stretched violin-string could have been familiar to Hotteterre and his contemporary Traverso-players.

In the instructive text *Code de la Musique* (1760/2004) by Rameau are important suggestions regarding how a singer can practice the development of flexibility and inflexions of the voice with help of the traditional method of *Sons filés*, which when applied for Traverso playing is equally valuable:

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1. To breathe in well you must raise & widen the chest so that the belly will inflate: by doing so we will fill the entire lung cavity with air: to breathe out well, the air in the lungs must be released with force, with volume, according to the character of the song. (Bérard, *L'Art du Chant*, 1755, IV: 25)
2. The air is like the bow; the Chest & Lungs perform the functions of the hand which moves the bow. (Bérard, 1755, V: 18)
3. […] the air contained in the Lung, which we will call Internal Air, must be regarded as the bow which imparts movement to the vocal […] (Bérard, 1755, V: 21)
4. The open air-column of a flute tube is exactly comparable with a stretched violin string. As the string is set into transverse vibrations by the bow and thus is made to sound, so the longitudinal vibrations of the air column of the flute are produced by the blowing. (Boehm, 1908, 64; trans. Miller)

> On sait que le son se file tout d'une haleine, en débutant par la plus grande douceur, en l'enflant insensiblement jusqu'au plus fort, mais non pas à l'excés, puis en l'affoiblissant de même jusqu'à l'extinction de la voix […] Il faut être droit sur ses pieds pendant cet exercice, se tenir avec grace & sans gêne, se bien examiner, sentir une grande aisance dans toutes les parties du corps, prendre la peine, en un mot, de n'en point prendre, sur-tout en donnant le vent nécessaire pour former le *son*, en l'enflant, en le diminuant; car enfin toute perfection dépend de là. Quand je dis qu'il faut se tenir avec grace, la grace peut-elle s'accorder avec la moindre contrainte? on ne la trouve qu'avec la plus grande liberté : & comme l'acteur pourroit-il suffire à tant d'objets différens qui doivent concourir mutuellement à une parfaite exécution de sa part, savoir, le beau son, la flexibilité de la voix, la Musique, la grace, le sentiment, dont l'expression doit être fidèlement rendue par le goût du chant, par la geste & par l'air du visage, si tous ces objets ne lui étoient pas familliers au point qu'ils lui deviennent naturels! (Rameau, 1760/2004, 14-15/96)[1]

Here Rameau again stresses the essential importance of *Grace* and an unconstrained posture of the whole body, connecting to that a breath should not be taken deeper than necessary, which is the essential condition for an effortless and supple breathing technique when speaking. In the context of Bérard and Rameau it is important to compare explanations on how to make *Sons filés* (*crescendo* and *diminuendo*) with the voice and on the Traverso. Rameau's rhetorical question if *Grace* is possible with even the slightest muscular tension is clearly answered by Rameau with *No*, and the conclusion is that an exquisite musical performance is inseparable from *Bonne grace*.

In the fragment of *Nouvelle Méthode courte et facile pour apprendre à jouer de la flûte traversière avec des préludes* (1758) by the French-Caribbean Traverso virtuoso Atys (1715-1784) published in *Mercure de France* (1758), is a detailed technical explanation regarding how to develop the embouchure and the airstream (ribcage, breathing muscles, and diaphragm) showing similarities with how Rameau explained the gradual increase and decrease of the volume of the voice:

> […] il faut appuyer sur le son par degré, du sorte que le milieu de ce son soit plus enflé que le commencement & la fin; ce qui se fait aisément en lâchant les levres & les serrant par gradation. Le vent qui se trouve resserré, sort avec plus de force, & grossit naturellement le son. Pour régler votre embouchure dans le commencement, soufflez dans la flûte vis-à-vis une chandelle allumée; si la chandelle varie, la flûte n'est pas bien embouchée. (Atys, *Mercure de France*, May 1758, 172–173)[2]

In *Die Flöte und das Flötenspiel* (1871/1980) Boehm discusses the importance of practicing *crescendo* and *diminuendo*—*Sons filés*—and suggested this as the fundamental exercise for the development of tone in similar terms when compared with Rameau and Atys:

> Hat man den richtigen Ansatz gefunden, bei welchem dieser Ton [C2] im zartesten Piano rein klingend anspricht, so suche man ihm allmählich ohne Erhöhung der Stimmung bis zum Forte anzuschwellen und ihn sodann wieder zum leisesten Pianissimo zurück zu führen. (Boehm, 1871, 18)[3]

As can been shown are Atys (1758), Rameau (1760) and Boehm (1871) over time explaining similar techniques aiming for the development of flexibility and inflexions and tonal qualities, all three stressing the importance of starting each note very softly, gradually expanding the volume, and then decreasing back to the very soft starting nuance.

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1. We know that the sound comes out in one breath, starting with the greatest softness, gradually swelling it to the loudest, but not to excess, then weakening it in the same way until the extinction of the voice […] You must be straight on your feet during this exercise, stand with grace and without embarrassment, examine yourself carefully, feel great ease in all parts of the body, take the trouble, in a word , not to take any, especially by giving the wind necessary to form the sound, by swelling it, by diminishing it; because ultimately all perfection depends on there. When I say that we must behave with grace, can grace be consistent with the slightest constraint? we only find it with the greatest freedom: and how could the actor suffice for so many different objects which must mutually contribute to a perfect execution on his part, namely, the beautiful sound, the flexibility of the voice , Music, grace, the sentiment, the expression of which must be faithfully rendered by the *goût* of singing, by the gesture and by the look of the face, if all these objects were not so familiar to him that they become natural! (Rameau, *Code de la Musique*, 1760/2004, 14-15)

2. […] it is necessary to give the sound different degrees, so that the middle of this note is stronger than the beginning and the end, which is easily done by releasing [stronger nuances] and tightening [softer nuances] the lips by graduation. When the lips are first tightened [for softer nuances] and then released the airstream goes out with more force [gives louder nuance], and naturally enlarges the sound. To set your embouchure in the beginning, blow into the flute in front of a lighted candle; if the flame flicker, the airstream is too strong. (*Mercure de France*, Atys, May 1758, 172–173)

3. When one has found the proper embouchure by which this tone [C2] can be clearly sounded in the delicate piano, one should gradually, without raising the pitch, swell it to a forte, and then bring it back again to the faintest pianissimo. When this is fully accomplished one passes in the following manner to the tone lying next. (Boehm, 1908, 64, 72-73; trans. Miller)

What makes Boehm remarkable in the present context is that he as a virtuoso mastered Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. Exceptionally enough he was as well a master-maker of these three flute models, and the inventor of the *Ringklappenflöte* and the *Boehm-flute* (Schmid, 1981; Lenski & Ventzke, 1992). Considered that the *Multi-keyed conical flute* in many respects have important similarities with the Traverso makes Boehm's suggestions even more noteworthy, and an example of transitions of embouchure techniques serving the Boehm-flute as Multi-keyed conical flutes, and *Ringklappenflöte*.

Acting and *Bonne grace*

Aesthetics regarding *Bonne grace* as an elegant, noble posture, and appearance on stage is described in *Théorie de l'Art du Comédien ou manuel Théâtral* (1826) by Aristippe, the pseudonym for Bernier de Maligny (*c.*1798-1864), which indicates that ideals and traditions with origins in the 18th Century were valued in France during the first part of the 19th Century:

> Plus on gesticule, moins l'action est noble, car on devrait toujours laisser échapper le geste comme malgré soi, le spectateur doit croire qu'on ne cède qu'à l'impulsion, aux movemens naturel. (Aristippe, 1826, 209)[1]

Similar thoughts regarding the importance of avoiding unnecessary gestures and grimaces when connection to singing is found in *Principes de Musique divisez en quatre parties* (1736) by Michel Pignolet de Montéclair (1667-1737) whereby making grimaces and unnecessary gestures with the face are dismissed:

> Il ne faut pas gesticuler en chantant, ni faire des grimaces de la bouche, des yeux et du front […] (Montéclair, 1736, 91)[2]

To conclude it seems to be clear that *Principes* and *Rudiments* share similar aesthetics as has been shown above regarding *Bonne grace* and can thus be understood as being a part of a tradition as expressed in Hotteterre's life-time and in *Code de la Musique* (1760/2004) by Rameau:

> […] d'objet différens qui doivent concourir mutuellement à une parfait exécution de sa part, savoir, le beau son, la flexibilité de la voix, la Musique, la grace, le sentiment, dont l'expression doit être fidèlement rendue par le goût du chant, par le geste & par l'air du visage […] (Rameau, 1760/2004, 15/96)[3]

Painting and *Bonne grace*

In a treatise on painting *Les Premiers elemens de la peinture pratique Enrichis de Figures de Proportion mesurée sur l'Antique, desinées & gravées par J. B. Corneille Peintre de l'Academie Royale* (1684) by the French art critic and painter Roger de Piles (1635-1709) is a short paragraph on *Bonne grace* and the action of when painting:

> Chapitre XXIX. De la bonne grace en peignant sur le Chevalet.
> Pour peindre de bonne grace il faut tenir son pinceau, le plus long que l'on peut, & estre droit sur son siége (sans contrainte pourtant) & dans une distance raisonnable de son ouvrage. Cela fait que ce que l'on peint est plus libre; au lieu que rien n'oste davantage cette bonne grace, que d'avoir le nez, comme on dit, dans son Ouvrage, & de tenir son Pinceau court. (Piles, 1684, 71-72)[4]

This paragraph is interesting because it connects to the importance of an elegant and natural posture when painting when compared with *Principes* and *Rudiments*. Further that *Bonne grace* is of importance for the painting artists in the atelier at work, which could be transposed to when the Traverso-player is practicing at home without having and audience. Altogether de Piles comments on the daily work and practice of the artist and musician points at and supports the value of maintaining *Bonne grace* on a personal level.

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1. The more one gesticulates, the less noble the action, because one should always let the gesture come as despite oneself, the spectator must believe that one is generated only to the [emotional] impulse, to natural movements. (Aristippe/Bernier de Maligny, *Théorie de l'Art du Comédien ou manuel Théâtral*, 1826, 209)
2. You must not gesticulate while singing, nor make faces with your mouth, eyes, or forehead […] (Montéclair, *Principes de Musique divisez en quatre parties*, 1736, 91)
3. […] different objects which must contribute mutually to a perfect execution, namely, the beautiful sound, the flexibility of the voice, the Music, the grace, the sentiment, the expression of which must be faithfully rendered by the *goût* for singing, by the gesture and by the air of the face […] (Rameau, *Code de la Musique*, 1760/2004, 15/96)
4. Chapter XXIX. *Of good grace while painting on the Easel.* To paint with grace, you must hold your brush, as long as you can, & be straight on your seat (without constraint however) & at a reasonable distance from your work. This makes what you paint freer; whereas nothing defies this grace more than to have one's nose, as they say, in one's work, and to keep one's brush short. (Piles, *Les Premiers elemens de la peinture pratique Enrichis de Figures de Proportion mesurée sur l'Antique, desinées & gravées par J. B. Corneille Peintre de l'Academie Royale*, 1684, 71-72)

Manners and *Bonne grace*

In connection to above discussed suggestion regarding posture is the text *L'Aristippe Moderne* (1738/1764) by Denesle (17??-1767) commenting on educated manners connecting to how Jean Rousseau (1687), Bretteville, (1689), Hotteterre (1707/1729), Pierre Rameau (1725), Montéclair (1736), Rameau (1752; 1760), Bérard (1755), and Dinouart (1761) exemplified suggestions regarding posture and expression.

In *L'Aristippe Moderne* (1738/1764; Fig. 22) Denesle explained that good manners are related to an attractive posture and expression that has kinship to above mentioned suggestions of a good posture which influences manners, and thus according to Denesle implicitly on musical expression and connected aesthetics regarding *Bon Goût*:

> La décence comprend trois choses; l'air, l'habit & la parole. L'air consiste à sçavoir se donner ce qu'on appelle la bonne grace, ou la bonne concenance. Pour cela il faut que l'art seconde la nature ; mais d'une maniére imperceptible,
>
> Dans son abord quelle noblesse!
> Quel charme dans sa politesse!
> Ah ! qu'il sçait agréablement
> Et de l'art & de la nature,
> Comme en une docte peinture,
> Faire un juste ménagement!
>
> dit un Poëte de nous jours. […] Il faut que le corps soit droit, sans aucune indice d'orgueil; ferme, sans paroître guidé; libre, sans aucun geste extraordinaire; les pieds bien posés, mais d'une maniére qui ne sent ni le Maitre de danse, ni le Prévôt de salle, le visage ouvert, les yeux rians, sans égaremens, assurés sans effronterie; le rencontre douce, sans bassesse; la démarche réglée, sans indolance, comme sans agitation. (Denesle, 1738, 29-30)[1] La danse, les jeux d'exercice, monter à cheval, faire des armes, tout cela aide beaucoup au dénouement du corps, & lui donne la grace, sur-tout quand on prend pour modéles ceux qui ont ce qu'on appelle le bon air ; c'est-à-dire, un air aisé & naturel. (Denesle, 1738, 36-37)[2] Il faut encore éviter soigneusement tout ce qui tient de la grimace, & qui donne au visage un air peu naturel. Tout ce qui rompt, ou défigure les traits dont la nature nous a caractérisés, s'appelle grimace: comme quand on se ride le front, que l'on se fronce le nez, ou les sourcils, que l'on ferme la bouche d'une maniére déplaisante. Tout ce qui altére le naturel, choque les yeux de ceux qui nous regardent, quand ce seroit pour les imiter eux-mêmes […] (Denesle, 1738, 32-33)

In the present context is above-mentioned Denesle of interest because he seems to have been attracted of the Traverso, and thus wrote a longer poem entitled *Syrinx ou l'origine de la Flûte Poeme a Messieurs Naudot, Blavet, Lucas* (1739, Appendix XXVIII). This poem is based on the metamorphose *Pan and Syrinx* as retold by Ovid and describes the charm and expression of the flute. As the title show this poem was dedicated to and a praise of three Parisian Traverso virtuoso players: Jean-Christophe Naudot (*c.*1690-1762), Michel Blavet (1700-1768) and Lucas (??).

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1. Decency includes three things: manner and behaviour, dress & speech. The manner consists in knowing how to give oneself what is called good grace, or good concentration. For this, art must second nature; but in an imperceptible way,

> In his approach what nobility!
> What charm in his politeness!
> Ah! that he knows pleasantly
> And art & nature,
> As in a learned painting,
> Made with carefulness!

says a poet of our day.
The body must be upright, without any sign of pride; firm, without appearing to be guided; free, without any extraordinary gesture; the feet well planted, but in a way that smacks neither of the Dancing Master nor of the Hall Marshal, an open face, smiling eyes, without bewilderment, assured without effrontery; meets him sweet, without baseness; the gait regulated, without indolence, as if without agitation. (Denesle, *L'Aristippe Moderne*, 1738, 29-30)

2. Dancing, games of exercise, horse-riding, fencing, all this helps a great deal in the denouement of the body, and gives it grace, especially when one takes as models those who have what is called the good manners; that is to say, an easy & natural appearance. (Denesle, *L'Aristippe Moderne*, 1738, 36-37) (Manière d'agir, comportement ; manner, behaviour, way of doing)

3. It is also necessary to carefully avoid anything resembling a grimace, which gives the face an unnatural look. Anything that breaks or disfigures the features with which nature has characterized us is called a grimace: as when one wrinkles one's forehead, wrinkles one's nose or eyebrows, closes one's mouth in an unpleasant way. Everything that alters the natural, shocks the eyes of those who look at us […] (Denesle, *L'Aristippe Moderne*, 1738, 32-33)



Figure 22 Engraving from *L'Aristippe Moderne* (1738/1764) by Denesle from the Paris edition printed in 1764 showing examples of manners in an environment of the Antiquity. (Private Collection)

In the influential *Méthode de Flûte* (1851) by Tulou and its section *Position du Corps* is stressed how important the playing position is for a functional breathing, which almost one hundred fifty years later sheds light on *Principes* and *Rudiments* and their suggestions regarding playing posture and position:

> La position du corps est une chose importante; il peut dépendre de cette position que la respiration soit facile ou gênée. (Tulou, 1851, 6)[1]

1. The position of the body is an important thing; it may depend on this position whether breathing is easy or difficult. (Tulou, *Méthode de Flûte,* 1851, 6).

Finally, mentioned Verschaeve rhetorically asked a significant question which directly connects to the absence of comments and suggestions regarding breathing in *Principes* and *Rudiments*, pointing on that the costumes of the late 17th and 18th Century—as shown on the engraving of the Traverso-player by Picard in *Principes*—favoured a straight posture without tightening the body:

> Apprendre à respirez, n'est-ce pas d'abord apprendre à se tenir? (1997, 59)[1]

Conclusions regarding posture, breathing, playing position and *Bonne grace*

- Posture and playing position as described and suggested in *Principes* and *Rudiments* aims for a graceful appearance and stresses the importance of an unconstrained playing position enhancing ergonomic functionality.
- The suggested playing position in *Principes* and *Rudiments* regarding arms, hands, and fingers makes the Traverso resting in the left hand as on a ball-joint, which is of great help when developing suppleness regarding the essential technique of turning the head-joint in different positions (*Normal—Outward—Inward*) when adjusting intonation. This playing position in combination with the technique of supporting the Traverso with the ring-finger and little-finger of the right hand enables a minimum of pressure of the head-joint against the lower lip, chin, and lower jaw which considerably facilitates control of intonation and flexibility of the sonority.
- In *Principes* and *Rudiments* are no specific discussions or suggestions regarding anatomical and technical aspects on breathing in direct terms. But, when applying suggested posture and playing position regarding the whole body when standing or sitting, how to position arms, wrist, and hands altogether facilitates a functional and expressive breathing when playing the Traverso.
- The suggestions in *Principes* and *Rudiments* regarding when playing standing and the positioning of feet and legs has distinct similarities to *Déhanchement—Contrapposto*, which is favourable for Traverso-playing because of its asymmetrical playing position. Further, *Déhanchement* associates to how singers and actors often uses this position, including artworks from the Antiquity, Renaissance, and French arts in the lifetime of Hotteterre.
- The essence of Hotteterre's guidelines regarding playing position could be summed up as:
  The body must be erect regardless of if sitting or standing.
  Elbows and shoulders should not be raised.
  The head should be rather raised than lowered, and slightly turned toward the left side.
  The left arm should be relatively close to the chest.
  The left foot is placed somewhat forward, and the weight of the body placed on the right hip.
  One should not move more than necessary while playing.
  The playing position should be without tension.
- There are parallels between *Principes* and *Rudiments* and suggestions on posture including the importance of supple playing positions and gracefulness as found in descriptions by Jean Rousseau (1687, Viole da Gambe), l'Abbé Etienne Dubois de Bretteville (1689, Rhetorics), Pierre Rameau (1725, Dance), Montéclair (1736, Music theory), Jean-Philippe Rameau (1752, 1760, Music education), Bérard (1755, Singing), and Dinouart (1761, Rhetorics).
- To conclude, the impression is that *Principes* and *Rudiments* mirrors common ideals, aesthetics, and traditions in France of the late 17th Century and the first half of the 18th Century being applied to Traverso playing, that could be summed up with a definition of *Grace* found in *Abregé de la Vie des Peintres, Traité du Peintre parfait* (1699) by earlier mentioned Roger de Piles:

  > […] ce qui plaît & ce qui gagne le cœur sans passer par l'esprit.
  > (Piles, 1699, 11)

  Freely translated it could be said that something is having *Grace* when it pleases, wins the heart spontaneously without reflective intelligence.

1. Learning to breathe, isn't that firstly to learn a good posture? (Verschaeve, *Le Traité de Chant et Mise en Scène Baroques,* 1997, 59)

6.2 The lips, embouchure, and airstream

> *Quoique biens des Gens soient persuadez que l'Embouchure ne se peut enseigner par regles; cependant il y en a quelques-unes qui facilitent extrêmement la recherche que l'on peut faire.*[1]
>
> *Principes* (1707, II: 2)

The quote above from *Principes* and the chapter on embouchure discusses the possibility and relevance of learning a complicated technique such as the embouchure on the Traverso with the help of a text. Of course, this is a relevant question, and in many situations, it can possibly be answered with "*perhaps not possible*", because often does an experienced teacher show and explain a complicated technique with help of playing on the instrument. Nevertheless, a text on Traverso-playing and aspects of how to learn and develop for example tone and sonority can if it has practice-based explanations, suggestions of methodological nature and written by outstanding musicians give tools for individual practice and development. If so, Hotteterre can be understood when stating that it would not be more difficult for him to explain fundamental elements of the embouchure in writing or in speech:

[...] il ne me sera pas plus difficile de les écrire que de les donner de vive voix [...] (II: 3)	This passage is not translated in Rudiments In the translation by Douglas this passage is translated as: [...] it will not be more difficult for me to write it down than to deliver it orally [...] (Hotteterre, 1968, 11)

An example of an opposite idea is found in earlier mentioned *Traité de la Viole* (1687) by Jean Rousseau which possibly mirrors a common opinion in the late 17th Century in France regarding music education. Rousseau started his *Traité* explaining playing positions and how to place the Viole, together with questioning the utility of the written word in this context. In the first chapter with the title *Comment il faut placer la Viole, porter la main, tenir & conduire l'Archet* Rousseau makes a clear statement regarding instrumental teaching which possibly seems to be a representative description mirroring music education in Paris in the last decades of the 17th Century:

> Il m'a toûjours semblé que c'estoit une chose inutile de vouloir enseigner par écrit la maniere de placer la Viole, de porter la main, & de tenir & conduire l'Archet; parce qu'il est difficile de comprendre ces choses par une simple lecture, & encore plus de les partiques sans le secours d'un Maistre, car l'experience journaliere nous fait sensiblement connoistre le contraire, puis que les Maistres avec tout leur sçavoir & leurs soins ont bien de la peine à les faire pratiquer à leurs Ecoliers, suivant les Regles de l'Art, particulierement dans les commencemens. (Rousseau, 1687, 26)[2]

In the second chapter *De l'Embouchure—Of filling the GERMAN FLUTE* in *Principes* and *Rudiments* Hotteterre gives a short but precise explanation of essential concepts regarding how to position the lips and the embouchure:

Il faut qu'elles [the lips] soient jointes l'une contre l'autre, excepté dans le milieu où l'on doit former une petite ouverture pour le passage du vent: On ne les avancera point, au contraire on les retirera du coin de la Bouche, afin qu'elles soient unies & applaties. Il faut placer l'embouchure vis-à-vis de cette petite ouverture (II: 3)	[…] what manner the lips are to be disposed, they ought to be joyn'd close together except just in their middle, where a little opening is form'd for the passage of the wind, the lips must not pout out, but rather be contracted toward the corners of the mouth; So that they may be smooth and even; let the hole of the Flute be plac'd just opposite to this opening of the lips, and resting the Flute upon the under lip […] (II: 3)

1. Although a great many are of opinion, that the filling of the Flute cannot be taught by Rules, but must be acquired by practice; there are nevertheless, some Rules that may very much facilitate the finding out the method (Trans. *Rudiments*, 3)

2. It has always seemed to me that it is a useless thing to want to teach in writing how to place the Viola, to carry the hand, & to hold & to lead the Bow; because it is difficult to understand these things by a simple reading, and even more of the parts without the help of a Master, because the daily experience makes us appreciably know the opposite, then that the Masters with all their knowledge and their care have great difficulty in making their pupils practice them, according to the Rules of the Art, particularly in the beginnings. (Rousseau, *Traité de la Viole*, 1687, 26)

Following Hotteterre's guidelines closely, together with studying the engraving by Picard is instructive regarding the embouchure, and results in a well centred airstream, slightly sloping downward (Fig. 23). It should be noted that Hotteterre's suggestion using a mirror regarding the development of the embouchure in combination with the instructive engraving by Picard, sheds light on that *Principes* and *Rudiments* has a dimension encouraging self-study, as discussed above.

Pour observer toutes ces Regles [regarding the lips and embouchure] il sera bon de se mettre devant un Miroir, (précaution qui sera d'un grand secours.) (II: 3)	To observe all these Rules [regarding the lips and embouchure] 'twill not be amiss to sit opposite a Looking-glass, which will prove of some advantage (II: 3)



Figure 23 Detail from the engraving of a Traverso-player in *Principes* (1707/1722) by Picard showing the positioning of the lips and embouchure with an almost photographic precision. (Private Collection)

It is remarkable how similar Hotteterre's explanations regarding the lips and embouchure is when compared with how Rampal in *La Flûte* (1978) explained the same subject:

> La positions des lèvres. Les coins de la bouche doivent être tires vers le haut, comme lorsque l'on sourit. (Rampal, 1978, 26; Appendix XI)[1]

Later in the chapter on the embouchure is an example of pragmatism in relation to Hotteterre's own guidelines on how to position the lips:

Par exemple, si une Personne se trouvoit avoir les Levres disposées de maniere, qu'il luy fut plus difficile d'emboucher la Flute, en les unissant, & en les applatissant, qu'en avançant celle d'enhaut; alors il ne faudroit prendre de mes Regles que ce qui ne seroit pas tout à fait contraire à cette disposition, & il faudroit suivre toûjours ce qui paroîtroit le plus naturel. (II: 4)	This section is not translated in Rudiments For example, if a Person happened to have the Lips arranged in such a way, that it was more difficult for him to mouth the Flute, uniting them, & flattening them, than by advancing the upper lip; then it would be necessary to take from my Rules only what will not be entirely contrary to this disposition, & it would be necessary always to follow what would appear the most natural.

From above shown concepts regarding the lips and embouchure, it can be concluded that Hotteterre shows an approach, based on naturalness regarding the lips and embouchure, giving the impression of an experienced teacher of the Traverso. It should be noted that Hotteterre—according to what can be deduced from *Principes* and *Rudiments*—seems to have encouraged that the airstream generally is blown in the same direction, and that necessary modifications regarding the angle, direction, and distance between the point where the airstream hits the sharp edge of the blowing-hole is regulated through three general positions *Normal—Outward—Inward*. The *Normal* position *Situation ordinaire–Usual situation* serves as a point of reference, the *Outward* position *Tourne la Flute en dehors–Turning the Flute outward* is used for sharping notes being too flat, and the *Inward* position *Tourne la Flute en dedans–Turning the Flute inward* is used for flattening notes being too sharp. Generally, this embouchure technique has its origin in that the placement of the tone-holes on a Traverso is the result of a compromise making some notes sharp and others flat when blowing the airstream in the same direction and angle. It seems clear that Hotteterre suggested a generally steady airstream when playing in the same nuance, and necessary adjustments regarding the angle and direction of the airstream in relation to intonation should be modified with the three mentioned head-joint positions. It can from the fingering-charts in *Principes* and *Rudiments* be extracted that those skills regarding the angle and direction of the airstream made with the three different head-joint positions is essential.

1. The positions of the lips. The corners of the mouth should be pulled up, like when you smile. (Rampal, *La Flûte*, 1978, 26)

This does, of course, not exclude that Hotteterre used the embouchure technique adjusting the angle and direction of the airstream with help of the lips in combination with the three positions of the head-joint, together with refined adjustments regarding the speed of the airstream with help of a flexible *Tonus* in the lips and ribcage, breathing muscles, and diaphragm. In this context are Rameau's explanation of *Sons filés* in *Code de Musique Pratique Code de Musique Pratique* (1760)*,* shedding light on the proportions between the speed of the airstream and the opening of the mouth when singing. Similarly, are proportions regarding the size of opening between the lips and the air-pressure when playing the Traverso of essential importance:

> La force du vent doit être proportionnée à chaque degré du son, ce qui est insensible, & ne peut s'acquérir que par un fréquent exercice, dès qu'on ne le doit pas à un heureux hasard: c'est la différente force de ce vent qui, en déterminant l'ouverture de la bouche, lui donne pour lors le calibre convenable à la perfection du son. (Rameau, 1760/2004, 16/96)[1]

When studying fingering-charts in *Principes* and *Rudiments* it can be extracted that Hotteterre structured how to handle the airstream into four different techniques, and thus giving a detailed method regarding fundamental flautistic techniques such as the control of speed, intensity, and direction of the airstream:

1. Influencing the speed and intensity of the airstream (ribcage, breathing muscles, diaphragm).
2. Influencing the speed and intensity of the airstream with *Tonus* in the lips.
3. Influencing the direction of the airstream with different head-joint positions.
4. Influencing the airstream and resonance while shaping the size of the mouth cavity.

As every flautist knows is the effect of speeding up the airstream that a given note generally will have a sharper intonation and *vice-verse*. Turning the head-joint inward will flatten intonation and *vice-verse*. The high register needs a somewhat faster airstream and *vice-verse* for the lowest register. Each of above shown techniques influences intonation, changes of register, nuances, and sound colours, which gives a vast number of potential combinations. An example could be to speed up and intensify the airstream, and at the same time turn the head-joint inwards together with shaping of the mouth cavity. As will be discussed later in section *6.2*, is the interaction of the four techniques regarding the airstream as described in *Principes* and *Rudiments* an efficient tool for modifying intonation, sound colours, and nuances, and thus for musical expression on the Traverso.

Hotteterre's embouchure technique is as has been shown mainly based on the three basic positions of the head-joint in relation to the lips: *Turning the head-joint outward for raising the intonation—Normal position—Turning the head-joint inward for flattening the intonation*. The effect of turning the head-joint inward is that the airstream is directed more down and into to Traverso having a flattening effect on the intonation. Turning the head-joint outward has the opposite effect directing the airstream up and sharpening the intonation. Hotteterre explains in this context two techniques:

- Turn the Traverso with help of the hands and fingers.
- Raise or lower the head, whereby raising the head has the same effect as turning the Traverso *Outward*, and lowering the head has the same effect as turning the Traverso *Inward*.

It should be noted that the technique of the positions *Outward—Normal—Inward* has as its prerequisite that the Traverso is resting on the knuckle of the left-hand forefinger as on a ball-joint, in combination with supporting the Traverso with the right-hand ring-finger and little-finger which altogether enables a minimum of pressure of the head joint against the lower lip, chin, and lower jaw. Further that the movements turning the Traverso to the *In-* and *Outward* positions is most functional when it is made with help of only the left-hand thumb, which is a technique described by De Lusse in *L'Art de la Flûte Traversiere* (*c.*1761):

> […] il faut que le pouce gauche agisse par graduation de vîtesse, en roulant le corps de la Flûte, sans perde l'embouchure. (De Lusse, *L'Art de la Flûte Traversiere, c.*1761, 9)[2]

1. The force of the wind must be proportionate to each degree of sound, which is insensitive, & can only be acquired by frequent exercise […] it is the different force of this wind which, by determining the opening of the mouth, gives it a suitable size for the perfection of the sound. (Rameau, *Code de Musique Pratique,* 1760/2004, 16/96)
2. [...] the left thumb must act by speed graduation, rolling the body of the Flute, without losing the embouchure. (De Lusse, *L'Art de la Flûte Traversiere, c.*1761, 9)

It can be deduced that Hotteterre combines the possibility to influence the speed and intensity of the airstream with the diaphragm and ribcage (Support), together with the activity of the lips, the latter will in following discussions be described as *Tonus*. This is a term with origins in ancient Greek τόνος and is a physiological and anatomical term describing muscular activity, whereby *low tone* or *low Tonus* alternatively *high tone* or *high Tonus* represents a lower versus a higher muscular activity. In the present context is the term *Tonus* applied for describing muscular activity of the embouchure and the lips when Hotteterre have suggestions regarding the lips and embouchure. An example is when Hotteterre suggested a higher muscular activity or *higher Tonus* for the note G2:

[…] serrer les Levres de plus en plus, de les retirer du coin de la bouche (III: 8, G2)	[…] you must take care to close the lips more, and more, to contract them towards the corners of the mouth (III: 6, G2)

This is an example of that a constant amount of air-pressure created with the breathing muscles (Support), can be modified with help of the muscular activity—*Tonus*—in the lips and embouchure when the airstream is hitting the sharp edge of the blowing-hole. A *lower Tonus* creates potentially a larger opening between the lips and thus slows down the airstream, and *vice-verse* a narrower opening between the lips—created with help of a *higher Tonus*—generally speeds up the airstream. In the above quote, Hotteterre described a technique regarding embouchure and the lips based on using a higher amount of *Tonus* in the embouchure and lips when playing in the middle register and upwards. This technique of the embouchure using different amount of *Tonus* is expressed in a strikingly similar way in *Méthode pour Flûte Systeme Boehm Contenant la Théorie Complète de la Musique. Œuvre 31* (1880) by Henri Altès (1826-1895):

> Il fera remarquer à l'Élève que pour faire sortir les sons graves, il faut que les lèvres soient moins tendues (serrés) que pour les sons du *medium*; de même, il faudra les serrer davantage pour obtenir les soins *aigus*. (Altès, 1880, 39)[1]

This suggestion regarding the embouchure made by Altès is important, because it sheds light on how techniques for the Traverso might have survived into techniques for Multi-keyed conical flutes of the 19th Century, and later to the Boehm-flute.

When Altès studied at the *Conservatoire* he played on Multi-keyed conical flutes having Jean-Louis Tulou (1786-1865) as his teacher. Altès finished his studies at the *Conservatoire* in 1842 being sixteen years old, and five years before Boehm had finished his work with the Boehm-flute. It can be expected that Tulou would have been well informed regarding the Traverso, although he played and taught Multi-keyed conical flutes, which in many respects could be described as a Traverso with more than one key. This fact makes it plausible that when Tulou taught techniques regarding the embouchure possibly there were remains of roots in Traverso playing-techniques. Consequently, Altès was exposed for these techniques being Tulou's student. Later, when Altès changed to play the Boehm-flute it seems reasonable that he kept functional elements of his embouchure technique that he had developed on Multi-keyed conical flutes of his youth and during his studies for Tulou (Dorgeuille, 1983/1986).

1. Explain to the pupil that the lips must be less pressed together (looser) for the lower notes than for the middle notes, and more pressed together for the upper. (Altès, *Grand method for Flute Boehm Systeme*, 1906, 39)

6.2.1 Shaping the speed and intensity of the airstream with the breathing muscles

A central subject in *Principes* and *Rudiments* and its fingering-charts relates to the intensity and speed of the airstream. Hotteterre's suggestions explains that when ascending from the lowest register (D1) to the high register (G3) this is realised with help of a gradual augmentation of the air-pressure through the breathing muscles (Support), which aims for making the airstream gradually faster when ascending and vice-verse:

a) Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas (III: 6, D1≈ G1)	a) You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend […] (III: 5, D1≈ G1)
b) Il faut augmenter le vent peu à peu, à mesure que l'on monte. (III: 7, A1)	b) *This suggestion is not mentioned in Rudiments*
c) On doit pour lors augmenter le vent; ensorte que le son soit aigu, cependant il ne faut point trop pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il ne faut. (III: 8, D2)	c) […] blow pretty strong, but not too strong, least you found an Octave higher than you ought. (II: 5, D2)
d) […] en soûtenant le vent toûjours un peu ferme; ainsi que dans le Tons suivants. (III: 8, E2)	d) […] and blowing stronger, continuing to increase the wind, also in the following Notes. (III: 5-6, E2)
e) […] d'augmenter le vent peu à peu. (III: 8, G2)	e) […] and increase the strength in blowing, by little, and little. (III: 6, G2)
f) […] en soûtenant toûjours le vent. (III: 8, A2)	f) *This suggestion is not mentioned in Rudiments*
g) […] Il faut forcer un peu le vent, & serrer les Levres. (III: 9, D3)	g) […] you must force the wind a little more, and close the lips. (III: 6, D3)
h) On doit forcer le vent […] (VII: 22, E♭3)	h) […] you ought to force the wind (VII: 16, E♭3)
i) Il faut continuër à forcer le vent. (III: 9, E3)	i) […] you must continue also to blow strong. (III: 6, E3)
j) […] en donnant le vent fort aigu. (III: 10, F3)	j) […] and blowing very sharp. (III: 7, F3)

Generally, it seems to be clear that Hotteterre described two techniques for the regulation of the speed and intensity of the airstream: a) by the breathing muscles, diaphragm, and ribcage, corresponding to common ideas of Support; b) with the lips and embouchure, which will be discussed in section *6.2.2*. It should be noted that Hotteterre described the action of what generally could be called Support in indirect terms, further that the technique regarding the effects of modifying the airstream as described in *Principes* and *Rudiments* is functional.

In a context of discussing essential Traverso techniques such as the control of the airstream is the text *Le Mécanisme du fluteur automate présenté à messieurs de l'Académie royale des sciences, An Account of the Mechanism of an Automaton or image playing on the German Flute* (1738/1742) by the French inventor Jacques de Vaucanson (1709-1782) of importance. In this text is described how the innovation of a highly refined Traverso-playing automat functions, which became rather famous in the mid 18th Century. Vaucanson's text was written thirty-one years after the first edition of *Principes* (1707), and as has been shown above, *Principes* was together with Corrette (1735) the only French texts available on Traverso playing in 1738, and possibly Vaucanson was familiar with *Principes*. An indication of that Vaucanson perhaps knew *Principes* are his explanations when discussing embouchure and its relation to the airstream are similar when compared with *Principes*. Vaucanson explained that changes of octaves can be realized with the help of a faster airstream when making ascending octaves or with a slower airstream when playing descending octaves:

> […] mais il faut doubler la force [speed of the airstream], pour produire les vibrations doubles dans tout le corps de la Flute […] on est obligé de donner le vent avec une double force […] On sera encore obligé de donner le vent avec une force triple pour former la triple octave (Vaucanson, 1738/1742, 5)[1]

To conclude, the effects of a slower or faster airstream as described in *Principes* corresponds with how Vaucanson explained the construction of his *Automaton or image playing on the German Flute*, which is of interest because it mirrors French 18th Century opinions regarding explications of essential functions of a Traverso.

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1. But then you must double the Force of the Wind, to produce double Vibrations in the whole Body of the Flute […] This is what is practiced in the Tones of the second Octave […] the Wind must be given with a triple Force to produce the third Octave. (Vaucanson, *Le Mécanisme du fluteur automate présenté à messieurs de l'Académie royale des sciences, An Account of the Mechanism of an Automaton or image playing on the German Flute*, 1738/1742, 5)

6.2.2 Shaping the speed and intensity of the airstream with *Tonus* in the lips and embouchure

When Hotteterre gives suggestions on the embouchure and its muscular activity—*Tonus*—in the lips in *Chapitre III* he applies expressions such as *Serrer les levres* (tighten the lips). This has the effect that when maintaining a constant air-pressure with help of the breathing muscles (Support) and simultaneously making the opening between the lips smaller—*Serrer les levres*—this directly has the effect of speeding up the airstream and with ease play notes in the middle and high register of the Traverso. The opposite happens when maintaining a constant air-pressure and simultaneously releasing the lips making the opening between the lips larger now having less *Tonus* the effect is a slowing down of the airstream facilitating the lower register. When the lips have a higher amount of *Tonus* it makes the opening between the lips narrower, simultaneously somewhat less flexible, having the effect that the airstream becomes a certain resistance caused by the higher *Tonus* in the tissue of the lips, being the reason why the airstream will be faster. The opposite phenomenon when the lips have less *Tonus* creating a sligthely larger opening between the lips, and becomes somewhat more flexible with less resistance, letting more air and a less fast airstream pass between the lips. In addition, it is a well-known phenomenon on generally all transverse flutes that a faster airstream sharpens the intonation, and a slower airstream flattens intonation.

Ainsi pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent peu à peu. (III: 8, G2)	I must here inform beginners, that as they ascend on this Instrument, they will find the filling it more difficult, therefore to sweeten the high Notes, and fill them easily, you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing, by little, and little. (III: 6, G2)
Il faut forcer un peu le vent, & serrer les Levres. (III: 9; D3)	[…] you must force the wind a little more, and close the lips. (III: 6, D3)

It should be noted that Hotteterre combined the techniques of speeding up and intensify the airstream with help of the breathing muscles (Support), in combination with a tightening of the lips (higher *Tonus*), which has the effect that these two techniques interact and support each other.

It is of importance to understand that the balance between the tissue of the lips having the appropriate level of *Tonus* creates a certain flexibility, in interaction with the speed and intensity of the airstream. The effect is that when the lips have a proportional amount of *Tonus* and flexibility they act with a certain resistance in relation to the intensity of the airstream. An example of when the proportional balance is deranged could be that a too high level of *Tonus*—having the effect of reduced flexibility in the lips—combined with a too high speed and intensity of the airstream generated by the breathing muscles (Support) generally results in an overblowing like when Hotteterre comments on how to blow, and be careful not blowing too strongly regarding D2:

On doit pour lors augmenter le vent; ensorte que le son aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il faut. (III: 8, D2)	[…] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5, D2)

The opposite occurs when the lips have a too low level of *Tonus* being too flexible not making enough resistance regarding the speed and intensity of the airstream, which will result in that a note in the higher register will fail or "fall down" in the middle octave as in the case of for example E3:

Il faut continuër à forcer le vent. (III: 9, E3) […] bien soûtenir le vent. (V: 15, E3)	[…] you must continue also to blow strong. (III: 6, E3) […] and blow pretty Sharp. (V: 10, E3)

Even though the intensity and speed of the airstream primarily is regulated by the breathing muscles (Support), has the size of the opening between the lips and the embouchure an imperative importance when it comes to regulating the speed and intensity of the airstream. To illustrate the interaction between the breathing muscles (Support), the lips and embouchure could be the metaphor of water pressure and a hose be enlightening, whereby the water pressure represents the action of the breathing muscles (Support), and the hose the opening between the lips and embouchure. If we imagine a constant pressure of water and a hose having a proportionally large opening, the water jet will not reach very far, but a relatively large amount of water will pass through the opening of the hose.

But, if the same water pressure is kept and the opening of the hose is made considerably narrower the water jet reaches further away, and a smaller amount of water passes through the opening of the hose. This could be a practical way of demonstrating the theory of *Pascal's law* formulated between 1647-1648, by the French scientist and mathematician Blaise Pascal (1623-1662), explaining how a fluid reacts under pressure. Playing the Traverso whilst blowing with a constant air-pressure and at the same time modifying the size and opening between the lips has similarities with *Pascal's law* regarding fluids under pressure. When playing in the low register, a larger opening between the lips creates a slower airstream allowing more air to be blown into the Traverso facilitating the first octave. Whereby a smaller opening between the lips and blowing the air with the same intensity with help of the breathing muscles (Support) as for the first octave reduces the amount of blown air, and at the same time speeds up the airstream considerably making playing in the middle and upper octaves comfortable:

> A mesure qu'on voudra monter dans les sons hauts, les muscles agiront avec plus de force, & les lévres se rétressiront proportionellement, pour que le vent poussé plus vivement & force de sortir dans un même tem par une issue plus petite, augmente considerablement de vitesse, & produise conséquemment des vibrations accélérées qui formeront des tons aigus. (Vaucanson, 1738, 8)[1]

As in the above discussed relation between speed and intensity of the airstream in relation to playing the Traverso in different registers as described in *Principes*, *Rudiments*, and by Vaucanson, it is of significance to observe the same conclusions made by Hotteterre and Vaucanson when giving suggestions regarding the effects of influencing the airstream and embouchure.

6.2.3 Shaping the direction and length of the airstream with head-joint positions

The third essential technique described in *Principes* and *Rudiments* is to use different positions of the head-joint which has the effect of directing the airstream horizontally, downward, or upward. Hotteterre gives detailed suggestions on different directions of the airstream—as is explained numerous times in the fingering-chart—using three positions:

Tourner la Flute en dehors [sharpening]	***Turn the Flute outwards*** [sharpening]
Situation ordinaire	**Usual situation**
Tourner la Flute en dedans [flattening]	***Turn the Flute inwards*** [flattening]

The *Inward position* is used for flattening notes being too sharp, the *Outward position* sharpens the intonation for notes being too flat, and the *Usual* or *Normal* positions is used on the notes having a balanced intonation not needing much correction, all due to the construction of the Traverso. The degree of how much to roll the head-joint in or out is up to the player and depends on the chosen Traverso, in an interaction with physical features of the player, combined with the intensity and speed of the airstream together with *Tonus* in the lips and embouchure. In addition are, of course, combinations an alternative as for example turning the head-joint slightly outward, and at the same time direct the airstream somewhat more downward with the lips and embouchure. Above-described techniques influence intonation, sound colour, and nuances.

There are generally two techniques regarding how to direct the airstream towards the sharp edge of the blowing-hole:

> a) Keep a constant direction of the airstream with help of the lips and embouchure and move the target being the sharp edge of the blowing-hole which is the technique discussed in *Principes* and *Rudiments*.
> b) Keep the head-joint in a steady position and change the direction of the airstream with the lips, embouchure, and lower jaw.

The two above-described techniques for making modifications regarding the direction of the airstream is closely linked to adjustments of intonation. The technique of turning the head-joint *Out-* or *Inward* is more important for the Traverso compared with the Boehm-flute. The reason is that a Traverso have seven tone-holes compared with that a Boehm-flute with C-foot joint have sixteen tone-holes, and with B-foot joint seventeen tone-holes. The seven tone-holes on the Traverso, when opened one after the other, give a D-major scale in the two first octaves.

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1. If one wishes to play in the high register, the muscles will act with more force, and the lips will contract proportionately, so that the wind, pushed more strongly, being forced to pass a smaller opening [between the lips], increases considerably the speed [of the airstream], & consequently facilitates the high register. (Vaucanson, *Le Mécanisme du fluteur automate présenté à messieurs de l'Académie royale des sciences, An Account of the Mechanism of an Automaton or image playing on the German Flute*, 1738, 8)

The consequence is that the tone-holes on a Traverso can't be placed on their acoustically best positions for all keys, whereby the far larger number of tone-holes and the key mechanism on the Boehm-flute allows for an almost perfect placement of the tone-holes in relation to the chromatic scale in the first two octaves, basically giving each note its own tone-hole. This has the effect that some notes on the Traverso need considerably more adjustment, than any note on the Boehm-flute. Necessary adjustments regarding intonation on the Boehm-flute are relatively small and can easily be managed with help of the lips, embouchure, and the lower jaw, and only in rather special cases asks for turning the head-joint in- or outwards. Whereas the Traverso generally need larger adjustments, which can easily be made when using the technique of turning the head-joint as described in *Principes* and *Rudiments* (Fig. 24). This technique is functional for the repertoire of the very late 17th Century and the first decades of the 18th Century not being virtuosic in the sense of *Batteries & des Roulades* (1746, 33-34) as the Lyonnaise musician and member of the French Academy Louis Bollioud de Mermet (1709-1794) described virtuosic elements with a certain ironic twist.

Influencing intonation playing in the same dynamic	**Throughout keeping the head-joint in the same position, modifying the direction of the airstream with the lips and embouchure**	**Normal position**	**Outward position Not changing the direction of the airstream**	**Inward position Not changing the direction of the airstream**
Sharpening	Direct the airstream more upwards	—	Turning the head-joint *Outward*	—
Flattening	Direct the airstream more downwards	—	—	Turning the head-joint *Inward*

Figure 24 Comparison between modifying the direction of the airstream with the lips and embouchure alternatively turning the head-joint *Out-* or *Inwards*.

Later sources such as Mahaut (1759) referred to the technique of turning the head-joint as described in *Principes* and *Rudiments* being obsolete and explained how adjustments of intonation could be made with exclusively the lips, embouchure, the lower jaw, and modifications regarding the speed of the airstream. Mahaut should be understood in the light of that the repertoire for the Traverso around the middle of the 18th Century developed into a virtuosity including *Batteries & des Roulades* whereby the turning of the head-joint easily became unpractical.

It should be remembered that using the technique of turning the head-joint as suggested in *Principes* and *Rudiments* has a side effect influencing the distance between the opening of the lips and the sharp edge of the blowing-hole, which corresponds to the length of the airstream before it hits its target. When turning the head-joint inward the length of the airstream is shortened, and prolonged when turning outward. This has the effect that when turning *Outward*, although the length of the airstream only gets some millimetres longer, generally needs to be slightly more focused which is realised making the opening between the lips somewhat smaller with *Tonus* in the lips and embouchure. Using the technique turning the head-joint *Inwards* covers the blowing-hole more and vice-verse, which influences timbre, sound colours, fullness of sound, and nuances. When Hotteterre suggested the technique of turning the head-joint in the three positions, does it not exclude that Hotteterre used an embouchure-technique adjusting the direction of the airstream with help of the lips in combination with the three positions of the head-joint, together with refined adjustments regarding the speed of the airstream with help of a flexible *Tonus* in the lips and embouchure. In this context is the *Normal position* of the head-joint to be understood as a reference of essential importance searching after a well-balanced intonation.

Considered that the chromatic fingering-chart in *Principes* and *Rudiments* (Fig. 9, 10, 11) indicates altogether 46 notes from C#1 to G3, and among them are 19 notes suggested to be played using the *Normal position*, 14 notes with the *Inward position*, 10 notes with the *Outward position*, 1 note with *Normal* or *Inward* position, and finally 2 notes with *Normal* or *Outward position* (Fig. 25). When as many as 19 notes are to be played with the *Normal position* it seems reasonable to have this position as a reference. The number of notes whereby the head-joint should be turned in (14) or outwards (10) gives the *Normal position* (19) a role of reference point.

Notes	Inward position	Normal position	Outward position	Notes	Inward position	Normal position	Outward position
C#1	X			E2		X	
D1		X		E#2	X		
D#1		X		F2	X		
E♭1			X	F#2			X
E1		X		G♭2	X*		
E#1	X			G2		X	
F1	X			G#2	X		
F#1			X	A♭2	X		
G♭1	X*			A2		X	
G1		X		A#2	X		
G#1	X			B♭2			X
A♭1	X			B2		X	
A1		X		B#2			X
A#1	X			C3	X	X	
B♭1	X			C#3			X
B		X		D♭3			X
B#1		X		D3		X	X
C2		X		D#3		X	X
C#2			X*	E♭3		X	X
D♭2			X*	E3			X
D2		X		F3		X	
D#2		X		F#3		X	
E♭2			X	G3		X	

Figure 25 Schematic list based on *Principes* and *Rudiment* regarding the head-joint positions *Outward—Normal—Inward*. Notes marked with a star should be very much turned out alternatively very much turned in according to *Principes* and *Rudiments*.

If the *Normal position* is calibrated in a too turned-in position, alternatively in a too turned-out position this will create almost unsurmountable difficulties regarding intonation. If the head-joint has a too turned in position when being in *Normal position* it will not be possible to flatten the notes having a too sharp tendency, and if the position is too turned out it will not be possible to sharpen notes having a tendency being too flat. This shows the importance of finding a method to calibrate the position of *Normal position,* which possible, at least partly, could be deduced when going back to when Hotteterre explained how to play the low C#1:

[…] on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton. (V: 17)	[…] by turning the Flute inwards, sufficiently to lower the Sound by half a Note. (V: 12)

This explanation is important in the present context, because playing the C#1 in the manner described in *Principes* and *Rudiments* stands in close relation to the *Normal position* of the head-joint. If the head-joint in the *Normal position* is too much turned in, it will be impossible to lower the note D1 a half-tone step downward reaching C#1. In other words: the explained technique for playing the note C#1 could supposedly be used for calibrating the *Normal position,* and further indicating tonal aesthetics and aspects of sound colour and timbre of the period. If so, this sheds light on both the *Normal position*, and when Hotteterre suggests turning the head-joint out- or inwards. It could be assumed that when finding a functional position of the *Normal position* this will have the result that just small adjustments while turning the head-joint will be necessary. Supposedly, the turning of the head-joint should strive for small adjustments and, there are only three notes whereby Hotteterre urges to turn the head-joint *as much as possible* or *very much*:

Ut Diézis **C#2**	Et on la tournera en dehors pour l'*Ut Diézis*. (V: 15) **Tourne la Flute en dehors**	[…] you must turn the Flute as much outward as possible for **C Sharp** (V: 10) **Outward position**
Ré Bemol **D♭2**	Le *Ré Bemol,* comme l'*Ut Diézis*. On ne sçauroit tourner la Flûte trop en dehors, pour ajuster ce demi-Ton. (V: 16) **Tourne la Flûte en dehors**	**D Flat**, as **C Sharp**, one can't turn the Flute too much outwards to adjust this Tone. (V: 11) **Outward position**
Sol Bemol **G♭2**	Le *Sol Bemol*, pourroit aussi se faire comme le *Fa Diézis*, mais il est plus parfaite comme je le démontre dans la Tablature : Pour ajuster, il faut tourner la Flûte beaucoup en dedans. (V: 16) **Tourne la Flûte en dedans**	**G Flat** may also be play'd as **F Sharp**, but 'tis more perfect to play it as I shew in the Scale, to adjust it, you must turn the Flute very much inwards. (V: 11) **Inward position**

It should be noted that Hotteterre clearly suggested that changes of the direction of the airstream could be made while raising or lowering the head, whereby raising the head corresponds to turning the head-joint *Outwards*, and lowering the head has the same effect as when the head-joint turning *Inwards*.

6.2.4 Shaping the airstream with the mouth and throat cavities

In *Principes* and *Rudiments* and *Chapter III Premiere explication de la premiere Planche sur les Tons naturels–The Explication of the first Scale of the Natural Tones* is suggested that all notes should be articulated with the syllable *Tu*, further that when playing the note G2 the tongue should advance towards the lips:

Il faut donner un coup de langue à chaque Ton; c'est à dire, articuler le vent; comme si l'on vouloit prononcer bas cette sillabe, *Tu*. (III: 7, E1)	[…] you must strike every Note with the tongue, as if you prounounc'd the Syllable **tu**. (III: 5, E1)
[…] d'avancer la langue vers les Levres […] (III: 8, G2)	[…] advance the tongue towards the lips […] (III: 6, G2)

These suggestions regarding the tongue has implications of shaping the cavities of the mouth and throat, and consequently on the resonance of the Traverso sound. When Hotteterre suggested that the tongue should approach the lips when playing G2, it has the indirect implication that for the notes in the first octave op to G2 possibly the tongue was supposed to be further back in the cavity of the mouth, creating a somewhat larger cavity in the front of the mouth. Then when moving the tongue more forwards in the mouth this creates a smaller cavity in the front of the mouth but a considerably larger cavity in the back of the mouth and throat. The quote above is the only example in *Principes* and *Rudiments* making a direct comment on shaping the cavity of the mouth and throat, which not excludes that Hotteterre used techniques shaping the mouth and throat cavities. Perhaps Hotteterre continued to shape the cavity of the mouth and throat for the register above G2 aiming for suppleness and ease, and when playing in different keys. To use shaping of the mouth and throat cavities as functional techniques for influencing timbre, resonance, intonation, and articulation were established Traverso techniques described in direct or indirect terms in sources such as Quantz (1752) and Tromlitz (1791).

English Traverso virtuoso Dr. Stephen Preston summarized above discussed and examined parameters in relation to Traverso-playing which confirm explanations and suggestions as found in *Principes* and *Rudiments* in his highly interesting book *Bird song as a basis for new techniques and improvisational practice with the baroque flute* (2004):

> Modifying the angle and distance of the airstream between the lips and the edge of the flute embouchure hole allows the pitch to be raised or lowered. […] Production, support, shaping, volume, intensity, propulsion, and direction of the air are all controlled by the muscles of the player's body in using the diaphragm and ribcage, and shaping the throat, mouth, soft palate, tongue, and lips, in order to modify the speed, volume and intensity of the airstream. (Preston, 2004, 57-58)

Conclusions regarding the lips, embouchure, and airstream

When summarizing described suggestions in *Principes* and *Rudiments* the following observations can be deduced (Fig. 26):

- The means of modifying the direction and angle of the airstream is generally achieved with three positions of the head-joint *Outward* (sharpening tendency), *Normal*, and *Inward* (flattening tendency), described in detail in comments and suggestions in the fingering-charts for generally all notes, and trills. It should be noted that this technique is based on that the airstream is blown with for generally the same angle and direction all the time.
- An alternative technique to the above mentioned three head-joint positions is described in *Principes,* and *Rudiments* is based on keeping the head-joint in the same position through-out and modify the angle and direction of the airstream with three positions of the flautist's head: *Normal*, *Upward* (sharpening), and *Downward* (flattening) which functions similarly to the three position of the head-joint.
- Both techniques described above are functional and assures potentially a perfect intonation, flexible nuances, and sound colours but might in fast tempi and passages with virtuosic *Batteries & des Roulades* (Bollioud de Mermet, 1746, 33-34) be somewhat less practical. It should be noted that the technique modifying the angle and direction of the airstream generally using the lips combined with one position of the head-joint is not explicitly described in *Principes* and *Rudiments*, which not necessarily has the implication that such a technique was not used by Traverso-players including Hotteterre himself at the end of the 17th and the first decades of the 18th Century in France.
- Modifications regarding the speed of the airstream is described with two techniques a) with help of the *Tonus* in the lips, and b) with adjustments of the general speed of the airstream with the breathing muscles which corresponds to today's terminology of Support. Different levels of *Tonus* in the lips could be described as that a lower *Tonus* in the lips make them somewhat more relaxed letting more air pass the opening between the lips in a generally slower speed which is beneficially for the low register, including playing in louder nuances. It should be noted that keeping a constant air-pressure with the breathing muscles (Support) and gradually diminish the opening between the lips has the effect of speeding up the airstream which facilitates the higher register and playing in soft nuances sustaining good intonation. A higher *Tonus* creates a smaller opening between the lips letting less air in a higher speed pass through the opening between the lips which is beneficially for the higher register and playing in softer nuances.

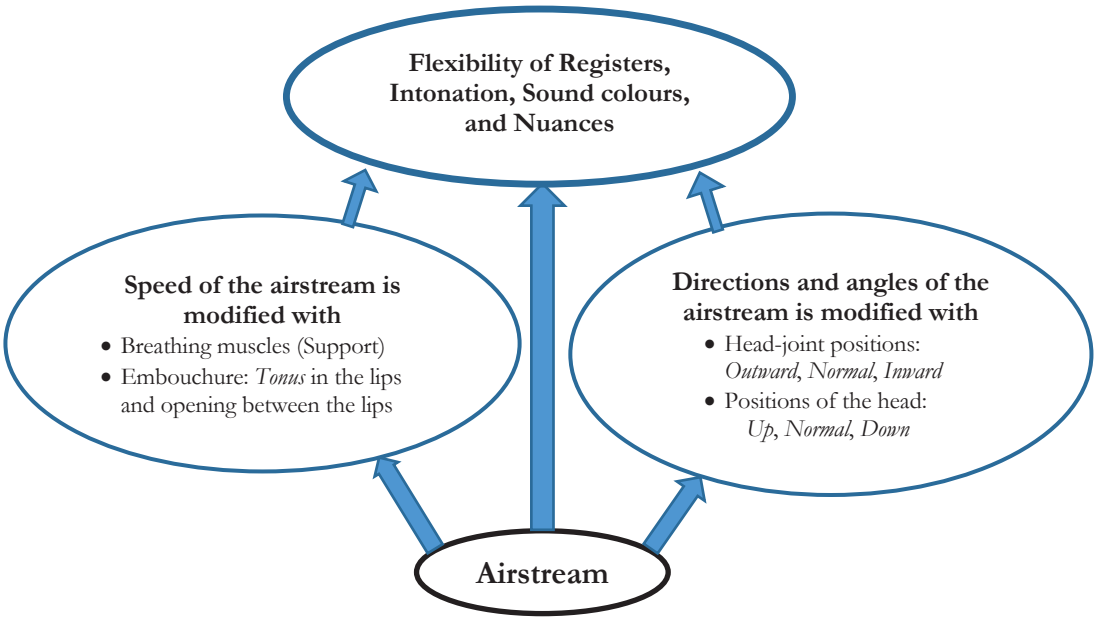


Figure 26 How the control of speed and direction of the airstream is described in *Principes* and *Rudiments*.

6.3 Fingerings: *Doigtés des fourches—Open-fingerings*

The placements of the seven tone-holes on the Traverso corresponds to a D-major scale, and a successive opening after closing all the seven tone-holes results in an ascending D-major scale in the first octave. The second octave has basically the same fingerings and are thus played while overblowing fingerings for the first octave. Regarding fingerings as shown in *Principes* and *Rudiments* is the distinction between *Doigtés des fourches—Open-fingerings* an important factor to consider because the two types of fingerings has pronounced differences vis-à-vis sound colours and timbre. An example of the principle of open-fingerings in *Principes* and *Rudiments* is the note A1 with its fingering 12/0. This fingering closes the first two tone-holes and the third, fourth, fifth, sixth tone holes are open, and the seventh tone-hole is closed by the D#-key and generates an open brilliant sound colour and timbre. An example of the amount of open-fingerings are the notes from the complete D-major scale with the exception of the notes E1 and E2 (Fig. 27):

Note	*Open-fingerings*	*Fork-fingerings*	Note	*Open-fingerings*	*Fork-fingerings*
D1	123/456	–	**D2**	23/456	–
E1	–	123/45	**E2**	–	123/45
F#1	123/47	–	**F#2**	123/47	–
G1	123/0	–	**G2**	123/0	–
A1	12/0	–	**A2**	12/0	–
B1	1/0	–	**B2**	1/0	–
C#2	0/0	–	**C#3**	0/4567	–
D2	23/456	–	**D3**	23/456	–

Figure 27 D-major scale in two octaves showing that all notes apart from E1 and E2 are played with open-fingerings according to fingerings given in *Principes* and *Rudiments*.

For making it possible to play the complete chromatic scale and indirectly in all major and minor keys including enharmonic notes is the technique of *Doigtés des fourches* a necessity which generates a somewhat veiled or shadowed sound colour and timbre. The principle of *Doigtés des fourches* or fork-fingerings on the Traverso is based on having the D-major scale as a point of departure and flattening a given note from this scale with a semi-tone, leaving one or two tone-holes open below the fingering in question, and close the next or several tone-holes. Fingerings for E1 and E2 could thus be considered as fork-fingerings because the fingering 123/45 leaves the sixth tone-hole open and the seventh tone-hole rest closed by the D#-key. When playing the complete chromatic scale, the notes F1, G♭1, G#1, A♭1, A#1, B♭1, C2, F2, G♭2, G#2, A♭2, A#2, B♭2, C3 are all played with fork-fingerings (Fig. 28).

Note	*Open fingerings*	*Fork fingerings*	Note	*Open fingerings*	*Fork fingerings*
D1	123/456	–	**D2**	23/456	–
D#1	123/4567	–	**D#2**	123/4567	–
E♭1	123/4567	–	**E♭2**	123/4567	–
E1	–	123/45	**E2**	–	123/45
F1	–	123/46	**F2**	–	123/46
F#1	123/47	–	**F#2**	123/47	–
G♭1	–	123/56	**G♭2**	–	123/567
G1	123/0	–	**G2**	123/0	–
G#1	–	12/456	**G#2**	–	12/4
A♭1	–	12/456	**A♭2**	–	12/4
A1	12/0		**A2**	12/0	–
A#1	–	13/45	**A#2**	–	13/0
B♭1	–	13/45	**B♭2**	–	13/0
B1	1/0	–	**B2**	1/0	–
C2	–	23/0	**C3**	–	2/45
C#2	0/0	–	**C#3**	0/4567	–
D♭2	0/0	–	**D♭2**	23/467	–
D2	23/456	–	**D3**	23/456	–

Figure 28 The complete chromatic scale D1-D3 including enharmonic fingerings like for F# and G♭, showing the amount off fork-fingered notes according to given standard fingerings in *Principes* and *Rudiments*.

The final adjustments of intonation as described in *Principes* and *Rudiments* is made with help of the three head-joint positions, in combination with *Tonus* in the lips, and the speed of the airstream (Support). The differences between notes played with open-fingerings and fork-fingerings is as mentioned that the latter generally has a veiled or shadowed regarding sound colour and especially so in the low register. Notes like E2, F2, G♭2, G#2, A♭2, A#2, B♭2, C2, C3 skilfully played on a good Traverso has generally almost the same sound colour and timbre as the notes from the D-major scale in second octave. When playing in the first octave and the notes E1, F1, G♭1, G#1, A♭1, A#1, B♭1, there are differences in sound colour and timbre when compared with the D-major scale in the same octave, and especially so regarding G#1, A♭1, A#1, B♭1, including G♭1 and G♭2 although this note is not used often according to *Principes* and *Rudiments* (V: 16). These differences are unavoidable even by a most skilful Traverso-player and has been commented on since the 18th Century up to the first half of the 19th Century (Castellengo, 1998a; Wolfe et al, 2001). In addition, mentioned fork-fingered notes have a secondary effect when following the explanations in *Principes* and *Rudiments* because these notes are played with the *Inward position* of the head-joint for making the intonation slightly flattened, which effects the sound colour already being somewhat veiled or shadowed due to the fork-fingering. It should be noted that Hotteterre does not comment on the difference in sound colour between open- and fork-fingerings which could be understood as that these differences were integrated in the aesthetics of Traverso playing in the late 17th and early 18th Century in France.

Earlier mentioned French acoustician Michèle Castellengo has since the 1960is made extensive and highly interesting research regarding the Traverso, Multi-keyed conical flutes, and the Boehm-flute in collaboration with flautists and flute makers in France. In her study *Métamorphose de la flute traversière au 19eme siècle, Esthétique musicale, acoustique et facture* (1998a), realised in collaboration with the Traverso soloist Luc Forest in *Orchestre des Champs Elysée* (Paris) have enlightening explanations and graph's regarding notes played with fork-fingerings on the Traverso and Multi-keyed conical flutes compared with open-fingerings on the Boehm-flute. In the above-mentioned study by Castellengo is an important example taken from the beginning of the flute solo from the Paris version of the opera *Orphée et Eurydice* (1774/1781) by Gluck using sonagrams when played on a Traverso and a Boehm-flute (Fig. 29).

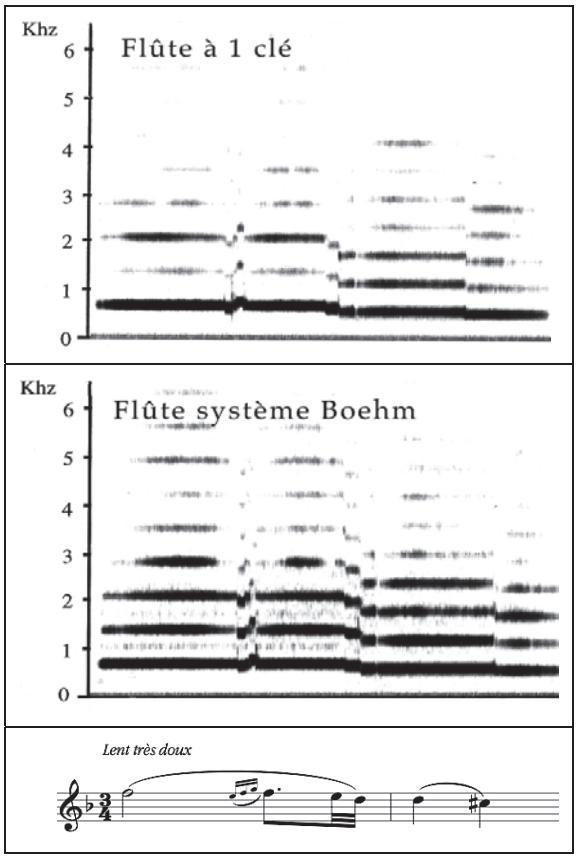


Figure 29 This is a comparison after sonagrams realised by Castellengo (1998a, 95) between a Traverso (*Flûte à une clé*) and Boehm-flute (*Flûte système Boehm*) playing the first nine notes of the famous flute solo from the Paris version of the opera *Orphée et Eurydice* (1774/1781, Acte IIe: Scene IIe, 89-90) by Gluck as shown in the music example.

The first note F2 is played with the fork-fingering 123/46 on the Traverso. The sonagram clearly show that F2 played on the Traverso has less and relatively weak harmonics creating a somewhat veiled or shadowed sound colour and timbre. When the same note is played on a Boehm-flute with its open-fingering F2 has additional and stronger harmonics which make the Boehm-flute sound more brilliant. The seventh and eights notes D2 is played with the fingering 23/456, and the final note C#2 with the fingering 0/0 (alternatively 0/7 or 0/456) on the Traverso, and these are open-fingerings including that these fingerings sound similar to the Boehm-flute and its open-fingerings for the same notes. This similarity between open-fingerings on the Traverso and the open-fingerings on the Boehm-flute is the reason why the sonagrams on these two notes have a certain similarity regarding the amount and strengths of harmonics. This example could be generalized regarding differences between fork-fingered and open-fingered notes on the Traverso, and consequently explaining the differences between sound colours and timbre when comparing the Traverso with the Boehm-flute.

6.4 *Les Coups de Langue—Tipping with the tongue*

In *Chapter VIII* in *Principes* and *Rudiments* is a detailed discussion dedicated to articulation and tonguing on the Traverso. At the end of the chapter is an explanation regarding how the articulation syllables should be adapted for the Traverso, Recorder and Oboe, which sheds light on the amount of energy needed making each type of instrument speak, in relation to the character of the music being played.

Il sera bon de remarquer que les coups de Langue doivent être plus ou moins articulez, selon l'Instrument dont on joüe; Par example on les adoucit sur la Flute Traversiere. On les marque davantage sur la Flute à Bec, & l'on prononce beaucoup plus fortement sur le Haut-Bois. (VIII: 27)	[…] 'twill be proper to observe, that tipping with the Tongue ought to be more, or less articulate, according to the Instrument on which you play, for 'tis soften'd on the German Flute, more distinct on the Common Flute, and very Strong on the Hautboy. […] (VIII: 20)

In *Chapter III* in connection to explanations regarding fingerings Hotteterre writes that each note should generally be articulated with the syllable ***Tu***:

Il faut donner un coup de langue à chaque Ton; c'est à dire, articuler le vent; comme si l'on vouloit prononcer bas cette sillabe, *Tu.* (III: 7)	[…] you must strike every Note with the tongue, as if you pronounc'd the Syllable ***tu***. (III: 5)

In *Chapter VIII* is explained that the most often used articulation syllable is ***Tu***, and that the syllable ***Ru*** is mixed with ***Tu*** when playing *Inégale* for avoiding a too uniform articulation:

Pour rendre le jeu plus agréable, & pour éviter trop d'uniformité dans les coups de Langue, on les varie en plusieurs manieres; Par example on se sert de deux articulations principales; Sçavoir, *Tu* & *Ru.* Le *Tu* est le plus en usage, & l'on s'en sert presque par tout […] (VIII: 23)	To render the playing more agreeable, and to avoid too great uniformity in tonguing, 'twill be proper to vary it after different manners, as for example, we use two principal articulations, Viz. ***Tu,*** and ***Ru***, the ***Tu*** is most in use […] (VIII: 16)

A sometimes-overlooked aspect when discussing historical articulation-syllables on wind instruments are relations to the spoken tongue of the authors of instrumental methods, their epochs, and geographical locations. In the present context of *Principes* is the language French, the epoch late 17th Century and the first decades of the 18th Century, and the location mainly Paris. In *Rudiments* are no suggestions regarding how to pronounce the French syllables *Tu* and *Ru* in relation an English spoken person. It is of importance—if possible—to shed light on how suggested syllables were pronounced in their respective historical contexts because the articulations syllables have direct impact on the musical character and interpretation when playing the Traverso. Considered that *Principes* gives no comments regarding the pronunciation of the suggested articulation syllables *Tu* and *Ru*, an examination on how mentioned consonants and vowel were described in singing methods, texts on grammar and rhetoric might shed light when axmining sources such as *Discours physique sur la parole* (1668) by Gérard de Cordemoy (1626-1684), *L'Art de Chant* (1679) by Bénigne de Bacilly (1621-1690), *La Rhetorique ou L'Art de Parler* (1688) by Lamy (1640-1715), and *L'Art de Chant* (1755) by Jean-Baptiste-Antoine Bérard (1710-1772). Despite that the latter was published as late as in 1755 its explanations have a reflective character and so far, possibly bearing on *Principes*.

As every flautist knows is an articulation syllable generally having two segments, a consonant, and a vowel, therefore will the vowel ***U*** as suggested by Hotteterre be examined in connection to the consonants ***T*** and ***R***:

1) The consonants ***T*** or ***R*** has the function of for a split second stopping the airstream with the tongue, then making a precise release of the airstream.
2) The vowel ***U*** shapes the lips, the position of the lower jaw, the cavity of the mouth, and throat when the airstream is released.[1]

T

When comparing how Cordemoy (1668), Bacilly (1679), Lamy (1688), and Bérard (1755) described the consonant *T* it shows that within a period of almost one hundred years the impression is that the suggested pronunciation in Paris would have been in the very front of the mouth (Fig. 30). Cordemoy, Lamy, and Bérard are giving similar and precise guidelines regarding where to place the tip of the tongue, and the suggested contact point is efficient for achieving a precise, clear, and supple articulation on the Traverso, as on later flute models such as Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. The remark by Bacilly that *T* should be articulated as in common spoken French mirrors the second half of the 17th Century and supposedly a Parisian pronunciation. Further is the explanation by Cordemoy important because it illustrates a pronunciation of *T* at the same period as when the Traverso was introduced by Lully and his operas around 1670.

R

When comparing Cordemoy, Bacilly, Lamy, and Bérard regarding the consonant *R* it shows that the suggested pronunciation is rather similar and favouring a pronunciation with the tip of the tongue. The explanations by Cordemoy and Lamy are important because they indicate the precise placement of the tip of tongue at the top of the palate, together with that it is the airstream that initiates the rolling *R* created by the tip of the tongue. Bacilly points on that *R* between two vowels should be pronounced in a supple manner, which sheds light on the articulation *Tu-Ru-Tu-Ru*, because in this articulation *R* is placed between the two vowels *U*. Bérard's explanation clearly indicates that *R* for a singer should be articulated in the front of the mouth, with the tip of the tongue against the palate behind the upper front teeth. Such a pronunciation of *R* can be heard today in some regions of France, whereas *R* in common French today mostly is pronounced with a velar friction in the back of the mouth. The conclusion is that in the late 17th Century and 18th Century was a widespread French pronouncing of *R* achieved with the tip of the tongue against the ridge behind the upper teeth.

U

Cordemoy, Bacilly, Lamy, and Bérard points on that the vowel *U* is pronounced having the mouth almost closed, and that the lips should have a supple movement forward making a small opening between the lips. To conclude, Cordemoy, Bacilly, Lamy, and Bérard described the pronunciations of *T*, *R* and *U* similarly, while Cordemoy, Bacilly, and Lamy described ideas covering the second part of the 17th Century, and Bérard covered the period up to the middle of the 18th Century.

In the *Comédie-Ballet Le Bourgeois Gentilhomme* (*The Middle-Class Gentleman*) (1670) by Molière—Jean-Baptiste Poquelin (1622-1673) — is in Act 2: Scene IV a dialog between the *Maître de la philosophie* (Philosophy Master) and the bourgeois *Monsieur Jordain*. For sure there are ironic undertones toward *Monsieur Jordain* when the *Philosophy Master* teaches him how to pronounce consonants and vowels in an aristocratic manner (Fig. 31). Still, the instructive manner of explaining how *U*, *D*, and *R* is pronounced has importance regarding the consonant *R* when compared with explanations by Cordemoy, Bacilly, Lamy, Bérard, and the articulation *Tu-Ru*. When comparing mentioned sources with Molière it seems to be clear that the pronunciation of *R* was pronounced in the front of the mouth and the tip of the tongue touching the hard palate just behind the upper front teeth. This makes sense in relation to Traverso playing because a guttural *R* in the back of the mouth does not result in a clear-cut articulation but rather in *Flatter-tonguing*. Of further interest is that the contact point between the tip of the tongue and the hard palate for *R*—as described by Cordemoy, Molière, Bacilly, Lamy, and Bérard—is close to the contact point when they described the pronunciation of the consonant *D* as described by Molière. This sheds light on that the articulation *Tu-Ru* as described in *Principes* and *Rudiments* in French flute methods from the 19th Century and onwards sometimes have been replaced by the articulation *Tu-Du*, which will be discussed in section *7.4.1.*

1 The French pronunciation of ***U*** is notated as **y** according to the International Phonetic Alphabet (IPA).

Cordemoy T 1668	[…] le **T**. en frappant du bout de la langue à l'endroit où se joignent les dents d'enhaut & d'enbas. (77)	[…] the [letter] **T**. by hitting with the tip of the tongue where the upper teeth & below meet.
Bacilly T 1679	Pour le ***t*** il n'y a rien de particulier, & l'on suit la prononciation qui est receuë dans le François ordinaire. (VII: 312)	For the ***t*** there is nothing special, & we follow the pronunciation which is received in the ordinary French.
Lamy T 1688	**T**. s'entend pareillement sur l'extrémité de la langue qui alors touche les dents de dessus, mais plus prés de leur trenchant. (III, IV: 71)	**T**. agrees similarly on the end of the tongue which then touches the upper teeth, but closer to their cutting edge [compared with D].
Bérard T 1755	On doit placer le bout de la langue entre les dents supérieures & les inférieurs, & les séparer par une sacade de gosier: ***T***. est tout ensemble lettre dentale, linguale & gutturale. (III: 61-62)	We must place the tip of the tongue between the upper & lower teeth, & separate them by a clear-cut throat movement: ***T***. is all together a dental, lingual & guttural letter.
Cordemoy R 1668	[…] la lettre **R**. en portant le bout de la langue jusqu'au haut du palais, de maniere qu'étant frôlée par l'air qui sort avec force, elle luy cede, & revient souvent au méme endroit, tandis que l'on veut que cette prononciation dure […] (77)	[…] The letter **R**. by carrying the tip of the tongue up to the top of the palate, in such a way that, being brushed by the air which comes out with force, it gives way to it, & often returns to the same place, when we want this pronunciation to last […]
Bacilly R 1679	[…] il faut tenir pour maxime, que toute ***r***, qui est entre deux Voyelles ne se doit prononcer que simplement & sans affectation […] (V: 291)	[…] it is necessary to take as a maxim, that any ***r***, which is between two vowels must be pronounced only simply & without affectation […]
Lamy R 1688	**R**. Cette lettre n'est pas entierement müette, parce qu'on commence par ouvrir la bouche. On pousse ensuite fortement la voix qui étant arréetée par les dents qui ferment le passage, elle est obligée de roules dans le pâlais, à qui contribuë la langue qui se replie un peu dans son extremité. (III, IV, 173)	**R**. This letter is not entirely muted, because we begin by opening our mouths. The voice [the airstream] is then strongly pushed which, being stopped by the teeth which close the passage, it is obliged to roll in the palate, to which contributes the tongue which folds up a little at its extremity.
Bérard R 1755	Il faut porter la langue au'dessous des dents supérieures, & pousser l'air du gosier, de sorte que cet air réfléchi par le palais, determine la langue à une espèce de tremblement, c'est pourquoi l'***r*** doit être appellée dentale & linguale. (III: 61)	It is necessary to bring the tongue below the upper teeth, and to push the air out of the throat, so that this air, reflected by the palate, determines the tongue to a kind of tremor, which is why the ***r*** must be called dental & lingual.
Cordemoy U 1668	[…] si on raproche les dents sans les joindres entierement, & si en méme instant on alonge les deux levres en les raprochant, sans les joindre tout à fait, on formera une voix en **U**. (70)	[…] If we bring the teeth together without completely joining them, and if at the same moment we lengthen the two lips by bringing them closer, without completely joining them, a **U**-shaped voice will be formed.
Bacilly U 1679	[…] en disant que dans le Chant on ne peut assez ouvrir la bouche, puis que pour bien prononcer l'***u***, il est necessaire de la tenir presque fermée, pour rendre cette Voyelle plus delicate & plus fine […] (III: 277)	[…] by saying that in Singing one cannot open the mouth enough, then in order to pronounce the ***u*** correctly, it is necessary to keep it almost closed, to make this vowel more delicate & finer […]
Lamy U 1688	**U**. La prononciation de l'u est douce. Le larinx contraint moins la voix qui sort des poulmons, ainsi cette voix est moins forte. Le gosier ne s'ouvre pas, ainsi l'on n'y entend pas la voix raissoner. Les lévres avancent en dehors, & se ressemblent pour faire une tres petite ouverture. (III, II: 161)	**U**. The pronunciation of u is soft. The larynx constrains the voice [airstream] coming out of the lungs less, so that voice is less loud. The throat does not open, so the voice cannot be heard there. The lips protrude outward, & resemble each other to make a very small opening.
Bérard U 1755	Avancez les lèvres de manière qu'elles forment une petite ouverture : donnez au gosier une molle secousse. L'***u*** est appellée lettre gutturale, & demi-labiale. (III: 62)	Move the lips forward so that they form a small opening: give the throat a soft shake. The ***u*** is called the guttural, & half-labial letter.

Figure 30 Comparison between how Cordemoy (1668), Bacilly (1679), Lamy (1688), and Bérard (1755) explains the pronunciations of the consonants *T* and *R*, and the vowel *U*.

Molière U 1670	*MAÎTRE DE LA PHILOSOPHIE* La voix, **U**, se forme en r'approchant les dents sans les joindre entierement, & allongeant les deux levres en dehors, les approchant aussi l'une de l'autre sans les rejoindre tout à fait, **U**.	*PHILOSOPHY MASTER* The vowel **U** is formed by bringing the teeth nearly together without completely joining them, and thrusting the two lips outward, also bringing them nearly together without completely joining them: **U**.
Molière D 1670	*MAÎTRE DE LA PHILOSOPHIE* […] La consonne, **D**, par exemple, se prononce en donnant du bout de la langue au dessus des dents d'enhaut: **DA**.	*PHILOSOPHY MASTER* Without a doubt. The consonant **D**, for example, is pronounced by clapping the tongue above the upper teeth: **D**.
Molière R 1670	*MAÎTRE DE LA PHILOSOPHIE* Et l'**R**, en portant le bout de la langue jusqu'au haut du palais; de sorte qu'estant frolée par l'air qui sort avec force, elle luy cede, et revient toûjours au même endroit, faisant une manière de tremblement: **Rra**.	*PHILOSOPHY MASTER* And the **R**, by carrying the tip of the tongue to the top of the palate, so that being grazed by the air that comes out with force, it yields to it and comes back always to the same place, making a kind of trill: **Rra**.

Figure 31 Extract from the dialog in Act II: Scene 4 from *Le Bourgeois Gentilhomme* (1670/1674, 26-27) by Molière, the *Maître de la Philosophie* teaches *Monsieur Jordain* the pronunciation of the consonants *D* and *R*, and the vowel *U*.

Regarding the pronunciation of the consonant *R* there is a suggestion on how to learn the tip of the tongue pronunciation found in *Théorie de l'Art du Comédien ou Manuel Théâtral* (1826/1854) by Aristippe (a pseudonym for the French actor Bernier de Maligny, *c.*1798-1864) referring to *Le Bourgeois Gentilhomme* by Molière. De Maligny suggested two exercises for developing skills correcting *R* when pronounced with the back of the tongue (*Grasseyement*) instead as with the tip of the tongue being considered as the correct pronunciation:

> Le premier moyen de correction pour le grasseyement, c'est de prononcer vivement et distinctement les deux particules *te* et *de*; cette prononciation continue ainsi pendant longtemps, donne au bout de la langue une certaine élasticité, qui finit par amener la vibration qui lui manquait. Le second moyen à employer est de lire haut, en soutenant sa voix, et de remplacer tous les *r* qui se rencontrent dans les mots par *td*, en prononçant *tdompter*, *coutdage*, au lieu de tromper, courage etc., afin d'éviter entièrement de faire agir le gosier dans toutes les articulations de l'*r.* (Maligny, 1826/1854, 45)[1]

*

When comparing descriptions by Cordemoy (1668), Molière (1670), Bacilly (1679), Lamy (1688), and Bérard (1755) on the pronunciation of the consonant *T* with studies of phonetics such as *Album Phonétique* by Georges Straka (1965b, Plate 23) these explanations are confirmed by research regarding the positions of the lips, tongue, and lower jaw (Fig. 32).

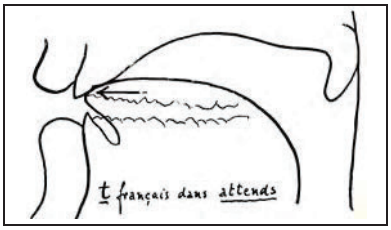


Figure 32 The arrow show the contact point between the tip of the tongue and the hard palate/backside of the upper front teeth when pronouncing a typical French *T* (Straka, 1965b, Plate 23), which supports the explanation described by Cordemoy: […] *le T. en frappant du bout de la langue à l'endroit où se joignent les dents d'enhaut & d'enbas.* (Cordemoy 1668, 77)[2]

Regarding the consonant *R* are the explanations by Cordemoy (1668), Molière (1670), Lamy (1688), Bérard (1755), and De Maligny (1826/1854) important because they indicate the placement of the tip of tongue at the top of the palate which when compared with Straka (1965, Plate 33) shows the same placement of the tip of the tongue for the *R Roulé* (Fig. 33).

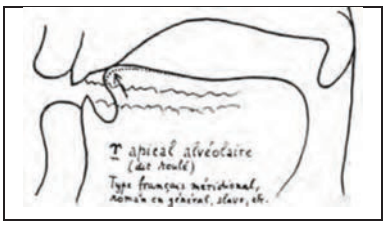


Figure 33 The arrow show the contact point between the tip of the tongue and the hard palate when pronouncing *R* with the tip of the tongue (Straka, 1965b, Plate 33).

1. The first means of correction for slouching is to pronounce vividly and distinctly the two particles *te* and *de*; this pronunciation continued thus for a long time, gives to the tip of the tongue a certain elasticity, which ends up bringing the vibration which it lacked. The second method to employ is to read aloud, while supporting one's voice, and to replace all the *r* which occur in the words by *td*, by pronouncing *tdompter*, *coutdage*, instead of tromper, courage etc., to avoid entirely to make the throat act in all the joints of the *r.* (Maligny, *Théorie de l'Art du Comédien ou Manuel Théâtral,* 1826/1854, 45)

2. […] *T* by hitting with the tip of the tongue where the upper teeth & below meet (Cordemoy, *Discours physique sur la parole*, 1668, 77)

It should be noted that the contact point between the tip of the tongue and the hard palate/backside of the upper front teeth when pronouncing the consonant *D* in French is rather close to the contact point as when pronouncing *R* with the tip of the tongue (Fig. 34). This is of interest because in later French flute methods (i.e., Altès, 1880) is the articulation *Tu-Du* suggested when playing dotted rhythms, which indirectly could point in the direction that when *Tu-Ru* is explained in *Princip* and *Rudiments* that the suggested *Ru* possibly could be replaced with *Du* when playing *Inégale*.

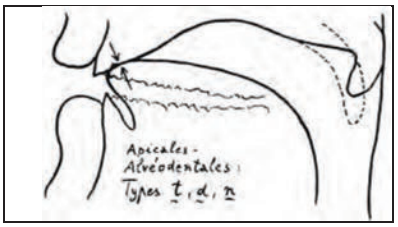


Figure 34 The arrow show the contact point between the tip of the tongue and the hard palate when pronouncing *D* (Straka, 1965b, Plate 26), and corresponds well with the explanation given by Molière (1670): [D] *se prononce en donnant du bout de la langue au dessus des dents d'enhaut*[1]

If *R* would be pronounced in the back of the mouth—*Grasseyement*— (Straka, 1965b, Plate 33) this could not possibly make a distinct and clear articulation syllable but rather resemble *Flutter-tonguing* (Fig. 35).

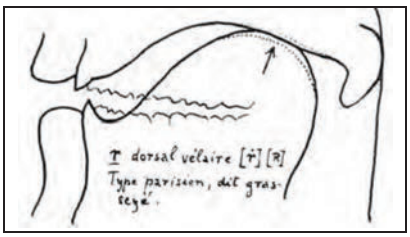


Figure 35 The arrow show the contact point between the tongue and hard palate when pronouncing *R* in the back of the mouth—*Grasseyement*—in a typical Parisian manner of today which would not result in a clear articulation but rather resemble *Flutter-tonguing* (Straka, 1965b, Plate 33).

When comparing the historical sources describing the pronunciation of the vowel *U* (**y**) it is striking how well explications by Cordemoy (1668) and Lamy (1688) corresponds with the explication by Straka (1965b; Fig. 36):

> […] si on raproche les dents sans les joindres entierement, & si en méme instant on alonge les deux levres en les raprochant, sans les joindre tout à fait, on formera une voix en *U*. (Cordemoy, 1668, 70)[2]

> Les lévres avancent en dehors, & se ressemblent pour faire une tres petite ouverture. (Lamy, 1688, 161)[3]

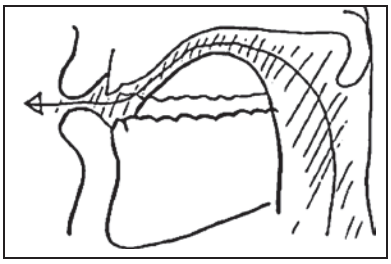


Figure 36 Observe that the lips have a slight position moving forward and that the shaping of the mouth cavity creates a large resonance cavity in the back of the mouth when pronouncing the vowel *U* (**y**) (after Straka, 1965b, Plate 44).

1. The consonant *D*, for example, is pronounced by clapping the tongue above the upper teeth: *D.* (Moliere, *Le Bourgeois Gentilhomme*, 1670)
2. If we bring the teeth together without completely joining them, and if at the same moment we lengthen the two lips by bringing them closer, without completely joining them, a *U*-shaped voice will be formed. (Cordemoy, *Discours physique sur la parole*, 1668, 70)
3. The lips protrude outward & resemble each other to make a very small opening. (Lamy, *La Rhetorique ou L'Art de Parler*, 1688, 161)

When suggesting the vowel *U* connected to the consonant *T*—as shown in *Principes* and *Rudiments*—this is the first documented example directly aiming for the Traverso of what should become one of the standard articulation syllables recommended in many French methods for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute up into the 21st Century.

*

The suggestions *Principes* and *Rudiments* show regarding articulation and how to use the syllables *Tu* and *Ru* is detailed as shown above, never-the-less, Hotteterre ends the chapter on articulation in a pragmatic manner—comparable to when explaining fundamentals of the embouchure—suggesting that the player should use the articulations most pleasing, trusting personal taste in search for an articulation being: *le plus agréable à l'Oreille* (VIII: 27):

[…] lorsque les coups de Langue paroîtront rudes en les faisant de la maniere que je les ay expliquez dans les premiers Exemples, & l'on doit s'arrester à ce qui semblera le plus agréable à l'Oreille, sans avoir égard à l'arrangement des Notes, n'y aux differens mouvemens. On observera seulement de ne point prononcer *Ru* sur les Tremblements; ny sur deux Notes de suite, parceque le *Ru* doit toûjours être mêlé alternativément avec *Tu*. (VIII: 27)	[…] when the tonguing appears harsh, when done as I advise in the first examples, then use the way which shall seem most agreeable, without respecting the ranging of the Notes, or the different movements. You must only observe never to pronounce ***Ru*** on a shake, nor on two Successive Notes, because ***Ru*** ought always to be intermixt alternatively with ***Tu***. (VIII: 19-20)

Another comment of importance is when Hotteterre explained that the articulation syllables should be pronounced softly on the Traverso:

Par example on les adoucit [articulations syllables] sur la Flute Traversiere. (VIII: 27)	for 'tis soften'd on the German Flute (VIII: 20)

That the articulation syllables should be pronounced in a soft manner on the Traverso reminds of when Rampal—even thou pointing at the Boehm-flute—explained how the French pronunciation of articulation syllables is favourable for a light and supple articulation:

> […] The French only brush the back of the teeth with the tongue, and the sound is much lighter […] French is more delicate and uses the muscles in the front of the mouth. (Rampal, *Music, My love*, 1989, 81)

*

In the following is an attempt to summarize how articulation is explained in *Principes* and *Rudiments*. Because *Rudiments* indeed is a faithful translation of *Principes* and the music examples are the same as in the French original, are music examples shown from *Principes*. When differences occur are examples in question shown from both *Principes* and *Rudiments,* the latter are identified because they are noted in the standard treble clef.

Notes inégales	**Pointed articulations**
On fera bien d'observer que l'on ne doit pas toûjours passer les Croches également & qu'on doit dans certaines Mesures, en faire une longue & une breve; ce qui se regle aussi par le nombre. Quand il est pair on fait la prémiere longue, la seconde breve, & ainsi des autres. Quand il est impair on fait tout le contraire; cela s'appelle pointer. Les Mesures dans lesquelles cela se pratique le plus ordinairement, sont celle à Deux-temps, celle du triple simple, & celle de six pour quatre. (VIII: 24)	You must observe that Quavers are not always to be play'd equally, but that you must in certain movements make one long, and one short, which is also regulated by their number when they are even. You make the first long, the second short, and so on when they are odd, you do quite the reverse, that is called pointing; the movements in which 'tis most commonly used is Duple, or Common Time. Triple Time and Jigg Time or 6/4 You must pronounce ***Ru*** on the Note which follows the Quaver when it ascends, or descends by one step only. (VIII: 17)
	

Mixed articulations

Il y a aussi certains Mouvemens où l'on ne se sert que du *Tu*, pour les Croches.

On prononce *Tu* sur toutes ces Croches, & l'on ne se sert du *Ru*, que sur les doubles Croches; C'est que les Croches supposent des Noirs, & les Doubles Croches des Croches simples, dans ces sortes de mouvemens, aussi-bien que dans les Mesures de 6/8 12/8 & 9/8. Il faut aussi dans ces Mesures passer les Croches également, & pointer les Doubles Croches. On se sert du *Ru* sur les doubles Croches; suivant les Regles que j'ay données pour les Croches simples: On s'en sert même plus frequemment: car soit que ces Doubles Croches soient sur la même ligne, soit qu'elles sautent, on ne laisse pas de le faire. (VIII: 25)

Mixed articulations

There are also certain Movements where you only use ***Tu*** for the Quavers, as for example. You pronounce ***Tu*** on all these Quavers, and you don't use ***Ru***, but on the Semiquavers, 'tis because in these movements a Quaver is to be suppos'd a Crotchet, and a Semiquaver a Quaver, that is, held as long in playing, as well as in those of 6/8 12/8 and 9/8 you must also in these movements pass the Quavers equally, and point the Semiquavers. You use ***Ru*** on the Semiquavers according to the Rules I gave of the Quavers, and more frequently, for you don't omit it whether they are on the same line, or whether they Skip. (VIII: 18)



Coulez

Il faut encore faire attention aux *Coulez*. Ce sont deux ou plusieurs Notes passées d'un même coup de Langue, ce qui est marqué au dessus ou au dessous des Notes par des liaisons.

Le *Port-de-voix* est un coup de Langue anticipé d'un degré, au dessous de la Note sur laquelle on le veut faire. Le *Coulement* est pris un degré au dessus, & ne se pratique guere que dans les intervales de Tierces en descendant. (VIII: 28)

Of Sliding, or Slurring.

Slurring is when two, or more Notes are pass'd over with only one tip with the Tongue, which is markt by a Curve line, over, or under the heads of the Notes (VIII: 20)

The *Port-de-voix* is a tipping with the Tongue, anticipated by one Note below the Note on which we design to make it, the *Slide* is taken a Note above, and is never practisd but in descending to a third. These little Notes which denote the *Port-de-voix*, and *Slides*, are accounted as nothing in the Time, you Tongue them nevertheless (VIII: 21)



Dotted rhythms and meters like 3, 6/4, and 3/2	**Dotted rhythms and meters like 3, 6/4, and 3/2**
Dans la Mesure du Triple double, on prononce *Tu, Ru*, entre les Noires, & *Ru* sur la Blanche qui est précedée d'une Noire, en montant ou en descendant, par degrez conjoints. Nous pourrons donc avancer que tous les Triples se rapportent au triple simple, & nous pourrons dire que dans le Triple double, les Blanches supposent des Noires, & les Noires des Croches; c'est pourquoy il faut pointer les Noires dans cette Mesure, suivant l'explication que j'ay donnée plus haut, au sujet des Croches. (VIII: 27)	In Triple Time of 3/2 you pronounce ***Tu Ru*** between the Crotchets and ***Ru*** to ye Minums that are preceded by a Crotchet, in ascending, or descending by one Notes distance, as for example. We may then say that all Triple Time is like the single Triple Time, and that in double Triple Time, (i.e.) 3/2 the Minums are to be accounted Crotchets, and the Crotchets Quavers, & c. for which reason, you point Crotchets in this movement according to the Explication I gave you of Quavers. (VIII: 20)



Exceptions	**Exceptions**
Quoique ces Regles soient générales, elles admettent cependant quelques exceptions, dans certains passages, comme on le peut voir icy. (VIII: 26) […] l'on doit s'arrester à ce qui semblera le plus agréable à l'Oreille, sans avoir égard à l'arrangement des Notes, n'y aux differens mouvemens. (VIII: 27)	Although these Rules are General, they admit of some Exceptions in certain Cases, as you may see by these [Examples] […] the Relish of the Ear that must decide it, you ought therefore to Consult the Ear, for when the tongueing appears harsh, when done as I advise in the first examples, then use the way which shall seem most agreeable, without respecting the ranging of the Notes, or the different movements. (VIII: 19)



A consideration regarding suggested articulations as found in *Principes* and *Rudiments* is to compare with how Hotteterre in detail notated articulations in *Air et Brunettes* (*c.*1721), and *L'Art de Preluder* (1719), whereby the *Legato* has been given a prominent role.

*

The articulation *Tu-Ru* is according to explanations in *Principes* and *Rudiments* the articulation used when playing *Inégale*, which generally is the well-known manner to play a longer note and a shorter note even thou the notation of the notes have the same value as shown in the examples above. The shorter note was according to the examples in *Principes* and *Rudiments* generally played with the syllable *Ru* and probably performed with a tip of the tongue. The question is how much longer is the longer note and how much shorter is the shorter note? This question is not directedly answered in *Principes*, *Rudiments*, *Avertissements Œuvre IIa* (1708), *Œuvre IIb* (1715), *L'Art de Preluder* (1719), or *Méthode pour la Musette Œuvre X* (1737). Playing *Inégale* is not exclusively an articulation technique using different syllables, but rather a tool for musical expression and characterization. When approaching the important concept of *Inégale* as a tool for musical expression, perhaps comparable to later tools for musical interpretation such as *Rubato* and *Agogic* for avoiding a too "metronomic" performance, the importance of *Inégale* playing becomes clear. Thus, it could be assumed that the amount of *Inégale*—the lengths of the longer note and the shortness of the shorter not—stands in direct relation to the general expression and emotion of a given piece, similarly to that the speed of a trill has a direct relation to the tempo and character of a given piece. Possible smaller differences between longer and shorter notes creates characters like *Tendrement*, whereas a sharper articulation in the direction of double dotting creates expressions like *Fièrement*.

In *L'Art de Preluder* (1719, 57-60) has Hotteterre given a general and instructive explanation of meter, tempi, which are the beats that generally should be stressed, together with suggestions regarding which notes the *Inégale* should be applied on (quarter, eighth or sixteenth notes) including musical examples, which in an abbreviated form is shown in Figure 37 (See also section *6.9.4 Words of expression and characters of keys in L'Art de Preluder,* Fig. 64, 65).

Meter	**Marked beats**		**Les croches & Les Noirs** ♪ ♩		**Les doubles croches** 𝅘𝅥𝅯	
4 Temps lents C	Elle se bat a 4 Temps	*In 4 beats*	les croches sont egale et sont aussi longues que les noirs dans les autres Mesures	*eighth notes are equal and are as long as the quarter notes in the other meters*	les doubles croches y sont pointées [inégales] c'est a dire une longue et une breve	*sixteenth notes are dotted there* [inégales] *that is to say a long and short*
C barré 𝄵	Son mouvement ordinaire est 4 temps legers ou 2 Temps lent	*Its ordinary movement is 4 light beats, or 2 slow beats*	les croches y doivent estre egales dans la regularité a moins que le Compositeur n'y mettre des points.	*eighth notes must be equal unless the Composer adds dots*	–	–
2 Temps	elles se bat a 2 temps egaux	*2 equal beats*	les croches y sont pointées [inégales]	*the eighth notes are dotted* [inégales]	–	–
Triple majeur ou Triple double 3/2	Elle se bat a trois temps lents pour l'ordinaire	*normally at three slow beats*	les noirs y sont pointées [inégales] comme les croches dans les autres mesures	*quarter notes are dotted* [inégales] *like the eighth notes in the other meters*	–	–
Triple simple 3	Elle se bat a trois temps. Elle est quelque fois fort lente et quelque fois fort vive.	*Three beats sometimes very slow and sometimes very lively*	Les croches y sont presque toujours pointées [inégales] dans la musique françoise.	*eighth notes are almost always dotted* [inégales] *in French music*	–	–
Triple mineur 3/8	Elle se bat a un temps quand elle est dans son veritable mouvement, qui dois estre vif.	*One beat when it is in its true movement which must be lively*	les croches simples y sont egales	*eighth notes are equal*	les doubles [croches] pointées [inégales]	*sixteenth notes are dotted* [inégales]
6/8	Elle se bat a deux temps	*In two beats*	les croches simples y sont egales	*eighth notes are equal*	les doubles [croches] pointées [inégales]	*sixteenth notes are dotted* [inégales]
12/8	Elle se bat a quatre temps	*In two beats*	les croches simples y sont egales	*eighth notes are equal*	–	–
2/4	Elle se bat a deux temps	*In two beats*	les croches simples y sont egales	*eighth notes are equal*	les doubles [croches] pointées [inégales]	*sixteenth notes are dotted* [inégales]
4/8	Elle se bat a deux temps	*In two beats*	les croches simples y sont egales	*eighth notes are equal*	les doubles [croches] pointées [inégales]	*sixteenth notes are dotted* [inégales]

Figure 37 Explanations regarding different meters, tempi, marked beats, and *Inégale* as explained in *L'Art de Preluder* by Hotteterre (1719, 57-60).

Conclusions regarding articulation

- *Legato* or *Coulez* is in *Principes* and *Rudiments* described as giving the first note under a slur an attack with the consonant *T* and then supporting the airstream on the following notes without using the tongue, which is the same technique as described in all French flute methods until today.
- The articulation syllables *Tu* and *Ru* are described in *Principes* and *Rudiments* in the same manner although the pronunciation is not necessarily the same when comparing spoken French and English. This might perhaps indicate that an English spoken Traverso-player could have adopted a French pronunciation or not.
- The consonant *T* and its pronunciation are described in French sources from the late 17th Century and first part of the 18th Century (Cordemoy, 1668; Molière, 1670; Bacilly, 1679; Lamy 1688; and Bérard, 1755) and is seems to be clear that *T* was pronounced similarly as in today's French (Straka, 1965b), whereby the tip of the tongue is placed in the front of the mouth hitting the backside of upper front teeth or just behind on the hard palate.
- Regarding the consonant *R* its pronunciation and how it was used for articulation and Traverso playing as described in *Principes* and *Rudiments* is a more difficult question. When relating to sources from the late 17th Century and the first part of the 18th Century up to the beginning of the 19th Century (Cordemoy, 1668; Molière, 1670; Lamy, 1688; Bérard, 1755; De Maligny, 1826/1854) regarding the pronunciation of *R*, it is suggested to bring the tip of the tongue below the upper front teeth, and to push the air out of the throat, so that the air, reflected by the palate, makes the tongue making a kind of tremor. In other words, an *R* pronounced with a rolling of the tip of the tongue is dental and lingual, and different from today's French in which *R* often is pronounced in the back of the mouth. When *R* is pronounced in the back of the mouth it is not possible to make a clear articulation as with *T*, and risk to resemble *Flutter-tonguing*. It should be noted that the above-described manner pronouncing *R* is realised in a manner that resembles the consonant *D* (Lavignac, 1926; Straka, 1965b).
- The vowel *U* seems according to mentioned sources (Cordemoy, 1668; Molière, 1670; Bacilly, 1679; Lamy, 1688; Bérard, 1755) to have been pronounced as in today's French (Straka, 1965b). This pronunciation results in that the lips moves slightly forward shaping a small opening between the lips.
- When playing with the mixed articulation *Tu-Ru* and pronounced as described in mentioned sources it resembles the mixed articulation *Tu-Du*—which is described in later French flute methods such as Altès (1880/1906)—creating a natural flow of *Inégale* when playing a sequenze of detached notes. A possible reason to that later French flute methods used the articulation *Tu-Du* for dotted rhythms resembling playing *Inégale* could have been that the more common pronunciation of *R* with the tip of the tongue gradually was replaced with the pronunciation in the back of the mouth. If so, it seems to be coherent that an alternative to *Tu-Ru* is to use *Tu-Du* in the repertoire of Hotteterre, La Barre and French Traverso music from the same period.

6.5 C#1, D♭1, the high register, and F3

How to play the note C#1 on the three-piece Traverso is described for the first time by Michel de La Barre in the *Avertissement* for his *Pieces pour la Flute Traversiere, avec la Basse-Continue. Œuvre Quatrieme* (1703):

> Pour le C, sol, ut dieze en bas, il se fait tournant l'embouchûre de la Flûte en dedans. (La Barre, 1703)[1]

In *Principes* and *Rudiments* is the explanation how to play C#1 described with almost the same words as by La Barre:

[…] on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton. (V: 17)	[…] by turning the Flute inwards, sufficiently to lower the Sound by half a Note (V: 12)

A third example of how to play C#1 is found in the fingering-chart for the four-piece Traverso in *Méthode pour apprendre aisement à jouer de la Flute Traversiere* (1735 & 1773) by Corrette:

> L'ut# d'embas, se peut faire en bouchant tous les trous, comme pour le ré d'embas, et en tournante l'embouchure de la flute en dedans (Corrette, 1735 & 1773, 50)[2]

A fourth example of how to play C#1 and adding D♭1 is found in the fingering-chart in *Méthode Raissonée* (1755) by Bordet:

> L'ut et le reb en bas se font comme le re naturel en tournant seulement l'embouchure en dedans (Bordet, 1755, 17)[3]

A fifth example giving the same explanation as La Barre and Hotteterre regarding C#1 and adding D♭1 is found in *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere* (1759) by Mahaut:

> L'Ut#, et le Reb au Commencement de l'Echelle ne sont pas des tons effectifs de la Flute, on ne les faits qu'articificiellement; l'on voit par les points obliques que ces deux notes se doigtent de même que le Re naturel qui suit imediatement apres, mais outre le doigté il faut former ces deux notes, tourner la Flute en dedans et Elargir l'ouverture des levres a l'embouchure par ce moyen on baiße le son d'un demi ton. (Mahaut, 1759, 7)[4]

Some years later is a sixth example found in *Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere* by Bailleux-Hotteterre (1765), with an explanation quoting Mahaut (1759) almost word by word:

> L'Ut# et le Reb au commencement de la Gamme ne sont pas des tons effectifs de la flute, on ne les fait qu'artificiellement l'on voit par les points obliques que ces deux notes doigtent de même que le Re naturel qui suit imédiatement après, mais outre le doigté il faut pour former ces deux notes tourner la flute en dedans et élargir l'ouverture des lévres à l'embouchure par ce moyen en baisse la note d'un démi-ton. (Bailleux-Hotteterre, 1765, 8)[5]

One more example is found in *L'Encyclopédie Méthodique* (1785 & 1788) and its chapter *Flûte Allemande* ou *Traversière*:

> […] l'*ut* diése au dessous, se fait en bouchant tous les trous exactement, & soufflant très-doucement, observant pour l'*ut* diése de tourner l'embouchure en dedans. (*L'Encyclopédie Méthodique,* 1785 & 1786, 106)[6]

A final example is found in *Nouvaux Principes Pour apprendre a jouer de la Flutte Traversiere* (1778) by Mussard:

> […] l'ut# et le réb en bas se font comme le re naturel et en tournant l'embouchure en dedans mais ils sont rarement bon. (Mussard, 1778, 7)[7]

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1. *Avertissement*, For the C, sol, ut dieze down [C#1], it is done whilst turning the head-joint of the flute inwards. (La Barre, 1703)
2. The low C# [1] can be made by closing all the tone-holes, as for the low D[1] and by turning the embouchure of the flute inwards. (Corrette, *Méthode pour apprendre aisement à jouer de la Flute Traversiere*, 1735 & 1773, 50)
3. The low C[1] and the D♭[1] are made like the natural D1 and by turning the head-joint inwards (Bordet, *Méthode Raissonée*, 1755, 17)
4 & 5. The C#[1] and the D♭[1] at the beginning of the Scale are not effective notes of the flute, they are only made artificially, we see by the oblique points [at the fingering-chart] that these two notes have the same fingerings as the natural D[1] which follows immediately afterwards, but in addition to the fingering, it is necessary to play these two notes turning the flute inwards and widen the opening between the lips and by these means, lowering the note [D1] by a semitone. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere*, 1759, 7) and (Bailleux-Hotteterre, *Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere*, 1765, 8)
6. […] the C sharp below [C#1], is done by closing all the tone-holes exactly, & blowing very gently, observing for the C sharp to turn the head-joint inwards. (*L'Encyclopédie Méthodique,* 1785 & 1788, 106)
7. […] the low C# and D♭ is played like low D and turning the head-joint inwards but it sounds rarely well. (Mussard, 1778, 7).

There is no other way to play the low C#1 and D♭1 on the Traverso having the standard D-foot joint than as described by La Barre, Hotteterre, Corrette, Bordet, Mahaut, Bailleaux-Hotteterre, *L'Encyclopédie Méthodique,* and Mussard. These explanations are important because playing the C#1 and D♭1 as explained stands in direct relation to the *Normal position* of the head joint discussed in the foregoing.

If the head-joint when being positioned in the *Normal position* is turned too much inward, it will be impossible to lower the note D1 a half-tone step downward for reaching C#1. If the head-joint has a *Usual position* too much turned outwards the C#1 and D♭1 is easily found, but all other notes will be completely out of tune. In other words: the explained technique for playing the note C#1 and D♭1 could supposedly be used for calibrating the *Normal position* which at the same time gives direct indicating regarding tonal aesthetics, aspects of sound character and timbre of the period. All together the search for C#1 sheds light on both the *Normal position* and when Hotteterre suggests to the use *Outward* and *Inward position* of the head joint.

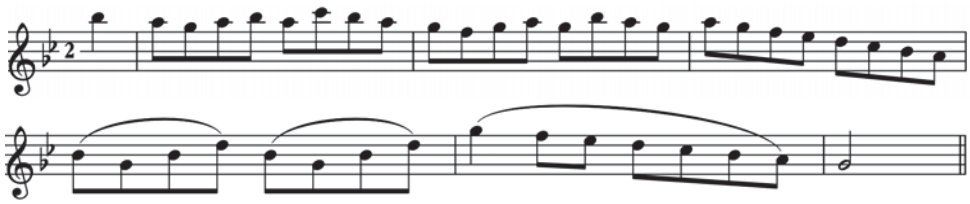
When thinking about the above-described technique how to play the note C#1 and D♭1 through turning the Traverso inwards, and especially so when having early French 18th Century music as by La Barre (1703) and *Principes* and *Rudiments* in mind could perhaps be interpreted as a reminiscence of a playing technique for the Renaissance Traverso. When playing the notes D#1, E♭1, D#2, and E♭2 on the Renaissance Traverso this is realized through half-covering the sixth tone-hole (right-hand ring-finger) because of the lack of the seventh tone-hole as found on the Traverso. An alternative to half-covering the sixth tone-hole could be to turn the instrument inwards as when playing C#1 on the Traverso, but the result is a sound quality that supposedly might be too far away from the surrounding notes. Half-covering the sixth tone-hole for D#1, E♭1, D#2, and E♭2 works, and especially so making a combination with turning the instrument somewhat inwards and simultaneously slightly half-cover the sixth tone-hole which then results in a sound colour almost like the surrounding notes, and is supple and elegant in fluent passages compared with only half-covering the sixth tone-hole.

*

In Hotteterre's important text on Traverso playing *L'Art de Preluder* (1719) are examples whereby the higher register is exploited (Ex. 2-4). In the section *Trait*—a collection of short technical exercises—are four examples named *Etude*, including one short *Trait* in g-minor which all circle around the high register.



Example 2 *Etude* in g-minor, register D1-E♭3 (1719, 20)



Example 3 *Etude* in B♭-major, register B♭1-E♭3 (1719, 21)



Example 4 *Etude* in b-minor, register D1-E3 (1719, 22)

The *Etude* in G-major (Ex. 5) and the *Trait* in g-minor (Ex. 6) includes F#3 and G3 being the two highest notes mentioned in the fingering-charts in *Principes* and *Rudiments* which are relatively easy to play according to Hotteterre:

FA#. Le *Fa Diézis* se fait plus aisément: Il faut boucher tout les trous, excepté le deuxiéme. **SOL.** Le *Sol* se fait, en bouchant le prémier & le troisiéme trou, & en débouchant tous les autres. (III: 10)	**F-fa-ut Sharp** is made easier, you must stop all the holes except ye 2d. **G-sol.** is made by stopping the first and 3d. holes, and opening all the rest (III: 7)



Example 5 *Trait* in g-minor, register G1-G3 (1719, 19)



Example 6 *Etude* in G-major, register G1-G3 (1719, 19)

Regarding the note F3 this is a note which is problematic, and on many Traversi from the first part of the 18th Century it can't be played, or only with advanced technique of the embouchure and fingerings, but on some Traversi it can easily be played. Because the instability of F3 this note was almost never used in the first half of the 18th Century. That F3 sometimes was needed despite its difficulties explains perhaps why there is an explanation in *Principes* and *Rudiments* on how this note can be played:

FA. Le *Fa* naturel ne se peut presque point faire tout au haut de la Flute; je l'ay neanmoins trouvé sur quelques-unes, en la maniere que je vais l'expliquer, mais il ne faudroit point s'opiniâtrer à le chercher indifferemment sur toutes sortes de Flutes, non plus que les Cadences qui en procédent; car ce seroit vouloir tenter l'impossible, Il se fait en bouchant tout à fait le premier, le deuxiéme, le quatriéme trou; en bouchant le cinquiéme seulement à moitié; en debouchant le troisiéme, le sixiéme & le septiéme; & en donnant le vent fort aigu. Au reste, je ne l'ay point démontré dans ma prémiere Planche, parcequ'il n'est pas proprement un Ton sur lequel on puisse compter. (III: 9-10)	**F-fa-ut** in altissimo for the most part cannot be blown, however, I have found some Flutes on which I cou'd blow it after the following manner, however, you must not expect to find it indifferently on all Flutes, no more then the shakes, or Cadences which proceed from it; 'tis play'd by stopping at once the first 2. and 4th. and half the 5th. & opening the 3. 6th. and 7th. and blowing very Sharp; yet I have not inserted it in my Scale, by reason 'tis not a Note on which we may depend. (III: 7)

Corrette (1735 & 1773) has a short comment regarding F3 that this note was never used by Traverso-players of earlier generations:

> Les anciens joueurs de flute n'ont jamais fait le fa naturel de la troisieme Octave. (Corrette, 1735 & 1773, 16)[1]

1. The ancient flute players never played the natural F of the third octave. (Corrette, *Méthode pour apprendre aisement à jouer de la Flute Traversiere*, 1735 & 1773, 16)

Mahaut (1759) writes about F3 as a difficult note and not playable on every Traverso, and especially so when using short *Corps de rechanges* (*petites Corps*):

> Le Fa naturel [F3] doigté comme on a montré dans la tablature [12/47] est juste, mais toute les Flutes ne le donnent pas facilement sur tout avec les petites Corps, plusieurs le doigtent en fermant le 1.2.3. 5 et 7e trou mais ce Fa est trop haut, on le fait encor le 1r trou a moitié et le 2. 4 et 5 tout a fait fermés, il est juste et Presque toutes les Flute le donnent, mais il est difficile, a cause du 1. trou qui n'est fermé qu'a moitié. (Mahaut, 1759, 11)[1]

Conclusions regarding C#1, D♭1, F3, and the high register

- In the fingering-charts found in *Principes* and *Rudiments* are fingerings shown covering the chromatic scale from C#1-G3, and mentions that it is possible to play some more notes in the highest register but no fingerings are shown.
- The general compass used in Hotteterre's compositions *Œuvre IIa* (1708), *IIb* (1715), *III* (1712), *IV* (1712), *V* (1715), *VI* (1717), *VIII* (1722), including *Airs et Brunettes* (*c.*1721), and the transcriptions *Sonates a deux dessus par le Sig Valentine* (1721), and *Sonates a deux dessus par le Sig Torelio* (1723) covers the register D1-E3. There are no examples of that Hotteterre have used the note C#1 in his published compositions.
- Considered that explications regarding how to play C#1 are well documented in sources such as La Barre (1703), *Principes* (1707), *Rudiments* (1729), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), Bailleux-Hotteterre (1765), *L'Encyclopédie Méthodique* (1785 & 1788), and Mussard (1778) possibly this note would have been used from time to time. It should be noted that the explained technique for how to play C#1 is the same for the three-piece as for the four-piece Traverso. A complementary reason why explaining how to play C#1 could have been that when successfully being able to play C#1 this skill can serve as a method to find and calibrate a well-balanced *Normal position* of the head-joint, which in its turn facilitates how to find a functional *Outward position* and *Inward position* of the head-joint.
- An observation—but not described in *Principes* and *Rudiments*—is that the high register generally is facilitated when using the *Inward position* with moderation. A test is to play an octave like D2 (23/456)–D3 (23/456). When playing D2 in the suggested *Normal position* keeping a steady appropriate speed of the airstream, and after having stabilized D2, start to gently search for the *Inward position* within a legato keeping the same air-pressure and *Tonus* in the lips as for D2 without modifying direction and speed of the airstream generally D3 will be found with facility. The same experiment could be done staying in the *Normal position* for D2 and D3, keeping the air-pressure and speed of the airstream steady and constant and only with help of the embouchure direct the airstream slightly downwards and D3 would generally and with ease be found (see Appendix XVIII).
- In Hotteterre's *L'Art de Preluder* (*Œuvre VII*, 1719) are in the section *Trait* a few short technical *Etudes* including the high notes F#3 and G3.
- Regarding the note F3 it is explained that this is a note which often is difficult, and not playable on all Traversi. Despite mentioned difficulties are several fingerings found in *Principes* and *Rudiments*: 12/4**5**7 given for this note, together with fingerings for the trill F3-E3: 12/4**5**7–1(**2**)/567, and F3-E♭3: 12/4**5**7–1(**23**)/567.
- Mahaut (1759) pointed on that F3 is a difficult note in similar terms when compared with *Principes* and *Rudiments*.



1. The natural F [F3] fingering as shown in the tablature [12/45] is just, but not all Flutes give it easily and especially so when using a short *Corps de rechange*, many uses a fingering by closing the 1.2.3. 5 and 7th hole but this F is too sharp, one can play it while half-closing the 1st tone-hole and the 2nd 4 and 5 being completely closed, it is equitable and almost all Flutes give it, but it is difficult because of the 1st tone-hole being half-covered. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere*, 1759, 11)

6.6 On intonation and *Temperaments*

> *Le Temperament consiste à changer la juste proportion d'un Intervale, sans donner atteinte à la satisfaction que l'Oreille doit en recevoir.* […] *Les Musiciens de pratique l'observent, même assez regulierement, sans autre secours que celuy de l'oreille* […][1]
>
> Jean-Philippe Rameau (1726/2004, 107/166)

The fifth chapter in *Principes* and *Rudiments*: *Seconde explication de la Prémiere Planche sur les Diézis & les Bemols—The 2d. Explanation of the first SCALE of Flats & Sharps* explains the differences between how to play for example a B♭ compared with the enharmonic A#. Such explanations make it clear that when Hotteterre discusses intonation in relation to fingerings, positions of the head-joint, *Tonus* in the lips and embouchure combined with the airstream it should altogether be understood in relation to models vis-à-vis tuning systems and temperaments, together with notions regarding the *Semitone mineur*, *Semitone majeur, Syntonic comma, Enharmonic comma*, and the *Pythagorean comma*. It is of interest that Hotteterre seems to direct his text to two types of readers: the already skilled person knowing the differences regarding intonation between a B♭ and A# within different tuning systems and temperaments, and to a reader that don't know about these perfections which instead is encouraged to initially concentrate on basic fingerings and embouchure:

Lorsque je compare en *Bemol* avec un *Diézis*, on conçoit bien que c'est entre les deux Notes qui sont à peu prés au même degré. Par exemple, je dis que le *Mi Bemol* (Note penultiéme,) se fait comme le *Ré Diézis*, j'entens le *Ré Diézis* (Note deuxiéme,) & ainsi des autres. Quelques observations que j'aye fait sur la justesse des demi-Tons, en faisant tourner la Flute en dedans ou en dehors, on ne doit pas pour cela s'embarrasser de cette délicatesse dans les commencemens, où l'on ne fait, pour ainsi dire, qu'ébaucher. On se contentera donc alors, d'acquerir la pratique de l'embouchure & des Doigts: après quoy l'on pourra s'exercer sur ces raffinemens qui sont essentiels pour la perfection & que l'on ne peut posseder qu'avec le temps. (V: 16)	When I compare a Flat and Sharp together, you must understand the two Neighbouring Notes of the same octave, and not compare the one in alt, to the other below, as when I say **E Flat**, which is the last Note but one is play'd like **D Sharp**, I mean **D Sharp** (the 2d. Note & c.] You need not to plague your self at first about this nicety of adjusting these Semitones, as I have shew'd by turning the Flute in or out, till you are a pretty way advanc'd in Practice, and then 'twill be proper to observe it, to attain to a perfection on this Instrument, which will require some time. (V: 11-12)

A challenging question is thus if Hotteterre had a specific temperament in his mind when giving suggestions on intonation in the fingering-charts, and if so: which? Trying to answer such questions, it is needed to contextualise fundamental characteristics involving basically any kind of transverse flute and intonation, as explained by the French acoustician Emil Leipp (1913-1986):

> Les flûtes ne sont pas des instruments à sons fixes. Selon qu'on souffle fort ou non, selon la façon dont on oriente le jet et dont on recouvre plus ou moins partiellement le trou de l'embouchure, le son est plus ou moins haut pour un même trou. Le champ de liberté indique les fluctuations de hauteur que les musiciens peu réaliser ainsi pour chaque note. Tout cela montre avec évidence qu'on ne peut déduire la gamme jouée par un musicien à partir de la disposition des trous d'une flûte: la gamme, c'est-à-dire le choix des notes à l'intérieur du champ de liberté, est inscrite dans la mémoire du musicien et non sur l'instrument. (Leipp, 1980, 241)[2]

Continuing, searching for answering above raised questions, it should be kept in mind that the Traverso is a melody instrument, and that generally every note—with the help of *Tonus* in the lips and embouchure, head-joint positions, and the airstream—can be intonated almost a quartertone up and down from its centre.

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1. Temperament is about changing the right proportion of an Interval, without compromising the satisfaction that the Ear should receive from it. [...] Practical musicians observe this, even quite regularly, without any help other than that of the ear [...] (Rameau, *Nouveau Système de Musique Theorique, Où l'on découvre le Principe de toutes les Regles necessaires à la Pratique, Pour server d'Introduction au Traité de l'Harmonie*, 1726/2004, 107/166)

2. Flutes are not instruments with fixed sounds. According to the intensity and direction of the breath, partial coverage of the embouchure, the sounds from the same tone-hole will be sharper or flatter. This potential span implies that a musician may obtain fluctuations of pitch on each note. All this demonstrates that one cannot identify the scale played by looking at the position of the flute's tone-holes, I. e. the choice of notes within the intonation span, is imprinted on the musician's memory and not in the instrument. (Leipp, *Acoustique et Musique,* 1980, 241)

According to numerous experiments realised by the French acoustician Michèle Castellengo, the conclusion was that transverse flutes (Traverso and Boehm-flute) generally has a deviation—*Champ de liberté*—of about ±5 to ±7 Savarts[1] (15 to circa 30 Cents) up and down on all notes:

> De nombreuses expériences nous ont appris que dans la tessiture allant du DO3 au DO5 la pente moyenne d'une flûte appréciée comme juste était d'environ +5 à +7 savarts. (Castellengo et al., 1978, 20)[2]

Similar observations regarding the flexibility of intonation and the *Champ de liberté* of each note—in this case relating to the Boehm-flute—was made by the French flautist Louis Fleury in the long article *La Flûte* in *Lavignac Encyclopédie de la Musique* (1925a), and the section *L'Art du flûtiste* based on notes written by Paul Taffanel (1844-1908):

> […] sur la même note, par le moyen de plus ou moins de pression des lèvres et de l'ouverture plus ou moins grande de l'embouchure, une inflexion qui va au moins jusqu'à un ¼ de ton en chaque sens. Pour les mauvais exécutants, ceci peut passer pour un inconvénient; pour les bons, c'est un grand avantage, car ils peuvent, par le seul moyen des lèvres, arrive à la justesse absolue. (Fleury, 1925a, 1523)[3]

A further aspect is that a temperament is to be understood as a compromise when it comes to tuning of instruments with fixed intonation as a harpsichord or an organ, when compared with the potentially flexible intonation of the voice, violin, Recorder, or Traverso. An in-depth discussion of different temperaments and tuning systems goes beyond the present study because of its high complexity that has challenged musicians and theorists since the Antiquity (Werckmeister, 1691; Huygens 1691; Castellengo, et al. (1978); Asselin, 1985/2000; Castellengo, 2015; Wolfs, 2017). But a shorter discussion on the subject could possibly prepare and deepen the understanding of fingering-charts, suggestions regarding the embouchure, and control of the airstream in relation to intonation as explained in *Principes* and *Rudiments*.

When discussing aspects regarding temperaments in the context of the late 17th and early 18th Centuries in France with relations to the Traverso, it seems to be clear that commonly used temperaments for instruments with fixed intonation like the harpsichord were based on different versions of meantone tuning—*Mésotonique*— (Asselin, 1985/2000; Wolfs, 2017). Typical examples of these were created by Chaumont (1695), Rameau (1726), D'Alembert (1752), and Corrette (1735). To illustrate the implications of these temperaments requires a basic understanding of *Equal 12 division* (12-ET)*, Just intervals*, and temperaments as for example *1/4-Comma Meantone*, and *1/5-Comma Meantone* used in France in the mentioned period. Further is to consider that the Traverso as shown above has a *Champ de liberté* regarding generally all notes that makes it practically possible to play with *Just intervals*. Considered that the *Champ de liberté* makes it possible to play with *Just intervals* the question could be asked if it makes sense for a Traverso-player or violinist to spend time learning different tuning systems like the ones mentioned above (Haynes, 1991; Folkers, 1998). Possibly this question should be answered: Yes it makes sense, because when playing together with instruments having fixed intonation like the harpsichord both theoretical knowledge as practical experiences of how mentioned tuning systems functions contributes to the interpretation and musical expression.

A practical methodology when discussing temperaments and intervals is the concept of *Cent*, based on that each semitone in the chromatic scale within *Equal 12 division* (12-ET) corresponds to 100 Cent in all octaves, and that an octave corresponds to 1200 Cent. For example, the interval C-C# or enharmonically C-D*b* corresponds to 100 Cent, and the important interval of the major third corresponds to 400 Cent within *Equal 12 division* (12-ET). But within *Just intonation* the major third corresponds to 386,31 Cent which in rounded numbers will make the major third clearly narrower when compared with the same interval played within *Equal 12 division* (12-ET). In rounded numbers is a just major third 14 Cent narrower played with *Just intonation* compared with *Equal 12 division* (12-ET). If a major third would be played within *1/5- Comma Meantone* it corresponds to 390.698 Cent, in rounded numbers about 9 Cent and slightly less narrow than played with *Just intonation* (Wolfs, 2017).

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1. 1 *Savart* = 3.9863 cent
2. We have learned from many experiments that in the range from DO3 to DO5 the average slope of a flute assessed as correct is around +5 to +7 Savarts. (Castellengo et al., *La Flûte Traversière à une Clef. Acoustique, Jeu, Facture,* 1978, 20)
3. […] On the same note, by means of pressure from the lips and a more or less big opening between the lips, it is possible to modify every note at least up to a ¼ of a tone in each direction. For poor performers, this may seem like a disadvantage; for the advanced, this is a great advantage, because they can, by the only means of the lips, arrive at absolute correctness of intonation. (Fleury, *Lavignac Encyclopédie de la Musique*, 1925a, 1523)

Although temperaments can be mathematically precisely calculated a too rigid approach is not evident, and especially so in relation to France in Hotteterre's period. The Canadian organist Dr Pierre-Yves Asselin explain in *Musique et Temperament* (1985/2000) that temperaments used in France in the 18th Century should possibly be understood as relatively supple, and that concepts of *Bon Gout* probably played an important role when tuning, giving a certain space for personal preferences. Asselin points on that tuning of fifths within French temperaments show a certain rate of augmentation which is not defined precisely but done with a certain progression, and compares with French ornamentation and how the playing of *Notes inégales* were described in the first part of the 18th Century:

> On peut donc déduire que, puisqu' *aucune règle précise ne régit l'emploi des notes inégales dans l'interprétation de la musique française, aucune règle ne doit déterminer de façon précise la grandeur des quintes dans la manière d'accorder.* (Asselin, 1985/2000, 108)[1]

From the discussion above can be deduced that a rigid approach regarding mathematical calculations of intervals and temperaments might be unhistorical in the context of *Principes* and *Rudiments*. Nevertheless, could basic knowledge regarding French temperaments possibly contribute for understanding Hotteterre's explanation of fingerings and how to adjust intonation on the Traverso. A suppleness regarding the mathematical sizes of intervals could shed light on common ornaments such as trills when described in detail with fingerings and head-joint positions in *Principes* and *Rudiments* because trills played on the Traverso sometimes do not result in precise half and whole tone steps.

6.6.1 The *Pythagorean comma, Syntonic comma*, and *Enharmonic comma*

The well-known *Pythagorean comma* describes the difference between an initial note and a final note which enharmonically can be understood as the initial note transposed seven octaves higher as when twelve perfect fifths with *Just intonation* are played in progression (Riemann, 1896, 624; Wolfs, 2017, 29). An example would be to start on a low C and one after another play twelve ascending perfect fifths ending on a final B# (enharmonically C; Fig. 38). A perfect fifth within *Equal 12 division* (12-ET) corresponds to 700 Cent, whereas the same interval played within *Just intonation* corresponds to 701.96 Cent. The progression of twelve perfect fifths thus accumulates a difference for each perfect fifth of plus 1.955 Cent. The difference between the first and last note in the progression of twelve perfect fifths can be calculated to 12 x 1.955 Cent = 23.46 Cent, which thus represents the size of the *Pythagorean comma*. Discussions in the Renaissance about different temperaments, practical experiments, and methods on how to divide the octave and its intervals aimed in a longer perspective for possibilities to play polyphon music modulating further and further away from a given tonal centre. This discussion was directly linked to the *Pythagorean comma* and how it should be balanced and divided within the octave and its intervals in more or less equal parts.

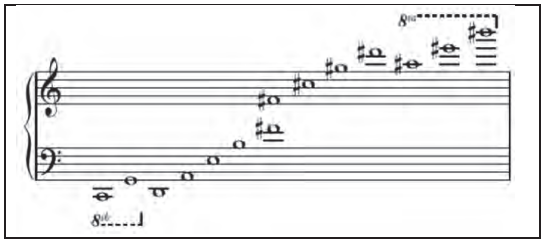


Figure 38 A progression of twelve just perfect fifths finaly ends on a B# (enharmonically C) which is 23.46 Cent sharper compared with the initial C if it would have been a succesion of perfect fifths within *Equal 12 division* (12-ET), creating the *Pythagorean comma.*

The *Syntonic comma* is the result of a progression of four just perfect fifths corresponding to 4 x 701.96 Cent = 2807.84 Cent. The top note of the final fifth—in this example F#3—creates an interval of two octaves plus a major third in relation to the initial note D1. A just major third corresponds to 386.31 Cent. When octaviating a just major third two times upwards this corresponds to 386.31 Cent +2 x 1200 Cent = 2786.31 Cent. The F#3 in the example—being the result of the progression of four just fifths—it has the total number of 2807.84 Cent.

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1. We can therefore deduce that, *since no precise rule governs the use of notes played Inégales in the interpretation of French music, no rules precisely define the size of the fifths in the manner of tuning.* (Asselin, *Musique et Temperament,* 1985/2000, 108)

The F#1 being a just major third in relation to D1 and being octaviated two times has the total number of 2786.31, and the difference is 21.53 Cent, thus representing the interval of a *Syntonic comma* (Fig. 39).



Figure 39 A progression of four just perfect fifths starting with D1 ending with F#3 has the number 4 x 701.96 Cent = 2807.84 Cent. When F#1 has the function of a pure major third to D1 and is octaviated two times this gives the number 386.31 Cent +2 x 1200 Cent = 2786.31 Cent. The difference between these two F#3 creates the *Syntonic comma* of 21.53 Cent (after Wolfs, 2017).

The *Enharmonic comma* is the result of a progression of three just major thirds as for example C2-E2 – E2-G#2 (A♭2) – A♭2 (G#2) – C3. When comparing C2 with its octave C3 is the latter as much as 41.05 Cent flatter compared with the octave of 1200 Cent within *Equal 12 division*. The calculation is based on that each just major third corresponds to 386.31 Cent, 3 x 386.31 = 1158. 93 Cent, which together covers the octave C2-C3. Considered that an octave corresponds to 1200 Cent the difference is calculated to 1200 Cent minus 1158.93 = 41.1 Cent (Fig. 40).



Figure 40 A progression of three just major thirds covers one octave. When the starting note is compared with its octave – in this example C2 and C3 – is C3 41.05 Cent flatter compared with the first note C2, thus creating the *Enharmonic comma* of 41.1 Cent (after Wolfs, 2017)

6.6.2 *Semitone majeur* and *Semitone mineur*

A further important aspect regarding intonation is the well-known concept of *Semitone majeur* and *Semitone mineur*. A French explanation of these two intervals is found in *Traité de la Viole* (1687) by Jean Rousseau (1644-*c.*1700):

> […] le Ton soit composé de neuf *Comma*; ainsi pour en faire deux Semitons, il y aura un qui sera composé de cinq *Comma*, & l'autre de Quatre; c'est à dire que le premier sera un Semiton Majeur, & le second un Semiton mineur. On connoist le Semiton Mineur, lors qu'on est obligé de faire un Semiton sans que la Note change de degré, comme lors qu'on procede de l'*Ut* de *C Sol Ut* à son Dieze; car ce sont deux Notes qui sont toûjours sur le mesme degré, & l'on connoist le Semiton majeur lors qu'on est obligé de faire un Semiton d'une Note à une autre sur differentes degrez, comme quand on procede du Dieze de *C Sol Ut*, au *Ré* de *D La Ré.* (Rousseau, 1687, 49-50)[1]

Another practical example is when Quantz (1752/1983/1985) explained that intervals such as D-D# should be considered being a *Semitone mineur*, and intervals such D-E♭ considered as a *Semitone majeur* (1752/1975/1983/1985, III, § 8, 46; Fig. 41).

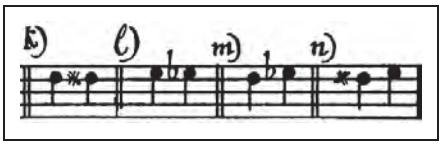


Figure 41 Quantz (1752/1985, III, § 8, 46, Fig 1) exemplifing *Semitone mineur* D–D# and E–E♭, and *Semitone majeur* D–E♭ and D#–E.

1. […] the Tone [whole tone step] is composed of nine *Comma*; thus, to make two Semitones, there will be one which will be composed of five *Comma*, & the other of four, the first will be a Major Semitone, & the second a Minor Semitone. We know the Minor Semitone, when we are obliged to make a Semitone without the Note changing degree, as when we proceed from C to C#; because these are two Notes which are always on the same degree, and we know the Major Semitone when we are obliged to make a Semitone from one Note to another on different degrees, as when we proceed from C# to D. (Jean Rousseau, *Traité de la Viole*, 1687, 49-50)

Rousseau (1687) and Quantz (1752) explains that the *Semitone mineur* corresponds to four *Pythagorean commas* (4 x 23.46 Cent = 93.84 Cent), and the *Semitone majeur* to five *Pythagorean commas* (5 x 23.46 Cent = 117.30 Cent). Examples of the relations regarding the *Semitone mineur* and *Semitone majeur* and their deviations calculated in Cent compared with the *Equal 12 division* (12-ET), can be seen below. Considered that the *Semitone mineur* corresponds to four times the *Pythagorean comma* (93.84 Cent) the upward interval D-D# could be rounded to 94 Cent representing, and the interval D-D♭ is then similarly 94 Cent (Fig. 42).

Notes	**D**	**D#**	**D**	**D♭**
Intervals	–	**Semitone mineur D-D#** 4 x 23.46 Cent = 93.84 Cent	–	**Semitone mineur D-D♭** 4 x 23.46 Cent = 93.84 Cent
Deviations in Cent rounded numbers	**±0**	**–6**	**±0**	**+6**

Figure 42 *Semitone mineur* upward and downward from D.

Regarding the *Semitone majeur* this interval corresponds to five times the *Pythagorean comma* (5 x 23.46 Cent = 117.30 Cent) and the upward interval D–E♭ could be rounded to 117 Cent, and the interval D-C# is then similarly 117 Cent (Fig. 43) representing a considerably wider interval when compared with *Equal 12 division* (12-ET),

Notes	**D**	**E♭**	**D**	**C#**
Intervals	–	**Semitone majeur D-D#** 5 x 23.46 Cent = 117.30 Cent	–	**Semitone majeur D-C#** 5 x 23.46 Cent = 117.30 Cent
Deviations in Cent rounded numbers	**±0**	**+17**	**±0**	**–17**

Figure 43 *Semitone majeur* upward and downward from D.

When comparing tuning systems of *Just intonation*, *1/4- Comma Meantone*, *1/5- Comma Meantone*, *Semitone majeur* and *Semitone mineur* this shows a rather interesting picture, and especially so when comparing with *Equal 12 division* (Fig. 44).

Tuning system	**D**	**D#**	**D♭**	**D**	**E♭**	**C#**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Semitone mineur	**±0**	**–6**	**+6**	**±0**	**–**	**–**
Semitone majeur	**±0**	**–**	**–**	**±0**	**+17**	**–17**
Just intonation **Chromatic semitone**	**±0**	**–8**	**+8**	**±0**	**–**	**–**
Just intonation **Minor second**	**±0**	**–**	**–**	**±0**	**+12**	**+12**
1/4-Comma Meantone **Chromatic semitone**	**±0**	**–24**	**+24**	**±0**	**–**	**–**
1/4-Comma Meantone **Minor second**	**±0**	**–**	**–**	**±0**	**+17**	**+17**
1/5-Comma Meantone **Chromatic semitone**	**±0**	**–16**	**+16**	**±0**	**–**	**–**
1/5-Comma Meantone **Minor second**	**±0**	**–**	**–**	**±0**	**+12**	**+12**

Figure 44 Comparison of *Semitone majeur* and *Semitone mineur* with the *Chromatic semitone* and *Minor second* within the tuning systems of *Equal 12 division* (12-ET), *Just intonation*, *1/4- Comma Meantone*, *1/5- Comma Meantone*, having D as its reference note and shown with rounded numbers.

It is well known that the above mentioned German Traverso virtuoso Johann Joachim Quantz (1697-1773) invented a foot-joint for the Traverso with two keys, one for D# and one for E♭, directly relating to the distinction drawn between the *Semitone mineur* and *Semitone majeur* explained above. However, this innovation never became popular, something that Quantz regretted (Quantz, 1752/1985, III, § 9, 47). A possible explanation why Quantz' innovation did not become standard can be found in *Méthode Raissonée pour apprendre aisément a jouer de la Flûte Traversiere* (1735)—the first method for the four-parted Traverso—by Michele Corrette (1707-1795). In the section *Observation sur les Diezes et Bémols* Corrette comments on differences between D# and E♭ saying that there is a small difference between these notes, but it makes no sense to amuse oneself while looking for this difference:

> […] il est vrai que le ré diéze et le mi B mol ont quelque petite difference; mais c'est si peu de chose, qu'il ne faut pas s'amuser a chercher cela sur la flute. (Corrette, 1735 & 1773, 16).[1]

Corrette later explains the difference between the *Minor* and *Major semitones* as described above, but that on the Traverso and other instruments the whole tone step is only split in two, without making the difference between the *Minor* and *Major semitone*:

> Le Ton est Composé de deux demi-tons, un Majeur et l'autre Mineur: Le Majeur est compose de 5 Comma: et le demi-ton Mineur de 4 Comma, ainsi il faut 9 Comma pour un ton; mais sur la Flute, et sur autres instrumens, le ton ne se partage qu'en demi-ton. (Corrette, 1735 & 1773, 17)[2]

A possible interpretation of the differences in opinion between Quantz and Corrette could be as simple as that Quantz was aiming for a high level of artistic professionalism in Traverso-playing, whereas Corrette writes for instructing the amateur player to play little tunes. In addition—as Quantz confirmed—it is possible for a skilful Traverso-player to adjust every note a quarter, half, or even a whole tone higher or lower with the help of the embouchure and airstream (1752/1985, IV, § 13, 34) which corresponds to the concept of *Champ de liberté* as formulated by Fleury (1925a), Castellengo (1978) and Leipp (1980). It should be noted that the fingering-charts in *Principes* and *Rudiments* describes the differences between enharmonic notes in a combination of fingerings, the amount of *Tonus* in the lips (embouchure), and the three head-joint positions *Outward–Normal–Inward*. An examination of Quantz' fingering-charts indicates a meantone temperament, which can be deduced by comparing the intonation of fingerings for enharmonic notes like for example for A# and B♭, whereby the A# is flat, and B♭ is sharp. The interval between the A# and the B♭ within a meantone temperament corresponds to a *Pythagorean comma*. The same relations can be studied when comparing all enharmonic notes in the fingering-charts as found in *Principes* and *Rudiments*, Quantz (1752), Mahaut (1759), and De Lusse (*c.*1761)[3]. Enharmonic differences between sharps and flats are less pronounced in flute methods from the very late 18th Century, early 19th Century and onwards.

6.6.3 *Meantone Temperaments*

Historically has the term meantone—*Mésotonique*—been used for describing a temperament with pure major thirds and narrowing fifths with a ¼ of the *Syntonic comma* (21.5 ÷ 4 = 5.375 Cent), generally referring to the major third and how it can be tempered. The term itself could be understood as the division of the major third in two equal parts "in the middle" (Asselin, 1985/2000, 75). The crucial intervals regarding versions of meantone temperaments is thus the major third and perfect fifths, and how they are tempered strongly influences the expressive character and sound colour of the temperament:

> La couleur d'un tempérament est donnée par la taille de ses tierces, pas par celle de ses quintes. (Wolfs, *Accords! pour comprendre les tempéraments et accorder son instrument,* 2017, 40)[4]

In a French context in the period of Hotteterre were two combinations of thirds and fifths regarding meantone temperaments in common use (Asselin, 1985/2000, 127):

> Quinte *tempérée* et tierce majeure *pure*—Tempered fifths and just major thirds
> Quinte *tempérée* et tierce majeure *tempérée*—Tempered fifths and tempered major thirds

This is of interest because both combinations are without any difficulty possible to realize on the Traverso and indicates that common temperaments in France were easy to realize for a Traverso-player. In the following are intervals within *Just intonation*, and the temperaments *1/4- Comma Meantone* and *1/5- Comma Meantone* discussed in relation to *Principes* and *Rudiments* because these were commonly used in France at the end of the 17th Century and the first decades of the 18th Century. Regarding different temperaments, Hotteterre should have been familiar with the above-mentioned tuning systems and as well *Temperament ordinaire*—Usual temperament—which was commonly used in the late 17th Century and the first decades of the 18th Century in France.

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1. […] it is true that when compared D# and E♭ have some slight difference; but it is so little that you should not amuse yourself looking for it on the flute. (Corrette, *Méthode pour apprendre aisément à jour de la Flûte Traversière*, 1735 & 1773, 16)
2. The Tone consists of two semitones, a *Major* and the other *Minor*: The *Major semitone* is composed of 5 Comma: and the *Minor semitone* of 4 Comma, so it takes 9 Comma for a tone; but on the Flute, and on other instruments, the tone is only divided into semitones. (Corrette, 1735 & 1773, 17)
3. Standard fingerings given by Hotteterre (1707), Corrette (1735 & 1773), Quantz (1752), Mahaut (1759), and De Lusse (*c.*1761) for A#2: 13/0 or 13/7, and for B♭2: 13/0, 13/7, and 12/4567. (Neuhaus, 1986, 64–65)
4. The colour of a temperament is given by the size of its thirds, not by that of its fifths. (Wolfs, *Accords! pour comprendre les tempéraments et accorder son instrument,* 2017, 40)

The *Temperament ordinaire* was discussed by Christiaan Huygens (1629-1695) in *Lettre touchant le Cycle Harmonique* (1691) and its calculations corresponds well to *1/4- Comma Meantone*. A comparison between the temperaments *Equal 12 division* (12-ET), *Just intonation*, *1/4- Comma Meantone* and *1/5-comma meantone* is helpful when it comes to examine intonation suggestions and possibilities of the Traverso as described in *Principes* and *Rudiments*. In the following is a chart showing above-mentioned tuning systems and intervals notated with deviations in Cent and compared with each other (Fig. 45).

Chromatic scale all intervals are given with G as the reference note	***Equal 12 division 12-ET***	***Just intonation* compared with *12-ET***	***1/4-Comma Meantone* compared with *12-ET***	***1/5-Comma Meantone* compared with *12-ET***	**Differences between *Just intonation* and *12-ET* rounded numbers**	**Differences between *1/4-Comma Meantone* and *12-ET* rounded numbers**	**Differences between *1/5-Comma Meantone* and *12-ET* rounded numbers**	**Maximum ranges of *Champ de liberté* comparing *12-ET*, *Just intonation* and *1/4-Comma* and *1/5-Comma Meantone* rounded numbers**
Unison G-G	**±0**	**0.00**	**0.000**	**0.000**	**±0**	**±0**	**±0**	**±0**
Chromatic semitone G-G#	**100**	**92.18**	**76.049**	**83.721**	**–8**	**–24**	**–16**	**–24**
Minor second G-A♭	**100**	**111.73**	**117.108**	**111.628**	**+12**	**+17**	**+12**	**+17**
Major second G-A	**200**	**203.91**	**193.157**	**195.349**	**+4**	**–7**	**–5**	**–7 to +4**
Minor third G-B♭	**300**	**315.64**	**310.265**	**306.977**	**+16**	**+10**	**+7**	**+16**
Major third G-B	**400**	**386.31**	**386.314**	**390.698**	**–14**	**–14**	**–9**	**–14**
Perfect fourth G-C	**500**	**498.04**	**503.422**	**502.326**	**–2**	**+3**	**+2**	**–2 to +3**
Augmented fourth G-C#	**600**	**590.22**	**579.471**	**586.047**	**–10**	**–21**	**–14**	**–21**
Diminished Fifth G-D♭	**600**	**609.78**	**620.529**	**613.953**	**+10**	**+21**	**+14**	**+21**
Perfect fifth G-D	**700**	**701.96**	**696.578**	**697.674**	**+2**	**–3**	**–2**	**–3 to +2**
Minor sixth G-E♭	**800**	**813.69**	**813.686**	**809.302**	**+14**	**+14**	**+9**	**+14**
Major sixth G-E	**900**	**884.36**	**889.735**	**893.023**	**–16**	**–10**	**–7**	**–16**
Minor seventh G-F	**1000**	**996.09**	**1006.84**	**1004.651**	**–4**	**+7**	**+5**	**–4 to + 7**
Major seventh G-F#	**1100**	**1088.27**	**1082.89**	**1088.372**	**–12**	**–17**	**–12**	**–17**
Octave G-G	**1200**	**1200.00**	**1200.00**	**1200.00**	**±0**	**±0**	**±0**	**±0**

Figure 45 This chart shows intervals and the temperaments of *Equal 12 division* (12-ET), *Just intonation, 1/4-Comma Meantone*, and *1/5-Comma Meantone* (after Asselin, 1985/2000). Differences are shown in Cent and indicates that all four temperaments are playable on a three-piece Traverso due to its *Champ de liberté* on all notes.

To show the effect of interval relations between *Equal 12 division* (12-ET), *Just intonation, 1/4-Comma Meantone*, and *1/5-Comma Meantone* in practice is to apply them to scales such as *Major*, *Natural minor*, *Harmonic minor*, and *Melodic minor* (Fig. 46, 47, 48, 49). These scales can easily be transposed when changing the main note, the relations are the same in all chosen keys.

Major scale	Main note	Major second	Major third	Perfect fourth	Perfect fifth	Major sixth	Major seventh	Octave of Main note
***Equal 12 division* (12-ET)**	±0	±0	±0	±0	±0	±0	±0	±0
Just intonation	±0	+4	–14	–2	+2	–16	–12	±0
1/4-*Comma Meantone*	±0	–7	–14	+3	–3	–10	–17	±0
1/5-*Comma Meantone*	±0	–5	–9	+2	–2	–7	–12	±0

Figure 46 Major scale

Natural minor scale	Main note	Major second	Minor third	Perfect fourth	Perfect fifth	Minor sixth	Minor seventh	Octave of Main note
***Equal 12 division* (12-ET)**	±0	±0	±0	±0	±0	±0	±0	±0
Just intonation	±0	+4	+16	–2	+2	+14	–4	±0
1/4-*Comma Meantone*	±0	–7	+10	+3	–3	+14	+7	±0
1/5-*Comma Meantone*	±0	–5	+7	+2	–2	+9	+5	±0

Figure 47 Natural minor scale

Harmonic minor scale	Main note	Major second	Minor third	Perfect fourth	Perfect fifth	Major sixth	Major seventh	Octave of Main note
***Equal 12 division* (12-ET)**	±0	±0	±0	±0	±0	±0	±0	±0
Just intonation	±0	+4	+16	–2	+2	–16	–12	±0
1/4-*Comma Meantone*	±0	–7	+10	+3	–3	–10	–17	±0
1/5-*Comma Meantone*	±0	–5	+7	+2	–2	–7	–12	±0

Figure 48 Harmonic minor scale

Melodic minor scale upwards	Main note	Major second	Minor third	Perfect fourth	Perfect fifth	Major sixth	Major seventh	Octave of Main note
***Equal 12 division* (12-ET)**	±0	±0	±0	±0	±0	±0	±0	±0
Just intonation	±0	+4	+16	–2	+2	–16	–12	±0
1/4-*Comma Meantone*	±0	–7	+10	+3	–3	–10	–17	±0
1/5-*Comma Meantone*	±0	–5	+7	+2	–2	–7	–12	±0

Melodic minor scale downwards	Octave of Main note	Minor seventh	Minor sixth	Perfect fifth	Perfect fourth	Minor third	Major second	Main note
***Equal 12 division* (12-ET)**	±0	±0	±0	±0	±0	±0	±0	±0
Just intonation	±0	–4	+14	+2	–2	+16	+4	±0
1/4-*Comma Meantone*	±0	+7	+14	–3	+3	+10	–7	±0
1/5-*Comma Meantone*	±0	+5	+9	–2	+2	+7	–5	±0

Figure 49 Melodic minor scale

6.6.4 *Champ de liberté*

Intervals within different temperaments as shown in Figure 45 needs a potential of modifications regarding intonation from –24 Cent to +20 Cent on all notes when played in all keys. Fortunately, due to the construction of a Traverso, Multi-keyed conical flute, *Ringklappenflöte*, as a Boehm-flute, such deviations are easily made with help of modifying the embouchure, airstream, and air-pressure (Fleury, 1925a; Castellengo et al., 1978; Leipp, 1980), which can be combined with head-joint positions and fingerings as described in *Principes* and *Rudiments*. Castellengo's finding's (1978) has been compared with that the author of the present study have examined the *Champ de liberté* on two top-quality copies of the three-piece *Model I* (A1=392 Hz, one made of Ivory, one made of Grenadilla) and three top-quality copies of the three-piece *Model II* (A1=400 Hz, one made of *Buis Ondé* (Boxwood), one of Cocos wood, and one of Ebony).

During the examination each Traverso has throughout being played with a resonant *Mezzo forte* nuance, striving for a natural, flexible, and warm sound-colour:

- Room temperature: ± 21°Celsius
- Room humidity: ± 50%
- For eliminating measurement errors has two different tuners been used:
  a) KORG Orchestral Tuner OT-120
  b) TLA Tuning-Set CTD-5-CA
- Every instrument was played on for ten (10) minutes before starting measurements.
- All notes were played in *Mezzo forte* striving for the sound colour as given by the instruments naturally and without force.
- The three head-joint position *Outward—Normal—Inward* were strictly followed when indicated in *Principes* and *Rudiments* in relation to *Just intonation* (–16 Cent to +16 Cent), *1/4 Comma Meantone* (–17 to + 14 Cent), and *1/5-Comma Meantone* (–12 Cent to +9 Cent).
- In addition, were the *Maximum Outward position* and *Maximum Inward position* with kept quality of sound investigated showing the entire *Champ de liberté* of each note.
- Suggestions regarding *Tonus* in the lips (*Embouchure*) and the airstream strictly followed indications in *Principes* and *Rudiments*.
- For examined instruments were fingerings for the chormatic scale analyzed as found in *Principes* and *Rudiments*, including all fingerings shown in Appendix XIII.
- The calibration of the positioning of the head-joint in relation to the middle-joint and the amount of coveridge of the blowing-hole was based on the discussion and suggestions as found in section *7.3.1 Positioning the blowing-hole in relation to the tone-holes*. Further has a combination with a technique using harmonics on the Boehm-flute for calibrating a functional and personalized amount of covering the blowing-hole been adapted to the Traverso with help of the fingering-chart for harmonics shown by Bordet (1755/2003)

Harmonics is an interesting object when discussing intonation and the calibration of the amount of coverage of the blowing-hole on transverse flutes because they can give indications of how to refine the amount of coverage of the blowing-hole. The simple and well-known principle sometimes used by Boehm-flute players is that when playing the same note—for example A2—with its original fingering strictly keep the same coverage of the blowing-hole, *Tonus* in the lips, speed, and direction of the airstream, and compare with its harmonic fingering the intonation should be very similar when not exactly the same. If this does not happen it's an indication that something has to be corrected regarding the coverage of the blowing-hole and direction of the airstream.

In the appendix to *Méthode Raisonnée Pour Apprendre la Musique d'une façon plus claire et plus précise* (1755) by Toussaint Bordet (*c.*1721-1799) is a duet for Traverso based on harmonics together with a fingering chart, and an explanation how harmonics are played:

> Pour éxécuter cette pièce en sons harmoniques, il faut proportionner le degré du vent dans l'embouchure de la Flute, au degré des guidons, et n'avoir égard aux petites nottes d'en bas que pour la position des doigts […] (Bordet, 1755, *Appendix*, 31)[1]

Regarding the fingering-chart for harmonics Bordet explained that notes marked with a line (–) indicate that the D#-key on the foot-joint should be opened (Ex. 7):



Example 7 Bordet's fingering chart for *Harmoniques*: *Il faut lever la clef pour les notes où cette petite barre* (–) *est posée.* (Bordet, 1755, *Appendix*, 31)

1. To perform this piece with harmonics [the duet for two Traversi], it is necessary to modify the airstream [speed and direction] blown in the blowing-hole in the head-joint, to the degree of the guidons, and only consider the small notes below for the fingerings. (1755, *Appendix* 31)

The result of the mentioned examination confirms that generally all notes have a *Champ de liberté* including kept quality of sound colour and timbre of at least –25 Cent to +25 Cent with the consequence that tuning systems such as *Equal 12 division* (12-ET), *Just intonation*, *1/4-Comma Meantone*, and *1/5-Comma Meantone* easily are realized on all examined instruments. For giving a shorter example of the examination on *Champ de liberté* has the three notes G2 (*Normal position*), F#2 (*Outward position*) and F2 (*Inward position*) been chosen (Fig. 50), whereby deviations are given in Cent with rounded numbers. Considered that the note G2 according to *Principes* and *Rudiments* should be played with the *Normal position* has this position been used as the reference when examining F#2 with the *Outward position*, and F2 with the *Inward position* according to *Principes* and *Rudiments*. For a complete documentation regarding the entire chromatic scale D1-G3 see Appendix XII. In the following are three examples shown regarding the *Champ de liberté* on the notes G2 (*Normal position*), F#2 (*Outward position*) and F2 (*Inward position*). All deviations are given in Cent with rounded numbers. Measurements of the *Champ de liberté* on F2 and F#2 are based on the relation to G2 played with *Normal* position as the reference (Fig. 50).

Instruments: **Traverso *Model I* A1=392 Hz** **Traverso Model *II* A1=400 Hz** • **±0** refers to the chromatic equal 12 division of the octave • All notes are played in *Mezzo forte* striving for a natural, flexible, and warm sound colour	**G2** **123/0**	**F#2** **123/47**	**F2** **123/46**
Suggested head-joint position in Principes* and *Rudiments	***Normal***	***Outward***	***Inward***
Outward maximum position with kept quality of sound	**+20**	**+15** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**	**+45** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**
Normal position with kept quality of sound	**±0**	**–15** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**	**+15** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**
Inward maximum position with kept quality of sound	**–20**	**–40** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**	**–30** With the same *Tonus*, in the lips, speed and direction of the airstream as for **G2**
Champ de liberté	**–20/+20** **↓↑ 40**	**–40/+15** **↓↑ 55**	**–30/+45** **↓↑ 75**

Figure 50 *Champ de liberté* on the notes G2, F#2 and F2.

Having Fleury, Castellengo and Leipp as references has the *Champ de liberté* further been explored on different transverse flutes and the Boehm-flute by the author of the present study having the above-described design of set conditions when examining.

The above shown data potentially indicates that the Traverso generally has a flexible intonation enabling the Traverso-player to use a variety of tuning systems, although some specific temperaments possibly work better than others. Considered that the three-piece Traverso (*Model I*, *Model II*) and its *Champ de liberté* gives a flexibility rate of intonation enabling playing within temperaments such as *Just intonation*, *1/4-Comma Meantone,* and *1/5-Comma Meantone* it can be concluded that without difficulties a Traverso-player—due to the *Champ de liberté*—like a singer can create a personal expressive and flexible intonation. The result of the examination confirms Fleury, (1925a), Castellengo et al. (1978), and Leipp, (1980) that generally all notes have a *Champ de liberté* with kept quality of sound colour and timbre of at least –25 Cent to +25 Cent.

*

To integrate harmonics when playing the Traverso is a technique well documented from the middle of the 18th Century in France and Bordet (1755) as discussed above is by far not the only example. An earlier example is *Six Sonates pour la Flûte traversière avec une Tablature des Sons Harmoniques Œuvre I* (1751) and its *Sonata Armonico* which includes harmonics as a basis throughout all its movements by Charles De Lusse (*c.*1720-*c.*1774). About ten years De Lusse published his *L'Art de la Flûte Traversiere* (*c.*1761) which has a section on *Harmoniques* and a fingering-chart for harmonics explaining how harmonics can be played on a Traverso by gradually modifying the airstream (*c.*1761). This is an explication similar for how harmonics are played on the Boehm-flute, although the cylindrical bore of the latter facilitates playing harmonics compared with the Traverso. In the article on the Traverso by De Lusse in *L'Encyclopédie Méthodique: Recueil de Planches* (1769, 11-12) by Diderot et d'Alembert. De Lusse added a more detailed fingering-chart for harmonics (*Planche XVI bis, Fig. 5,* Ex. 8) when compared with *Six Sonates pour la Flûte traversière Œuvre I* (1751). In the above-mentioned article is explained how an extra tone-hole on the foot-joint or playing without the foot-joint can facilitate harmonics, and that it is easier to play higher harmonics on a *Basse de flûte*:

> Nous ferons remarquer ici, que tous les sons harmoniques désignés par un guidon, ne peuvent être exprimés bien sensiblement que sur une *basse de flûte*; sur une *flûte traversiere* ordinaire, ils sont pour la plupart inappréciables […] il faudroit supprimer la patte de la flûte ou faire percer un trou sur la noix, vis-à-vis la goupille, qui se boucherait au moyen d'une clé, & le déboucher quand ces succesions auroient lieu […] (De Lusse in *L'Encyclopédie Méthodique: Recueil de Planches* by Diderot et d'Alembert, 1769/1994, 11)[1]

That harmonics high up in the over-tone sequence are easier to play on a *Basse de flûte* was confirmed by Ljungar-Chapelon (1995; 2002), through the reconstruction of a *Basse de Traversière* as shown in Diderot's *Encyclopédie Méthodique: Art du Faiseur d'Instrument de Musique et Lutherie* (1785/1984) realised by the master flute maker Alain Weemaels in Brussels (see Appendix XXXII).



Example 8 *Planche XVI bis Fig. 5* showing harmonics in the article on the Traverso by De Lusse, in *L'Encyclopédie Méthodique: Recueil de Planches* by Diderot et d'Alembert (1769/1994, 11-12).

*

De Lusse was the first to publish a flute method including harmonics, which leads to questions about what might have inspired him to do so. Firstly, the construction of any kind of transverse flute is based on the sequence of overblowing notes from the low octave reaching overtones in the natural sequence of harmonics present on any given pitch. For example, the D-major scale (D1-D3) on generally any Traverso including the three-piece Traverso of *Model I* and *Model II* and the main focus for the present study, is based on overblowing the first octave to the first over-tone its octave, the first harmonic. Further does the fingering-charts for trills in *Principes* and *Rudiments* exemplify how harmonics are used but without using the specific term harmonics. Sooner or later this basic technique would steer towards experimentation with fingerings in relation to tonal variations and improved intonation in relation to different temperaments.

A potential source of inspiration regarding De Lusse and his publications on harmonics (1751, *c.*1761, 1769)—discussed by Jane Bowers (1977)—is *Les Sons Harmoniques Sonatas à Violon Seul avec La Basse Continue. Œuvre IV* (*c.*1738) by French violinist Jean-Joseph Cassanéa de Mondonville (1711-1772). This collection of violin sonatas explores how harmonics can be used as a tool for musical expression and is possibly one of the first of its kind. In the *Avertissement* Mondonville writes that his use of harmonics is a new way of playing. When explaining ideas on harmonics Mondonville refers to the natural over-tone sequence and its use on brass instruments such as the trumpet, and rhetorically asks why harmonics are not explored on the violin, the instrument judged by the public as being the most perfect of all. Mondonville gives a longer explanation on how to play harmonics on the violin, together with a musical realisation in mentioned six violin sonatas.

1. It should be noted that all notes marked with a guidon [indication of the sounding note] is easier to play on a Bass Traverso than on the ordinary Traverso on which many of the harmonies can't be played […] one could take away the foot-joint or make an extra tone-hole on the foot-joint and an extra key for the right little-finger […] (De Lusse in *L'Encyclopédie Méthodique: Recueil de Planches* by Diderot et d'Alembert, 1769/1994, 11)

Possibly De Lusse found inspiration in Mondonville's work (*c.*1738) as Bowers (1977) suggests, and it is documented that De Lusse was inspired by violin-playing and an example is how Geminiani explained his use of vibrato on the violin in around 1750, and how De Lusse (*c.*1761) explained *Tremblement flexible* on the Traverso (see section *7.3.7*).

To conclude, it seems that playing harmonics on a Traverso during the 18th Century probably have been a technique used by professional Traverso-players, and that De Lusse (1751, *c.*1761, 1769) and Bordet (1755) are examples on how this practice was explained for a bigger public. In the 19th Century harmonics became a common practice in the 19th Century for leading notes—*Notes sensibles*—(Brown, 2002). A late 19th Century example is found in *L'Art de la Nouvelle Edition. Revue, mise au point de l'Art modern et augmentée de 6 Etudes inédites par Raoul Gally* (1818/1897), a revised edition of Berbiguier's flute method (1818). In addition, there are numerous examples of fingering-charts for leading notes, including patterns where harmonics are used for sound colour in flute methods such as Fürstenau (1844), Dorus (1845), Altès (1880), and Schwedler (1897).

6.6.5 Intonation and placement of tone-holes

Considered that the Traverso have seven tone-holes which are placed in a manner naturally giving the diatonic scale of D-major when opening the tone-holes after each other starting with the fingering for D1 (123/456) having all seven tone-holes closed. Thus, it could be said that the Traverso is an instrument having D-major as its foundation when it comes to the placements of tone-holes. When comparing the Traverso with the Boehm-flute which has sixteen tone-holes with a C-foot (seventeen tone-holes with a B-foot), starting on the lowest note with all tone-holes closed this gives a chromatic scale when successively opening the tone-holes one after each other. From this we can deduce that the Traverso is a diatonic instrument, and the Boehm-flute a chromatic instrument because its nine or ten extra tone-holes makes each chromatic note having its own tone-hole in the first two octaves.

An important observation regarding the tone-holes on the Traverso is that the placement of the first tone-hole (left fore-finger) and fifth tone-hole (right hand middle-finger) has a direct impact on the tuning of the Traverso with far reaching effects according to a discussion about the Traverso by the French Traverso virtuoso and teacher at the *Conservatoire* Pierre Sechet (Devie, 1990/2018, 360). The fifth tone-hole determine mainly the intonation of the notes F1, F2, F#1, F#2, and the first tone-hole determine especially the intonation of C2 and C#2. Because that the D-major scale is the base for placements of the seven tone-holes of the Traverso does the placement of the fifth tone-hole directedly influence the major third D-F# and the minor third D-F. Traverso-player knows that F#1 and F#2 has a tendency of being slightly flat and therefore it is suggested in *Principes* and *Rudiments* to turn the head-joint in the *Outward position*, and that F1 and F2 has a tendency of being fairly sharp and therefore suggested to turn the head-joint in the *Inward position* (Fig. 51). Because both notes (F and F#) are directedly influenced by the opened fifth tone-hole it could be said that both F# and F are played on the same tone-hole. F# is the starting point as being the major third in D-major, and F is based on the fingering for F# being lowered when closing the sixth tone-hole (the seventh tone-hole is closed because its key is not used for F). When examining the just major third in the temperaments of *Just intonation*, *1/4-Comma Meantone,* and *1/5-Comma Meantone* this interval should be narrower than sometimes thought of, and the just minor third should in the same temperaments be somewhat larger.

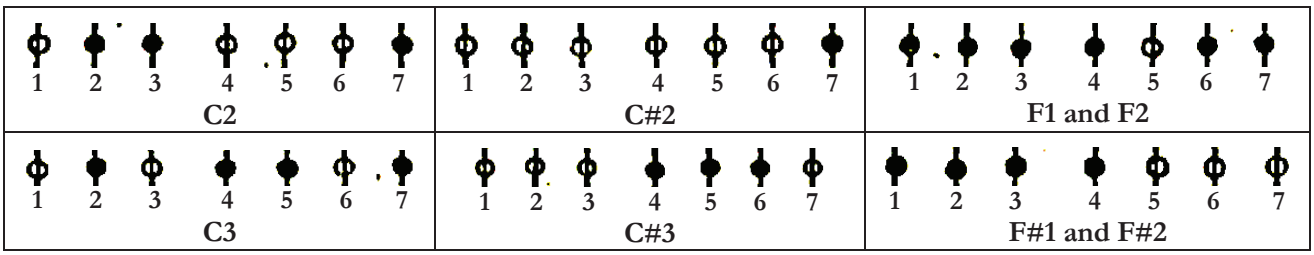


Figure 51 Fingerings for C2, C3, C#2, C#3, F1, F2, F#1 and F#2 taken from *Principes* as shown in *Planche 1ere* the placements of tone-hole 1 (left hand fore-finger) determines the foundations of intonation of C2, C3, C#2 and C#3 being major and minor thirds in relation to the fifth A in D-major and d-minor. Tone-hole 5 determines the foundation for intonation of the major third F#, and minor third F in D-major and d-minor.

When playing the notes F#1, F#2, F1, F2 in major keys such as C, G, D, A, E, F and B♭, and in Minor keys such as a, d, g, e, b the F# and F does not need so much adjustment due to the compromise of how the fifth tone-hole is placed. It should be noted that the just major third D-F# is easy to play with *Just intonation* (F# –14 Cent) on the three-piece Traverso of *Model I* and *Model II* due to the placements of the seven tone-holes, because F#1 and F#2 already have a tendency being somewhat flat due to the construction of the Traverso. Regarding the just minor third D-F played with *Just intonation* (F +16 Cent) is similarly easy because F1 and F2 has a tendency of being slightly sharp due to mentioned placements of the tone-holes. Other examples are when F# has the function of being a major seventh (–12 Cent) in G-major and g-minor which is easily played with *Just intonation* by the same reasons as when playing F# as a just major third. The same counts for that the first tone-hole determine the note C2 and C#2, and that the Traverso by the placement of this tone-hole naturally generate a C# being somewhat flat which is beneficial when playing the just major third A1-C#2, and that C2 is somewhat sharp when playing the just minor third A1-C2.

A key for understanding the placements of tone-holes is that due to the *Champ de liberté* of mentioned notes—which for sure has influenced how they are placed—and that temperaments such as *Just intonation*, *1/4-Comma meantone,* and *1/5-Comma meantone* have above-mentioned deviations from the *Equal 12 division* (12-ET) in the important intervals of major and minor thirds. In *Principes* and *Rudiments* are several examples commenting on enharmonic differences such as A♭ compared with G#, and G♭ compared with F#, whereby the A♭ and G♭ should be played slightly sharper than G# and F#. The same relations between sharps and flats count for all enharmonic notes on the chromatic scale and connects to concepts regarding the *Semitone mineur* and *Semitone majeur* as mentioned above. Making a close reading of the fingering-charts in *Principes* and *Rudiments* sheds light on ideals regarding temperaments and intonation, the importance of differences between enharmonic notes, which on several notes have precise suggestions regarding how much the Traverso should be turned inward or outward, together with suggestions regarding the embouchure and air-pressure.

Generally, but not always, are fingerings in *Principes* and *Rudiments* often somewhat flat for sharps, and slightly sharper for flats. An example are the differences between A#2 and B♭2. In this example it is explained that A#2 should be intonated flatter, and B♭2 sharper which is consistent with an intonation system having relations to *Just intonation*, and temperaments such as *1/4-Comma meantone* and *1/5-Comma meantone,* and the *Semitone mineur* and *Semitone majeur*. An example is if B♭2 is played as a just minor third to G2, then the Traverso needs to be turned outwards, but when B♭2 is enharmonically replaced with an A#2 (the same fingering) as the just major third to F#2 then the Traverso must be turned inwards. To be consistent, all enharmonic notes should be handled in the same manner, and there are similar comments in *Principes* and *Rudiments* regarding the relations between D#–E♭, F#–G♭, and G#–A♭. What makes the examples above enlightening is that the same fingering should be used for B♭1 and A#1 and that the adjustments are made while turning the Traverso (Fig. 52).

It is of further interest that Hotteterre suggested different amounts on *how much* the Traverso should be turned in or out on several pitches, and how these techniques stand in relation to the reference head-joint position *Normal position* combined with fingerings. Further examples of explanations regarding enharmonic differences are shown in Figure 52.

As mentioned in section *5.2* and the subsection *Trills and concepts regarding semi-tone and whole-tone intervals*, regarding possibilities to adjust the intonation of trills with the help of taking care of the distance between the fingers and their respective tone-holes (Kaiser, 2014) the same technique can be used when refining tuning of intervals. One example is when playing the minor third A1-C2 with just intonation the C2 should be +16 Cent sharper when compared with *Equal 12 division* (12-ET). If the C2 is played with its standard fingering as shown in *Principes* and *Rudiments* (23/0) it is beneficial to raise the left fore-finger somewhat more than normally because this sharpens the C2 and makes it easy the play this note +16 Cent sharper. If the same C2 is played as the perfect forth G1-C2 having the same position of the left-hand fore-finger as when playing C2 as the just minor third to A1-C2 then C2 will have a tendency being too sharp. When playing the just perfect forth G1-C2 the C2 should be –2 Cent flatter compared with *Equal 12 division* (12-ET) which is easily achieved when letting the left-hand fore-finger be somewhat closer to its tone-hole.

These are just two examples and there are many more which could be summarized as that a note being sharp due to the construction the Traverso like for example the notes F1 and F2 (123/46 in both octaves) it could be beneficial that the middle-finger of the right hand (/5) follows suggestions given in *Principes* and *Rudiments*:

[…] de ne pas beaucoup lever les Doigts (III: 7)	[…] you must not raise the fingers high (III: 5)

When playing the notes F#1 and F#2 (123/47 in both octaves) it could be an idea to take care of that the right-hand middle-finger is not too close to its tone-hole because this would have a flattening effect on notes already and due to the construction of the Traverso having a tendency of being somewhat flat. To conclude, it is striking when examining the possibilities how relatively easy it is to play just thirds and sixths in minor-keys such as a, d, g, c, e, b, and major keys such as C, G, D, A, E, F, B♭ often used in the repertoire for Traverso around 1700 and onwards for decades in France. Considered that all models of a Traverso is a diatonic instrument this could be taken as an indication for those compromises when choosing placements of the tone-holes possibly aimed for enabling just thirds and sixths in certain keys. When combining the above discussed *Champ de liberté*, the placements of the tone-holes making it relatively easy to play just thirds and sixths, it could be deduced that the *Model I* and *Model II* possibly were designed for playing in temperaments relating to *1/4-Comma Meantone* and *1/5-Comma Meantone* as used in France at the end of the XVII Century and the beginning of the XVIII Century.

G♭1 **123/56** [/7]	Le *Sol Bemol*, est different du *Fa Diéziz* aussi bien que son Octave. On doit l'ajuster de même en tournant la Flute en dedans. Plusieurs personnes ne font point cette difference. (V: 16) **Tourne la Flute en dedans**	**G Flat** is different from **F Sharp**, as well as its octave; you ought to adjust it the same way by turning the Flute inwards: A great many don't make this difference. (V: 11) **Inward position** *Rudiments* follows the explanation in *Principes* regarding **G♭1**, but the fingering-chart show the standard fingering for **F#1** (123/47).
A♭1 **12/456** [/7]	Le *La Bemol*, comme le *Sol Diézis*. Il ne faut pas tant tourner la Flute en dedans [for **A♭1** in relation to **G1**]. (V: 16)	**A Flat** as **G Sharp**, but you must not turn the Flute so much inwards. (V: 11) **Inward position**
A#1 **13/45** [/6 +/7]	[…] on la tournera en dedans pour le *La Diézis*: On peut encore baisser ce demi-Ton, en ajoûtent quelques Doigts, ce que j'ay démontré dans la Planche des Cadences. (V: 14) **Tourne la Flute en dedans**	[…] turn it inward for **A Sharp**, you may also make this Semitone somewhat lower, by adding some fingers as I have shew'd in the Scale of Shakes (V: 10) **Inward position**
D#2 **123/4567**	On la remettra pour le *Ré naturel* & *Diézis*. (V: 14) **Situation ordinaire**	[...] you must return it for **D Natural**, and **Sharp** (V: 10) **Normal position**
E♭2 **123/4567**	Le *Mi Bemol*, se fait comme le *Ré Diézis*. Il faut tourner la Flute en dehors. (V: 16) **Tourne la Flute en dehors**	**E Flat** is play'd as **D Sharp**, you must turn the Flute Outwards. (V: 11) **Outward position**
G♭2 **123/567**	Le *Sol Bemol*, pourroit aussi se faire comme le *Fa Diézis* [123/47], mais il est plus parfaite comme je le démontre dans la Tablature : Pour ajuster, il faut tourner la Flute beaucoup en dedans. Ce demi-Ton est fort peu usité, & ne se rencontre que dans des Tons fort chromatiques, sur lesquels on ne compose guere pour cet Instrument. (V: 16) **Tourne la Flute en dedans**	**G Flat** may also be play'd as **F Sharp**, but' tis more perfect to play it as I shew in the Scale, to adjust it you must turn the Flute very much inwards; this Semitone is seldom used, 'tis never found but in Notes very Chromatick, on which they never Compose Musick for this Instrument. (V: 11) **Inward position** The standard fingering for **G♭2** in *Rudiments* (123/47) is different when compared with the fingering given in *Principes* (123/567).
A♭2 **12/4**	Le *La Bemol*, se forme comme le *Sol Diézis*. (V: 15) **Tourne la Flute en dedans**	**A Flat** as **G Sharp**, but you must not turn the Flute so much inwards [for **A♭2**]. (V: 11) **Inward position**
A#2 **13/0** [/6 +/7]	[…] on la tournera en dedans pour le *La Diéziz*. (V: 14) **Tourne la Flute en dedans**	[…] and turn it inward for **A Sharp**. (V: 10) **Inward position**
B♭2 **13/0** [/6 +/7] 13/7	Le *Si Bemol*, se fait comme le *La Diézis*. Il faut tourner la Flute en dehors, ce qui fait quelque difference du *Si Bemol* au *La Diézis,* & il faut à quelques Flutes déboucher le septiéme trou pour faciliter ce Ton. (V: 15) **Tourne la Flute en dehors**	**B Flat** is played as **A Sharp**, you must turn the Flute outwards, which makes some difference between **B Flat** and **A Sharp** you must on some Flutes open the 7th. hole to facilitate this Note. (V: 11) **Outward position**
D♭3 **23/467**	Le *Ré Bemol* se pourroit faire aussi comme l'*Ut Diézis* [0/4567]: mais il est plus parfait de la manière que je le démontre dans la Tablature. (V: 15) **Tourne la Flute en dehors**	**D Flat** may be made as **C Sharp** [0/4567], but 'tis more perfect to play it as I shew in the Scale. (V: 11) **Outward position**

Figure 52 Examples from the fingering-charts as found in *Principes* and *Rudiments* regarding adjustments of intonation when playing enharmonic notes.

Considered that Hotteterre lived and worked in Rome in the years 1698-1700 (Hilsheimer, 2008b), and that temperaments relating to meantone systems were commonly used in Italy in this period (Asselin, 1985/2000), could be added as a further indication when discussing fingerings, embouchure and the control of the airstream which altogether are directly linked to aspects of temperaments and intonation as described in *Principes* and *Rudiments*. A final comment about intonation and temperaments is that the inherent flexibility of the three-piece Traverso of *Model I* and *Model II*—as on most high quality Traversi—makes it practically possible to play in above discussed temperaments including the *Semitone majeure* and *Semitone mineur* which opens for that the skilful Traverso-player can create a personal temperament in relation to different keys and expressions. Further a platform of potential flexibility regarding a linear intonation, as well as a vertical intonation when playing in ensemble with fixed pitch instruments as for example the harpsichord. Altogether the flexibility of the *Model I* and *Model II* shapes a refined potential for a personally shaped mood of *Expressive intonation*. To close the circle with earlier quoted statements by Fleury (1925a) and Leipp (1980) in the beginning of this chapter: an examination of temperaments combined with *Principes* and *Rudiments* together with experiments with *Model I* and *Model II* confirm each other. The intonation and temperament are to be found in the ear of the player, and the placement of the tone-holes on the Traverso—even though not perfect—is a benefit for the advanced Traverso-player enabling the creation of an *Expressive intonation*.

6.6.6 The three head-joint positions

In the following are three examples shown on how the notes G2 (*Normal position*), F#2 (*Outward position*) and F2 (*Inward position*) and their different functions in all major and minor scales in relation to the intervals major second, major and minor thirds, perfect fourths and fifths, major and minor sixths and sevenths effects the intonation in relation to *Equal 12 division* (12-ET), *Just intonation, 1/4-Comma meantone*, and *1/5-Comma meantone*. All deviations are given in Cent and with rounded numbers. Measurements of the *Champ de liberté* are based on the relations to notes marked *Normal position* being the reference, the complete documentation of the chromatic scale covering D1-G3 regarding *Champ de liberté* is shown in Appendix XII. The three-piece Traversi examined and used for this exploration was two high-quality copies of *Model I* (Grenadilla, Ivory) tuned to the pitch of A1=392 Hz, and three of *Model II* (*Buis Ondé*/Boxwood, Cocos wood, Ebony) with the pitch of A1=400 Hz, throughout being played with a resonant *Mezzo forte* nuance striving for a natural, flexible, and warm sound colour. Regarding minor scales have both the major and minor *sixths* and *sevenths* been added because of how these intervals appears in Melodic minor scales. The technique using the three head-joint positions *Outward—Normal—Inward* as explained in *Principes* and *Rudiments* has its origin in that the Traverso have seven tone-holes which are placed in the diatonic scale of D-major when opening the tone-holes after each other starting with the fingering for D1 (123/456) closing all seven tone-holes.

Notes having the indication *Normal* should thus be considered as notes having acoustically good positions in relation to diatonic keys not too far away from D-major. Notes being indicated *Inward* (for with a sharp tendency) or *Outward* (for notes with a flat tendency) needs more adjustments regarding intonation because of the placements of the tone-holes on the Traverso as described above. Consequently, the notes marked *Outward* or *Inward* and the placements of their respective tone-holes are to be considered as compromises compared with the placement of the tone-holes for notes marked *Normal*. This is the reason for using the techniques of turning the head-joint positions *Inward* or *Outward* as described in detail in *Principes* and *Rudiments* because these notes generally need more adjustments as being comfortable simply by using the lips and embouchure. Final adjustment of intonation regarding notes marked *Normal* are made with the embouchure (*Tonus* in the lips) in combination with air-pressure and airspeed of the airstream according to explanations in *Principes* and *Rudiments*. It is well-known that the technique of turning the head-joint as described in *Principes* and *Rudiments* functions well on the Boehm-flute but are rarely needed because of the far higher number of tone-holes.

Instruments: **Traverso *Model I* A1=392 Hz** **Traverso Model *II* A1=400 Hz** **±0** refers to *Equal 12 division* (12-ET) All notes are played in *Mezzo forte*	**G2** **Fingering: 123/0**
Suggested head-joint position in *Principes* and *Rudiments*	**Normal position**
Suggestions regarding the airstream and embouchure in *Principes* and *Rudiments*	[…] *ils auront soins de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent* […] (III: 8) […] *you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing* […] (III: 6)
Outward maximum position With kept quality of sound	**+20-25**
Normal position With kept quality of sound	**±0**
Inward maximum position With kept quality of sound	**–20-25**
Champ de liberté	**–20-25/+20-25** **↓↑ 40-50**

Major keys	**C**	**G**	**D**	**A**	**E**	**B**	**F#**
Functions of G2	**Perfect fifth**	**Main note**	**Perfect fourth**	**–**	**–**	**–**	**–**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**–**	**–**	**–**	**–**
Just intonation	**+2**	**±0**	**–2**	**–**	**–**	**–**	**–**
1/4-Comma Meantone	**–3**	**±0**	**+3**	**–**	**–**	**–**	**–**
1/5-Comma Meantone	**–2**	**±0**	**+2**	**–**	**–**	**–**	**–**
Major keys	**G♭**	**D♭**	**A♭**	**E♭**	**B♭**	**F**	**–**
Functions of G2	**–**	**–**	**Major seventh**	**Major third**	**Major sixth**	**Major second**	**–**
***Equal 12 division* (12-ET)**	**–**	**–**	**±0**	**±0**	**±0**	**±0**	**–**
Just intonation	**–**	**–**	**–12**	**–14**	**–16**	**+4**	**–**
1/4-Comma Meantone	**–**	**–**	**–17**	**–14**	**–10**	**–7**	**–**
1/5-Comma Meantone	**–**	**–**	**–12**	**–9**	**–7**	**–5**	**–**
Minor keys	**a**	**e**	**b**	**f#**	**c#**	**g#**	**d#**
Functions of G2	**Minor seventh**	**Minor third**	**Minor sixth**	**–**	**–**	**–**	**–**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**–**	**–**	**–**	**–**
Just intonation	**–4**	**+16**	**+14**	**–**	**–**	**–**	**–**
1/4-Comma Meantone	**+7**	**+10**	**+14**	**–**	**–**	**–**	**–**
1/5-Comma Meantone	**+5**	**+7**	**+9**	**–**	**–**	**–**	
Minor keys	**e♭**	**b♭**	**f**	**c**	**g**	**d**	**–**
Functions of G2	**–**	**–**	**Major second**	**Perfect fifth**	**Main note**	**Perfect fourth**	**–**
***Equal 12 division* (12-ET)**	**–**	**–**	**±0**	**±0**	**±0**	**±0**	**–**
Just intonation	**–**	**–**	**+4**	**+2**	**±0**	**–2**	**–**
1/4-Comma Meantone	**–**	**–**	**–7**	**–3**	**±0**	**+3**	**–**
1/5-Comma Meantone	**–**	**–**	**–5**	**–2**	**±0**	**+2**	**–**

Champ de liberté	***Equal 12 division* (12-ET)**	***Just intonation***	***1/4-Comma Meantone***	***1/5-Comma Meantone***
–17/+16 **↓↑33**	**Major keys** **±0** **Minor keys** **±0**	**Major keys** **–16/+4 = 20** **Minor keys** **–4/+16 = 20**	**Major keys** **–17/+3 = 20** **Minor keys** **–7/+14 = 21**	**Major keys** **–12/+2 = 14** **Minor keys** **–7/+7 = 14**

Instruments: **Traverso *Model I* A1=392 Hz** **Traverso Model *II* A1=400 Hz** **±0** refers to *Equal 12 division* (12-ET) All notes are played in *Mezzo forte* **±0** refers to *Equal 12 division* (12-ET) All notes are played in *Mezzo forte*	**F#2** **Fingering: 123/47**
Suggested head joint position in *Principes* and *Rudiments*	**Outward position**
Suggestions regarding the airstream and embouchure in *Principes* and *Rudiments*	*Pour ajuster ce Ton, on doit tourner la Flûte en dehors, & lever un peu la tête. Par ces termes, tourner la Flute, ou tourner l'embouchure, on doit entendre la même chose.* (V: 13-14) […] *you must turn the Flute outwards & raise the head a little.* (V: 9)
Outward maximum position With kept quality of sound	**+15** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Normal position With kept quality of sound	**–15** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Inward maximum position With kept quality of sound	**–40** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Champ de liberté	**–40/+15** **↓↑ 55**

Major keys	**C**	**G**	**D**	**A**	**E**	**B**	**F#**
Functions of F#2	**Perfect fifth**	**Major seventh**	**Major third**	**Major sixth**	**Major second**	**Perfect fifth**	**Main note**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Just intonation	**–**	**–12**	**–14**	**–16**	**+4**	**+2**	**±0**
1/4-Comma Meantone	**–**	**–17**	**–14**	**–10**	**–7**	**–3**	**±0**
1/5-Comma Meantone	**–**	**–12**	**–9**	**–7**	**–5**	**–2**	**±0**
Major keys	**–**	**D♭**	**A♭**	**E♭**	**B♭**	**F**	**–**
Functions of F#2	**–**	**–**	**–**	**–**	**–**	**–**	**–**
***Equal 12 division* (12-ET)**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Just intonation	**–**	**–**	**–**	**–**	**–**	**–**	**–**
1/4-Comma Meantone	**–**	**–**	**–**	**–**	**–**	**–**	**–**
1/5-Comma Meantone	**–**	**–**	**–**	**–**	**–**	**–**	**–**
Minor keys	**a**	**e**	**b**	**f#**	**c#**	**g#**	**d#**
Functions of F#2	**Major sixth**	**Major second**	**Perfect fifth**	**Main note**	**Perfect fourth**	**Minor seventh**	**Minor third**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Just intonation	**–16**	**+4**	**+2**	**±0**	**–2**	**–4**	**+16**
1/4-Comma Meantone	**–10**	**–7**	**–3**	**±0**	**+3**	**+7**	**+10**
1/5-Comma Meantone	**–7**	**–5**	**–2**	**±0**	**+2**	**+5**	**+7**
Minor keys	**e♭**	**b♭**	**f**	**c**	**g**	**d**	**–**
Functions of F#2	**–**	**–**	**–**	**–**	**Major seventh**	**–**	**–**
***Equal 12 division* (12-ET)**	**–**	**–**	**–**	**–**	**±0**	**–**	**–**
Just intonation	**–**	**–**	**–**	**–**	**–12**	**–**	**–**
1/4-Comma Meantone	**–**	**–**	**–**	**–**	**–17**	**–**	**–**
1/5-Comma Meantone	**–**	**–**	**–**	**–**	**–12**	**–**	**–**

Champ de liberté	***Equal 12 division* (12-ET)**	***Just intonation***	***1/4-Comma Meantone***	***1/5-Comma Meantone***
–17/+16 **↓↑33**	**Major keys** **±0** **Minor keys** **±0**	**Major keys** **–16/+4 = 20** **Minor keys** **–4/+16 = 20**	**Major keys** **–17/±0 = 17** **Minor keys** **–7/+10 = 17**	**Major keys** **–12/±0 = 12** **Minor keys** **–5/+7 = 12**

Instruments: **Traverso *Model I* A1=392 Hz** **Traverso Model *II* A1=400 Hz** **±0** refers to *Equal 12 division* (12-ET) All notes are played in *Mezzo forte*	**F2** **Fingering: 123/46**
Suggested head joint position in *Principes* and *Rudiments*	**Inward position**
Suggestions regarding the airstream and embouchure in *Principes* and *Rudiments*	*Il faudra tourner encore sur ce Ton, l'embouchure de la Flute en dedans.* (III: 8) […] *yu must also here turn the Flute a little inward, as I told you before on* ***F*** *below.* (III: 6)
Outward maximum position With kept quality of sound	**+45** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Normal position With kept quality of sound	**+15** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Inward maximum position With kept quality of sound	**–30** With the same *Tonus*, speed, and direction of the airstream as for **G2**
Champ de liberté	**–30/+45** **↓↑ 75**

Major keys	**C**	**G**	**D**	**A**	**E**	**B**	**F#**
Functions of F2	**Perfect fourth**	**–**	**–**	**–**	**–**	**–**	**–**
***Equal 12 division* (12-ET)**	**±0**	**–**	**–**	**–**	**–**	**–**	**–**
Just intonation	**–2**	**–**	**–**	**–**	**–**	**–**	**–**
1/4-Comma Meantone	**+3**	**–**	**–**	**–**	**–**	**–**	**–**
1/5-Comma Meantone	**+2**	**–**	**–**	**–**	**–**	**–**	**–**
Major keys	**G♭**	**D♭**	**A♭**	**E♭**	**B♭**	**F**	**–**
Functions of F2	**Major seventh**	**Major third**	**Major sixth**	**Major second**	**Perfect fifth**	**Main note**	**–**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**–**
Just intonation	**–12**	**–14**	**–16**	**+4**	**+2**	**±0**	**–**
1/4-Comma Meantone	**–17**	**–14**	**–10**	**–7**	**–3**	**±0**	**–**
1/5-Comma Meantone	**–12**	**–9**	**–7**	**–5**	**–2**	**±0**	
Minor keys	**a**	**e**	**b**	**f#**	**c#**	**g#**	**d#**
Functions of F2	**Minor sixth**	**–**	**–**	**–**	**–**	**–**	**–**
***Equal 12 division* (12-ET)**	**±0**	**–**	**–**	**–**	**–**	**–**	**–**
Just intonation	**–4**	**–**	**–**	**–**	**–**	**–**	**–**
1/4-Comma Meantone	**+7**	**–**	**–**	**–**	**–**	**–**	**–**
1/5-Comma Meantone	**+9**	**–**	**–**	**–**	**–**	**–**	**–**
Minor keys	**e♭**	**b♭**	**f**	**c**	**g**	**d**	**–**
Functions of F2	**Major second**	**Perfect fifth**	**Main note**	**Perfect fourth**	**Minor seventh**	**Minor third**	**–**
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**–**
Just intonation	**+4**	**+2**	**±0**	**–2**	**–4**	**+16**	**–**
1/4-comma meantone	**–7**	**–3**	**±0**	**+3**	**+7**	**+10**	**–**
1/5-comma meantone	**–5**	**–2**	**±0**	**+2**	**+5**	**+7**	**–**

Champ de liberté	***Equal 12 division* (12-ET)**	***Just intonation***	***1/4-Comma Meantone***	***1/5-Comma Meantone***
–17/+16 **↓↑33**	**Major keys** **±0** **Minor keys** **±0**	**Major keys** **–16/+4 = 20** **Minor keys** **–4/+16 = 20**	**Major keys** **–17/+3 = 20** **Minor keys** **–7/+10 = 17**	**Major keys** **–12/+2 = 14** **Minor keys** **–5/+9 = 14**

6.6.7 A four-step examination of techniques regarding the airstream as described in *Principes*, *Rudiments*, and by Mahaut

The following examination regarding intonation techniques is based on *Principes* and *Rudiments* and the detailed explanations regarding fingerings, the interaction of *Tonus* in the lips and embouchure, positions of the head-joint, airstream, and air-pressure (Support) combined with suggestions by the Traverso-player, composer, and editor Antoine Mahaut (1719-*c.*1785).

The method been used when examining techniques as described in *Principes* and *Rudiments* compared with *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere* by Mahaut (1759) is divided in four parts:

> **I** Examine the three *Head-joint positions* as described in *Principes* and *Rudiments*, keeping the same *Tonus* regarding embouchure and lips, together with a constant *air-pressure* throughout. Turning the Traverso with the wrist or hands alternatively lowering or raising the head in the three positions *Outward—Normal—Inward* keeping the head, the angle and direction of the airstream in the same direction (lips, embouchure, and lower jaw) throughout.
> **II** Examining different degrees of *air-pressure* as suggested in *Principes*, *Rudiments* and by Mahaut (1759), created with the breathing muscles and ribcage (Support), throughout keeping the same *Tonus* and angle and direction of the airstream regarding lips, embouchure, and lower jaw, in combination with the *Normal* head-joint position throughout.
> **III** Examining different degrees of *Tonus* regarding embouchure and lips as recommended by Mahaut (1759), while keeping the *Normal* head-joint position throughout combined with a constant air-pressure blended with supple changes regarding the angle and direction of the airstream with help of the embouchure, lips, and lower jaw.
> **IV** Examining a supple flexible interaction whilst combining *Principes*, *Rudiments* and Mahaut (1759) between *Tonus* regarding lips, embouchure and lower jaw, angle, and direction of the airstream, combined with modifications of the *air-pressure* (Support), and the three *head-joint positions*, achieved with a minimal utilization of each parameter.

In this context is Mahaut (1759) of importance because his suggestions—not found in earlier sources—seem to mirror changes of Traverso playing-techniques around the middle of the 18th Century. Mahaut pointed on that many Traverso-player used to turn the Traverso outwards for sharpening a flat note as suggested in *Principes* and *Rudiments*:

> […] plusieurs y remedient en tournant la Flute en dehors a chaqu'un de ces tons [E♭, D♭, C♭, F#, C#] ; mais il vaut mieux y supleer par l'Embouchure […] (Mahaut, 1759, 9)[1]

Instead of turning the Traverso outwards Mahaut suggested that it is more functional to correct too flat notes with help of the embouchure combined with a somewhat higher speed of the airstream, whereby the latter could be understood in today's terms of using the breathing muscles and Support:

> […] en retirant les levres vers le coin de la Bouche; et forçant un peu le vent. (Mahaut, 1759, 9)[2]

Regarding notes being too sharp like F1, F2, G#1, G#2 Mahaut suggested to not turn the Traverso inwards as recommended by Traverso-players in the beginning of the 18th Century as in *Principes* and *Rudiments*, but instead use the embouchure making the opening between the lips slightly larger in combination with that the upper lip slightly advances and consequently directs the angle of airstream somewhat downwards, having the effect that the lower jaw moves back a little which all together slows down the airstream and flattens the note in question:

> […] on y remedie encore en tournant la Flute en dedans, mais il vaut toujours mieux d'y supleer par l'Embouchure, en Elargißant un peu l'ouverture des levres de façon que la levre d'enhaut avance tant soit peu. (Mahaut, 1759, 9)[3]

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1. […] many correct this by turning the Flute outward on these notes [E♭, D♭, C♭, F#, C#]; but it is better to correct them with the embouchure, drawing
the lips towards the corner of the mouth; and strengthening the airstream a little. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere,* 1759, 9)
2. […] drawing the lips towards the corner of the mouth; and strengthening the airstream a little. (Mahaut, 1759, 9)
3. […] one still uses the technique of turning the Traverso inwards, but it is always better to correct with the embouchure, by enlarging the opening of the lips a little so that the upper lip advances ever so slightly. (Mahaut, 1759, 9)

Sources for the examination are the detailed suggestions regarding speed, size, angle, and direction of the airstream in the fingering-charts with comments as found in *Principes*, *Rudiments,* and Mahaut (1759), a schematic model of these suggestions are shown in Figure 53.

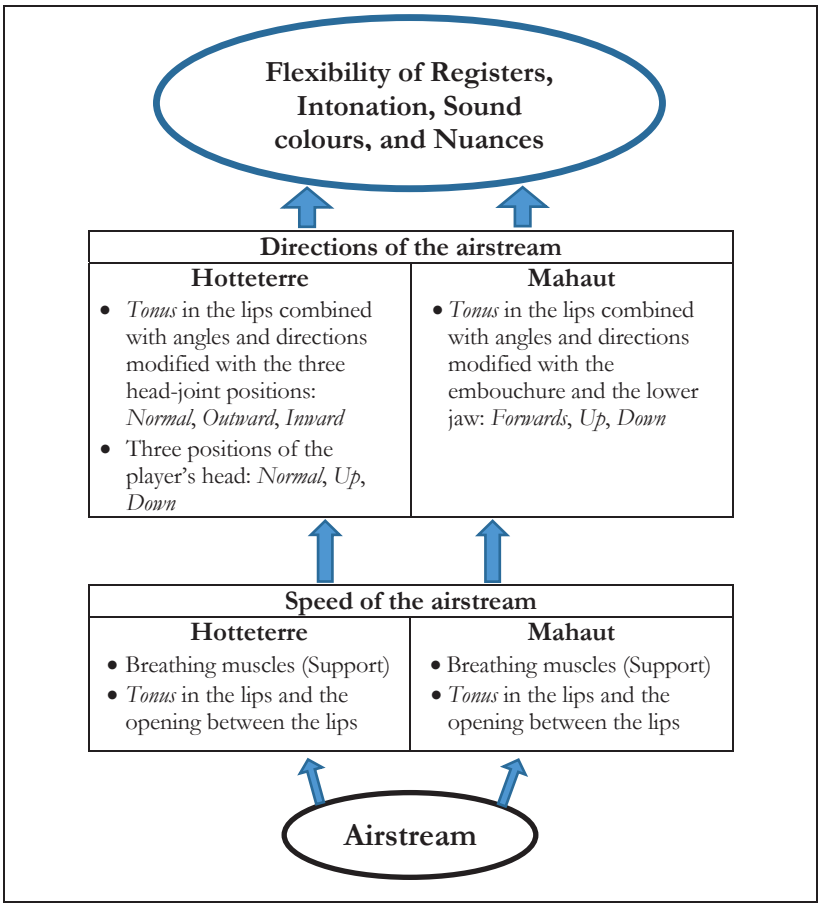


Figure 53 Techniques regarding the control of embouchure and the angels and directions of the airstream according to explanations by Hotteterre (*Principes,* 1707; *Rudiments,* 1729), and Mahaut (1759).

The result of the four-step examination is that step I, II and III are functional, and step IV possibly the most useful. Considered that Hotteterre generally show a pragmatic approach regarding the embouchure in *Chapter II*, still the impression is that even though explanations in *Principes* and *Rudiments* is not a combination of the above examined parameters discussed in depths. To conclude, both Hotteterre and Mahaut described functional but different techniques regarding the control of the embouchure and how to control angles and directions of the airstream. When these two techniques are compared with their respective repertoires are works for the three-piece Traverso of the late 17th and early 18th Century by for example La Barre, Gaultier de Marseille, and Hotteterre less virtuosic but requires advanced sound qualities regarding flexibility and inflexions whereby the techniques described in *Principes,* and *Rudiments* are efficient. Repertoire for the four-piece Traverso some decades later include virtuosity as in the works by for example Buffardin, Blavet, and Devienne at the middle and end of the 18th Century, and for these works are techniques regarding the embouchure and the airstream as described by Mahaut more efficient, and especially so in fast tempi.

I Head-joint positions

The first examination is based on that all adjustments of intonation are made exclusively with the help of the three head-joint positions *Outward—Normal—Inward* as described in *Principes* and *Rudiments*. For this examination should *Tonus* in the lips and the speed of the airstream (Support) throughout remain constant.

In the following are the *Semitone mineur* and *Semitone mineur* marked for comparison with the *Chromatic semitone*, minor second and major second in the tuning systems of *Just intonation*, *1/4-Comma Meantone* and *1/5-Comma Meantone*.

Deviations regarding intonation are in the following marked in Cent and rounded numbers in relation to G2.

Notes and fingerings	**G2 123/0** [/7]	**A♭2 12/4** [7]	**G2 123/0** [/7]	**A2 12/0** [/6 +/7]	**G#2 12/4** 12/467	**G2 123/0** [/7]	**G#2 12/4** 12/467	**F#2 123/47**	**G2 123/0** [/7]
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Semitone mineur	**±0**	**–**	**–**	**–**	**–6**	**–**	**–6**	**–**	**–**
Semitone majeur	**±0**	**+17**	**–**	**–**	**–**	**–**	**–**	**–17**	**–**
***Just intonation* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–8**	**±0**	**–8**	**–**	**±0**
***Just intonation* Minor second**	**±0**	**+12**	**±0**	**–**	**–**	**±0**	**–**	**–12**	**±0**
***Just intonation* Major second**	**±0**	**–**	**±0**	**+4**	**–**	**±0**	**–**	**–**	**±0**
***1/4-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–24**	**±0**	**–24**	**–17**	**±0**
***1/4-Comma Meantone* Minor second**	**±0**	**+17**	**±0**	**–**	**±0**	**±0**	**–**	**–17**	**±0**
***1/4-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–7**	**±0**	**±0**	**–**	**–**	**±0**
***1/5-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–16**	**±0**	**–16**	**–**	**±0**
***1/5-Comma Meantone* Minor second**	**±0**	**+12**	**±0**	**–**	**+12**	**±0**	**+12**	**–12**	**±0**
***1/5-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–5**	**±0**	**±0**	**–**	**–**	**±0**
Level of *Tonus* in the lips	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**
Head-joint positions	**Normal**	**Inward position**	**Normal**	**Normal**	**Inward position**	**Normal**	**Inward position**	**Outward position**	**Normal**
Speed and pressure of the airstream	[…] encrease the strength in blowing, by little, and little. (III: 6)	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**

II Air-pressure and speed of the airstream

The second examination is based on that the *Tonus* in the lips and the three positions *Outward—Normal—Inward* of the head-joint remains the same throughout, and that all adjustments regarding intonation is made exclusively with the help of changing the air-pressure and speed of the airstream as indicated below. It should be noted that today's concept of Support within woodwind environments is not expressed in the same manner in *Principes* and *Rudiments*. But short comments such as […] *increase the strength in blowing, by little, and little* (*Rudiments*, III: 6), and […] *et forçant un peu le vent* (Mahaut, 1759, 9), supposedly could be understood as pointing at the Support and functions of the breathing muscles.

Notes and fingerings	**G2 123/0** [/7]	**A♭2 12/4** [7]	**G2 123/0** [/7]	**A2 12/0** [/6 +/7]	**G#2 12/4** 12/467	**G2 123/0** [/7]	**G#2 12/4** 12/467	**F#2 123/47**	**G2 123/0** [/7]
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Semitone mineur	**±0**	**–**	**–**	**–**	**–6**	**–**	**–6**	**–**	**–**
Semitone majeur	**±0**	**+17**	**–**	**–**	**–**	**–**	**–**	**–17**	**–**
***Just intonation* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–8**	**±0**	**–8**	**–**	**±0**
***Just intonation* Minor second**	**±0**	**+12**	**±0**	**–**	**–**	**±0**	**–**	**–12**	**±0**
***Just intonation* Major second**	**±0**	**–**	**±0**	**+4**	**–**	**±0**	**–**	**–**	**±0**
***1/4-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–24**	**±0**	**–24**	**–17**	**±0**
***1/4-Comma Meantone* Minor second**	**±0**	**+17**	**±0**	**–**	**±0**	**±0**	**–**	**–17**	**±0**
***1/4-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–7**	**±0**	**±0**	**–**	**–**	**±0**
***1/5-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–16**	**±0**	**–16**	**–**	**±0**
***1/5-Comma Meantone* Minor second**	**±0**	**+12**	**±0**	**–**	**+12**	**±0**	**+12**	**–12**	**±0**
***1/5-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–5**	**±0**	**±0**	**–**	**–**	**±0**
Level of *Tonus* in the lips	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**	*Tonus as for* **G2**
Head-joint positions	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**
Speed and pressure of the airstream	[…] increase the strength in blowing, by little, and little. (III: 6)	*Less air-pressure than for* **G1**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Less air-pressure than for G***1**	*Air-pressure as for* **G2**	*Less air-pressure than for G***1**	*More air-pressure than for* **G1**	*Air-pressure as for* **G2**

III *Tonus* in the lips and embouchure

The third examination is based on that air-pressure and speed of the airstream (Support) together with the three positions *Outward—Normal—Inward* of the head-joint remains the same throughout, and that all adjustments regarding intonation is made exclusively with the help of changing the *Tonus* (muscular activity) in the lips and embouchure as indicated in *Principes*, *Rudiments*, and Mahaut (1759).

Notes and fingerings	**G2 123/0** [/7]	**A♭2 12/4** [7]	**G2 123/0** [/7]	**A2 12/0** [/6 +/7]	**G#2 12/4** 12/467	**G2 123/0** [/7]	**G#2 12/4** 12/467	**F#2 123/47**	**G2 123/0** [/7]
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Semitone mineur	**±0**	**–**	**–**	**–**	**–6**	**–**	**–6**	**–**	**–**
Semitone majeur	**±0**	**+17**	**–**	**–**	**–**	**–**	**–**	**–17**	**–**
***Just intonation* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–8**	**±0**	**–8**	**–**	**±0**
***Just intonation* Minor second**	**±0**	**+12**	**±0**	**–**	**–**	**±0**	**–**	**–12**	**±0**
***Just intonation* Major second**	**±0**	**–**	**±0**	**+4**	**–**	**±0**	**–**	**–**	**±0**
***1/4-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–24**	**±0**	**–24**	**–17**	**±0**
***1/4-Comma Meantone* Minor second**	**±0**	**+17**	**±0**	**–**	**±0**	**±0**	**–**	**–17**	**±0**
***1/4-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–7**	**±0**	**±0**	**–**	**–**	**±0**
***1/5-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–16**	**±0**	**–16**	**–**	**±0**
***1/5-Comma Meantone* Minor second**	**±0**	**+12**	**±0**	**–**	**+12**	**±0**	**+12**	**–12**	**±0**
***1/5-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–5**	**±0**	**±0**	**–**	**–**	**±0**
Level of *Tonus* in the lips	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)	*Less Tonus in the lips than for* **G2**	*Tonus in the lips as for* **G2**	*Tonus in the lips as for* **G2**	*Less Tonus in the lips than for* **G2**	*Tonus in the lips as for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G2**	*Tonus in the lips as for* **G2**
Head-joint positions	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**
Speed and pressure of the airstream	[…] increase the strength in blowing, by little, and little. (III: 6)	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**

IV

Interaction between *Tonus*, head-joint positions, air-pressure and airstream

The fourth examination is based on that the *Tonus* in the lips and the embouchure, air-pressure, and speed of the airstream (Support), together with the three positions *Outward—Normal—Inward* of the head-joint are all used simultaneously in a flexible interaction, and that all adjustments are made with a minimum use of each parameter.

Notes and fingerings	**G2 123/0** [/7]	**A♭2 12/4** [7]	**G2 123/0** [/7]	**A2 12/0** [/6 +/7]	**G#2 12/4** 12/467	**G2 123/0** [/7]	**G#2 12/4** 12/467	**F#2 123/47**	**G2 123/0** [/7]
***Equal 12 division* (12-ET)**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**	**±0**
Semitone mineur	**±0**	**–**	**–**	**–**	**–6**	**–**	**–6**	**–**	**–**
Semitone majeur	**±0**	**+17**	**–**	**–**	**–**	**–**	**–**	**–17**	**–**
***Just intonation* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–8**	**±0**	**–8**	**–**	**±0**
***Just intonation* Minor second**	**±0**	**+12**	**±0**	**–**	**–**	**±0**	**–**	**–12**	**±0**
***Just intonation* Major second**	**±0**	**–**	**±0**	**+4**	**–**	**±0**	**–**	**–**	**±0**
***1/4-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–24**	**±0**	**–24**	**–17**	**±0**
***1/4-Comma Meantone* Minor second**	**±0**	**+17**	**±0**	**–**	**±0**	**±0**	**–**	**–17**	**±0**
***1/4-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–7**	**±0**	**±0**	**–**	**–**	**±0**
***1/5-Comma Meantone* Chromatic semitone**	**±0**	**–**	**±0**	**–**	**–16**	**±0**	**–16**	**–**	**±0**
***1/5-Comma Meantone* Minor second**	**±0**	**+12**	**±0**	**–**	**+12**	**±0**	**+12**	**–12**	**±0**
***1/5-Comma Meantone* Major second**	**±0**	**–**	**±0**	**–5**	**±0**	**±0**	**–**	**–**	**±0**
Level of *Tonus* in the lips	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)	*Less Tonus in the lips than for* **G2**	*Tonus in the lips as for* **G2**	*Tonus in the lips as for* **G2**	*Less Tonus in the lips than for* **G2**	*Tonus in the lips as for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G2**	*Tonus in the lips as for* **G2**
Head-joint positions	**Normal**	**Inward position**	**Normal**	**Normal**	**Inward position**	**Normal**	**Inward position**	**Outward position**	**Normal**
Speed and pressure of the airstream	[…] increase the strength in blowing, by little, and little. (III: 6)	*Less air-pressure than for* **G1**	*Air-pressure as for* **G2**	*Air-pressure as for* **G2**	*Less air-pressure than for* **G1**	*Air-pressure as for* **G2**	*Less air-pressure than for* **G1**	*More air-pressure than for* **G1**	*Air-pressure as for* **G2**

*

In the following is a G-major scale and a melodic g-minor scale shown with the suggestions and explanations as found in *Principes* and *Rudiments* covering the compass from D1 to G3 indicating basic fingerings in combination with *Just intonation*, *1/4-Comma Meantone*, and *1/5-Comma Meantone*. To play these scales using the previous four-step examination sheds light over the Traverso and its intonation techniques.

G-major scale

Notes and fingerings	**D1** **123/456** [/7]	**E1** **123/45** [/7]	**F#1** **123/47**	**G1** **123/0** [/7]	**A1** **12/0** [/6+/7]	**B1** **1/0** [/6+/7]	**C2** **23/0** [/6+/7]	**D2** **23/456** [/7]	**E2** **123/45** [/7]	**F#2** **123/47**	**G2** **123/0** [/7]
Just intonation	**+2**	**–16**	**–12**	**±0**	**+4**	**–14**	**–2**	**+2**	**–16**	**–12**	**±0**
1/4-Comma Meantone	**–3**	**–10**	**–17**	**±0**	**–7**	**–14**	**+3**	**–3**	**–10**	**–17**	**±0**
1/5-Comma Meantone	**–2**	**–7**	**–12**	**±0**	**–5**	**–9**	**+2**	**–2**	**–7**	**–12**	**±0**
Level of *Tonus* in the lips	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G1**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G2**	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)
Head-joint positions	**Normal**	**Normal**	**Outward**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Normal**	**Outward**	**Normal**
Speed and pressure of the airstream	You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend (III: 5)	See **D1**	See **D1**	See **D1**	*Increase the wind, little by little*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	[…] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5)	[…] and blowing stronger, continuing to encrease the wind, also in the following Notes. (III: 5-6)	*Gradually increase the speed of the airstream*	[…] increase the strength in blowing, by little, and little. (III: 6)

Notes and fingerings	**A2** **12/0** [/6+/7]	**B2** **1/0** [/6+/7]	**C3** **2/45** [/6+/7]	**D3** **23/456** [/7]	**E3** **12/567**	**F#3** **13/456** [/7]	**G3** **13/0** [/7]
Just intonation	**+4**	**–14**	**– 2**	**+2**	**–16**	**–12**	**±0**
1/4-Comma Meantone	**–7**	**–14**	**+3**	**–3**	**–10**	**–17**	**±0**
1/5-Comma Meantone	**–5**	**–9**	**+2**	**–2**	**–7**	**–12**	**±0**
Level of *Tonus* in the lips	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	[…] close the lips […] (III: 6)	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*
Head-joint positions	**Normal**	**Normal**	**Normal or Inward**	**Normal or Outward**	**Outward**	**Normal**	**Normal**
Speed and pressure of the airstream	*Always supporting the wind*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	force the wind a little more (III: 6)	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	*Gradually increase the 'speed of the airstream*

Melodic g-minor scale

Notes and fingerings	**D1** **123/456** [/7]	**E1** **123/45** [/7]	**F#1** **123/47**	**G1** **123/0** [/7]	**A1** **12/0** [/6+/7]	**B♭1** **13/45** [/6+/7]	**C2** **23/0** [/6+/7]	**D2** **23/456** [/7]	**E2** **123/45** [/7]	**F#2** **123/47**	**G2** **123/0** [/7]
Just intonation	**+2**	**–16**	**–12**	**±0**	**+4**	**+16**	**–2**	**+2**	**–16**	**–12**	**±0**
1/4-Comma Meantone	**–3**	**–10**	**–17**	**±0**	**–7**	**+10**	**+3**	**–3**	**–10**	**–17**	**±0**
1/5-Comma Meantone	**–2**	**–7**	**–12**	**±0**	**–5**	**+7**	**+2**	**–2**	**–7**	**–12**	**±0**
Level of *Tonus* in the lips	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G1**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*Less Tonus in the lips than for* **G2**	*More Tonus in the lips as for* **G2**	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)
Head-joint positions	**Normal**	**Normal**	**Outward**	**Normal**	**Normal**	**Inward**	**Normal**	**Normal**	**Normal**	**Outward**	**Normal**
Speed and pressure of the airstream	You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend (III: 5)	See **D1**	See **D1**	See **D1**	*Increase the wind, little by little*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	[…] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5)	[…] and blowing stronger, continuing to increase the wind, also in the following Notes. (III: 5-6)	*Gradually increase the speed of the airstream*	[…] increase the strength in blowing, by little, and little. (III: 6)

Notes and fingerings	**A2** **12/0** [/6+/7]	**B♭2** **13/0** [/6+/7]	**C3** **2/45** [/6+/7]	**D3** **23/456** [/7]	**E3** **12/567**	**F#3** **13/456** [/7]	**G3** **13/0** [/7]	**F3** **12/457**	**E♭3** **123/567**	**D3** **23/456** [/7]	**C3** **2/45** [/6+/7]
Just intonation	**+4**	**+16**	**– 2**	**+2**	**–16**	**–12**	**±0**	**–4**	**+14**	**+2**	**– 2**
1/4-Comma Meantone	**–7**	**+10**	**+3**	**–3**	**–10**	**–17**	**±0**	**+7**	**+14**	**–3**	**+3**
1/5-Comma Meantone	**–5**	**+7**	**+2**	**–2**	**–7**	**–12**	**±0**	**+5**	**+9**	**–2**	**+2**
Level of *Tonus* in the lips	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	[…] close the lips […] (III: 6)	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	*Gradually increase the Tonus in the lips*	[…] close the lips […] (III: 6)	*Gradually increase the Tonus in the lips*
Head-joint positions	**Normal**	**Outward**	**Normal or Inward**	**Normal or Outward**	**Outward**	**Normal**	**Normal**	**Normal**	**Normal or Outward**	**Normal or Outward**	**Normal or Inward**
Speed and pressure of the airstream	*Always supporting the wind*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	force the wind a little more (III: 6)	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	force the wind a little more (III: 6)	*Gradually increase the speed of the airstream*

Notes and fingerings	B♭2 13/0 [/6+/7]	A2 12/0 [/6+/7]	G2 123/0 [/7]	F2 123/46 [/7]	E♭2 123/4567	D2 23/456 [/7]	C2 23/0 [/6+/7]	B♭1 13/45 [/6+/7]	A1 12/0 [/6+/7]	G1 123/0 [/7]	F1 123/46 [/7]
Just intonation	**+16**	**+4**	**±0**	**–4**	**+14**	**+2**	**–2**	**+16**	**+4**	**±0**	**–4**
1/4-Comma Meantone	**+10**	**–7**	**±0**	**+7**	**+14**	**–3**	**+3**	**+10**	**–7**	**±0**	**+7**
1/5-Comma Meantone	**+7**	**–5**	**±0**	**+5**	**+9**	**–2**	**+2**	**+7**	**–5**	**±0**	**+5**
Level of *Tonus* in the lips	*Gradually increase the Tonus of the lips*	*Gradually increase the Tonus of the lips*	[…] take care to close the lips more, and more, to contract them towards the corners of the mouth […] (III: 6)	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**
Head-joint positions	**Outward**	**Normal**	**Normal**	**Inward**	**Outward**	**Normal**	**Normal**	**Inward**	**Normal**	**Normal**	**Inward**
Speed and pressure of the airstream	*Gradually increase the speed of the airstream*	*Always supporting the wind*	[…] increase the strength in blowing, by little, and little. (III: 6)	*Gradually increase the speed of the airstream*	And blowing stronger, continuing to increase the wind (III: 5-6)	[…] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5)	*Gradually increase the speed of the airstream*	*Gradually increase the speed of the airstream*	*Increase the wind, little by little*	See **D1**	See **D1**

Notes and fingerings	E♭1 123/4567	D1 123/456 [/7]
Just intonation	**+14**	**+2**
1/4-Comma Meantone	**+14**	**–3**
1/5-Comma Meantone	**+9**	**–2**
Level of *Tonus* in the lips	*Less Tonus of the lips compared with* **G2**	*Less Tonus of the lips compared with* **G2**
Head-joint positions	**Outward**	**Normal**
Speed and pressure of the airstream	See **D1**	You must observe to blow but gently, for the lower Notes; (III: 5)

6.6.8 The interaction of techniques regarding the three head-joint positions, the airstream, *Tonus* in the lips, and the mouth cavity

Below is a chart (Fig. 54) showing the parameters *Tonus in the lips*, *Speed of the airstream,* and *Mouth cavity*, together with notes and comments by Hotteterre, from which the following can be deduced:

- The speed of the airstream should gradually be increased from D1 to G3, which is partly realized with the diaphragm and ribcage, and relates to what today would be described as using the Support.
- Several levels regarding the amount of *Tonus* in the lips are clearly described in *Principes* and *Rudiments*, whereby the first level covers D1-F#1 but not explicitly commented on, still it can be deduced as having a bigger opening between the lips in combination with somewhat less *Tonus* in the lips. From G2-C#3, and then from D3-G3 there is a gradual tightening of the lips indicated which describes a stepwise increase regarding *Tonus* in the lips, aiming for a smaller opening between the lips, having the natural effect of speeding up the airstream when keeping a more or less constant air-pressure with the diaphragm and ribcage (Support).
- Regarding the mouth cavity Hotteterre suggested to diminish the size of the frontal mouth cavity, while moving the tongue forward and closer to the lips starting with the note G2. From this recommendation could be deduced that from D1-F#2 Hotteterre possibly had a position of the tongue further back in the mouth cavity, and from G2 and upward perhaps continued to diminish the frontal part of the mouth cavity.

Above mentioned parameters should interact, and it seems that Hotteterre understood the note G2 as a breaking point regarding speed of the airstream and *Tonus* in the lips and embouchure. If so, G2 represents a balance point regarding *Tonus* in the lips and connected speed of the airstream: notes below G2 generally should have less *Tonus* in the lips and a somewhat slower airstream, notes upwards from G2 should have more *Tonus* in the lips and a somewhat faster airstream. Because when playing G2 is the opening between the lips suggested to be made somewhat smaller than for the low register and somewhat wider than for the high register, the frontal mouth cavity should be narrowed and, altogether this has the effect to speed up the airstream, which facilitates the medium register of the Traverso. The simultaneous combination makes mentioned parameters interact, and is finally refined when each note has its special position regarding the direction of the airstream with help of the head-joint positions *Outward—Normal—Inward* as suggested by Hotteterre, when so it is not necessary to make more than rather small adjustments on each parameter for realising just intonation and beauty of sonority.

An example clearly describing the interaction and necessity of combining the three parameters *airstream* (Support), *embouchure* (*Tonus* in the lips, and opening between the lips), and *fingerings* is found in the late Traverso method *Méthode pour la Flûte* (*c.*1802) by [Mathieu] Peraut:

> **Article Sixième**
> **Manière à employer pour rendre la Flûte juste.**
> Il n'existe pas de Flûte parfaitement juste; l'art et l'oreille peuvent seuls remédier à cet inconveniant; c'est là l'obstacle le plus difficile à surmonter.
> 1° Tout dépend de la quantité de vent que vous faites entrer dans l'Instrument.
> 2° De serrer ou lâcher plus ou moins les lèvres.
> 3° De rentrer un peu l'embouchure en dedans, si vous êtes trop haut et de même la tourner en dehors si vous êtes trop bas: On a recours aussi pour cela à des différentes façons de doigter qui deviennent nécéssaires pour la justesse, même pour l'éxécution de certains passages. (Peraut, *Méthode pour la Flûte*, *c.*1802, 4)[1]

These explanations by Peraut regarding techniques how to play in tune on the Traverso corresponds well with explanations and suggestions found in *Principes*, and is therefore an important source embracing generally all 18th Century explanations regarding the airstream, the lips and the embouchure on the Traverso.

1. *Article Six. Manners and techniques how to play in tune on the Flute.* There is no such thing as a perfectly in-tune Flute; only art and ear can remedy this inconvenience; this is the most difficult obstacle to overcome.
1° It all depends on the quantity of wind you put into the Instrument [airstream and support].
2° To more or less tighten or release the lips [embouchure].
3° To bring the head-joint slightly inwards if you are too sharp, and to turn it outwards if you are too flat [direction of the airstream]: For this [just intonation] we also resort to different fingerings which is necessary for accuracy, even for the execution of certain passages. (Peraut, *Méthode pour la Flûte*, *c.*1802, 4)

Notes	D1-G#1	A1-C#2	D2-D#2	E2-F#2	G2-G#2	A2-C#3	D3-D#3	E3-G3
Level of *Tonus* in the lips influencing the size of the opening between the lips. An increase of *Tonus* results in a smaller opening between the lips which increases the speed of the airstream when having a constant air-pressure	*Lower Tonus in the lips compared with* **G2**	*Lower Tonus or tension in the lips compared with* **G2**	*Lower Tonus or tension in the lips compared with* **G2**	*Lower Tonus or tension in the lips compared with* **G2**	[…] serrer les Levres de plus en plus, de les retirer du coin de la bouche (III: 8) ——— […] take care to close the lips more, and more, to contract them towards the corners of the mouth (III: 6)	*Gradually increase the Tonus in the lips*	… serrer les Levres. (III : 9) ——— […] close the lips (III: 6)	*Gradually increase the Tonus in the lips*
Speed of the air-stream influenced by the breathing muscles (Support) in interaction with *Tonus* in the lips and amount of blown air	Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas (III: 6) ——— You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend (III: 5)	Il faut augmenter le vent, peu à peu, à mesure que l'on monte. (III: 7) ——— *Increase the wind, little by little*	On doit pour lors augmenter le vent; ensorte que le son aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il faut. (III: 8) ——— […] blow pretty strong, but not too strong, least you sound an Octave higher than you ought. (III: 5)	[…] soutenant le vent toûjours un peu ferme; ainsi que dans les Tons suivants. (III: 8) ——— […] and blowing stronger, continuing to increase the wind, also in the following Notes. (III: 5-6)	[…] d'augmenter le vent peu à peu. (III: 8) ——— […] increase the strength in blowing, by little, and little. (III: 6)	[…] en soûtenant toûjours le vent. (III: 8) ——— *Always supporting the wind*	Il faut forcer un peu le vent, & serrer les Levres. (III: 9) ——— […] you must force the wind a little more, and close the lips. (III: 6)	Il faut continuër à forcer le vent. (III: 9) […] bien soûtenir le vent. (V: 15) ——— […] you must continue also to blow strong. (III: 6) […] and blow pretty Sharp. (V: 10)
Mouth cavity and resonance					[…] d'avancer la langue vers les Levres (III: 8) ——— […] advance the tongue towards the lips (III: 6)			

Figure 54 Explanations regarding the interaction of *Tonus* in the lips (embouchure), speed of the airstream (Support), and mouth cavity according to *Principes* and *Rudiments*.



6.6.9 Different tonalities and sound colour

The Traverso like the Recorder, Oboe, and Bassoon in the 18th Century can be described as diatonic instruments. For the Traverso—as discussed above—the tonality due to its construction is a D-major scale because a successive opening of the seven tone-holes results in a D-major scale in the first two octaves. When playing chromatic passages in other keys than D-major the notes F1, G♭1, G#1, A♭1, A#1, B♭1, C2, F2, G♭2, G#2, A♭2, A#2, B♭2, C3 are played with fork-fingerings as described in section *6.3 Fingerings: Doigtés des fourches—Open-fingerings*. The principle of a fork-fingering is to flatten a note from the D-major scale with a semi-tone, leaving one tone-hole open below the fingering in question, and close the next or several tone-holes. Fingerings for E1 and E2 could be considered as fork-fingerings because the fingering 123/45 leaves the sixth tone-hole open and the seventh tone-hole closed by the D#-key. The final adjustments of intonation are described in *Principes* and *Rudiments* with help of the three head-joint positions, the level of *Tonus* in the lips, and the speed of the airstream adjusted with the breathing muscles (Support). The differences between notes played with open-fingerings and fork-fingerings is that the latter has a tendence of being somewhat veiled regarding sound colour and especially in the low register. Notes like E2, F2, G♭2, G#2, A♭2, A#2, B♭2, C2, C3 skilfully played on a good Traverso has generally a similar sound colour and timbre as the notes from the D-major scale. When playing E1, F1, G♭1, G#1, A♭1, A#1, B♭1, there are differences in sound colour and timbre when compared with the D-major scale, and regarding G#1, A♭1, A#1, B♭1, including G♭1 and G♭2 although this note is not often used according to *Principes* and *Rudiments* (V: 16). These differences are unavoidable due to the construction of the Traverso even when played by a most skilful player on a high quality Traverso and has been commented on in flute methods since the 18th Century up to the first half of the 19th Century. This phenomenon caused the gradual increase of keys and initially for F, G#, A♭, A#, and B♭ aiming for more evenness in sound colour and timbre, starting in the late 18th Century. In the influential *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne (1759-1803) and in its *Discours Préliminaire* (*c.*1794, 1) is a short discussion on the introduction of keys for the notes G#, A♭, B♭ and A# because these notes have a character described as *Sons bouchés*, thus having a sound colour being veiled and less resonating compared with the surrounding notes in the first octave. Devienne writes that these extra keys have an advantage in slow movements, and especially on long notes:

> […] elles [the keys] sont d'une grande nécessité dans les morceaux lents et surtout quand les Notes ci dessus désignées [G#1, A♭1, B♭1 and A#1], sont soutenu (Devienne, *c.*1794, 1)[1]

In this context it is of interest that Devienne discusses that he favours of tuning F1 and F2 tuned on the flat side not needing much adjustment, although F#1 and F#2 are then somewhat flat but easily corrected with the embouchure. He continues quoting the article *Flute* in the *L'Encyclopédie Méthodique* (1785 & 1788) that the tonality of F#-major is rarely when at all used for the Traverso, because F# being the base for the scale is not practical due to its intonation being flat. At the contrary was a key like F-major often used for the Traverso, and as written in *L'Encyclopédie Méthodique* (1785 & 1788) this tonality count among the most beautiful on the Traverso. Regarding sound colour Devienne has a comment regarding the low register:

> […] les sons durs que l'on tire avec force dans le bas et que l'on nomme (je ne sais pourquoi) sons de Haut bois (Devienne, *c.*1794, 1)[2]

This is an important statement in relation to the timbre of the low register on the Traverso and to the above mentioned somewhat veiled sound colour on the notes G#1, A♭1, B♭1 and A#1, because if the desired sound colour on the remaining notes of the chromatic scale in the low register is not corresponding to the idea of *les sons durs que l'on tire avec force* the difference between the forked-fingered and open-fingered will not be as pronounced as when forcing the open-fingered notes. Devienne's aesthetics points on one of the important differences between the Traverso and the Boehm-flute whereby the latter potentially has a low register being considerably more projecting regarding nuances and sound colour. The culmination regarding a search for evenness of sound colour on the complete chromatic scale was the construction of the Boehm-flute by Theobald Boehm in 1847. His revolutionary design generally gave every note its own chromatic tone-hole in the first two octaves, aiming for eliminating mentioned differences in sound colour and timbre caused by fork-fingerings.

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1. […] they [the keys] are of great necessity in slow pieces and especially when the notes above designated [G#1, A♭1, B♭1 and A#1], are sustained (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte, c.*1794, 1)
2. […] the hard sounds that are pulled with force in the low register and that are called (I don't know why) sons de Haut bois [Oboe] (Devienne, *c.*1794, 1)

In this context is a statement in the *Méthode pour Flûte Systeme Boehm* (1880/1906) by Altès of interest because almost hundred years later than Devienne is a similar aesthetics idealised regarding that the low register of the flute—in this case the Boehm-flute—should not be played in a manner resembling the sound colour of an Oboe:

> J'ai lu dans quelques Méthodes [i.e. Berbiguier, *c.*1818] que la beauté des sons graves sur notre instrument consistait à ce qu'ils se rapprochassent des sons du *Hautbois*; cette erreur est, préjudiciable à deux points de vue: d'abord, en ce que pour obtenir ces sons il faut couvrir à *moitié* l'embouchure ce qui en les rapprochant du timbre du Hautbois, les rend maigres, chétifs et par cela, incapables de lutter avec la belle sonorité de cet instrument; puis, la suavité qui est le caractère dominant de la Flûte disparu complètement. (1) Ce ne pas pour entendre une mauvaise imitation des sons *vibrants* du Hautbois, que MEYERBEER a écrit, en employant les sons graves de la Flûte le prélude du songe du *Prophète*, mais bien pour arriver à un effet de *sonorité voilée* que la suavité de notre instrument peut seule produire. (Altès, 1880, 26me Leçon, 205) [1]

Considered that Altès as a young man was a student at the *Conservatoire* having Tulou as his teacher playing on Multi-keyed conical flutes which has sound qualities in common with the Traverso, the aesthetics regarding sound colour of the low register possibly echo ideals from the classical Traverso and the late 18th Century.

A consequence of inherent differences of sound colour and timbre on the Traverso between fork-fingered notes and notes played with open-fingerings is that playing in different keys—especially when played in the first octave—tends to sound distinctly different from each other. Keys needing a higher amount of fork-fingered notes as for example b♭-minor sounds different compared with b-minor, but when played on the Boehm-flute such differences are practically eliminated. This stand of things possibly has caused minor keys such as a, d, g, c, e, b, and major keys as C, G, D, A, E, F, B♭ being the most often used by for example La Barre, Hotteterre, J. S. Bach, Vivaldi, and Telemann (Ljungar-Chapelon, 1991a). In a sense are keys far away from D-major interesting because of their potential of different sound colours, although often more complicated because of the many fork-fingerings and frequent adjustments of intonation. Examples using many different keys on the Traverso is found in *L'Art de Preluder* (1719) by Hotteterre. In this important book are 58 *Preludes* for the Traverso alone written in eighteen different keys including transpositions. Not used minor keys are c#, g#, and e♭, not used major keys are A♭, D♭, G♭ (Fig. 55).

Order, and numbers of *Preludes* in each key marked within brackets, including suggested transpositions marked with arrows	**1: G** (4) → E, E♭ **2: g** (4) → b	**3: a** (4) → f, f# **4: A** (4) → F	**5: B♭** (3) → G **6: b** (4) → g **7: B** (2) → G **8: b♭** (2) → g	**9: C** (3) → A **10: c** (3) → a	**11: d** (3) → b, b♭ **12: D** (4) → B, B♭	**13: e** (3) → c **14: E (3)** → E♭, C **15: E♭** (3) → E	**16: F** (3) → D **17: f#** (2) → d **18: f** (2) → d
Major keys	**G** → E, E♭	**A** → F	**B♭**, **B** → G	**C** → A	**D** → B, B♭	**E**→E♭, C **E♭**→E	**F** → D
Minor keys	**g** → b	**a** → f, f#	**b**, **b♭** → g	**c** → a	**d** → b, b♭	**e** → c	**f#, f** → d
G-major scale g-minor scale	**G**	**A**	**B** **B♭**	**C**	**D**	**E** **E♭**	**F#** **F**

Figure 55 The arrows show Hotteterre's suggested transpositions *L'Art de Preluder* (1719), an example is that the first four *Preludes* in G-major are transposed to E- and E♭-major.

In *L'Art de Preluder* (1719) are as well 76 *Trait* which can be described as examples of difficult passages and short studies (*Etude*). When comparing the 58 *Preludes* with the 76 *Trait*, the order of keys and suggested transposition is very similar (Fig. 56).

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1. I have read in some works on the Flute that the beauty of its lower notes consists in its resemblance to the tone of the *Oboe*. This error is detrimental from two points of view. In the first place, to obtain this tone one *half* of the mouth-hole must be covered, which, in assimilating them to the tone of the Oboe, renders them thin, weak, and thereby incapable of comparison with the beautiful sonorousness of that instrument, moreover the sweetness which is the predominant character of the Flute disappears altogether. When MEYERBEER employed the lower notes of the Flute in the prelude to the dream of the Prophet, he did not intend a bad imitation of the Oboe, but simply an effect of *veiled sonority* which the characteristic tone of the Flute alone can produce. (Altès, *Méthode pour Flûte Systeme Boehm,* 1880/1906, Leçon 26, 205)

Keys Order, and numbers of *Trait* in each key marked within brackets, including suggested transpositions marked with arrows	**1: G** (7) → E **2: g** (9) → e	**3: a** (4) → f# **4: A** (4) → F	**5: B♭** (4) → G **6: b** (4) → g **7: B** (4) → G **8: b♭** (2) → g	**9: C** (4) → A **10: c** (5) → a	**11: d** (6) → b **12: D** (9) → B, B♭	**13: e** (3) → c **14: E** (2) → C **15: E♭** (3)	**16: F** (4) → D **17: f** (2) → d
Major keys	**G** → E	**A** → F	**B♭**, **B** → G	**C** → A	**D** → B, B♭	**E** → C	**F** → D
Minor keys	**g** → e	**a** → f#	**b**, **b♭** → g	**c** → a	**d** → b	**e** → c	**f** → d
G-major scale g-minor scale	**G**	**A**	**B** **B♭**	**C**	**D**	**E** **E♭**	**F**

Figure 56 The arrows show suggested transpositions as found in *L'Art de Preluder* (1719), an example is that the first seven *Trait* in G-major are transposed to E-major.

It seems likely that Hotteterre had a system when making the order of keys as shown in the *Preludes* and *Trait*. When examining the order of keys it starts with a scale in G-major alternatively in g-minor (Fig. 55 & 56). It has been shown that the placements of the tone-holes on a Traverso are based on the D-major scale, the question is then why Hotteterre not used D-major as the reference but G-major. Of course, there can be many reasons, still it seems that the choice of G-major was a rational decision. When playing a G-major scale in the first two octaves following the suggestions given in *Principes* and *Rudiments* are all notes played with the head-joint *Normal position* which generally has a stable intonation not needing much adjustment, except for F#1 and F#2 which must be played with the *Outward position* to correct their intonation being too flat. In addition are only the notes C2, C3 —and indirectly E1 and E2 as explained above—in the G-major scale played with fork-fingerings. This creates in theory stability regarding intonation, sound colour, and timbre which potentially could be used as a reference for playing in other keys. When looking at the first two *Prelud*es they cover the register F#1-B2, notes which all are played with the *Normal position* of the head-joint apart from F#1 and F#2 both played with the *Outward position,* and F2 played with the *Inward position.* The third *Prelude* covers the register D1-C3, having C#2 added, which according to *Principes* and *Rudiments* should be played in the *Outward position* in generally the same manner as F#. The fourth *Prelude* covers the register D1-D3, including D#2, which according to *Principes* and *Rudiments* is to be played with the *Normal position*. When comparing the G-major scale with a key as far away as b♭-minor it shows a completely different picture regarding head-joint positions, intonation, including more complicated fingerings (Fig. 57):

b♭-minor	**E♭1**	**F1**	**G♭1**	**A♭1**	**B♭1**	**C2**	**D♭2**
Head joint position	*Outward*	*Inward*	*Very inward*	*Inward*	*Inward*	*Normal*	*Very outward*
General tendency of intonation	Flat	Sharp	Very sharp	Sharp	Sharp	–	Flat
Fingering	123/4567	**123/46**	**123/56**	**12/456**	**13/45**	**23/0**	0/0

b♭-minor	**E♭2**	**F2**	**G♭2**	**A♭2**	**B♭2**	**C3**	**D♭3**
Head joint position	*Outward*	*Inward*	*Very inward*	*Inward*	*Outward*	*Normal* or *Inward*	*Outward*
General tendency of intonation	Flat	Sharp	Very sharp	Sharp	Flat	Sharp or Flat	Flat
Fingering	123/4567	**123/46**	**123/567**	**12/4**	**13/0**	**2/45**	23/467

Figure 57 In the natural b♭-minor scale and its two first octaves and played standard fingerings are generally almost all notes played with fork-fingerings (here marked with bold) apart from E♭1, E♭2, D♭2 and D♭3 and combined with changes of the head-joint positions.

The following four *Preludes* in g-minor have many notes in common with G-major, and introduces just three new notes B♭1, B♭2, and E♭2. Having B1 and B2 as a reference it is easy to play B♭1 in the *Inward position*, and the B♭2 in the *Outward position*.

Playing E♭2 in the *Outward position* is as well easy when having played D#2 in the *Normal position* as suggested in *Principes* and *Rudiments*. An analyse of all *Preludes* and *Trait* suggests that Hotteterre had a plan starting with a stable playing position of the head-joint and embouchure as a reference, gradually working toward complicated combinations of playing- techniques and keys like b♭-minor.

Conclusions regarding intonation and sound colour

- Trying to answer the initial question if there might have been an underlying *specific* temperament for the three-piece Traverso of *Model I* and *Model II* the question could be answered that experiments has shown that the Traverso was constructed for playing in versions of meantone temperaments, and that it with ease can play generally all intervals with just intonation.
- Although *Equal 12 division* (12-ET) *is* playable the Traversi of *Model I* and *Model II* were not indented to play in this temperament. Firstly, because needed adjustments regarding intonation tend to harm suppleness making playing less comfortable as when playing in *Just intonation, 1/4-Comma Meantone*, and *1/5-Comma Meantone*. Secondly, commonly used temperaments in France in the first decades of the 18th Century can be described as versions of meantone.
- *Model I* and *Model II* and their respective *Champ de liberté* allows to play with just intonation whereby thirds and sixths needs the largest deviations as the Major sixth (–16 Cent), Minor third (+16 Cent), including *Semitone mineur* and *Semitone majeur* (±17 Cent). This flexibility regarding intonation poses the question on how the *Champ de liberté* could have been handled by the Traverso-players. When playing together with an instrument having fixed intonation as the harpsichord the flexibility of intonation could point in the direction that Traverso-players pragmatically combined a temperament with just intonation and concepts of *Bon Gout*. When playing a solo cadenza or a prelude for Traverso alone as in *L'Art de Preluder* (1719) by Hotteterre, the Traverso-player possibly could have chosen to play all intervals with just intonation.
- Due to that *Model I* and *Model II* have their tone-holes placed in a manner making the D-major scale to the reference, and that the placement of the first and fifth tone-hole facilitates playing with just major thirds such as D1-F#1, D2-F#2, A1-C#2, A2-C#3, further minor thirds such as D1-F1, D2-F2, A1-C2, A2-C3, experiments points in the direction that *Model I* and *Model II* have their tone-holes placed for playing with a blend of just intervals and versions of meantone temperaments.
- Considering *Just intonation, 1/4-Comma Meantone*, and *1/5-Comma Meantone* findings support that all three temperaments work well together with other versions of meantone temperaments, and with suppleness. An example is that it is possible to play just and tempered thirds, sixths, seventh, *Semitone majeur* and *Semitone mineur*—intervals needing the largest amount of *Champ de liberté*—in the keys most often used by composers such as La Barre, Hotteterre and Blavet with a beautiful mellow sound colour in generally all dynamics—although some keys needs somewhat more effort—which indirectly indicates that playing in meantone temperaments as used in France in the first part of the 18th Century such as *1/4-Comma Meantone*, and *1/5-Comma Meantone* probably are temperaments that Hotteterre could have aimed for when giving suggestions regarding intonation with the three head-joint positions, embouchure and the airstream as found in *Principes* and *Rudiments*.
- The Traverso commonly used in France during the first part of the 18th Century has a *Champ de liberté* as experiments has shown, allowing supple playing in generally any meantone temperament, in combination with just intervals in generally all keys.
- An essential difference between the Traverso when compared with the Boehm-flute is that the Traverso in a sense is an instrument which has the phenomenon of considerable differences in sound colours built into it due to the necessary technique of fork-fingerings and open-fingerings, whereas the Boehm-flute has an almost perfect evenness of sound colour due to its construction aiming for eradicating fork-fingerings because of their different sound colours compared with open-fingerings. Differences in sound colours caused by fork-fingerings and open-fingerings could so far be described as embraced as a tool for realising distinct variations of sound colour on the Traverso. Finally, discussed transposition as suggested in *L'Art de Preluder* (1719) are highly interesting because when playing and practicing with these transpositions a wealth of possibilities and contrasts between different keys are discovered and developed.

6.7 *Des Agrémens*: Ornamentation

When discussing how ornaments and ornamentation are described in *Principes* and *Rudiments* it could serve to find a definition with bearing on the French first part of the 18th Century for a contextualisation. To start is the definition of *Agrémens* as found in the dictionary *Synonymes françois, leurs significations et le choix qu'il en faut faire pour parler avec justesse* (1769) by Girard & Beauzée of interest giving a larger context:

> Les agrémens viennent d'un assemblage de traits fins que l'humeur & l'esprit animent, ils l'emportent souvent sur ce qui est plus régulierement beau. […] L'on dit d'une personne qu'elle marche, danse, chante avec grace, & que sa conversation est pleins d'agrémens. (Girard & Beauzée, 1769, Tome I §. 54: 74)[1]

A late 17th Century source is the already mentioned *Traité de la Viole* (1687) by Rousseau with its chapter *Des Agrémens* giving definitions contemporary to the early years of Hotteterre. Rousseau compared the *Agrémens* for the voice and an instrument to the ornamentation on a building and explained that the use of ornaments in architecture is structured with certain rules. Further explaining that singers practice ornaments with rules and guidelines that should serve as models for the instrumental player. Finally, Rousseau's opinion is that the *Viole* is the instrument that most successfully can imitate the voice. The statement that the *Viole* (Viole de Gambe) so successfully can imitate the voice could possibly be compared with when an outstanding violin virtuoso today as a matter of fact can be as expressive as an exquisite opera singer.

> Les Agrémens sont à la Voix & aux Instruments ce que les Ornements sont à un Edifice, & comme les Ornements ne sont pas necessaires pour la subsistence du Batiment, mais qu'ils servent seulement à le rendre plus agreable à la veuë, ainsi un Air pour la Voix, & une Piece pour les Instruments peuvent estre reguliers quant au fond, qui pourtant ne satisferoient point l'oüye, s'ils n'estoient ornez des Agrémens convenables, & de mesme que la trop grande quantité d'Ornements produiroit une espece de confusion qui rendroit l'Edifice moins agreable; ainsi la confusions des Agrémens dans les Airs & dans les Pieces ne sert que pour en diminüer la beauté, c'est pourquoy comme dans l'Architecture on distribuë les Ornements avec Ordre & avec Regles, de mesme il faut pratiquer les Agrémens dans les Airs & les Pieces avec Ordre & avec Regles, & comme la Voix les pratique parfaitement, c'est sur ce modelle que les Instruments se doivent conformer, & particulierement la Viole, qui imite mieux la Voix qu'aucun autre. (Rousseau, 1687, 74-75).[2]

Rousseau continues and makes a comparison between ornamentation and how salt is used when cocking, wanting to explain that salt/ornamentation is necessary for giving taste to a dish and bring life to a melody. At the same time Rousseau makes clear that certain meets need more salt and others less, and that it is the same with melodies, some needs more ornamentation and others less:

> On peut dire encore que les Agrémens sont un Sel Melodique qui assaisonne le Chant, & qui luy donne le goût, sans lequel il seroit fade & insipide, & comme le Sel doit estre employé avec prudence, en sorte qu'il n'en faut ny trop, ny trop peu, & qu'il en faut plus dans l'assaisonement de certaines viandes, & moins en d'autres: Ainsi dans l'usage des Agrémens il faut les appliquer avec moderation, & sçavoir dicerner où il en faut plus, & où il en faut moins. (Rousseau, 1687, 75).[3]

When following in the footsteps of Rousseau associating to architecture and cocking it could possibly be of some relevance to associate the idea of *Agremens* and ornaments to the aesthetics of French parks and gardens as we know them from the achievements of the French landscape architect André Le Notre (1613-1700), the chief gardener for King Louis XIV. The typical style of Le Notre's French aesthetics of gardening and landscape architecture with its well-known codified forms can be studied and enjoyed today in the parks of Versailles, Saint-Cloud, and Fontainebleau just to mention a few (Jung-Kaiser & Simonis (2015).

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1. The embellishments come from an assemblage of fine features that the mood & the spirit enliven, they often outweigh what is more regularly beautiful. […] It is said of a person that he walks, dances, sings with grace, and that his conversation is full of pleasures. (Girard &Beauzée, *Synonymes françois, leurs significations et le choix qu'il en faut faire pour parler avec justesse* , 1769, Tome I §. 54: 74)

2. The *Agrémens* are to the Voice & to the Instruments what the Ornaments are to a Building, & as the Ornaments are not necessary for the subsistence of the Building, but only serve to make it more pleasant to the sight, so an Air for the Voice, & a Piece for the Instruments may be regular as to substance, which nevertheless would not satisfy the hearing, if they were not adorned with suitable *Agrémens*, & just as the excessive quantity of Ornaments would produce a kind of confusion which would make the Building less pleasant; thus the confusion of the *Agrémens* in the Airs & in the Pieces only serves to diminish their beauty, this is why as in Architecture we distribute the Ornaments with Order & with Rules, in the same way we must practice the *Agrémens* in the Airs & the Pieces with Order & with Rules, & as the Voice practices them perfectly, it is on this model that the Instruments must conform, & particularly the Viole, which imitates the Voice better than any other. (Jean Rousseau, *Traité de la Viole*, 1687, 74-75)

3. We can also say that the *Agrémens* are a Melodic Salt which seasons the melody, and which gives it the taste, without which it would be tasteless and dull, and as the Salt must be used with prudence, so that it is not necessary neither too much, nor too little, & that more is needed in the seasoning of certain meats, & less in others: Thus in the use of *Agrémens* they must be applied with moderation, & know how to discern where they are needed more, and where less is needed. (Jean, Rousseau, 1687, 75)

In *Principes* and *Rudiments* are seven ornaments described: *Cadences ou Tremblements – Cadences or Shakes*, *Ports-de-voix*, *Coulement – Sliding*, *Accents, Flattement* ou *Tremblement Mineurs – Softening of Notes* or the *Lesser Shakes*, and *Battements – Beats*. In *Premier Livre de Pieces pour la Fluîte-traversière Œuvre IIa* (1708) and *Œuvre IIb* (1715) by Hotteterre's are the same seven ornaments described as in *Principes* and *Rudiments*, together with five more ornaments; *Port de voix double*, *Demi Cadence apuiée*, *Tour de gosier*, *Double Cadence coupée*, and *Tour de chant* (Fig. 58):

***Principes* Œuvre I (1707)**	***Rudiments* [Œuvre I] (1729)**	***Premier Livre de Pieces pour la Fluîte-traversière Œuvre IIa* (1708)**	***Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715)**	***Méthode pour la Musette Œuvre X* (1737)**
Cadences ou Tremblements	*Cadences or Shakes*	*Cadences ou Tremblements*	*Cadences ou Tremblements*	*Cadences ou Tremblements*
Ports-de-voix	*Port-de-voix*	*Port-de-voix*	*Port-de-voix*	*Port-de-voix*
Coulement	*Sliding*	*Coulement*	*Coulement*	*Coulement*
Accents	*Accents*	*Accents*	*Accents*	–
Doubles Cadences	*Double Cadences*	*Double Cadence*	*Double Cadence*	*Double Cadence*
Flattement ou Tremblement Mineurs	*Softening of Notes or the Lesser Shakes*	*Flattement*	*Flattement*	*Flattement*
Battements	*Beats*	*Battements*	*Battements*	*Battements*
–	–	–	*Port de voix double*	*Port de voix double*
–	–	–	*Demi Cadence appuiée*	–
–	–	–	*Tour de gosier*	*Tour de gosier*
–	–	–	*Double Cadence coupée*	*Double Cadence coupée*
–	–	–	*Tour de chant*	–

Figure 58 Ornaments explained in *Principes* (1707), *Rudiments* (1729), *Premier Livre de Pieces pour la Fluîte-traversière Œuvre IIa* (1708), *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere IIb* (1715), and *Méthode pour la Musette Œuvre X* (1737).

The seven ornaments *Tremblements, Ports-de-voix, Coulement, Accents, Doubles Cadences, Flattement, Battements* as described in *Principes* and *Rudiment* has instructive explanations making it easy to understand and reproduce these ornaments. It is interesting that the explanations of the ornaments not really use the codified signs as they were given in *Premier Livre de Pieces pour la Fluîte-traversière Œuvre IIa* (1708) and in its second edition *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715). These two editions of *Œuvre IIa* (1708) and *Œuvre IIb* (1715) both has an *Avertissement* with explanations regarding ornamentation in combination with codified signs. In addition, *Œuvre IIb* includes a manual giving codified signs for the above-mentioned ornaments together with five more ornaments: *Port de voix double, Demi Cadence apuiée, Tour de gosier, Double Cadence coupée,* and *Tour de chant* (Ex. 9). The same ornaments are also frequently applied—often written out in notes—in the *Preludes* and *Traits* in the important text and practice book *L'Art de Preluder* (1719) by Hotteterre.



Example 9 From left to right 1. *Le Coulement,* 2. *Accent,* 3. *Port-de-Voix double,* 4. *Demi Cadence appuiée,* 5. *Tour de Gosier,* 6. *Double Cadence coupée,* 7. *Double Cadence,* 8. *Battement,* 9. *Tour de Chant,* 10. *Port-de-voix*. The upper system shows the codified signs for the ornaments, and the second line show the realisation of the signs. As found in the ornamentation-chart and the *Avertissement* explaining *Agréments* in *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere et autres Instruments. Avec la Basse* (1715, *Œuvre IIb*) by Hotteterre.

In the following will the seven ornaments—*Tremblements, Ports-de-voix, Coulement, Accents, Doubles Cadences, Flattement, Battements*—be described according to explanations in *Principes* and *Rudiments* (Fig. 59) together with *Démonstration's* found in *Premier Livre de Pieces pour la Flûte-traversière Œuvre IIa Avertissement* (1708), *Nouvelle edition 1er Livre de Pieces Œuvre IIb Avertissement* (1715), and *Méthode pour la Musette* (*Œuvre X*, 1737). It should be noted that Hotteterre in his published compositions generally added ornamentation using the above shown signs (Ex. 9), and often included the nuances *Fort–Doux* (Fig. 59). The frequent markings of ornaments and nuances as found in the compositions by Hotteterre possible sheds light on that the potential buyer of these compositions were not mainly professional musicians, but music lovers needing some help and instruction. Therefore, are the *Avertissements* and explanations as found in *Principes*, *Rudiments*, the two editions of *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments Œuvre IIa* (1708) and especially *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715) to be understood as being of pedagogical character. The ornaments and nuances notated in the compositions by Hotteterre indicates for sure a common practice regarding were to add ornaments and nuances during the first decades of the 18th Century in France, which is an equally helpful tool for the Traverso-player of today as at the beginning of the 18th Century in France.

Year of publication	*Œuvre*	Title of the work	*Agréments*	Nuances *Fort – Doux*
1708	**IIa**	*1er Livre Pieces pour la Flute Traversiere*	**X**	**X**
1712	**III**	*1er Livre de Sonates en Trio*	**X**	**X**
1712	**IVa**	*Premiere Suitte de Pieces a deux Dessus*	**X**	**X**
1712	**IVb**	*Premiere Suitte de Pieces a deux Dessus*	**X**	**X**
1715	**V**	*Deuxieme Livres pour la Flute Traversiere*	**X**	**X**
1715	**IIb**	*Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere*	**X**	**X**
1717	**VI**	*Deuxieme Suitte de Pieces a deux Dessus*	**X**	**X**
1719	**VII**	*L'Art de Preluder*	**X**	**–**
1721	**No number**	*Sonates à deux dessus par le Sig Roberto Valentine*	**X**	**X**
***c.*1721**	**No number**	*Airs et Brunettes*	**X**	**–**
1722	**VIII**	*Troisieme Suitte de Pieces a deux Flutes traversieres seules*	**X**	**X**
1722	**No number**	*Pieces par Accord pour la Muzette a deux Chalumeaux*	**X**	**–**
1723	**No number**	*Sonates a deux dessus par le Sig Torelio Francesco, recueillies et accomodées au gout de la flute traversière par M. Hotteterre, le Romn.*	**X**	**–**
1737	**X**	*Méthode pour la Musette. Contenant des Principes, par le moyen desquels on peut apprendre à joüer de cet Instrument de soy-même au défaut de Maître*	**X**	**–**

Figure 59 List of identified composition by Hotteterre showing that all have marked suggested ornamentations, and a majority has indications of the nuances *Fort* and *Doux*.

Cadences ou Tremblements—Cadences or Shakes

Pour faire concevoir ce que c'est que Cadence à ceux qui n'en auroient aucune idée, on peut la définir, une agitation de deux sons éloignez d'un Ton ou d'un demi-Ton l'un de l'autre, & battus plusieurs fois de suite. On la commence par le Son superieur, on la finit par l'inferieur, & on ne luy donne que la prémiere articulation: C'est le Doigt qui l'a continuë. (IV: 11)	[…] some shou'd not known what a Shake is I'll give them a definition of it, (Viz) Tis an agitation or mixture of two sounds together, distant from each other but the space of a Tone or Semitone, and several times beat upon after you begin with the Superior Note, and end with the lower and you give it but the first articulation, 'tis the finger continues it. (IV: 7-8)
1°. La liaison qui embrasse les deux Notes de Musique,  faite de la maniere que l'on voit icy marque qu'il ne faut donner qu'un coup de langue pour les deux Notes. Il se donne sur la prémiere qui ne sert que de préparation ou de port-de-voix à la Cadence, & l'on continuë le même vent, sans reprendre haleine jusqu'à la fin de la Cadence; ce que j'ay déjà expliqué ailleurs. La petite Croix qui est au dessus signifie que c'est sur cette Note qu'il faut trembler. (VI: 17)	First the little curve line over, or under ye heads of two, or more Notes, commonly call'd a Slur, and markt as you see in this Example on ye right hand;  Signifies, that you must only tip the first of them with your tongue, which here serves only as a preparation, (or what in French is call'd a Port de voix) to the Cadence, or Shake, and you are to continue ye same wind, without drawing your breath, to the end of the Cadence, or Shake, as I have already shew'd you, the little cross above the 2d. Note shews that 'tis on this Note you must Shake, the Slur which joyns two dotts in the Tablature, shews from which hole you take the Shake, and on which it ends. (VI: 12)

Port-de-voix

Le Port-de-voix est un coup de Langue anticipé d'un degré, au dessous de la Note sur laquelle on le veut faire. (VIII: 28)



The Port-de-voix is a tipping with the Tongue, anticipated by one Note below the Note on which we design to make it. (VIII: 21)



A l'égard du Port-de voix, on en trouvera des Exemples aux pages 4. 5. 18. 36 &c. je l'ay marqué par cette figure (**V**) ainsi qu'on le pratique dans la Musique vocale, j'ajoûteray qu'il doit être presque toûjours accompagné du Battement.
(1708, *Œuvre IIa*, *Avertissement*))

Regarding Port de voix, examples will be found on pages 4. 5. 18. 36 &c. I have marked it with this figure (**V**) *as it is done in vocal music, I will add that it must almost always be accompanied by a Battement.*
(1708, *Œuvre IIa*, *Avertissement*)

A l'égard du port de voix, je l'ay marqué presque dans tous les endroits où il se doit faire; j'adjoûteray qu'il doit etre presque toujours accompagné d'un battement.
(1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

Regarding the port de voix, I have marked it almost in all the places where it should be done; I would add that it must almost always be accompanied by a battement.
(1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

Le Port-de-voix est un agrément qui se fait en montant d'une Note à une autre par degrez conjoints il est presque toûjours accompagné d'un Battement. On le désigne par cette marque **V**, comme on l'a déja observé, ou bien par une petite Note, & un coulé qui le lie avec la Note suivante.
(1737, *Œuvre X*, Ch. XV: 58)

The Port-the-voix is an ornament which is done by rising from one note to another by joint degrees it is almost always accompanied by a Beat. It is designated by this mark **V**, *as we have already observed, or else by a small Note, and a slur which links it with the following Note.*
(1737, *Œuvre X*, Ch. XV: 58)



Port-de-voix, its notation, sign, and realization (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*).



Port-de-voix followed by a *Battement* as suggested in the *Avertissements* of *Œuvre IIa* (1708) and *Œuvre IIb* (1715), and *Œuvre X*, Ch. XV: 58 (1737)

Le Coulement—The Slide

Le Coulement est pris un degré au dessus, & ne se pratique guere que dans les intervales de Tierces en descendant.
(VIII: 28)



[…] the Slide is taken a Note above, and is never practisd but in descending to a third. (VIII: 21)



Que l'on doit faire un coulement presque dans tous les Intervalles de tierce en descendent […]
(1708, *Œuvre IIa*, *Avertissement*)

That one must make a Slide in almost in all the Intervals of thirds in descending […] (1708, *Œuvre IIa*, *Avertissement*)

Que l'on doit faire un coulement presque dans tous les intervalles de tierce en descendents; voyés-en la demonstration cy dessus. (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

That one must make a Slide almost in all the Intervals of thirds in descending; see the example […] (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)



Le Coulement – *The Slide*, its notation, sign, and realization (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

L'Accent—The Accent

L'Accent est un son que l'on emprunte sur l'extremité de quelques Tons, pour leur donner plus d'expression. (VIII: 29) 	The Accent is a Sound borrowed from the end of some Note to give them a greater expression. (VIII: 21) 
On ne peut queres determiner tous les endroits où l'accent se doit placer; on le fait ordinairement sur l'extremité d'une Noire pointée, lorsqu'elle est suivi d'une Croche sur le même degré, j'entends dans les Mesures où les Croches sont inégales; Dans les autres Mesures il faudra proceder par rapport à celles-cy. On le fait encore sur certaines Notes longues, mais il en faut user rarement. Lorsqu'on trouvera deux Notes l'une sur l'autre, on choisira celle qu'on voudra. (1708, *Œuvre IIa*, *Avertissement*)	*It is impossible to determine all the places where the Accent should be placed; it is usually done on the end of a dotted quarter note, when it is followed by an eighth note on the same degree, I mean in bars where the eighth notes are unequal; In the other Measures it will be necessary to proceed by comparison with these. It is still done on certain long Notes, but it should be used rarely. When you find two Notes on top of each other, choose the one you want.* (1708, *Œuvre IIa*, *Avertissement*)
On ne peut queres determiner tous les endroits où l'accent se doit placer; on le fait ordinairement sur l'extremité d'une note pointée, lorsqu'elle est suivi d'une croche sur le même degré, j'entens dans les mesures où les croches sont inegales. (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)	*It is impossible to determine all the places where the Accent should be placed; it is usually done on the extremity of a dotted note, when it is followed by an eighth note on the same degree, I mean in measures where the eighth notes are unequal.* (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)
 *L'Accent – The Accent*, its notation, sign, and realization (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)	

La double Cadence—The double Cadence

La double Cadence est un tremblement ordinaire, suivi de deux Doubles Croches, coulées ou articulées. (VIII: 29) 	The double Cadence is an ordinary Shake follow'd by two Semiquavers Slur'd or tipt. (VIII: 21) 
Que l'on fait souvent une double Cadence, lorsquu'aprés les Tremblements on monte d'un degré; on en trouvera des Exemples, page 2. & 3. &. (1708, *Œuvre IIa*, *Avertissement*)	*That we often make a double Cadence, when after the Cadences or Shakes we go up a degree; examples will be found on page 2. & 3. &.* (1708, *Œuvre IIa*, *Avertissement*)
Que l'on fait une double cadence lorsqu'aprés les tremblements on monte d'un degré. (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)	*That we make a double Cadence when after the tremors we go up a degree.* (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)
 *La double Cadence – The double Cadence,* its notation, sign, and realization (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)	

Le Flattement ou Tremblement Mineur—The softening, or lesser shakes

Le Flattement ou Tremblement Mineur, se fait presque comme le tremblement ordinaire: Il y a cette difference, que l'on releve toûjours le Doigt en le finissant; excepté sur le *Ré*; De plus on le fait sur des trous plus éloignez, & quelques-uns sur le bord ou l'extremité des trous; Il participe d'un son inferieur ce qui est le contraire du tremblent. (IX: 30)

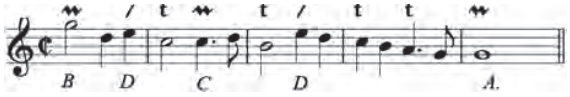
Ces agréments ne se trouvent pas marquez dans toutes les pieces de Musique, & ne le sont ordinairement que dans celles que les Maîtres écrivent pour leurs Ecoliers; voicy de quelle maniere.



Au reste il seroit difficile d'enseigner à connoître précisement tous les endroits où l'on doit les placer en joüant; ce que l'on peut dire la dessus en général, c'est que les Flatements se font frequemment sur les Notes Longues: comme sur les Rondes *A*, sur les Blanches *B*, sur les Noires pointées, *C*, & c. […] (IX: 33)

The softening, or lesser shake, is made almost like the usual shake, there is this difference, that you always end with the finger off, except on **D-la-sol-re**, for the most part they are made on holes more distant, and some on the edge, or half the hole only, it participates of a lower Sound, which is contrary to the Shake. (IX: 22)

These Graces are not commonly set down in all pieces of Musick, but in such only as Masters write for their Scholars, as in the following example.



Yet 'twou'd be hard to teach a method of knowing exactly all the Notes whereon the Graces are to be play'd, what can be said in general thereupon, is, that the softenings are frequently made on long Notes, as on Semibriefs, *A*, on Minums, *B*, and on pointed Crotchets, *C* &c. […] (IX: 24)

On observe qu'il faut faire des flattements presque sure toutes les Notes longues, & qu'il les faut faire aussi bien que les tremblements & battements, plus lent ou plus précipités, selon le mouvement & le caractere des Pieces.
(1708, *Œuvre IIa*, *Avertissement*), (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

It is observed that Flattements should be done almost on all long Notes, & that they should be done (as well as Cadences or Shakes & Beats) slower or more hasty, according to the movement & character of the Pieces. (1708, *Œuvre IIa*, *Avertissement*), (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

It should be noted Hotteterre systematically did indicate suggestions where to add *Flattement* in all the music examples as found in the *Second Partie de la Methode pour la Musette Œuvre X* (1737). These indications perfectly well confirm *Principes* (1707), *Rudiments* (1729), *1er Livre Pieces pour la Flute Traversiere Œuvre IIa* (1708), and *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715).

Le Battement—The Beat

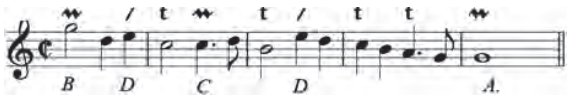
Le Battement se fait en frappant une ou deux fois de suite, & le plus vite qu'on peut sur le trou toûjours plein, ou tout bouché, & le plus proche du ton où l'on veut le faire. On doit encore relever le Doigt en finissant le Battement, excepté sur le *Ré*, comme je l'expliqueray cy-après; Il participe aussi d'un son inferieur. (IX: 30)

Les Battements se font plus ordinairement sur les Notes Breves: comme sur les Noires simples *D*, dans les mouvements legers; & sur les Croches, dans les Mesures où elles se passent également. (IX: 33)



The Beat is the hitting once or twice as quick as we can, full on the hole, and as near the Note we beat upon as possible, we ought also to end a Beat with the finger off, except on **D**, as I shall shew hereafter, it also partakes of a lower Tone. (IX: 22)

[…] the Beats are made more commonly on the short Notes, as on Crotchets *D* in light movements, and on Quavers, in movements where they pass equally […] (IX: 24)



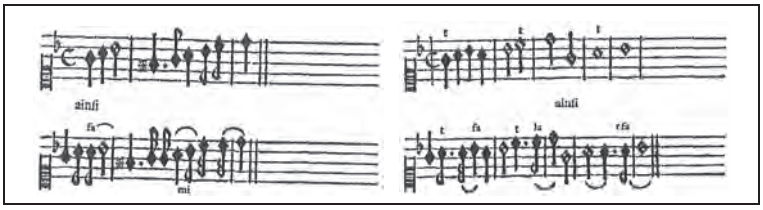
A l'égard des Battements, on doit en être instruit presqu'entierement, par ce que nous venons de voir, puisqu'ils font partie de Port-de voix. Leur différence consiste, en ce que l'on fait entendre d'abord le son de la Note, puis le Battement; mais si précipitamment que ces deux opérations se confondent ensemble, & n'en font qu'une. (1737, *Œuvre X*, Ch. XV: 61)

With regard to the Battements, we must be informed of them almost entirely, by what we have just seen, since they are part of Port-de-voix. Their difference consists in that the sound of the Note is heard first, then the Battement; but so precipitately that these two operations merge together and become one. (1737, *Œuvre* X, Ch. XV: 61)



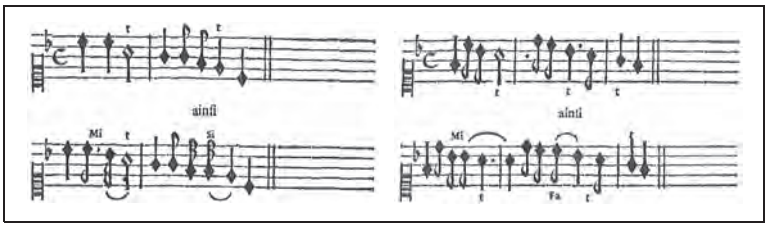
Le Battement—The Beat, its notation, sign, and realization (1715, *Nouvelle edition Œuvre IIb*, *Avertissement*)

Hotteterre's explanations regarding the meaning of the signs for *Coulement*, *Accents, Port-de-voix double*, *Demi Cadence appuiée*, *Tour de gosier*, *Double Cadence, Double Cadence coupée*, *Battement*, *Tour de chant*, and *Port-de-voix* is easily understood, still some questions may occur. One question regards where to place the *Port-de-voix*, in short before or on the beat. In *Méthode Claire Certaine et Facile Pour apprendre à chanter la Musique* (*c.*1710) by Rousseau are guidelines explaining where to place a *Port-de-voix*. Regarding the examples given by Rousseau the *Port-de-voix* is played before the beat, together with a rhythmical variation regarding the length of the grace note (Ex. 10).



Example 10 *Port-de-voix* and its realisation showing that the grace note is placed before the beat, including rhythmical variations regarding the length of the grace note. (Rousseau, *c.*1710, 50-51)

A similar practice is shown regarding where to place the grace note before trills (Ex. 11).



Example 11 The realisation showing where to place the grace note before a trill and that it is placed before the beat, including rhythmical variations regarding the length of the grace note. (Rousseau, *c.*1710, 55-56)

Explanations regarding ornamentation, as described by Hotteterre in *Principes*, *Rudiments*, *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments. Avec la Basse* (1708, *Œuvre IIa*; 1715, *Œuvre IIb*), and *Méthode pour la Musette* (*Œuvre X*, 1737) are instructive examples of French aesthetics of performance in the first decades of the 18th Century. It is well-known that the two dominant European musical styles during the first decades of the 18th Century were the French and Italian styles. In this context it is interesting to see how Quantz discussed ornamentation in *Versuch einer Anweisung die Flute Traversiere zu spielen* (1752) when comparing French and Italian aesthetics regarding ornamentation in section *XIV Von der Art des Adagio zu spielen*:

XIV: 2. §

Man kann das Adagio, in Ansehung der Art dasselbe zu spielen, und wie es nöthig ist, mit Manieren auszuzieren, auf zweyerley Art betrachten: entweder im französischen oder im italienischen Geschmack. Die erste Art erfordert einen netten und an einander hangenden Vortrag des Gesanges, und eine Auszierung desselben mit dem wesentlichen Manieren, als Vorschlägen, ganzen und halben Trillern, mordanten, Doppelschlägen, battemens, flattemens, u. d. gl.; sonst aber keine weitläuftigen Passagien, oder großen Zusatz willkührlicher Verzierungen. […] Die zweite, nämlich die italienische Art besteht darinne, daß man in einem Adagio, so wohl diese kleinen französischen Auszierungen, als auch weitläufige, doch mit der Harmonie übereinkommende gekünstelte Manieren anzubringen suchet. […][1]

XIV: 3. §

Die französische Art das Adagio auszuzieren, kann man durch gute Anweisung ohne die Harmonie zu verstehen, erlernen. Zur italienischen hingegen wird die Wissenschaft der Harmonie unumgänglich erfordert […] (Quantz, 1752, 136-137)[2]

1. The Adagio may be viewed in two ways with respect to the manner in which it should be played and embellished; that is, it may be viewed in accordance with the French or Italian style. The first requires a clean and sustained execution of the air, and embellishments with the essential graces, such as appoggiaturas, whole and half shakes, mordents, turns, battemens, flattemens, &c., but no extensive passage-work or significant additions of extempore embellishments. […] In the second manner, that is, the Italian, extensive artificial graces that accord with the harmony are introduced in the Adagio in addition to the little French embellishments. […] (Quantz, 1752/1985, 162; Trans. Reilly)

2. With good instruction the French manner of embellishing the Adagio may be learned without understanding harmony. For the Italian manner, on the other hand, knowledge of harmony is indispensable […] (Quantz, 1752/1985, 163; Trans. Reilly)

In the quotes above Quantz described differences between French and Italian styles of ornamentation as understood around the middle of the 18th Century in a retrospective perspective, which, of course, are to be understood as general. Having Quantz as the reference it seems to be clear that what Hotteterre suggested and explained regarding ornamentation corresponds to what Quantz explained concerning French codified signs for ornamentation. But the question is if the codified ornaments when performing French music from the first decades of the 18th Century really is enough as Quantz suggested, possible two elements should be considered:

> a) The codified ornaments as described in *Principes*, *Rudiments*, *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments* (1708, *Œuvre IIa*; 1715, *Nouvelle edition Œuvre IIb*), and *Méthode pour la Musette* (*Œuvre X*, 1737) in relation to the *Doubles* in *Airs et Brunettes* (*c.*1721).
> b) The combination of codified ornaments with the elaborated ornamentation as found in *Airs et Brunettes* (*c.*1721) and its richly ornamented *Doubles*, and *L'Art de Preluder* (1719).

An example of a richly ornamented *Brunette* and its *Doubles* is the anonymous well-known *L'autre jour ma Cloris* (its song text is shown in Appendix XIX). In this example—originally for two Traversi—is the melody and its *Doubles* shown over each other as in a score with the suggested free ornamentation by Hotteterre in three layers over each other to illustrate how elaborated the free ornamentation is compared with the theme of the *L'autre jour ma Cloris* (*c.*1721). As can be seen does some measures contain "too much time" in relation to what a bar in ***2*** meter allows, which are supreme examples that these notes should be played freely because they are to be understood as ornamentation (Ex. 12):

L'autre jour ma Cloris





Example 12 The *Theme* of the *Brunette L'autre jour ma Cloris,* the second line show *Double 1*, and the third line show *Double 2* with the elaborated free ornamentation suggested by Hotteterre (*c.*1721).

In *Double I* by Hotteterre and the bars 11 and 19 are examples of an elaborated ornamental style which goes beyond the French codified ornamentation such as *Le Coulement, Accent, Port-de-Voix double, Demi Cadence appuiée, Tour de Gosier, Double Cadence coupée, Double Cadence, Battement, Tour de Chant, Port-de-voix*. The ornamental style in these bars have affinity to early 18th Century editions of slow movements as found in for example the *Violin Sonatas* Opus V (1700) by Arcangelo Corelli (1653-1713).

*

One more source of importance regarding ornamentation is the above mentioned and discussed *L'Art de Preluder Œuvre VII* (1719) in which Hotteterre only marked *Tremblement* and *Port-de-voix* using codified signs, although very frequently and generally in all *Preludes* and *Traits*. The remaining signs—*Le Coulement, Accent, Port-de-Voix double, Demi Cadence appuiée, Tour de Gosier, Double Cadence coupée, Double Cadence, Battement, Tour de Chant*—as explained in *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments Nouvelle edition Œuvre IIb* (1715) are not shown with their signs, but in their written-out form. Considered that the method regarding how to improvise a *Prelude* as explained by Hotteterre, is to use a simple triad, a diatonic scale, or a scale in thirds like a canvas then filling out intervals, adding passages, and using for example the codified French ornaments. When examining the *Preludes* searching for mentioned elements and their canvases, the remaining passages and figurations can be understood as examples of a freer style of making ornaments which resembles the style of free ornamentation in the *Doubles* as found in *Airs et Brunettes* (*c.*1721).

*

When following Quantz' idea that when learning how to make and apply the ornamentation within the French style this can all be learnt by good teaching, it should be remembered that Hotteterre stressed that it is difficult to make rules on where to apply the ornaments, and that only practice can develop such skills while initially playing pieces whereby the ornaments are marked, and gradually through experience independently apply appropriate ornaments:

On ne peut guere donner de Regles plus certaines de la distribution de ces agréments, c'est le goût & la pratique, qui peuvent apprendre à s'en servir à propos, plûtôt que la Theorie. Ce que je puis conseiller; c'est de joüer pendant quelque temps sur des Pieces ou tous les agréments soient marquez, afin de s'accoûtumer peu à peu à les faire sur les Notes où ils réüssissent le mieux. (IX: 33-34)	[…] we can give no certainer Rules for placing these Graces; 'tis the Ear, and practice which must teach you to use them in proper time, rather than Theory, what I wou'd advise you to, is to play for some time such pieces of Musick only, as have the Graces markt, thereby to accustome yourself by little, and little, to use them to such Notes as they agree best with. (IX: 24)

An important source indicating examples *where* to make *Flattement* and *Softening* is found in the *Suittes* for two *Flûtes-Traversieres seulles*, and *Suittes* for *Dessus et Basse Pour les Hautbois, Flûtes, Violons, etc.* (1718, Ex. 13, 14) by Pierre Danican Philidor (1681-1731):



Example 13 *Prelude* from *Douxiéme Suitte* for *Dessus et Basse Pour les Hautbois, Flûtes, Violons, etc.* by Philidor (1718, 76).



Example 14 *Gayment* from *Septiéme Suitte* for two *Flûtes-Traversieres seulles* by Philidor (1718, 49).

In these pieces by Philidor are longer notes marked with the sign  being similar to how Hotteterre marked *Flattement* in *Principes*:  . These signs used by Hotteterre and Philidor are comparable to how the composer and Viole-virtuoso Marin Marais (1656-1728) notated *Flatement* or *Pincé*  , and *Plainte*  in the *Avertissement* to *Pieces a une et deux Violes* (1686). Marais' both techniques of expression could be described as two different kinds of vibrato in today's terminology. The *Flatement* or *Pincé* is equivalent to Hotteterre's *Flattement* being a microtonal deviation downwards from the note in question. Whereas the *Plainte* seems to have been similar to the *Close shake* described by Geminiani (1751), and *Du Tremolo ou Tremblement en François* described by Tartini (1771) which resembles a vibrato oscillating up and down around the note in question.

In this context and from a pedagogical point of view is *Premiere Suitte de Pieces a deux Dessus, sans Basse Continue Œuvre IV* (1712) by Hotteterre of great interest because its first edition does include rather few suggestions regarding ornamentation (Ex. 15a), whereas its second edition (Ex. 15b)—also published in 1712—includes a vast variety of French codified signs for ornamentation. The impression given is that the second edition of 1712 used the same copperplates as the first edition, and simply added the frequent ornamentation signs. The reason for publishing the second edition seems to fulfil a pedagogical purpose for the Traverso-playing *Mélomane* and music-lover, needing these suggestions and examples where to add which ornament. In this context is *Zwölf Methodische Sonaten für Querflöte (Violine) und Basso Continuo* by Georg Philipp Telemann (1728 & 1732) of interest because in these sonatas has Telemann given vast examples on how to embellish especially slow movements in a manner that could be associated with how Hotteterre embellished the second edition of *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments Nouvelle edition Œuvre IIb* (1715).



Example 15a Beginning of the first movement *Gravement* in *Premiere Suitte de Pieces a deux Dessus, sans Basse Continue Œuvre IVa* (1712) in the first edition which show no ornaments apart from four *Tremblements* in the first part in the bars 6, 12, 13 and 17.



Example 15b The beginning of the first movement *Gravement* in *Premiere Suitte de Pieces a deux Dessus, sans Basse Continue Œuvre IVb* (1712) in the second edition published in 1712, which show the ornaments *Battement*, *Port-de-Voix*, *Le Coulement*, *Tremblements*, and *Double Cadence coupée*. The first part has altogether 24 suggested ornaments within the first 17 bars.

Conclusions regarding ornamentation

- Hotteterre's explanations and suggestions regarding ornamentation in *Principes*, *Premier Livre de Pieces Pour la Flûte-traversière, et autres Instruments* (*Œuvre IIa*, 1708), *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715), *L'Art de Preluder Œuvre VII* (1719), and *Méthode pour la Musette* (*Œuvre X*, 1737) are when combined with *L'Art de Preluder Œuvre VII* (1719) and *Airs et Brunettes* (*c.*1721) important documents representing detailed explanations of a French performance style and its ornamentations during the first decades of the 18th Century. And especially so in *L'Art de Preluder Œuvre VII* (1719), and *Airs et Brunettes* (*c.*1721) because in these sources are many examples of a freer style of ornamentation going beyond the French codified signs of the standard ornaments *Tremblement*, *Port-de-voix, Le Coulement, Accent, Port-de-Voix double, Demi Cadence appuiée, Tour de Gosier, Double Cadence coupée, Double Cadence, Battement, Tour de Chant*— as explained in *Principes*, *Rudiments* and *Œuvre IIb* (1715).
- The manner the *Doubles* as found in *Airs et Brunettes* (*c.*1721) and the discussed example *L'autre jour ma Cloris* are ornamented by Hotteterre point on that a blend of French codified ornaments together with Italian styled freer ornaments is important when playing French music from the first decades of the 18th Century, and perhaps sometimes being overlooked. It should be noted that the notation regarding the subdivision of the beat in *L'autre jour ma Cloris* its *Doubles* often don't correspond to the exact amount "time" given within the meter as notated according to today's praxis and represents too much "time" in several bars. This could be interpreted that the Traverso-playing *Mélomane* and music-lover of the early 18th Century through this notation was shown and given examples of ornaments beyond French codified signs having a pedagogical purpose. These ornaments include a certain freedom regarding rubato and agogics, still should the pulsation of the beat generally be respected, and the ornaments has the pulsation of the beats as its stabilizing framework.
- According to Quantz (1752), the Italian style of ornamentation was considerably freer compared with French style and therefore needing a deeper knowledge of harmony and Basso continuo because it included more elaborated ornaments and figurations, than compared with typical French styled music like above mentioned compositions by Hotteterre. To this should be added that Hotteterre's *L'Art de Preluder* (1719) and *Airs et Brunettes* (*c.*1721) are important sources contribution to the development of a rich ornamental style in the early French 18th Century and to some extent is contradicting Quantz (1752). Further it should be noted that Hotteterre show clear influences and familiarity with Italian music in *L'Art de Preluder* with quite some examples taken from the *Trio Sonatas* Opus III (1689) and *Violin Sonatas* Opus V (1700) by Corelli.
- Finally, Hotteterre had a two-year sojourn in Rome the years 1698-1700 (Hilsheimer, 2008b) and since then added *Le Romain* to his published works, which definitely points in a direction of affection for Italian music, and thus for a freer elaborate style of ornamentation.



6.8 *Accomodées au gout de la flute traversière*: Transcribing violin music to the Traverso

Regarding the gradual development towards a flamboyant virtuosity on the Traverso the violin and violin virtuosi has played an important role. Early examples are found in *Principes* with de recommendation to study *Suites en Duo et en Trio pour les flûtes et pour les violons* (1707) by Gaultier de Marseille and transcribe the violin parts for the Traverso. Such a gradual process towards violinistic idioms and virtuosity with Italian influences from composers such as Albinoni, Corelli, and Vivaldi stand in contrast to earlier aesthetics and ideals expressed by above-mentioned Abbé Carbasus (1739), praising the sober aesthetics of Michel de La Barre and his style of Traverso-playing. In *Methode pour apprendre aisement à joüer de la Flute Traversiere* (1735 & 1773, 50) by Corrette, and *Chapitre* XV *Des Accords en batterie que l'on peut faire sur la Flute et la manière de joüer les tons bas des Sonates de Violon sur cet Instrument* are suggestions how to transcribe violin-writing for the Traverso regarding the violins double-stops, and notes played on the G-string below the range of the Traverso:

Quoi que l'on ne puisse pas faire des accords sur la Flute, cependant on peut les faire entendre en joüant les notes d'un accord les unes après les autres A.[1]



Cela est très utile quand on veut joüer des Sonates et des Concerto de Violon ou il se trouve souvent des Arpegio. Pour lors on peut Arpeger selon l'Example cy dessus quand les notes ne descendent pas au dessous de ré d'embas de la Clef de Sol, qui est le dernier ton de la Flute traversiere, et les notes au dessous de la portée de la flute B, se peuvent transposer a l'Octave au dessus, C, D[2]

Autres exemples tirées du V[e] Œuvre de Corelli, Edition d'Hol. Ou d'Angleterre. Les petites notes marquent les notes que la flute doit joüer à l'Octave au dessus de celles qui sont pour la 4 corde du Violon.[3]



L'ut# d'embas, se peut faire en bouchant tous les trous, comme pour le ré d'embas, et en tournante l'embouchure de la flute en dedans.[4]

In an anonymous transcription of *I[ere.] Partie du Cinquième Œuvre de Corelli, Ajustée à la Flûte Traversiere avec la Basse* (*c.*1740/1996) of the first five Sonatas for Violin and Basso continuo Opus V (1700) by Arcangelo Corelli (1653-1713) show a method for transcribing violin works for the Traverso. In the example below are keys like C-major and F-major transposed to D-major and G-major which are comfortable keys on the Traverso (Fig. 60). Passages still below the range of the Traverso, double-stops, and arpeggios are then easily adopted for the Traverso with help of the method suggested by Corrette (1735 & 1773).

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1. Although chords cannot be made on the Flute, they can be made by playing the notes of a chord one after the other A. Corrette, *Méthode pour apprendre aisément à jour de la Flûte Traversière*, 1735 & 1773, 50)

2 This is very useful when you want to play Sonatas and Violin Concertos where there are often Arpeggios. For then we can make Arpeggios according to the Example above when the notes do not descend below D of the base of the Treble-clef, which is the lowest note of the Flute, and the notes below the staff of the flute B, can be transposed an octave above, C, D Other examples taken from the Fifth Work of Corelli, Edition of Holland or from England. Corrette, 1735 & 1773, 50)

3. The small notes mark the notes that the flute must play an Octave above those which are for the 4th string of the Violin. Corrette, 1735 & 1773, 50)

4. The low C#[1] can be made by closing all the tone-holes, as for the low D[1] and by turning the embouchure of the flute inwards. (Corrette, 1735 & 1773, 50)

Sonatas for Violin and Basso continuo Opus V (1700) by Arcangelo Corelli	
Original keys for Violin 1700	Transcriptions for Traverso *c.*1740
Sonata I D-major	Sonata I D-major
Sonata II B♭-major	Sonata II B♭-major
Sonata III C-major	Sonata III D-major
Sonata IV F-major	Sonata IV G-major
Sonata V g-minor	Sonata V g-minor

Figure 60 Comparison between the original keys for the Violin and the transcriptions for Traverso (*c.*1740) of the first five Sonatas from Opus V (1700) by Corelli.

Other examples of suggestions regarding how to adopt violin-writing to the Traverso is found in the *Preface* to *Piéces de Clavecin en Concerts* (1741) by Rameau:

AVIS POUR LA FLUTE substituée au Violon.

Si l'on trouve des accords, il faut y choisir la Note qui forme le plus beau chant, & qui est ordinairement la plus haute.

A l'égard des Notes qui passent l'éntenduë de bas de la Flute, j'ai été obligé d'employer differens signes pour y suppléer, sans brouiller la Musique.

Un 8. par exemple, marque qu'il faut porter à une *Octave* plus haut tout ce qui se trouve depuis ce 8. jusqu'à la lettre *u*, qui signifie *unisson*.

Dans un passage rapide de plusieurs Notes, il suffit de substituer à celles qui descendent trop bas des voisines qui soient dans la même harmonie, ou d'y répéter celles qu'on juge à propos ; excepté qu'on ne trouve en pareil cas, des petites têtes de notes au milieu des queuës, à peu près comme des points, qui indiqueront justement celles qui conviennent à la Flute. Ce signe // marque qu'il faut commencer qu'à la Note qui lui répond.[1]



One of the celebrated Traverso virtuosos of the 18th Century was Michel Blavet (1700-1768), whose compositions have examples of how virtuosic violin writing and passages are reworked for the Traverso. Blavet was considered one of the most outstanding soloists in Parisian musical life, and his compositions represent Traverso compositions clearly inspired by violin writing. In the *Sonates Œuvre II* (1732) and *Œuvre III* (1740) for Traverso and Basse, and especially in the *Concerto* in a-minor (*c.*1740, Gronefeld, 1992; Ex. 16) are virtuosic passages with influences from Corelli, Vivaldi and writing for the violin.



Example 16 Passages from the Traverso solo part from the first movement *Allegro* in the *Concerto* (*c.*1740) by Blavet.

With help of the above shown 18th Century methods for transcribing violin-writing for the Traverso it would be easy to transcribe a *Trio Sonata* for two Violins and Basso continuo in the style of the first part of the 18th Century by for example Albinoni or Corelli for the Traverso. The inspiration drawn from the virtuosity of the violin altogether did in a profound way influence powers of expressions, aesthetics, playing-techniques which gradually included and influenced making of flutes, and stepwise expanded aspects of flautistic expressions and aesthetics via the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* to the Boehm-flute.

1. *NOTICE FOR THE FLUTE substituted for the Violin*. If we find chords, we must choose the Note which forms the most beautiful song, and which is usually the highest. Regarding the Notes which pass the lower range of the Flute, I have been obliged to employ different signs to supplement them, without confusing the Music. An 8. for example, marks that everything from this 8. to the letter *u*, which means unison, must be played one *Octave* up. In a rapid passage of several Notes, it suffices to substitute for those which descend too low neighbouring ones which are in the same harmony, or to repeat there those which one judges appropriate; except that in such cases we do not find small note heads in the middle of the tails, like dots, which will precisely indicate those which are suitable for the flute. This sign // indicates that it is necessary to begin only at the Note were it is marked. (Rameau, *Piéces de Clavecin en Concerts, Preface*, 1741)

6.9 Aesthetics and expression: *Translation—Interpretation*

Clair-obscure est la science de placer les jours & les ombres[1]

Dufresnoy (1673, Xxii)

A musical instrument and its repertoire include in a symbiosis its playing-techniques based on the inherent possibilities and impossibilities due to the construction of the instrument in question, together with aesthetics regarding musical character and expression. The repertoire directly connected to the Traverso at the end of the 17th Century and the first decades of the 18th Century in France is music by Lully, Marais, Gaultier de Marseille, Campra, François Couperin, Montéclair, Dornel, and pieces written by Traverso-players such as La Barre and Hotteterre. In this context is *Chansons et Brunettes* (*c.*1721) by Hotteterre a good example on how Traverso playing, and singing are united into a method for the development of expression and phrasing, including timbre and nuances derived from the content of the texts to the songs transcribed for the Traverso. The main character of what the Traverso was supposed to express in this repertoire is not an explicit virtuosic style—as found in somewhat later works like the *Concerto* in a-minor by Michel Blavet (1700-1768), or the *Concertos* by Pierre-Gabriel Buffardin (*c.*1690-1749)—but rather a singing expressive style. In addition, the singing voice was in the 17th Century considered as the supreme model for aesthetics regarding instrumental playing. The essence of what could be extracted from *Principes* and *L'Art de Preluder* (1719) seems to correlate well with somewhat later sources such as D'Aquin de Chateau-Lyon (1752) when describing that the main character of the Traverso in a retrospective perspective when speaking to the heart of the listener while being singing, touching the soul of the listener creating poetic expressions:

> Elle [the Traverso] a aujourd'hui ses Illustres, qui l'ont mis, si vous voulez, dans toute sa perfection; c'est-à-dire, qu'on exécute les choses les plus difficiles & les moins chantantes, sur un instrument qui n'est fait pourtant que pour toucher l'ame & pour nous attendrir. Je peux me tromper, mais je crois qu'un beau chant, & moins de vitesse & de batteries, sont plus de l'essence de la Flûte […] (1752, 147)[2]

It seems that aesthetics of the Traverso in the late 17th and early 18th Century in France was not at all connected with a dramatic character, nor a virtuosic style in the sense of Italianised virtuosity being important just some decades later in France. When searching for an understanding in these areas regarding sources like *Principes* and *Rudiments* and their epoch with other publications by Hotteterre such as the *Avertissement* to *Pieces pour la Flute Traversiere Œuvre IIa* (first edition, 1708, *Œuvre IIb* second edition, 1715), *L'Art de Preluder Œuvre VII* (1719), together with inherent possibilities of the Traverso itself is of essential importance. In the following will mentioned sources be discussed starting with how playing-techniques are described in *Principes* and *Rudiments*, followed by how words of expression and tempo are suggested in *Pieces pour la Flute Traversiere Œuvre IIa* (1708) and *IIb* (1715) and *L'Art de Preluder Œuvre VII* (1719).

It should be noted that the French repertoire for the Traverso around 1700 and the first decades of the 18th Century did not explicitly highlight virtuosity but was instead directed towards an expressive tone development and melodic playing. The highly advanced virtuosity of the Traverso was developed around the middle of the 18th Century. Typical examples are found in the output of earlier mentioned Pierre-Gabriel Buffardin and his *Concerto* for Traverso in e-minor, and especially so in a *Concerto* in f-minor attributed to Buffardin. The latter is an example of extraordinary virtuosity, but it seems that authors like Bollioud de Mermet (1746) and D'Aquin de Chateau-Lyon (1752) were favouring an earlier aesthetics regarding the Traverso highlighting melodic playing, sound qualities and expression as found in the works by La Barre, Gaultier de Marseille and Hotteterre. Reasons for this interest in tonal flexibility could possibly have been that the Traverso in a sense is a far more supple instrument regarding tonal flexibility when compared with the Recorder, due to that the Traverso-player directly shapes the airstream with the embouchure. When comparing virtuosity as developed in Italy during the first decades of the 18th Century in the style of *Batteries & des Roulades* in concertos for the Recorder such as the *Concerto* in c-minor (*c.*1730, RV 441) compared with the concertos for Traverso such as *La Tempesta di Mare*, *La Notte* and *Il Gardellino* (*c.*1727, Opus X: 1-3) by Vivaldi it is clear that writing for the Recorder in this period were far more virtuosic.

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1. *Clair-obscure* is the science of placing days and shadows […] (Charles-Alphonse Dufresnoy ; 1611-1668; *L'Art de Peinture*, Seconde édition. 1673, Xxii)

2 [the Traverso] today has its Illustrious, who have put it, if you like, in all its perfection; that is to say, they perform the most difficult and least singing things, on an instrument which is mainly made to touch the soul and to soften. I could be wrong, but I believe that a beautiful song, & less *vitesse & de batteries*, are more of the essence of the Flute […] (D'Aquin de Chateau-Lyon, *Lettres sur les hommes celebres, dans les sciences, la literature & les beaux arts, sous le regne e Louis XV*. 1752, 147)

6.9.1 Aesthetics and playing-techniques

Possibly is one of the main reasons why the Traverso from the end of the 17th Century and onwards gradually marginalized the Recorder caused by that the Traverso relatively easily can make differences regarding timbre and dynamic as suggested above. Considered that *Principes* and *Rudiments* not really are methods but rather manuals for self-studies with detailed explanations regarding fingerings, intonation, articulation, and basic ornamentation, a discussion on how to make different nuances and changes of timbre would possibly have gone beyond such a frame. It should be noted that no explicit comment on nuances or *Sons filés* are to be found in *Principes* and *Rudiments*, neither direct comment on expression nor timbre. A possible interpretation is that what is described and discussed in *Principes* and *Rudiments* is each note and detailed explanations regarding its optimal fingering, position of the head-joint and the direction of the airstream, *Tonus* in the lips, and the intensity of the airstream. It is said that when a note is played on the Traverso or Boehm-flute with its optimal above-described criteria, it is relatively easy to play the note in question with different nuances including *Sons filés* (Boehm, 1871). It should be remembered that Hotteterre suggested in the beginning of *Principes* that the interested Traverso-player could visit him personally for a lesson, and get his *Pieces*, which as described above, perhaps were private copies of *Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue Œuvre IIa* before they went in print 1708. At the end of *Œuvre IIa* is a short piece entitled *ECHOS. Pour la Flûte Traversiere seule* (Appendix XIV), which is based on the idea of playing the same patterns in *Forte* and *Piano,* which could be described as a study for playing in different nuances. Considered that playing in different nuances or dynamics influences intonation on the Traverso, it could possibly be supposed that Hotteterre's fingering-charts are modelled around what in later French flute traditions has been called *Le Son Naturel*, which in today's flautistic vocabulary would be a natural *Mezzo forte,* played with a relative large sound but without forcing the instrument. This has the implication that playing in softer or louder nuances effects the positions of the head-joint influencing the direction of the airstream, air-pressure, *Tonus* and activity of the lips and embouchure, including the size of the mouth cavity, altogether has to be adapted to the nuance or dynamic in question:

- More *Tonus* in the embouchure—the lips—generally makes the opening between the lips smaller combined with a constant air-pressure tends to sharpen the intonation and vice-verse.
- A higher *air-pressure* or speed of the airstream generally sharpens the intonation and vice-verse.
- The *Outward* position of the head-joint sharpens the intonation and vice-verse.

Blowing softly when playing in the low register, as suggested in *Principes*, is not necessarily the same as playing with a soft or weak sound in the low register as sometimes thought. Hotteterre is explicit when suggesting blowing gently for the lower notes:

Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas; & qu'on doit bien boucher tous les trous marquez dans la Tablature, par les Zeros noirs. (III: 6)	You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend, and all those holes must be perfectly stopt that are markt with the black dotts. (III: 5)

To blow the airstream gently in the low register has sometimes been understood as an indication of an ideal and aesthetics to play the Traverso soft in the low register in France during the late 17th and early 18th Centuries. This interpretation is then understood as an opposite to when Quantz wrote that the character of the low register on the Traverso should be strong (1752, Ch. IV, § 21). When examining music written for the Traverso by La Barre and Hotteterre, most of the composition's circles around the first one and a half octave (D1-A2). In addition, the three-piece Traverso like *Model I* and *Model II* has a relatively large diameter of the bore which facilitates the low register. Thus, it seems unlikely that music by La Barre and Hotteterre should be played in a pronounced soft manner—a French Harpsichord from the early 18th Century is an ins instrument with a full-bodied sound—because the characters of these pieces don't give this impression, and if played together with a harpsichord it could be difficult to find a good balance between the Traverso and the Harpsichord.

To conclude, Hotteterre explains that when playing in the low register the opening between the lips should be comparably larger then when played in the middle and high registers. The effect when doing so in the low register this creates a larger airstream, and as Hotteterre explains:

Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas (III: 6)	You must observe to blow but gently, for the lower Notes (III: 5)

When a large airstream hits the sharp edge of the blowing-hole at the same time being relatively uncovered, this creates a substantial sound which by no means could be characterized as rather soft. It should be remembered that the comparable large bore of *Model I* and *Model II* generates by its nature a full sound in the first octave. Hotteterre explained clearly that when ascending from the low register to the middle and high register it is necessary to gradually making the opening between the lips more and more narrow:

On nous permettra d'observer icy pour les Commençants, qu'à mesure qu'ils monteront sur cet Instrument ils en trouveront l'embouchure plus difficile; Ainsi pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent peu à peu. (III: 8)	I must here inform beginners, that as they ascend on this Instrument, they will find the filling it the more difficult, therefore to sweeten the high Notes, and fill them easily, you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing, by little, and little. (III: 6)

*

When describing idiomatic playing positions, embouchure, articulations, the airstream (Support), and ornaments Hotteterre gives explications and suggestions in relation to the Traverso pointing towards an aesthetic, and character connecting to concepts regarding *Bon goût* in France and the early 18th Century as shown above in section *1.4 Savoir–Goût*. When extracting explications and suggestions found in *Principes* and *Rudiments* regarding playing technique has found indications been divided in *Ideals of aesthetics and Traverso techniques* (Fig. 61), and *Negations to ideals of aesthetics and Traverso techniques* (Fig. 62). Attempting to define playing-techniques of the Traverso as described in *Principes* and *Rudiments* are found ideals generally related to a style of effortless playing without constraint, being elegant, natural, neat, precise, aiming to achieve suppleness for finger, embouchure, the airstream, and that the high register should be sweet just using what is needed when it comes to physical strength regarding the embouchure, airstream, and air-pressure. In negative terms the playing should not be harsh, forced, or unnatural.

Preface	*plus agréables* *joüer proprement & avec goût*	*most agreeable* *playing properly, and with a rellish*
Chapter I Posture and playing position	*la bonne grace* (I: 1) *sans aucune contrainte* (I: 1) *fort gracieuse* (I: 2) *le son de l'Instrument* [the Traverso] *flâte argréablement l'oreille* (I:2)	— *without any constraint* (I: 2) *gracefull* (I: 2) *it's* [the Traverso's] *agreeable Sound* (I: 2)
Chapter II Embouchure	*il faudroit suivre toûjours ce qui paroûtre le plus naturel* (II: 4)	—
Chapter III Fingerings	*pour la liberté des Doigts* (III: 7) *pour adoucir les Tons hauts & les former plus facilement* (III: 8) *Le Ré* [D2] *Il faut forcer un peu le vent, & serrer les Levres.* (III: 9)	— [D1] *you must force the wind a little more, and close the lips.* (III: 6)
Chapter VII Fingerings	*aisement* (VII: 21)	*easily* (VII: 15)
Chapter VIII Articulations and ornaments	*rendre le jeu plus agréable* (VIII: 23) *un plus grand adoucissement* (VIII: 27) *le plus agréable à l'Oreille* (VIII: 27) *on les adoucit sur la Flute Traversiere* (VIII: 27)	*To render the playing more agreeable* (VIII: 16) *for a greater Sweetning, and 'tis the Rellish of the Ear* (VIII: 19) *use the way which shall seem most agreeable* (VIII: 19)
Chapter IX Ornaments	*c'est le goût* (IX: 33)	—

Figure 61 Ideals of aesthetics and Traverso techniques as described in *Principes* and *Rudiments* (1707/1729).

Chapter II Embouchure	*n'est pas si naturelle ni si gracieuse* (II: 4)	—
Chapter III Fingerings	*des Tons forcez* [notes higher than E3] *& ne peuvent entrer naturellement* (III: 9) *si forcez* (III: 10)	*but they are* [notes higher than E3] *so forced, and so useless* (III: 7)
Chapter IV Fingerings	*de ne se point presser de battre la Cadence* (IV: 11)	*you must not press the shaking too quick* (IV: 8)
Chapter VII Fingerings	*pas bien naturelle* (VII: 21)	*But this way is not very natural* (VII: 15-16)
Chapter VIII Articulations and ornaments	*les coups de Langue paroîtront rudes* (VIII: 27)	*when the tonguing appears harsh* (VIII: 19)
Chapter IX Ornaments	*Je laisse les Tons au dessus, comme étant trop forcez* (IX: 33)	*I shall omit the Notes higher than this, because they are too much forced* (IX: 24)

Figure 62 Negations to given ideals regarding aesthetics and Traverso techniques as expressed in *Principes* and *Rudiments* (1707/1729).

6.9.2 The singing voice as an ideal and the airstream

An example of instrumental aesthetics relating to the sang voice is found in *Traité de la Viole* (1687) by earlier mentioned Jean Rousseau. Considered that Rousseau's *Traité* was published only twenty years before *Principes* (1707), it could perhaps be assumed that its sections on musical interpretation could have had importance also for Traverso-playing in the late 17th Century as in the beginning of the 18th Century, and consequently for Hotteterre. In the chapter *Du Jeu de Melodie* Rousseau described late 17th Century ideals regarding singing, and how it could serve as a model for instrumental playing, and in his case to the Viole:

> Le Jeu des Pieces de Melodie est un Jeu simple, & qui demande par consequent beaucoup de delicatesse & de tendresse, & c'est en ce Jeu que l'on doit s'attacher plus particulierement à imiter tout ce que la Voix peut faire d'agreable & de charmant […] (Rousseau, 1687, 56)[1]
>
> Le Jeu de Melodie est son propre caractere c'est pourquoy ceux qui veulent parvenir à bien joüer de cét Instrumente [Viole] doivent s'attacher à la delicatesse du Chant, pour imiter tout ce qu'une belle Voix peut faire avec tous les charmes de l'Art […] (Rousseau, 1687, 72)[2]

Having the sang voice as an ideal includes that the instrumental player should develop a flexibility regarding timbre and nuances as described in French 17th and 18th Century singing methods. A typical example is *L'Art ou les Principes philosophiques du Chant* (1756) by Jean-Antoine Blanchet (1724-1778) describing how the singer with the help of expiring the air in different speeds could influence the expression and character of the voice:

> Si on expire longtemps sur les sons, ils sont nourris et moëlleux; si on expire quelque temps et avec une certaine force, ils sont majestueux; si on expire long-temps et mollement, ils sont tendres; si on expire avec douceur et très-peu de temps, ils sont légers et gracieux ; enfin quand on sçait attire une grande quantité d'air dans les poumons & le rendre ensuite en petit volume, on a une grande facilité à faire de longues phrases et à executer avec tout le succès imaginable les dives agrémens. Ne semble-t-il pas que je vien de tracer le portrait du beau chant, envisage précisément par rapport à la voix. (Blanchet, 1756, 38–39)[3]

When Blanchet's ideas are combined with different degrees of *Tonus* in the lips and air-pressure this develops expression, timbre, and dynamics on the Traverso.

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1. The playing of melodic pieces need simplicity, & therefore requires a lot of delicacy & tenderness, & it is in this style of playing that we must particularly endeavour to imitate all that the Voice can do being pleasant & charming […] (Rousseau, *Traité de la Viole*, 1687, 56)

2. For the Playing of a Melody with its own character, that is why those who want to achieve a good performance of this instrument [Viol] must attach themselves to the delicacy of the Song, to imitate all that a beautiful voice can do with all the charms of Art. (Rousseau, 1687, 72)

3. If you breathe out a long time on the sounds they are nourished and soft; if you breathe out for some time and with a certain force, they are majestic; if we breathe out long and softly, they are tender; if one expires gently and for a very short time, they are light and graceful; finally, when one knows how to attract a great quantity of air into the lungs and then render it in small volume, one has a great facility to make long sentences and to execute the various ornaments with all imaginable success. Doesn't it seem that I have just drawn the portrait of the beautiful song, envisaged precisely in relation to the voice. (Blanchet, *L'Art ou les Principes philosophiques du Chant,* 1756, 38-39)

6.9.3 *Clair-obscure* and sound colours

A first step searching for criteria of aesthetics is to carefully define features of the Traverso, starting with how the finger-technique using the indispensable fork-fingerings due to the construction of the Traverso when playing in all tonalities, and how this influences sound colour. Especially the first octave when comparing the sound colour of the notes G1, A1, B1 with G#1, A♭1, A#1, and B♭1, whereby the latter—even when played on an excellent Traverso by an outstanding player—always have a different sound colour being less brilliant, veiled and somewhat shadowed when likened with G1, A1, B1. When comparing the Traverso and its seven tone-holes with the Boehm-flute having sixteen tone-holes (C-foot) or seventeen tone-holes (B-foot) rather different features are revealed due to the construction of the Boehm-flute, in combination with its far bigger tone-holes allowing a fingering-system constructed for avoiding fork-fingerings because of a sound ideal directed towards an almost impeccable evenness over three octaves.

An important ideal regarding the art of painting, drawing, and engraving in the 17th and 18th Centuries were the techniques mastering light and shadow—*Clair-Obscure*—when using its French term originating from the Italian term *Chiaro-scuro* (Dufresnoy, 1673). The differences between the Traverso when compared with the Boehm-flute as mentioned above makes the Traverso in a sense to an instrument which has the phenomenon of *Clair-Obscure* built into it, whereas the Boehm-flute has an almost perfect evenness of sound colour due to its construction. Considered that in the 18th Century the idea flourished that also music instruments ideally should make a display of *Clair-Obscure* (Quantz, 1752), which can be understood as integrating not only flexibility of nuances such as *Fort–Doux* and everything in between, but also distinct changes of sound colours. Differences in sound colours caused by forked and open-fingerings could so far be described as a tool for realising *Clair-Obscure*—light and shadow—as expressed by Quantz among many:

> Il faut y entretenir continuellement le clair & obscur. [...] Il faut donc observer un changement continuel du Forte & du Piano [...] (Quantz, 1752/1985, 108).[1]

In this context it is of interest that compositions by early flute composers such as Hotteterre and La Barre generally use the register D1-E3 of the Traverso, and the first octave (D1-D2) has a central role whereby the differences regarding sound colour between above mentioned notes such as G1, A1, B1 with G#1, A♭1, A#1, and B♭1 are frequent in often used keys as g-minor, a-minor, B♭-major, b-minor etcetera, potentially embracing a display of different sound colours and facilitating the idea of realising *Clair-Obscure*. When playing the Traverso differences of sound colours is as mentioned so to speak built into the instrument, whereas the Boehm-flute player must make an effort for realising an interpretation including *Clair-Obscure*.

Considered that *Clair-Obscure* is a technique regarding painting that since long has been borrowed by musicians for describing the importance of nuances when interpreting music, it's not far away to connect to how master-painters in the 17th and 18th Centuries excelled in virtuosity when painting silk and velvet, and especially so when painting portraits. An excellent example of this is the painting *Lady with the Veil* (1768) by the Swedish master-painter Alexander Roslin (Malmö 1718-Paris 1793; Fig. 63). Roslin was a very successful portrait-painter working in Sweden, Italy, Poland, Russia, and especially in France and Paris, being famous for painting empathetic portraits and having exquisite virtuosic skills when painting silk, velvet, and jewels. On the portrait of the French painter Marie-Suzanne Giroust (1734-1772), married with Roslin, his virtuosity of how the silk-velvet scarf is painted is more than impressive. This painting could serve as a wonderful model for how the Traverso-player can strive for making an expressive display of the Traverso's almost built-in variety of sound colours partly due to some notes being fork-fingered, and especially so in the first octave, endorsing the phenomenon of *Clair-Obscure*, sound colours, and nuances. The importance of the acoustic surroundings in relation to sound colours and nuances in Traverso-playing is a well-known factor, which metaphorically has an affinity to when the French designer Yves Saint Laurent (1936-2008) pointed on how he loved to "sculpt" an exquisite silk fabric or brocade with different kinds of lightening:

> *Ce que j'aime surtout, c'est faire comme si je pouvais sculpter la lumière. Choisir un tissue, me soumettre à ses lignes, l'offrir à la lumière, maitriser son mystère… Là c'est comme si j'étais un peintre, un écrivain.*[2]

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1. Licht und Schatten muß dabey beständig unterhalten werden. [...] Es muß also eine stetige Abwechselung des Forte und Piano dabey werden. (Quantz, Trans. Reilly. 1752/1985, 106)
Light and shadow must be constantly maintained. [...] Thus a continual alteration of the Forte and Piano must be observed. (Quantz, Trans. Reilly. 1752/1985, 124).

2. What I especially like is making it look as if I could sculpt light. Choosing a fabric, surrendering to its lines, offering it up to the light, mastering its mystery…that is when I am like a painter, a writer. Yves Saint Laurent, *L'insensé*, 1991. The exhibition *L'insensé.* Paris/Lyon, (1991/2019).

This statement by Yves Saint Laurent raises questions for the Traverso-player as for any instrumentalist to *how* and *where* to listen when practicing and performing? In a close up, behind, to the sides, or far away in front of the audience? How does different acoustic surroundings influence listening and the techniques shaping sound colours, nuances, and *Clair-Obscure*? Such questions connect to methods like the Italian singing technique *Inalare la voce ma cantare davanti*, aiming for activating resonance in the head, mouth, and throat areas and cavities, and at the same time project the voice to listeners far out in a concert hall, opera, or church. Such singing methods and techniques are for the Traverso-player as important as for a singer.



Figure 63 The wonderful painting *Lady with the Veil* (1768) by Roslin is a portrait of Marie-Suzanne Giroust (1734-1772) who was married with Roslin (Nationalmuseet, Stockholm, Sweden).

To make a connection between painting and music regarding expression was discussed in *Kern melodischer Wissenschaft* (1737) by the German composer and music theorist Johann Mattheson (1681-1764), a contemporary to Hotteterre. The example given by Mattheson is interesting because it connects to concepts of enlarged language when comparing painting with music, highlighting the importance of expression whereby the impression is that a highly developed craftsmanship is the platform but not the finalization:

> Wir mögen bey Gelegenheit der Vergleichung mit der Mahlerey noch dieses bedencken, daß eines geschickten Künstlers Vorhaben nicht etwa bloß dahin gehen ein Paar schwarze Augen, eine erhabene Nase, und einen rothen Mund zu mahlen, sondern er trachtet immer in solchen Gesichts-Zügen die eine oder andere Regung vorzustellen, damit z.E. der Zuschauer sage: in den Augen stecke was verliebtes; an der Nase sey was großmüthiges, und am Mund was hönisches. Eben so wenig muß sich auch der Musicus damit begnügen, daß er bunte Noten hinmahle, seine Intervalle und übriges Geraethe wohl auskrame, und alles mit den schönsten Bey-Wörtern schmücke; sondern er muß sich wirklich dahin bestreben, daß in seinem Machwerk eine ausnehmende Gemüths-Bewegung herrsche. (Mattheson, 1737, Drittes Kapitel, § 27, 40)

6.9.4 Words of expression and characters of keys in *L'Art de Preluder*

When comparing a characterization of the three-piece Traverso as found in *Principes* and *Rudiments* which mainly relates to playing-techniques as shown above, with words of musical expression as found in Hotteterre's important treatise *L'Art de Preluder* (1719) are expressions like *Tendrement, Affectueusement, Gay, Gracieusement, Fierement, Badinez,* and *Majestueusement* the most common (Fig. 64, 65). Thus, both sources' points in a direction that the three-piece Traverso in the first decades of the 18th Century in France was aesthetically understood as an instrument having a character and expression embracing a gracious, elegant, tender, sometimes melancholic, affectionately playing style, together with a sense of joyful, witty, and sparkling moods. It could be said that the descriptions of playing technics as explained in *Principes* and *Rudiments* when mastered are apt for mentioned characters of expression.

L'interprétation de la musique française: 1661–1789. Dictionnaire d'interprétation (Vol 1. 1983/2016) by Jean Sainte-Arroman and its contextualization's and explanations can successfully be applied regarding words of expression as found in *L'Art de Preluder* (1719) and sheds light on these words in a French 18th Century context. When discussing the well-known subject of different keys and their potential differences regarding expression and character in the period of the late 17th Century, Hotteterre, and the early 18th Century (Demeilliez, 2009) are examples such as Jean Rousseau (1683), Charpentier (1690/Cessac, 2004), and Rameau (1722; Fig. 64, 65, 66) giving major and minor keys clearly defined expressions an important source. When thinking about *why* different keys have been understood as having different characters of expression, there are especially two hypotheses to consider:

- From a general point of view could differences of expression and character relate to the chosen temperament and tuning system.
- From a perspective based on the Traverso could differences of expressions and character relate to differences in sound colour and timbre between more or less fork-fingerings in different keys.

The explanation to why different keys has been thought to have different expressions could thus relate to temperaments and how intervals such as for example a pure major third sound in a main key and when modulating to keys further away from the main key. When playing and using for example *Just intonation*, *1/4-Comma Meantone*, and *1/5- Comma Meantone* these tuning systems show distinct differences between keys and especially so when modulating. When playing in temperaments such as *Equal 12 division* (12-ET) and other temperaments close to a rather similar and symmetrical division of the octave this neutralizes modulations making different keys sounding almost similar. It can be concluded that when playing in temperaments not dividing the octave in twelve equal parts, and on the diatonic three-piece Traverso, different keys *have* distinct differences regarding sound colours and character due to its construction.

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1. When making a comparison with painting, we should also keep in mind that a skilled artist's intention is not just to create a pair of black eyes, a sublime nose, and a red mouth, but he always aims to achieve one in such facial features or imagine other impulses so that e.g. the spectator says: there is something amorous in the eyes; there is something noble in the nose and something mocking in the mouth. Just as little does the musician have to be content with grinding out colourful notes, digging out his intervals and other equipment, and decorating everything with the most beautiful epithets; Rather, he must really strive to ensure that an exceptional emotional movement prevails in his work. (Mattheson, 1737, Drittes Kapitel, § 27, 40)

Prelude	Key & Range	Meter	Character Tempo Hotteterre 1719	Character Charpentier 1690	Character Rameau 1722
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**G-major** **D1-D3**	**2** **3** **3** **2***	*Moderé* *Gravement* *Moderé* *Animé*	Doucement joyeux *Sweetly joyful*	Chants tendres et gai *Tender and cheerful songs*
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**g-minor** **D1-D3**	**2** **2*** **2** **2***	*Tendrement* *Gay* *Affectueusement* *Gay*	Serieux et magnifique *Serious and magnificent*	La douceur et à la tendresse *Sweetness and tenderness*
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**a-minor** **E1-C3**	**3** **2** **2*** **2**	– *Tendrement sans lenteur* *Gay* *Moderément*	Tendre et plaintif *Tender and plaintive*	—
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**A-major** **E1-E3**	**2** **3 – 2** **2** **2/4*** *Croches egales*	*Moderé* *Moderé* *Moderé & Animé* *Gay*	Joyeux et champêtre *Joyful and pastoral*	Chants d'allegresse et de reconnaissance Grand et magnifique *Songs of joy and recognition Noble and magnificent*
Prelude 1 Prelude 2 Prelude 3	**B♭-major** **F1-C3**	**2** **2*** **2**	*Moderément* *Gay* *Moderément*	*Magnifique et joyeux* Magnificent and joyful	Aux tempêtes, aux furies, et autres sujets de cette espèce *To tempests, furies,* *and other subjects of this species*
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**b-minor** **F#1-D3**	**2** **𝔠** **2*** **6/4**	*Tendrement* *Animé & Gracieusement* *Gay* *Gay*	Solitaire et mélancholique *Solitary and melancholic*	La douceur et à la tendresse *Sweetness and tenderness*
Prelude 1 Prelude 2	**B-major** **F#1-B2**	**2** **2***	*Tendrement* *Gay*	Dur et plaintif *Severe and plaintive*	—
Prelude 1 Prelude 2	**b♭-minor** **F1-B♭2**	**2** **3/2**	*Tendrement* *Gay*	Obscur et terrible *Obscure and terrible*	Chants lugubres *Lugubrious songs*
Prelude 1 Prelude 2 Prelude 3	**C-major** **E1-C3**	**𝔠** *Croches egales* **2 – 3 – 2** **C*** *Croches egales*	*Un peu animé* *Tendrement* *Gay*	Gai et guerrier *Joyful and martial*	Chants d'allegresse et de reconnaissance *Songs of joy and recognition*
Prelude 1 Prelude 2 Prelude 3	**c-minor** **E♭1-C3**	**2** **3** *Croches egales* **2**	*Lentement* *Un peu gay* *Moderé*	Obscur et triste *Obscure and mournful*	La tendresse et aux plaintes *Tenderness and complaints*
Prelude 1 Prelude 2 Prelude 3	**d-minor** **D1-D3**	**2** **2 – 3** *Croches egales* **– 2** **𝔠**	*Tendrement* *Animé & Moderé* *Majestueusement*	Grave et dévot *Serious and devotee*	La douceur et à la tendresse *Sweetness and tenderness*
Prelude 1 Prelude 2 Prelude 3 Prelude 4	**D-major** **D1-D3**	**2** **2*** **𝔠** **2**	*Gravement sans lenteur* *Gay* *Fierement* *Gravement*	Joyeux et très guerrier *Joyful and very martial*	Grand et magnifique Chants d'allegresse et de reconnaissance *Noble and magnificent* *Songs of joy and recognition*
Prelude 1 Prelude 2 Prelude 3	**e-minor** **E1-C3**	**3** **C*** *Croches egales* **2**	*Moderé* *Gay* *Gravement & Badinez*	Effemmé, amoureux et plaintif *Effeminate, in love plaintive*	La douceur et à la tendresse *Sweetness and tenderness*
Prelude 1 Prelude 2 Prelude 3	**E-major** **D#1-B2**	**3** **C*** *Croches egales* **2**	*Tendrement sans lenteur* *Gay* *Tendrement*	Querelleux et criard *Quarrelsome and shrill*	Chants tendres et gai Grand et magnifique *Tender and joyful songs* *Noble and magnificent*
Prelude 1 Prelude 2 Prelude 3	**E♭-major** **E♭1-D♭3**	**3** **2*** **3***	*Gravement* *Gay* *Gay*	Cruel et dur *Ruthless and harsh*	—
Prelude 1 Prelude 2 Prelude 3	**F-major** **F1-D3**	**2** **3** **3 – 2**	*Rondement* *Un peu animé* *Moderé*	Furieux et emporté *Furious and hot tempered*	Aux tempêtes, aux furies, et autres sujets de cette espèce *To tempests, furies,* *and other subjects of this species*
Prelude 1 Prelude 2	**f#-minor** **E#1-C#3**	**3** **3/8***	*Moderément* *Gay*	—	La tendresse et aux plaintes *Tenderness and complaints*
Prelude 1 Prelude 2	**f-minor** **E1-C3**	**3** **2***	*Tendrement* *Gay*	Obscur et plaintif *Obscure and doleful*	Chants lugubres *Lugubrious songs*
2 Preludes Traverso with Basso continuo	**D-major** **D1-D3** **g-minor** **F1-E♭3**	**C** **3**	*Gravement* *Gravement*	Joyeux et très guerrier Serieux et magnifique	*Grand et magnifique* *Chants d'allegresse et de reconnaissance* *La douceur et à la tendresse*

Figure 64 Words of expression, tempo, tonality, range, and meter (***** indicates that a *Prelude* has bar-lines) for the 58 *Preludes* for Traverso in *L'Art de Preluder* (1719) by Hotteterre. Further examples regarding keys and expression in *Régles de Composition* (1690) by Charpentier, *Traité de l'Harmonie* by Rameau (1722) as described in *L'Interprétation de la Musique Française: 1661–1789. Dictionnaire d'Interprétation* (Vol 1. 1983/2016) by Jean Sainte-Arroman.

Trait	Key & Range	Meter	Expression & Tempo
Trait 1	G-major	–	*Fierement*
Trait 2	D1-G3	2/4*	*Gay*
Trait 3		2	*Moderé*
Trait 4		2	*Rondement – Badinez*
Trait 5		3*	*Arpege*
Trait 6		¢ *Croches egales*	–
Trait 7		2	*Etude*
Trait 1	g-minor	–	–
Trait 2	D1-G3	¢	*Moderé*
Trait 3		2	*Rondement*
Trait 4		¢	*Fort lent & a l'Italienne*
Trait 5		2/4	–
Trait 6		¢	–
Trait 7		3*	*Arpege*
Trait 8		3/8	*Etude*
Trait 9		2	–
Trait 1	a-minor	3	*Gravement*
Trait 2	E1-C3	2*	*Moderé*
Trait 3		2*	*Gay*
Trait 4		2*	*Rondement*
Trait 1	A-major	3 *Croches egales*	*Rondement*
Trait 2	E1-D3	¢ *Croches egales*	*Leger*
Trait 3		2	*Lent*
Trait 4		3/8	–
Trait 1	B♭-major	C *Croches egales*	*Gay*
Trait 2	D1-E♭3	3*	*Arpege*
Trait 3		¢ *Croches egales*	*Gay*
Trait 4		2*	*Etude*
Trait 1	b-minor	3 *Croches egales*	*Rondement*
Trait 2	D1-D3	2/4*	*Gay*
Trait 3		3*	*Arpege*
Trait 4		2*	*Etude Rondement*
Trait 1	B-major	3	*Gay*
Trait 2	F#1-D#3	3	*Gravement*
Trait 3		2	*Leger*
Trait 4		2	*Gay*
Trait 1	b♭-minor	3	*Gravement*
Trait 2	F1-B♭2	C	*Gay*
Trait 1	C-major	2	*Rapidement*
Trait 2	E1-C3	C	*Gay, et Sauille – Badinez*
Trait 3		3	*Rondement*
Trait 4		3*	*Arpege*
Trait 1	c-minor	2	*Fierement*
Trait 2	E♭1-D3	9/8	*Rondement*
Trait 3		3	*Tendrement*
Trait 4		2*	*Gay*
Trait 5		3*	*Arpege*
Trait 1	d-minor	¢	*Rondement*
Trait 2	D1-D3	¢	–
Trait 3		¢* *Croches egales*	*Animé*
Trait 4		3*	*Marqué*
Trait 5		¢	*Rondement*
Trait 6		3*	*Arpege*
Trait 1	D-major	¢	*Moderé*
Trait 2	D1-D3	2/4*	*Marqué*
Trait 3		¢* *Croches egales*	*Legerement*
Trait 4		¢* *Croches egales*	*Leger*
Trait 5		C	*Vivement*
Trait 6		¢* *Croches egales*	*Leger*
Trait 7		¢*	*Doubles du precedent*
Trait 8		3*	*Arpege*
Trait 9		3*	*Autre Arpege*
Trait 1	e-minor	2	*Gravement*
Trait 2	D#1-B2	¢* *Croches egales*	*Gay & Sautillé*
Trait 3		3/8* – 9/16* – 3/8* *Doubles croches egales*	*Rondement*
Trait 1	E-major	¢	*Tendrement*
Trait 2	E1-B2	2/4*	*Gay*
Trait 1	E♭-major	2	*Gravement*
Trait 2	E♭1-B♭2	¢	*Gay*
Trait 1	F-major	2	*Rapidement*
Trait 2	D1-C3	¢	*Moderé*
Trait 3		2	–
Trait 4		3*	[*Arpege*]
Trait 1	f-minor	3	*Gravement*
Trait 2	F1-D♭3	2	*Gay*

Figure 65 Words of expression, tempo indication, tonality, range (D1-G3), and meter (if followed by ***** indicates that the *Trait* has bar-lines) for the 75 *Trait* for Traverso in *L'Art de Preluder* (1719) by Hotteterre.

Hotteterre *L'Art de Preluder* **1719**	***L'interprétation de la musique française : 1661–1789. Dictionnaire d'interprétation Vol 1.* (1983/2016) Jean Sainte-Arroman**	
Affectueusement [Affetuoso]	Affetuoso – Affectuoso – Affecto – Con affecto – Affetto – Con affetto. Correspond au terme «tendrement». Cette expression convenant mal aux mouvements rapides, on assimile souvent «affetuoso» à un tempo très modéré. Les compositeurs du XVIII[e] siècle, sous l'influence italienne, écrivent souvent des pièces à 3/8 «affetuoso»: malgré le signe de mesure, le tempo est modéré; il s'agit de formes vocales (souvent A-B-A), parfois appelées ariettes, aria, air. Le mot «affetuoso» est aussi employé comme indication d'expression, pour la gavotte, par plusieurs compositeurs. (25)	*Affetuoso – Affectuoso – Affecto – Con affecto – Affetto – Con affetto. Corresponds to the term tendrement. As this expression is not well suited to rapid movements, affetuoso is often equated with a very moderate tempo. Eighteenth-century composers, under Italian influence, often wrote pieces in* 3/8 *affetuoso: despite the time signature, the tempo was moderate; these are vocal forms (often A-B-A), sometimes called ariettes, aria, air. The word affetuoso is also used as an indication of expression, for the gavotte, by several composers.*
Animé	«Animé» placé au début d'une œuvre indique qu'il faut lui donner de la vie (expression). «Animé» placé au cours d'une pièce signifie souvent qu'il faut presser un peu le tempo. (36)	*Animé placed at the beginning of a work indicates that it must be given life (expression). Animé placed during a piece often means that the tempo must be somewhat faster.*
Animé & Gracieusement	See *Animé* and *Gracieusement*	See *Animé* and *Gracieusement*
Animé & Modéré	See *Animé* and *Modéré*	See *Animé* and *Modéré*
Un peu animé	See *Animé*	See *Animé*
Badinez [Badin]	Comme son nom indique, il s'agit d'un badinage musical; le terme «badiner» n'impliquant pas une idée de tempo très vif. La pièce est appelée souvent «Badinage». Le tempo est généralement plus modéré ou gracieux que vraiment vif. Le plus fréquemment, la badine est à deux temps (2, 6/8, 2/4) parfois à quatre temps modérés notés par un C barré, rarement à trois temps (3, 3/4). Elle n'a pas de forme particulière, sinon qu'elle adopte ordinairement un plan en deux parties avec reprises. La badine se rencontre surtout durant la première moitié de XVIII[e] siècle. (51)	*As the name suggests, this is musical banter; the term badiner not implying a very lively idea of tempo. The piece is often called* Badinage. *The tempo is usually more subdued or graceful than fast. Most frequently, badine is in two beats* (2, 6/8, 2/4) *sometimes in moderate four beats noted by a C barré, rarely in three beats* (3, 3/4). *It has no particular form, except that it usually adopts a plan in two parts with repeats. Badine is found mainly during the first half of the 18th Century.*
Fierement	Terme d'expression employé au XVIII[e] siècle pour des tempi généralement très modérés. «Fièrement» implique un jeu hardi, s'attachant plus aux grandes lignes qu'au détails. (159)	*Term of expression used in the 18th century for generally very moderate tempi. Fièrement* [Proudly] *implies a bold playing, focusing more on outlines than details.*
Gay [Gai – Gaiment]	«Gai» indiquant un tempo modéré à vif (sans excès), et se traduisent par «allegro». «Gai» était généralement un peu plus rapide que «léger». Au XVIII[e] siècle, il arrivait, mais rarement, que gai soit un terme d'expression et non de tempo. (168)	*Gai indicating a moderate to lively tempo (without excess) and translates to allegro. Gai was generally a bit faster than léger. In the 18th century, it happened, but rarely, that gai was a term of expression and not of tempo.*
Un peu gay	See *Gay*	See *Gay*
Gracieusement [Gracieux]	Terme d'expression et de tempo. Certains auteurs lui donnent le même sens que l'italien «gracioso», d'autres lui donnent le sens d'andante. En général, «gracieusement» comprend à la fois une notion d'expression gracieuse et de tempo modéré; ce mot est très employé pour la gavotte, l'ariette et la musette. (176)	*Term of expression and tempo. Some authors give it the same meaning as the Italian gracioso, others give it the meaning of andante. In general, gracieusement includes both graceful expression and moderate tempo; this word is often used for the gavotte, the ariette and the musette.*
Gravement	Terme de mouvement indiquant un tempo lent, «Gravement» est généralement considéré comme moins lent que «lentement». Certains auteurs ajoutent au tempo, une expression de «gravité» dans le jeu. Quelques compositeurs vont même jusqu'à écrire «gravement mais sans lenteur», réduisant ainsi la notion de tempo au profit de l'expression. (184)	*A movement term indicating a slow tempo, Gravement is generally considered less slow than lentement. Some authors add to the tempo, an expression of gravité. Some composers even go so far as to write "seriously but without slowness", thus reducing the notion of tempo in favour of expression.*
Gravement sans lenteur	See *Gravement*	See *Gravement*
Gravement & Badinez	See *Gravement* and *Badinez*	See *Gravement* and *Badinez*
Majestueusement [Maestoso]	Mot, employé durant la seconde moitié du XVIII[e] siècle, et qui traduit le français «Majestueusement». Avant 1750 le terme, «noblement» tenait la place de l'indication italienne. (209)	*Word, used during the second half of the 18th Century, and which translates the French Majestueusement. Before 1750 the term noblement took the place of the Italian indication.*
Moderé	Tempo situé entre rondement et légèrement, c'est-à-dire entre andante et allegro. L'emploi de ces termes suppose également une certaine modération dans l'expression. (222)	*Tempo located between rondement and légèrement, between andante and allegro. The use of these terms also implies a certain moderation in expression.*
Modéré & Animé	See *Animé* and *Modéré*	See *Animé* and *Modéré*
Moderément	See *Modéré*	See *Modéré*
Rondement	Rondement est une indication de tempo. Il s'agit d'un mouvement voisin de l'andante, dans son sens ancien (allant). On entend également par ce terme un jeu simple et naturel. (335)	*Rondement is a tempo indication. This is a movement close to the andante, in its old sense (walking). This term also means a simple and natural manner of playing.*
Tendrement	Terme indiquant une expression tendre et touchante; cette expression pouvait aller jusqu'au «passionné», mais en gardent élégance et retenue. Au XVIII[e] siècle, on fait correspondre «tendrement», soit à «affetuoso», soit à «amoroso». Bien que ce mot ne comporte pas de notion de mouvement, il est surtout employé pour des tempi lents ou modéré. (390)	*Term indicating a tender and touching expression; this expression could go as far as passionné but retain elegance and restraint. In the 18th Century, tendrement was made to correspond either to affetuoso or to amoroso. Although this word does not include the notion of movement, it is mainly used for slow or moderate tempi.*
Tendrement sans lenteur	See *Tendrement*	See *Tendrement*

Figure 66 Words of character and tempo explained in *L'Interprétation de la Musique Française: 1661–1789. Dictionnaire d'Interprétation* (Vol 1. 1983/2016) by Jean Sainte-Arroman.

6.9.5 Interpretation and translation: Madame Dacier

It could be said that pedagogical activity and research regarding musical learning—in the present context learning how to play and perform on the three-piece Traverso of the very early 18th Century in France—could be studied as a separate object not having essential relations to artistic research investigating the process of musical expression and musical interpretation. Such an opinion is problematic because instrumental skills, explanations, and suggestions how to play on an instrument have its profound *Raison d'être* in musical expression. This could be described with the metaphor of a coin having its two sides. To take this one step further—despite the fascinating daily practice penetrating deeper in the mastery of playing the three-piece Traverso in combination with developing skills, including that a devoted musician never can get enough skills—this makes no sense without constantly aiming for musical expression. Probably one of the difficulties for a flautist today wanting to refine skills regarding musical expression on the Traverso in the period of Hotteterre is to develop a natural and intuitive sense for aesthetics in relation to musical expression based on how the three-piece Traverso was understood in the beginning of the 18th Century. A first step aiming for a contextualization of French aesthetics regarding the three-piece Traverso in France would be to study how its powers of expression was described in French 18th Century in sources such as texts on musical interpretation, pedagogical documents like instrumental methods and, the original repertoire in combination with playing on high quality copies of original three-piece Traversi. When studying *Principes* and *Rudiments* a result is that Hotteterre often gives suggestions and clues in indirect terms. An example are the explications and suggestions regarding posture, which when followed develops the foundations for a functional breathing technique when playing a wind-instruments or singing. But in explicit terms there are no clear-cut definitions regarding breathing in *Principes* and *Rudiments*, neither direct explanation in relations to musical interpretation. A complementary source that was discussed above is how Hotteterre used words of character and expression as found in *L'Art de Preluder* (1719) and his compositions. From a methodological perspective this connects to principles of the *Hermeneutical circle* as a method, and the hermeneutical idea that the whole mirrors the part, and the part mirrors the whole as described by philosophers like Hans-Georg Gadamer (1960/1990), further, to establish a historical contextual horizon of understanding in the spirit of Friedrich Schleiermacher (1838).

Before discussing interpretation and translation could a brief definition of music be of importance as found in earlier quoted *Dictionnaire Général et Curieux* (1684) by Cesar de Rochefort from the late French 17th Century, mirroring the period when the three-piece Traverso gradually became the common transverse flute:

> La Musique entretien nostre joye & flatte également nostre tristesse, elle s'accommode aux malades comme aux plus sains, elle charme nostre esprit de quelque passion qu'il puisse estre prévenu, elle est agreable à toutes sortes de personnes, de quelque âge, de quelque humeur & de quelque conditions qu'ils soient, c'est une discipline Royale, qui n'est pas moins martiale que pacifique, elle est la bonne amie de la Philosophe, & comme elle fait une partie des Mathematiques, l'étude en est agreable & innocent. (Rochefort, 1684, 461)[1]

The interpretation of a musical score could in a sense be compared with a translation of a text. When making an interpretation of a text or score being written centuries and even thousand years ago, of course, difficulties arise by the reason that times, meaning of words and signs, and aesthetics changes. The present study with its focus on *Principes* and *Rudiments* makes it motivated to find French sources discussing interpretation and the phenomenon of translation from the period of the late 17th Century and the first decades of the 18th Century. Such a source is found in the output by the French philologist and translator Anne Le Fèvre Dacier (1645-1720; Fig. 67)—or Madame Dacier as she was called during her lifetime in France—and her translations of Greek and Latin texts from the Antiquity such as *Les Comédies de Terence* (1688), *L'Iliade* (1711) and *L'Odyssée* (1716) by Homer. In Madame Dacier's work we encounter translations together with long and detailed comments which all together sheds light on aesthetics and thoughts regarding interpretation and translation from the early French 18th Century. In Dacier's introduction to her translation of *L'Iliade* (1711) she compares the act of translating Latin and Greek texts of the Antiquity to French of her epoch referring to music and how musicians "translate" a score into sounding music. She explained how skillful musicians sing exactly and strictly from their scores, never making mistakes, still everything is finally a mistake because the performance becomes soulless and cold.

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1. Music maintains our joy & flatters our sadness equally, it accommodates the unwell as the healthiest, it charms our spirit with whatever passion it may be prevented, it is pleasant to all kinds of people, of any age, of whatever mood & whatever conditions they may be, it is a Royal discipline, which is no less martial than peaceful, it is the good friend of the Philosopher, & as it is part of Mathematics, its study is pleasant & innocent. (Rochefort, *Dictionnaire Général et Curieux,* 1684, 461)



Figure 67 A Portrait of Madame Anne Dacier (1654-1720), engraving by Ferdinand Delannoy after Gustave Staal. (Private Collection)

This kind of musicians stands in contrast to the really gifted musician who performs in the spirit the music is written without taking away anything but adding liveliness to the piece. This description represents two traditions regarding interpretation, one strictly following the score intellectually risking the loss of emotion and spirit, and another that respects the score but with freedom and nobleness keep the emotion without departing from the score but making something entirely new of the already known:

> [...] on voit tous les jours des musiciens, qui, tres sçavants dans leur art, chantent exactement & rigoureusement la note des airs qu'on leur presente, il n'y font pas la moindre faute; mais le tout est une faute, parce que dépourvûs de genie & froids, ils ne faisissent pas l'esprit dans lequel ces airs ont esté composez, & qu'ils n'y jettent ni les agrements, ni les graces qui en sont comme l'ame; au lieu qu'on en voit d'autres, qui plus vifs & doüez d'un plus heureux genie, chantent ces airs dans l'esprit ou ils ont esté composez, leur conservant toute leur beauté, & le font paroistre tres differents, quoyqu'ils soient les mesmes. Voila, si je ne me trompe, la difference qui ce trouve entre les bonnes & les mauvaises traditions; l'une par une imitation basse & servile rend la lettre sans l'esprit, & l'autre par une imitation libre est noble, conserve l'esprit sans s'éloigner de la lettre, & fait une chose toute nouvelle d'un sujet desja connu [...] (Dacier,1711, *L'Iliade*, xliij)[1]

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1. [...] we see musicians every day, who, very knowledgeable in their art, sing exactly and rigorously the note of the airs that are presented to them, they do not make the slightest mistake; but the whole thing is a fault, because devoid of genius and coldness, they do not reflect the spirit in which these airs were composed, and they do not impart to them either the chords or the graces which are like them the soul ; whereas we see others, who more lively and endowed with a happier genius, sing these airs in the spirit in which they were composed, preserving all their beauty, and making them appear very different, the same. Here, if I am not mistaken, is the difference between good and bad traditions; one by a low & servile imitation renders the letter without the spirit, & the other by a free imitation is noble, preserves the spirit without departing from the letter, & makes a subject entirely new already known [...] (Dacier, *L'Iliade*, 1711, xliij)

Connecting to the notation of music and the arsenal of signs regarding ornamentation in relation to a fluent musical performance in the unforeseeable, intuitive, and explosive moment of the instance, is the statement by Kuijken […] *the notation is not the music* […] (2013, XIII) an interesting point of departure. And in this context is Dacier's thoughts regarding the process of translating Greek and Latin of the Antiquity to French of the late 17th and early 18th Century corresponding to the lifetime of Hotteterre important because it sheds light on musical notation and its codification and inherent possibilities and limits.

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In a context discussing translation and interpretation is *imitation* and to *imitate* concepts having relations to the Greek Antiquity and *mi´mēsis* and *mime´omai*. These concepts explain actions in relation to artistic activity, translation, as to learning in a general sense, and thus to a discussion regarding *Principes* and *Rudiments*. To make an application of mimesis for processes regarding learning implies learning styles based on having or not having a teacher, includes that the learning person—a child or adult—becomes his or her own teacher. Hence mimesis can potentially create foundations for self-teaching and is related to processes which could be described as *automaieutics* (Ljungar-Chapelon, 2008). The latter is a concept based on *maieutics* as explained by Socrates in the dialogue *Theaetetus* by Plato (1992), and the idea that teaching has similarities with the task of a mid-wife, with the addition that automaieutics is a process whereby the learning person becomes the mid-wife/teacher (Ljungar-Chapelon, 2008). An example could be that someone having basic knowledge about music, maybe being an amateur Recorder player would like to learn how to play the Traverso, then *Principes* and *Rudiments* could be used as an efficient automaieutic tool. The processes of mimesis and automaieutics connects to Plato, Socrates, and thoughts about artistic expression and the concept of the *Stone of Heraclea* (Plato, 2001; Ljungar-Chapelon, 2012) regarding the magnetism originated from the creator of art, which magnetises the performer and audience, and establishes platforms for translation, interpretation, and artistic creation. German philosopher Gadamer (1960/2001) pointed on *te'chne* and *poiēsis* as aspects of mimesis in relation to the arts. *Techne* relates to craftsmanship, and *Poiesis* to creation. Both concepts have a symbiotic relation to learning the craft of a given art (e.g., learning to play a musical instrument or to translate Ancient Greek and Latin to late 17th Century French), and at the same time *how* the craft is used. Within performing arts this includes music, dance and theatre and has been discussed in the *Poetics* by Aristotle (1996):

> Similarly in the case of the arts I have mentioned: in all of them the medium of imitation is rhythm, language, and melody […] For example, music for pipe or lyre (and any other arts which have a similar effect e.g., music for pan-pipes) uses melody and rhythm only […] (Aristotle, 1996, 3-4)

It is of importance while discussing mimesis to distinguish between *making a copy* and *imitation*. The process of mimesis could be misunderstood and equalled to a soulless copying of a model. Such an inexpressive formula is however not included in a discussion of mimesis based on Aristotle and Gadamer. In 18th Century France a distinction was articulated in relation to the terms *imitation* and *copying*. Both expressions were described as *Termes qui désignent en général l'action de faire ressembler* (Girard & Beauzée, 1769, II §. 13: 14), and both concepts include a 'resembling', but with the difference that copying is understood as […] *on copie par stérilité* […] *servilement* (1769, II §. 13: 14), and regarding imitation […] *on imite par estime* […] *en embellissant* (1769, II §. 13: 14). Girard & Beauzée compares the process of copying with when a printer prints the text from a manuscript *Copie ne se dit qu'en fait d'impression, & du manuscrit de l'auteur sur lequel l'imprimeur travaille* (Girard & Beauzée,1769, I §. 173: 213). These examples include that imitation can be associated with a *free recreation of a model* and stands in opposition to copying which aims for an *exact reproduction of the model*. A similar opinion was expressed by Baillot (1834) violin virtuoso and teacher at the *Conservatoire*. He explained the difference between copying and imitation as […] *imiter n'est pas copier, ne vous y tromper pas! Se choisir un modèle n'est pas, matériellement parlant, copier ce modèle ; c'est suivre la marche du maître qu'on préfère et s'éclairer de son expérience* (1834, 8). In other words: imitation should not be confused with copying, and choosing a model is in Balliot's perspective not based on copying but to follow a master's path, and while doing so learning from the master's experiences and skills.

While connecting the *enlarged concept of language* based on Dilthey (1905/1924), it is imaginable to compare how a graphic artist works with woodblocks and copper plates using different tools, colours, and qualities of paper, with how a musician works with and interprets a score in relation to specific instruments, acoustics of concert halls, co-musicians, and the audience (Ljungar-Chapelon, 2012).

Woodblocks and copper plates in principle have the same structure and form for each new printing, but the graphic artist can strongly influence these parameters in choices of colours and paper qualities. In a similar way a score can be said having the same kind of given structure comparable with the structure and form of woodblocks and copper plates, which directly will be influenced by the musician's interpretation, choice of instruments and its connected aesthetics. This could be understood as an analogy between printing plates and scores concerning interpretation and flexibility in relation to mimesis, imitation, and artistic expression. To use models when learning is probably as old as mankind. The dialect we speak our mother-tongue, how we learned to walk, are examples of a universal learning based on imitation. Of course, there are countless examples of how imitation has been used as a learning tool. Within language teaching has imitation often had a major importance, and a French 18th Century example is the professor in grammar and rhetoric's Nicolas Adam (1717-1792) and his *La vraie manière d'apprendre* (1787). Here he discusses that four-year-old children often speak their mother tongue surprisingly well. The conclusion is that children learn through imitation—without teachers—in combination with using their mother-tongue in everyday life. Adam recommends this method for adults wanting to learn foreign languages.

In *Ritter Gluck* (1808-09) the first published novella by Ernst Theodor Amadeus Hoffmann (1776-1822) in *Allgemeine Musikalische Zeitung* (February 15, 1809, Leipzig), is described how the narrator in the novella on several occasions meets a stranger, a mysterious elderly gentleman in Berlin during the autumn of 1809. This stranger claims at the end of the story to be the composer Christoph Willibald von Ritter Gluck (1714-1787), who in 1809 had been dead for twenty-two years. Such a statement makes the reader uncertain regarding *who* was the stranger that the narrator encountered. Considered that Hoffmann is writing in a romantic, almost supernatural—*Unheimlich-Phantastique*—style whereby reality and fiction are intermixed the reader is invited to a poetically fantastic—*Dichterisch-Phantastisch*—setting. In the literature about the novella *Ritter Gluck* and its fascinating story there is a discussion about *whom* the stranger might be (Scher, 1968; Fetzer, 1971; Müller, 1974; Steinecke, 1993). There are suggestions that the stranger is the composer Gluck himself being still alive (!) and a character like the undying *Wandering Jew*, a ghost, a hallucination of the narrator, or a mad elderly man imaging himself being Gluck (Müller, 1974, 459). However interesting this discussion might be, there seems to be a sometimes-overlooked dimension in this story, which relates to essential ideas regarding artistic intention, inspiration, and creation, considering *if* and *how* inspiration and intention can be realized and materialized within an artwork. Here is the point whereby Hoffmann's story is of interest in the present context, discussing concepts of translation and interpretation within literate and musical contexts. At the end of *Ritter Gluck* is an episode whereby the stranger is claiming to be Gluck and starts to sing the final scene from Gluck's opera *Armide* (1776) from a an almost empty score without really having notation, and the narrator describes this vibrant moment:

> Nun sang er die Schlußszene der Armide mit einem Ausdruck, der mein Innerstes durchdrang. Auch hier wich er merklich von den eigentlichen Originale ab: aber seine veränderte Musik war die Glucksche Szene gleichsam in höherer Potenz. Alles, was Haß, Liebe, Verzweiflung, Raserei in den stärksten Zügen kann, faßte er gewaltig in Tönen zusammen.[1]
>
> Hoffmann, *Ritter Gluck* (1809, 1814, 1993, 79)

The described moment points on difficulties when realizing the materialization and notation of expression within the arts and when overcome, although the latter in a fictive setting. St Augustine described in *De trinitate* (*c.*417; Ljungar-Chapelon, 2008) a phenomenon that he called *inner* and *outer language* and argued that thinking and speaking is originally an internal process—*verbum interius*—which initially is not formulated in a particular language, which could include music when understood as a language applying Diltey's concept of *enlarged language* (1905/1924). This inner language or inner music is materialized in speech, written words, scores, and sounds but in an incomplete way, because of its dependence and limitations of the spoken, written, or instrumental medium and inherent material resistance. Thus, as it is not possible to fully express the inner language and inner music, consequently St Augustine created the concept of *internal–external language* (Jung, 2007). Above discussed *Ritter Gluck* and *De trinitate* connects to Madame Dacier and her thoughts regarding translation when referring to how musicians can realize interpretations of scores and the materialization into sounding music with a certain sense of freedom.

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1. Then he sang the final scene of *Armide* with such expression that it penetrated my very being. Here, too, he deviated from the original, but his variants were absolutely true to Gluck's style, only with heightened potency. He gathered into powerful tones everything expressing extremes of hate, love, desperation, rage. (E. T. A. Hoffmann, *Ritter Gluck* , 1809, 1814, 1993, 79)

Questions related and connected to the notation of music, interpretation, and performance combined with the translation-metaphor is how punctuation and phrasing in speech and writing as a tool has been connected to music. Within French flute traditions since the 18th Century until today—suggested by flautists such as Blavet (1732, *c.*1744), Atys (1760, 1763), Van der Hagen (1798), Hugot & Wunderlich (1804), Wunderlich (1812), Drouët (1827), Walckiers (1829), Coche (1839), Brettoniere 1840, Tulou (1851), Gatterman (1861), Altès 1880/1906/1956/1979), Devienne-Gaubert (1908), Taffanel & Gaubert (1923/1958), Rampal (1978), Debost (1996), and Bernold (2021)—is a comparison found between a flautist's phrasing and a text's use of punctuation, often insisting that the flautist should breathe as while speaking, which in its turn has two dimensions: (i) flute technique; (ii) expression.

An important 18th Century example regarding phrasing having breathings as its tool is found in *Sonates Melées de Pieces Pour la Fluûte Traversiere avec la Basse Œuvre II* (1732) by Blavet, in which almost every movement has indications of where to take a breath using the sign h the first letter in the French word *Haleine* meaning breath and breathing:

Avertissement.

> J'ay toûjours remarque, dans les Ecoliers, de la difficulté à réprendre la respiration à propos; en sorte qu'ils confondent, le plus souvent, une frase avec l'autre, ou ils interompent un chant, qui doit être passé tout d'une haleine. Pour éviter cette confusion, j'ay imagine de mettre la lettre h dans les endroits, où l'on doit respirer, sur tout dans les morceaux de chant, comme les Rondeaux, ou autres petittes pieces de caractere, dont toutte la grâce depend de l'arangement des frases, de la netteté, et de la précision, que l'on ne peut trouver sans respire à son aise, et dans les vrais repos. (Blavet, 1732)[1]

Something that could surprise is how frequently Blavet has marked breathings, an example is the beginning of *Les Regréts-Tendrement* the third movement from *Sonate V* in D-major in *Sonates Melées de Pieces Pour la Fluûte Traversiere avec la Basse Œuvre II* (1732, Ex. 17).



Example 17 The beginning of *Les Regréts-Tendrement* the third movement from *Sonate V* in D-major in *Sonates Melées de Pieces Pour la Fluûte Traversiere avec la Basse Œuvre II* (1732). Observe the sign h being the first letter in the French word *Haleine* meaning breath and breathing.

Of course, it would be easy for any flautist—Traverso or Boehm-flute—to play the first eight bars in one breath corresponding to about ten seconds of playing, instead of making the two breathings marked together with the initial breathing before starting to play. This example sheds light on technical dimensions of breathing and that a taken breath and its amount of air should have a clear relation to the length of what is going to be played. Secondly that if the first eight bars in the example is played as indicated by Blavet compared with playing all eight bars in breath a completely different expression will be the result.

1. I have always noticed the difficulty among students in getting the breath back in time; so that they most often confuse one phrase with another, or interrupt a song line or melody, which should be played in one breath. To avoid this confusion, I imagined putting the letter **h.** in places where one should breathe, above all in melodic pieces, such as the Rondeaux, or other little character pieces, the whole grace of which depends on the arrangement of the phrases, on the neatness, and on the precision, which one cannot find without breathing at ease, and in the correct places of rests. (Blavet, *Sonates Melées de Pieces Pour la Fluûte Traversiere avec la Basse Œuvre II*, 1732, *Avertissement*)

If comparing these eight bars with a spoken or written phrase the breathings in bar 1 and bar 6 could be compared with the interpunction sign of the comma ❟, and after the last note E2 when the first phrase is finished in bar 8 the sign of the dot . would be the interpunction sign to use.

Clef facile et methodique, pour apprendre en peu de tems à battre la mesure, a distinguer les modulations, à préluder, et à phraser la musique par le moyen de la ponctuation grammaticale et typhographique. Œuvre V (1763) by Atys (1715–1784) —a French Creole flautist born in what is today Haiti, was professionally active in Vienna and Paris— is an example of an elaborated method explaining how the signs of punctuation can be used as a powerful tool for developing musical interpretation (Ljungar-Chapelon, 2015).

For sure, the example above with the beginning of *Les Regréts-Tendrement* by Blavet shows that a too technical dimension—in this case breathing technique—risk to result in playing too long phrases without breathing on the expenses of musical expression. Still craftsmanship and its technique in connection with knowledge are irreplaceable when it comes to a fluent and living performance. To put it short: when performing on a Traverso, Boehm-flute or any wind instrument each breath should be drenched in the emotion or affect the music has. Possibly this is what Dacier was aiming for when exemplifying her work as a translator with how musicians handle a score and its metamorphose into sounding music.

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When referring to Blavet as above is the text *Défense de la Basse de Viole Contre les Entréprises du Violon Et les Prétentions du Violoncel* (1740) by Hubert Le Blanc of interest. This text gives several descriptions of the apparently exquisite Traverso playing of Blavet giving the impression that Le Blanc wrote about what he had heard in a concert listening to Blavet's Traverso playing. Le Blanc discusses the benefits of the Traverso when comparing with the Violin, and described that *L'Art divin* of Blavet when he played the Traverso connected to his master ship when handling breathings, describing the sonority of Blavet's Traverso as being somewhat hard standing close but round, mellow, and beautiful in distance and many more aspects:

> […] Si l'on faisot des Cadences, il falloit écacher la corde pour vaincre sa résistance, elles ne pouvoient jamais être perlées comme celles de la Flute. (Le Blanc, 1740, 33)
> […] Cependant, malgré tous ces avantages, le Violon rencontra dans la Flute traversière une Emule, au point où il ne s'attendois pas, & qui rabattoit bien de la bonne opinion qu'il avait conçue de son propre mérite, & donnée aux autres sur la nature du Son qu'il tiroit. La Flute se trouva mieux déclamer que le Violon, etre plus maitresse d'enfler ou faire des diminutions. Après la fin du Concert on en remporta cette opinion, que la Flute jouée par *Blavet*, s'entend, est préférable au prémier Violon, lorsqu'il s'agit d'imiter la Voix (Le Blanc, 1740, 49)
> […] L'Art divin de Mr. *Blavet* est de réparer sur la Flute, par le moyen de l'haleine modifiée. (1740, 55)
> […] La Flute traversière a l'Harmonie mâle, parce qu'elle est dure de près: il n'est nullement agréable d'être tout proche de l'embouchure; mais elle a le son rond & moileux quand on s'en éloigne. (Le Blanc, 1740, 74)
> […] Il remplit l'oreille de Sons moileux, étoffés d'une rondeur sans pareille, déclamés avec dignité, avec affection, d'une beauté ravissante. La noblesse de l'expression se trouva répandue dans toute la manière de jouer, dont on ne pouvoit rien détacher qui affectât un mérite particulier (Le Blanc, 1740, 99-101)[1]

*

Ideas in relation to musical performance are expressed by dancer and choreographer Jean-Georges Noverre (1727-1810). In Noverre's central work *Lettres sur les arts imitateurs en general et sur la danse en particulier* (1807), he writes that music is not only the craft of combining sounds and modulations to flatter the ear.

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1. […] If Cadences were made, the string had to be chipped to overcome its resistance, they could never be beaded like those of the Flute. (Le Blanc, *Défense de la Basse de Viole Contre les Entréprises du Violon Et les Prétentions du Violoncel,* 1740, 33)
[…] the Violin met in the Flute an Emulator, to the point where he did not expect, and who fell well short of the good opinion he had formed of his own merit, & given to others on the nature of the sound he derived. The Flute was found to declaim better than the Violin, to be better able to swell or make decreases. After the end of the Concert, the opinion was won that the Flute played by Blavet, of course, is preferable to the first Violin, when it comes to imitating the Voice (Le Blanc, 1740, 49)
[…] The divine Art of Mr. Blavet is to repair on the Flute, by means of modified breath. (Le Blanc, 1740, 55)
[…] The Flute sound hard when standing close: it is by no means pleasant to be very close to the head-joint; but it has a round & mellow sound when you move away from it (Le Blanc, 1740, 74)
[…] It fills the ear with mellow Sounds, with an unparalleled roundness, declaimed with dignity, with affection, of a ravishing beauty. The nobility of expression was found throughout the whole manner of playing, from which nothing could be detached which affected a particular merit (Le Blanc, 1740, 99-101)

But that the gifted musician should not be imprisoned in a strict fulfilment of rules, and should study different characters and passions and use them in his compositions:

> […] comme la musique elle-même n'est que l'art de combiner des sons et des modulations propres à flatter agréablement l'oreille. Mais le musicien doué de genie ne se renferme pas dans ce cercle borné, et l'espace qu'il parcourt au-delà est immensément plus étendu que le cercle lui-même. Il étudie le caractère et l'accent des passions, et le fait passer dans ses compositions. (Noverre, 1807, IX)[1]

When combining Dacier's ideas regarding translation with how flautists since the 18th Century until today has connected musical expression with phrasing and breathing, together with Noverre insisting on not being imprisoned by rules it becomes important to find definitions and descriptions of aesthetics regarding the instrument played on, in the present study mainly the three-piece Traverso. Searching for definitions reflecting the beginning of the 18th Century in France makes a return to earlier quoted Bollioud de Mermet (1746) and D'Aquin de Chateau-Lyon (1752) shed some light.

When Bollioud de Mermet criticized his contemporaries in *De la Corruption du Goust dans la Musique Françoise,* (1746) and took distance to ideals and aesthetics around the middle of the 18th Century he gave examples on how the decline regarding *Bon Goût* also could be found in instrumental music:

> L'on accoutume la main sur l'Instrument à des positions génantes, à des situations forcées, à des progressions épineuses, à des modes transposée […] (Bollioud de Mermet, 1746, 41)[2]

Further examples regarding the powers of expression of the Traverso sheds light on what a flautist of today should incorporate when making interpretations and performances of French music for the Traverso up to about the middle of the 18th Century (Fig. 68). On a print (*c.*1775; see Appendix XXVII for the whole print) by Richard Earlom (1743-1822) after a drawing of *Pan's wedding with Flora* (*c.*1670) in *Liber veritas* by Claude Lorrain (*c.*1604-1682) is a group with four musicians and one playing on a transverse flute in a pastoral scenery. This scene is possibly mirroring mid 17th Century aesthetics regarding the powers of expression of a transverse flute and connecting to when the Traverso was integrated in *Ritournelle pour Diane* and *Prelude pour l'Amour* in *Le Triomphe de l'Amour Ballet Royal* (1681) by Jean-Baptiste Lully (1632-1687; Fig. 69).

La Flute, dont la propriété consiste à former des mouvements affectueux, & des sons soutenus, est employée maintenant à articuler des batteries & des roulades. Bollioud de Mermet (1746, 33-34)	*The Flute, whose property consists of forming affectionate movements, & sustained sounds, is now used to articulate batteries & roulades.*
La Flûte, cet instrument si doux, si flatteur, si charmant, & qui parloit autrefois au cœur […] D'Aquin de Chateau-Lyon (1752, 147)	*The Flute, this instrument so sweet, so flattering, so charming, and which once spoke to the heart* […]
Le son de la flûte allemande est tendre & triste. Il convient à la douleur & aux plaintes. Bethisy (1754/2003, 60)	*The sound of the German flute is tender & sad. It is suitable for pain & complaints.*
Si l'on veut parler exactement sur le chapitre de la Flûte, on conviendra qu'elle n'embrasse pas tout les genres & les caracteres de Musique, tells que sont les airs de Démons, de Furies, de Guerriers, de Tempêtes, de Matelots, & de plusieurs autres, dans lesquels elle n'est pas du moins employee en principal elle sera donc mieux placée dans les morceaux tendres & pathetiques, dans les accompagnemens, dans les petits airs & les brunettes, que dans les Sonates & les Concerto reservée aux meilleurs Maîtres, qui ne doivent point eux-mêmes en abuser. Ancelet (1757/2003, 27/116)	*If we want to speak exactly on the chapter of the Flute, we will agree that it does not embrace all genres & musical characters, such as the arias of Demons, Furies, Warriors, Storms, Sailors, and several others, in which it is not at least mainly employed, it will therefore be better placed in tender & pathetic pieces, in accompaniments, in small arias & brunettes, than in Sonatas & Concerto. reserved for the best Masters, who should not themselves abuse it.*
[…] un son doux (quoique fort) noble et moëlleux. […] Il y a de grands Concerts où la Flute Traversiere fait un bel effet; elle est sur-tout excellente pour accompagner les voix avec lesquelles elle se marie parfaitement. Garsault (1761/2003, 152)	[…] *a soft (albeit strong) noble and mellow sound.* […] *There are great Concertos where the Flute Traversiere has a great effect; it is especially excellent for accompanying the voices with which it goes perfectly.*

Figure 68 Characterizations of what suits the Traverso regarding expression according to Mermet (1746), Chateau-Lyon (1752), Ancelet (1757), and Garsault (1761).

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1. […] music itself is not only the art of combining sounds and modulations that pleasantly flatter the ear. But the musician gifted with genius does not confine himself to this limited circle, and the space he traverses beyond is immensely more extended than the circle itself. He studies the character and the accent of the passions and conveys it in his compositions. (Noverre, *Lettres sur les arts imitateurs en general et sur la danse en particulier,* 1807, IX)

2. One gets used to the hand on the Instrument to awkward positions, forced situations, thorny progressions, transposed modes [...] (Bollioud de Mermet, *De la Corruption du Goust dans la Musique Françoise,* 1746, 41)

Considered that the Harpsichord and Viole de Gambe were among the most important solo instruments during the second part of the 17th Century and the first decades of the 18th Century in France, with personalities such as Louis Couperin (*c.*1626-1661), Sainte-Colombe (*c.*1640-*c.*1700) and Marin Marais (1656-1728). Probably mentioned musicians and their compositions have had influence on Hotteterre as a composer, and especially so regarding Hotteterre's earlier compositions and *L'Art de Preluder* (1719). The last *Prelude* in g-minor for Traverso and Basso continuo in *L'Art de Preluder* possibly bridges to music by Sainte-Colombe and his solo-pieces for Basse de Viole *Pour la Basse* (*c.*1690/2013), having a somewhat melancholic expression which reminds of Sainte-Colombe.



Figure 69 Detail from a print after a drawing of *Pan's wedding with Flora* (*c.*1670) in *Liber veritas* by Claude Lorrain (*c.*1604-1682), depicting a pastoral scene with four musicians, one playing a transverse flute. Coloured *Mezzotinto* print (1775), Nr. 108 by Richard Earlom (1743-1822). (Private Collection)

Conclusions regarding temperaments, character of the Traverso, interpretation, and aesthetics

- The three-piece Traverso—for the first time described in depths in *Principes* and *Rudiments*—is with its seven tone-holes a more complex and versatile type of a transverse flute than sometimes being thought of. When the seventh ton-hole and its D#-key was added to previous transverse flute models like the Renaissance Traverso a wealth of possibilities were created. Examples are that the Traverso became a flexible instrument regarding sound colour, intonation and temperaments, nuances including the possibility to play in all major and minor keys, although some are easier than others.
- When *Principes* and *Rudiments* are studied together with *Pieces pour la Flute Traversiere Œuvre IIa* (1708), *Nouvelle edition 1er Livre de Pieces pour la Flute Traversiere Œuvre IIb* (1715), *Premiere Suitte de Pieces a deux Flutes traversieres seules Œuvre IV* (1712), *L'Art de Preluder Œuvre VII* (1719), *Airs et Brunettes* (*c.*1721), and *Méthode pour Musette Œuvre X* (1737) all has pedagogical dimensions as being discussed above in Part I and Part II. When mentioned works are studied and understood as an entity an image emerges of a complex body resembling a predecessor to later epochs *Méthodes pour Flûte* by authors like Tulou (1851), Altès (1880/1906) and Taffanel & Gaubert (1923/1958), covering a multifaceted variety of aspects regarding flute playing, flautistic learning and teaching, together with discussions on interpretation, musical expression and performance.
- Regarding an examination of intonation and different temperaments, it has been shown that the three-piece Traverso is a flexible instrument, capable to play in generally any temperament, although some suits the instrument better. It is also clear that Hotteterre give detailed suggestions on how to play in different temperaments and tuning system when showing how to use the same fingering for example A#2 and B♭2 and refine the intonation with help of the three head-joint positions *Outward—Normal—Inward.* Another example is how to distinguish the difference between G♭ and F# with the help of fingerings in combination with control of the airstream and *Tonus* in the embouchure.
- Due to the diatonic construction of the three-piece Traverso different tonalities and keys show a variety of distinct characters of sound colours and flexibility, which when developed are strong tools regarding musical expression and character. In *Principes*, *Rudiments* and especially in *L'Art de Preluder* (1719) are these possibilities explained from a practical technical point of view as from a musical expressive perspective.
- Another important dimension discussed in *Principes*, *Rudiments* and especially so in *L'Art de Preluder* (1719) regarding interpretation is the flow of time, and how and where to employ different degrees of *Inégale* alternatively not doing so.
- A final topic is that *Principes* and *Rudiments* became influential throughout the 18th Century and not exclusively in France, which show the impact of the detailed and with high precision explained features of the three-piece Traverso. When comparing Hotteterre's work with Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Hotteterre-Bailleux (1765), and Devienne (*c.*1794) these works represent in several respects transitions of what Hotteterre explained in *Principes* and *Rudiments*. The reason for making such transitions possible is the exquisite quality of Hotteterre's ground-breaking work.



Part III

7 Transitions and changes of flute techniques and aesthetics within French flute traditions covering 300 years

When discussing potential transitions of playing-techniques between different transverse flute models as in the present study is the period from 1707 with the first publication of *Principes* well documented throughout the 18th Century, and from 1795 with the foundation of the *Conservatoire* until today even more documented. Whereas the transition from the Renaissance Traverso to the Traverso is far more complicated to map, even if documents as Jambe de Fer (1556/2005), Van Eyck (1649 & 1654/2019), and works like Praetorius (1620) gives important information in combination with preserved original instruments.

One of the first examples of instrumentation including the Traverso—*Flute d'Allemagne*—is *Le Triomphe de l'Amour Ballet Royal* (1681) by Jean-Baptiste Lully (1632-1687; Lebez, 2017). In this work which was premiered in 1681 there are two examples whereby the Traverso is a part of the ensemble and probably for contributing with a new sound colour and timbre: a *Ritournelle pour Diane* (Ex. 18) for two Traversi and Basse Continue, and a *Prelude pour l'Amour* for a flute ensemble and Basse Continue including Traversi (Ex. 19).



Example 18 The first fifteen bars of *Ritournelle pour Diane* from *Le Triomphe de l'Amour* (1681, 70-71) by Lully.



Example 19 The first eight bars of *Prelude pour l'Amour* from *Le Triomphe de l'Amour* (1681, 200-201) by Lully.

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Two well-known Traverso-players of the first generation in the environment of Lully, and the period of *Le Triomphe de l'Amour* (1681) were Philippe Rebillé *dit* Philbert (1639-*c.*1717)—sometimes spelled *Philibert* but not to be confused with the famous Philidor-family of musicians—and René Pignon Descoteaux (*c.*1645-1728), the latter's name is sometimes written as *des Coteaux*. It seems to be clear that there were strong connections between both Philbert, Descoteaux, and the Court of Louis XIV and Versailles (*Mercure de France*, 1725, Mathieu Marais, 1715-1737/1863-1868; Sauzé de Lhoumeau, 1938).

Regarding Philbert there is a short biography—partly somewhat anecdotical—in *Mercure de France* published in June 1725, including a poem by Alexandre Lainez (*c.*1650-1710; Appendix XXIX). Here is a description regarding Philbert's Traverso-playing and his friendship with Descoteaux, and their relations to the King Louis XIV:

> […] il [Philbert] joüoit parfaitement de la flute Allemande, il étoit camarade de Descôteaux, celebre dans l'art de joüer de cet instrument. Loüis XIV se faisoit un vrai plaisir d'entendre ces deux personnes exprimer des chants melodieux sur leurs flutes, & les faisoit souvent venir pour cela dans ses appartements, & dans les bosquets de Versailles. (*Mercure de France*, Juin 1725, 1081)[1]

Philbert should according to the same source have been an excellent singer, skilfully tempering his voice from softness to fullness and strengths:

> […] Philibert chantoit fort bien; pour donner plus d'expression à ses chants, il sçavoit adoucir sa voix, & la grossissoit tout-à-coup, pour passer du gracieux, au bruyant & au martial. (*Mercure de France*, Juin 1725, 1081-1082)[2]

Having the singings skills as described above in combination with the ideal that the singing voice with all its inflections is the ideal for all music instruments it doesn't seem to be farfetched that Philbert did "translate" these skills into Traverso-playing with its possibilities of sound-colours and *Sons filés*.

As regards Descoteaux there is a characterization of his Traverso-playing in the obituary notice found in *Mercure de France* in December 1728:

> […] Il [des Coteaux] avoit de grands talens pour la Musique en general, avec un gout admirable pour le Chant & pour les Instrumens, sur tout pour la Flute Traversiere, dont il tiroit un son admirable, dans un temps où cet Instrument n'étoit presque point connu en France. C'est un des premiers qui l'a mis en vogue. Il ne joüoit guere que de petits airs tendres, mais avec un gout & une propreté charmante. (*Mercure de France*, Décembre 1728, 2897)[3]

In *Journal et Mémoires* by Mathieu Marais (1665-1737) covering the period 1715-1737, published by Adolphe de Lescure (1833-1892) in the years 1863-1868 is a short description of Descoteaux's Traverso-playing and that he like Philbert also was an excellent singer:

> […] C'est lui qui a poussé la flute allemande au plus haut point et qui a perfectionné la pronunciation du chant, suivant les regles de la valeur des lettres qu'il sait mieux que personne. Il chante les paroles de Verger très exactement. (Marais, 1715-1737/1863-1868, Tome III, 44-45)[4]

It is interesting that both Philbert and Descoteaux were excellent Traverso-players and singers at the same time, further the observation that Descoteaux had developed the pronunciation to a high level when singing which perhaps could be transformed to a clear and expressive articulation when playing the Traverso. Altogether mentioned comments by contemporaries to Philbert and Descoteaux point in the direction of a style and aesthetics regarding that the first generations of Traverso-players high-lighted a melodic expressive singing style, and not what later sometimes was called *Batteries & des Roulades* (1746, 33-34) as Louis Bollioud de Mermet (1709-1794) described virtuosic elements with an ironic twist.

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1. […] he [Philbert] played la flute Allemande perfectly, he was a friend of Descôteaux, famous in the art of playing this instrument. Louis XIV took a real pleasure in listening to these two persons expressing melodious songs on their flutes, and often had them come to his apartments and in the appartements of Versailles for this purpose. (*Mercure de France*, June 1725, 1081)
2. […] Philibert sang very well; to give more expression to his songs, he knew how to soften his voice, and suddenly increase it, to pass from the graceful, to the noisy and the martial. (*Mercure de France*, June 1725, 1081-1082)
3. […] he [des Coteaux] had great talents for Music in general, with an admirable taste for Singing & for Instruments, above all for the *Flute Traversiere*, from which he drew an admirable sound, at a time when this Instrument was hardly known in France. He was one of the first to put it in vogue. He hardly played more than small, tender airs, but with a charming taste and cleanliness. (*Mercure de France*, December 1728, 2897)
4. […] It was him who advanced *la flute allemande* to the highest point and who perfected the pronunciation of singing, following the rules and of the value of the letters that he knows better than anyone. He sings Verger's lyrics very exactly. (Marais, *Journal et Mémoires*, 1715-1737/1863-1868, Tome III, 44-45)

In *Le «Fleuriste» des Caractères de la Bruyère René Pignon des Coteaux*—a biography about Descoteaux—by Charles Sauzé de Lhoumeau (1864-1942) is explained that the personality *Le Fleuriste* as found in the *Les Caractères* (1688) by Jean de La Bryère (1645-1696) is Descoteaux. The reason why Descoteaux became the nickname *Le Fleuriste* is based on that he must have been an extraordinary, gifted gardener and lover of not the least Tulips, and when retired was given an apartment and little garden in the park of *Palais du Luxembourg* in Paris. In addition is it interesting that Descoteaux enjoyed the friendship in the circle of *Les quatre amis: Molière, Boileau, Racine et La Fontaine* (Sauzé de Lhoumeau, 1938, 4). Marais also described Descoteaux's skills as a gardener:

> Il a encore, au supreme degré, le gout des fleurs et c'est un des grands fleuristes de l'Europe. Il est loge au Luxembourg où on lui à donné un petit Jardin qu'il cultive lui-même. La Bruyère ne l'a pas oublié dans ses Caractères sur cette curiosité outré de ses tulips, qu'il baptise du nom qui lui plait. Il veut être philosophe et perler de Descartes. Mais c'est bien assez d'être musicien et fleuriste. (Marais, *Journal et Mémoires*, 1715-1737/1863-1868, Tome III, 45)[1]

Regarding both Descoteaux and Philbert similar characterisations as above are found in *Letters sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV* (1752) by earlier mentioned D'Aquin de Chateau-Lyon:

> Je me rappelle le nom de *Descoteaux*, fameux joueur de Flûte, & excellent Convive. Ce fameux Musicien vivoit familièrement avec *Moliere*, *Racine*, *Despreaux* & *La Fontaine*: il étoit admis à leurs joyeuses parties: & ne pouvoit avec son talent qu'augmenter le plaisir que l'on devoit goûter dans de pareils Festins, & avec des hommes d'un si grand mérite. (Château-Lyon, 1752, 147-148)[2]

> *Philbert* avoit aussi beaucoup de réputation pour cet instrument [la Flûte]: d'ailleurs il étoit bon chanteur, grand fleuriste, homme très-plaisante, & plus que tout cela, il étoit assez heureux pour plaire à son Maître, à Louis XIV. (Château-Lyon, 1752, 1752, 148)[3]

To summarize above-mentioned documents makes it clear that Philbert and Descoteaux—both being excellent Traverso virtuosos and singers—was in personal contact with King Louis XIV performing chamber music with two Traversi in private settings, which should be understood as a very generous privilege regarding the social hierarchies in the *Ancien Régime*. Further that the Court around Louis XIV and Versailles with its art-loving environment metaphorically could be likened with a *Gesamtkunstwerk* (Jung-Kaiser & Simonis et al., 2015), and it is striking that this coincides precisely with the period when the three-piece Traverso started to become a most cherished new instrument in France.

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If we acknowledge that the Traverso could have been introduced in France and Parisian music life around 1660-1670 and in the environment of Lully, then Philbert and Descoteaux as young men were possibly familiar with the Renaissance Traverso, most likely rather familiar with the Recorder, and perhaps the Oboe. If so, it seems to be natural that elements of playing the Renaissance Traverso could had been in a process of transitions when learning to play the Traverso in the years around 1660-1670. Unfortunately, these potentially possible transitions of playing-techniques regarding the Renaissance Traverso seems to be in a void regarding precise sources. The next generation of well-known Traverso-players after Philbert and Descoteaux are represented by Michel de La Barre and Hotteterre, both being born around 1675 which potentially could have had he implication that when they started to learn how to play on the Traverso—let say around 1685—this could possibly have been done directedly on the Traverso, which not exclude a familiarity with the Renaissance Traverso. Possibly Descoteaux could have been the Traverso teacher for La Barre, if so, it could be assumed that La Barre through the potential possibility that Descoteaux due to his age had a familiarity to the Renaissance Traverso which in its turn could have had the effect of at least partly a transition of playing-techniques and aesthetics with origins in the Renaissance Traverso.

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1. He still has, to the highest degree, the taste for flowers and he is one of the great florists of Europe. He lives in Luxembourg where he was given a small garden that he cultivates himself. La Bruyère has not forgotten him in his *Characters* and his curiosity of tulips, which he baptizes with names he likes. He wants to be a philosopher and talk about Descartes. But it's a lot to be a musician and a florist. (Marais, *Journal et Mémoires*, 1715-1737/1863-1868, Tome III, 45)

2. I remember the name of *Descoteaux*, famous flute player, and excellent fellow. This famous Musician was familiar with *Moliere*, *Racine*, *Despreaux* & *La Fontaine*: and was admitted to their joyful parties: and could only with his talent increase the pleasure that one had to taste at such Feasts, & with men of such great merit.

3. *Philbert* also had a lot of reputation for this instrument [the Flute]: moreover, he was a good singer, a great florist, a very pleasant man, and more than all that, he was happy enough to please his Master, Louis XIV. (Château de Lyon, *Letters sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV* 1752, 147-148)

In *Écrits de Musiciens XV^e-XVIII^e siècles* (1912) by the French musicologist Jacques-Gabriel Prod'homme (1871-1956) is an article about the above-mentioned Parisian Traverso virtuoso and composer Michel de La Barre (*c.*1675-1745; Fig. 70). This article is important when discussing the beginnings of the Traverso in France in the late 17th and early 18th Centuries. Further Prod'homme has added a short text—*Notice et Mémoire sur les Musettes et Hautbois* (*c.*1740)—written by La Barre that will be shown below. La Barre is a key personality within French Traverso playing in the period mentioned above, because he was literally the first to write and publish music for Traverso and Basso (1702/1703).



Figure 70 Possibly a portrait of Michel de La Barre? Note the three-piece Traverso with the typical *Barillet* connecting the head-joint with the middle-joint, as often used on the earlier models of the three-piece Traverso. (*c.*1740, Bibl. Nat. Paris)

The complete article in French by Prod'homme is reproduced as a facsimile and found in Appendix XV, and in the following is a summary in English:

> Michel de La Barre, musician, was the son of a wine merchant, living in the St. Paul district in Paris. He was justly considered the most excellent player of *Flûte Allemande* [Traverso] of his time, and for this talent distinguished himself in *l'Orchestre de l'Académie Royale de Musique*. He died as a resident of the said *Académie*, around the year 1743 or 1744. He wrote the music of the two following Poems:
> *Le Triomphe des Arts*, ballet in five entries, words by M. de la Motte, 1700.
> *La Vénitienne*, ballet in three acts, with a prologue, words by M. de la Motte, 1705.
> The ballet *La Vénitienne*, whose first performance took place on May 26, 1705, had some success, and was partly performed until 1711.
> La Barre's reputation as a flautist is proven not only by his official title of *Flûte de la Chambre de Roy*, or *l'un des musiciens de la Chambre pour la flûte traversière*, but also by his works for the Traverso, which consist of three *Livres de Trio*, and thirteen *Suites* for two Traversi.
> Michel de la Barre, *Officier de la musique du Roi* made his will on March 8, 1741. (Prod'homme 1912, 241-242)

The text *Sur les Musettes et Hautbois* (*c.*1740) by La Barre is here shown in an English translation, the complete French text with the complete footnotes by Prod'homme is found in Appendix XV.

MEMORY OF M. DE LA BARRE[1]
On the Musettes and Oboes & c [*c.* 1740]

> we find in the archives of the *Chambre des comptes*, four oboes and musettes de Poitou, from the creation of King Jean, in those barbaric times at least for the arts, and above all for music, we did not know other instruments than the musette, the oboe, the bagpipe, the cornet, the cromorne, and the cacbouc[2], the latter was a species of bagpipe but much larger, all these instruments were good for rejoicing the peasants and for their dances, whatever they played very badly, primarily through the ignorance of those who played them, and through the very fault of the instruments; from the ninth of François the First, we began to clean up on the music, a man named du Coroy[3] valet de chambre of his majesty and music master of his chapel was the first and the only one who did well for that time;

he wanted to make use of these instruments, but he never could, we were obliged to bring in violins from Milan, after his death the music fell back into the barbarian, and it remained there very nearly, until the autumn of Louis XIV, under the famous reign where all the arts were carried to their perfection, the music shone infinitely Le Camus, Boisset, Dembris and Lambert[4] were the first to make airs which expressed the words, but especially the *Celebre* Lully; one could say that one should call *L'Apollon* of France but his promotion brought about the total downfall of all these ancient instruments with the exception of the oboe, thanks to the Philidor and Hauteterre[5] which spoiled so much wood [made so many experiments regarding the making of Traversi] and supported the music, that they are finally appeared to make it clean for the Concerts. From that time the musette was left to the shepherds, the violons, the recorders, the theorbos and the viols, took their place, for the Traverso came later. It was Philibert [Philbert][6] who was the first to play the Traverso in France, and then almost at the same time Descoteaux[7], the King as well as the whole court, who liked this instrument infinitely, added two positions to the four musettes de Poitou, and gave them to Philibert [Philbert] and Descouteaux, and they told me several times that the King had told them when giving them that he very much wished that the six musettes were transformed into the Traverso, that the less they would be useful, and that the musettes were only useful to make the peasants dance, that is all that I read and all that I has said regarding the musette. I hope that this it is written well enough for you to be able to read it, I cannot do better, it is not my profession to write, I play the Traverso at your very humble service.

Je suis très parfaitement, Monsieur, votre tres humble
et tres obeissant serviteur DELABARRE

(*Adresse* : A Monsieur, Monsieur Deulliers[8] a l'hotel de la Monnaye, A Paris)

(Prod'homme, 1912, 242-245)

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It should be noted that the French repertoire for the Traverso around 1700 and the first decades of the 18th Century did not explicitly highlight a virtuosity, but was directed towards a singing, expressive sonority and melodic playing. In the text *Lettre de Monsieur l'Abbé Carbasus, a Monsieur*** auteur du temple du goust sur la Mode des Instruments de Musique, avec l'origine de la Vielle* (1739) by the French guitarist, theorbist, lutenist, and theoretician François Campion (1686-1747) but published under the name of his pseudonym Abbé Carbasus is an example of praising La Barre and his sober singing style of playing the well-known *Brunette L'autre jour ma Cloris* that was discussed above in the section on *Des Agrémens* and Ornamentation:

> C'est de joüer, *L'autre jour ma Cloris*, ou quelqu'autre simple *Brunette*, comme le fameux de la Barre les joüoit. Ce Musicien a connu, mieux qu'un autre, les justes bornes de cet Instrument, qui sont le tendre & le pastoral; & s'est contenté d'y joüer une seule partie, sçavament ménagée par des sons naturels, agréables & charmans; mais cette prudence est gauloise aujourd'hui, tant il est vrai que tout flêchit devant le Goût du Temps & la Mode. (Carbasus/François Campion, 1739, 31-32)[9]

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1. Arch. Nat. King's House, O1. 878 (Music of the Grand Ecurie). The so-called Grande Ecurie Music included, in the seventeenth and eighteenth centuries, trumpets, fifes and tambourines or drums, oboes, saquebutes (trombones) and cornets, oboes and Poitou musettes. There were also violins. This kind of military music, or open air, depended on the Grand Ecuyer.
2. Perhaps we should read "cacbout" for saquebote, the ancestor of the trombone: but then, the explanation of La Barre, which compares this instrument to the bagpipes, would be fanciful.
3. Eustache du Caurroy
4. Leader of the large band of the King's violins, Sébastien Le Camus left "airs" in manuscript collections; we know almost nothing of his life, although he enjoyed a great reputation under Louis XIII and the following reign. He died on March 24, 1677.
His son Charles Le Camus, "joüer de Téorbe" and "joüer de Violle de la Musique de la Chambre" inherited these two positions from him. A posthumous collection of *Airs de Sébastien* appeared in 1678. A Master of Music, Honoré Dambruis, obtained on November 23, 1684, a privilege for the printing of works of music; he had it recorded on the following March 31. Lambert, father-in-law of Lully (1610-1696).
5. The Danican Philidors, a dynasty of musicians who settled in France under Louis XIII. The Hotteterre, a family of flautists and oboists, flourished at the same time.
6. Philibert Rebeillé, flautist. [Philippe Rebillé *dit* Philbert, 1639-*c.*1717] He was involved in the affair of the poisons. A big bourgeois from Port Saint-Landry, Brunet, intended his daughter for him. "Brunet adored the flautist for the charm of his talent, and Mrs. Brunet for the charm of her person," says M. Funck-Brentano. All would have been for the best, if Brunet had not taken it into his head to offer his daughter to Philibert [Philbert], with a handsome dowry. Madame Brunet, jealous, confided her fate to *La Voisin*; for 2,000 pounds, Brunet was poisoned, and Philibert [Philbert] married the mother instead of the daughter, and the King signed the contract. Brunet had died in 1672; seven years later, everything was discovered, and the flautist's wife was condemned to make amends, then to be hanged in the Place de Grève, her body thrown into the fire and her ashes in the wind. Philibert [Philbert], who had made himself a prisoner in the Bastille, was absolved by judgment of August 8, 1680. He succeeded around the same time to Jean Brunet, at the *Grand Ecurie* "flute player of the Cabinet", he resigned from this charge, the December 31, 1689, in favour of Pierre Piesche. He died at the earliest in 1715. La Bruyère, alluding to this famous affair, put Philibert [Philbert] under the name of Dracon in his *Characters*.

7. Pignon Descoteaux (François) would have been born around 1655. He died in 1728, having had his surviving son René named as oboe and musette of Poitou, on December 11, 1689. He was one of the most famous flautists of his time. Friend of Molière, of Racine, of La Fontaine, of Boileau, he lived in Luxembourg in the last years of his life. Very fond of flowers, he had lived in the Faubourg Saint-Antoine for a long time. It would be the "curious flower" of the characters. (Lhoumeau de, Sauzé, *Le «Fleuriste » des Caractères de la Bruyère René Pignon des Coteaux,* 1938)
8. M. de Villiers was secretary to Prince Charles of Lorraine, Grand Squire of France "at the *Carouselle*."
9. It is to play, *L'autre jour ma Cloris*, or some other simple *Brunette*, as the famous de la Barre played them. This Musician has known, better than any other, the true limits of this Instrument [the Traverso], which are the tender and the pastoral; & contented himself with playing a single part, skilfully managed with natural, pleasant & charming sounds; but this caution is Gallic today, as it is true that everything gives way to *Gout du Temps & la Mode.* (François Campion*, Lettre de Monsieur l'Abbé Carbasus, a Monsieur*** auteur du temple du goust sur la Mode des Instruments de Musique, avec l'origine de la Vielle* 1739, 31-32)

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In a *Suite* in b-minor for Traverso and Basse (1711) by Antoine Dornel (1680-1765) is a wonderfully beautiful *Prélude* having the title *L'aimé de Mr. de la Barre* (Ex. 20) which possibly could be understood as a musical portrait of La Barre and exemplifying the characterisation of La Barre's style and aesthetics as described by Campion/Abbé Carbasus in 1739. In above mentioned *Letters sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV* (1752) by D'Aquin de Chateau-Lyon is again a reference to La Barre's apparently wonderful Traverso-playing:

> Le fameux de *La Barre* avoit, dit'on, le talent merveilleux d'attendrir, c'est un don de la nature que l'Art tel qu'il soit n'atteindra jamais. (Château-Lyon, 1752, 149)[1]



Example 20 *Prélude, L'aimé de Mr. de la Barre* from *Suite* in b-minor for Traverso and Basse by Dornel (1711).

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1. The famous de *La Barre* had, it is said, the marvellous talent of touching and moving people with his playing, such a talent comes from nature, Art will never achieve its like. (Château-Lyon, 1752, 149)

Principes (1707) is the first in depth treatise and manual on how to play the Traverso together with some suggestions in the *Avertissement* to *Pieces pour la Flute Traversiere, avec la Basse-Continue. Œuvre Quatrieme* (1702/1703) by La Barre. *Principes* is thus the first step in a long row of flute methods and practice-books for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute up to the present day. In the period from the first publication of *Principes* in 1707 until 1795 when the *Conservatoire* was founded, the Traverso had its heyday. Traverso-playing in this period is described in several methods, texts about Traverso-playing and Traverso-players together with originals of different models of the Traverso found in museums and private collections, and a display of these models are today available through good copies made by master Traverso-makers. These artefacts represent all-together sources for researching possible transitions of flute techniques and aesthetics. When studying this vast material, it becomes clear and as an example that when Mahaut published his *Nouvelle Methode pour Apprende en peu de tems a joüer la Flûte Traversiere* (1759) he was familiar with *Principes*, because he discussed changes regarding how to develop the embouchure in relation to intonation and articulation compared with *Principes*. This kind of relations and sometimes direct transitions of playing-techniques and aesthetics have many examples within French flute traditions. When discussing potentially possible transitions of flute techniques and aesthetics is the *Conservatoire* a most precious source regarding flute traditions from 1795 up to the present day, representing an immense documentation of which flute models that has been taught, combined with that most of the flute teachers has written flute methods or practice-books. Further has the strong dominance of Paris regarding cultural life being the capital of France during the *Ancien Régime*, after the French revolution in 1789, and far up in the 20th Century played an important role because its centralizing effects.

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Starting with looking at the different transverse flutes being taught at the *Conservatoire* makes a display of the Traverso (1795-*c.*1803), Multi-keyed conical flutes (*c.*1803-1860), *Ringklappenflöte* (1831-1841), and the Boehm-flute (1860-). When a new flute teacher was appointed, the new teacher was generally a former student that had been taught at the *Conservatoire* by the retired teacher, having the effect of a certain transition of playing-techniques, teaching methods and aesthetics in combination with that the new teacher had been an active flautist in the professional music life in Paris or elsewhere for quite some time (Ljungar-Chapelon, 2008). A typical example—as mentioned above—is Henri Altès (1826-1895) who was a student at the *Conservatoire* in the years 1840-1842 and the flute class of Jean-Louis Tulou (1786-1865), and by then was studying Multi-keyed conical flutes. Later Altès changed to the Boehm-flute, and twenty-six years later started to teach the Boehm-flute at the *Conservatoire* in the years 1868-1893, and wrote one of the very important French flute methods for this instrument *Méthode pour Flûte Système Boehm Contenant la Théorie complète de la Musique. Œuvre 31* in 1880. This is an example of how a transition could have shaped itself regarding playing-techniques and aesthetics with origins in Multi-keyed conical flutes and then transmitted to the Boehm-flute. In addition, it can be assumed that Tulou—due to that he was born in 1786—most likely have had direct knowledge and possibly skills playing the Traverso. Such examples shows that a certain amount of transitions of playing-techniques probably have taken place—Traverso to Multi-keyed conical flutes (Tulou), and Multi-keyed conical flutes to the Boehm-flute (Altès)—with long reaching effects up into the 20th Century when Jean-Pierre Rampal (1922-2000) and Alain Marion (1938-1998)—both teachers at the *Conservatoire*—and explain why they published a facsimile edition of Altès' *Méthode pour Flûte Système Boehm Œuvre 31* in 1979 for making a tool for flute teaching in the late 20th Century. Other examples of transitions and changes is when *Principes* was revised by the Parisian editor and violinist Antoine Bailleaux (*c.*1720-*c.*1801) and published in 1765 as *Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere, Divisée en differents traités par Mr. Hotteterre*, when Philippe Gaubert made a revision in 1908 of *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne, and when the French virtuoso Fernand Caratgé (1902-1991) revised *Méthode pour Flûte Système Boehm Contenant la Théorie complète de la Musique. Œuvre 31* (1880) by Altès in 1956.

From the beginning of the 20th Century are recordings an important complementary source, whereby one of the very first recordings were made by Adolphe Hennebains in 1905, followed by Philippe Gaubert in 1919. In the period starting in about 1930 more recordings were made, and the period after 1945 to the present day represents a vast and highly important source regarding French flute-playing, its repertoire and aesthetics. What has been attempted to show in previous sections of the present study is that fundamental playing-techniques for the Traverso, firstly described in *Principes*, can be traced throughout almost the whole 18th Century.

Then, at the end of the 18th Century changes in musical aesthetics and compositions starts to influence the construction of the Traverso adding more keys for the sake of primarily a more equalized sound quality. We can assume—having French flute methods as an important source—that the gradual change from the Traverso to Multi-keyed conical flutes included elements of transitions regarding playing-techniques and aesthetics. When Boehm had constructed the *Ringklappenflöte* in 1832 which in a sense is a flute having important similarities with Multi-keyed flutes, which in its turn had pronounced links to the Traverso of the late 18th Century and Devienne. The kinship between Multi-keyed conical flutes and the *Ringklappenflöte* is described by Tillmetz (*c.*1905/1906) and the above discussed *Parsifal*-episode. A major change of primarily aesthetics and ideals of the flute sound and connected playing-techniques is the construction and finalization of the Boehm-flute in 1847. Still, it seems that important elements of previous flute models have been influential at least in the beginning of the second half of the 19th Century and up to the period around 1900. It seems to be clear that French traditions regarding the Boehm-flute had links to the past for some decades of the second half of the 19th Century. Even thou playing-techniques are described rather similarly when comparing methods for Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute it must be taken in account that Boehm-flute playing today at the beginning of the 21st Century has developed an aesthetic which embraces the idea of playing transcriptions of violin works like the *Sonata* by César Franck, the *Concerto* by Khachaturian, and the *Chaconne* in d-minor from *Partita* No. 2 BWV 1004 by Johann Sebastian Bach. Further works like *Cassandra's Dream Song* (1970) by the English composer Brian Ferneyhough (1943; Ljungar-Chapelon, 2013) including a broad spectrum of so-called extended techniques. The repertoire list is long and altogether represents examples of works that French flautistic aesthetics in the 19th Century and beginning of the 20th Century not necessarily thought could correspond to the powers of expression of the flute. In this context is the French virtuoso and *Homme des lettres* Louis Fleury (1878-1926) and his writings on the flute and its music an important source, which seems to mirror flautistic aesthetics around Paul Taffanel, Paris and France in the final decades of the 19th Century and beginning of the 20th Century. In the long article *La Flûte* in *Lavignac Encyclopédie de la Musique* (1925a) based on outlines written by Taffanel we can almost hear an echo from the 18th Century and Bollioud de Mermet highlighting a sober style of playing not being the victim of superficial effects:

> Il en est résulté un retour à un style plus sobre. C'est, en effet, l'extrême sobriété du style que nous nous permettrons de préconiser. Il nous parait, qu'avec une technique solide et une sonorité riche et variée, l'exacte observance des désirs de l'auteur conduit à l'interprétation idéale, celle qui met l'instrument au service de la musique, et non pas la musique à celui du virtuose. (Fleury in Lavignac, 1925a, 1525)[1]

When Fleury in *Cobbett's Cyclopaedic survey of chamber music* (1929) did comment on the *Undine Sonata* for flute and piano Op. 167 (1883) by the German composer Carl Reinecke (1824-1910) is a similar questioning of what suits the flute and its powers of expression, when pointing at *Sonate pour flûte, alto et harpe* (1915) by Debussy and the *Sonatina* for flute and piano (1922) by Darius Milhaud (1892-1974) concluding that the power of the flute is to express emotions of tender melancholy which as well echo's French aesthetics regarding the Traverso in the 18th Century:

> His work [Reinecke: *Undine Sonata for flute & piano, op. 167,* 1883], is essentially graceful, charming, and flexible – with the exception of the finale, in which he demands of the flute a greater degree of passion than it is able to express […] (402); […] the delicate tones of the flute […] (403);[…] the penetrating sweetness of the lover octave of the flute… [*Debussy: Sonate pour flûte, alto et harpe,* 1915] […] (404). The real master of the flute prefers to seek variety, and the picturesque, and they write "leggiero". The criterion of success is the feeling of ease of the flautist […] the composer [Milhaud: *Sonatina for flute & piano,* 1922], brings in the gentle tone of the flute with a kind of sooting effect […] What Milhaud has so perfectly understood is the power of the flute to express emotions of tender melancholy (405). *Cobbett's Cyclopaedic survey of chamber music* compiled and edited by Walter Wilson Cobbett. (1929). London: Oxford University Press.



1. This resulted in a return to a more restrained style. It is, in fact, the extreme sobriety of the style that we will allow ourselves to recommend. It seems to us that with a solid technique and a rich and varied sonority, the exact observance of the desires of the author leads to the ideal interpretation, one that puts the instrument at the service of the music, and not the music to that of the virtuoso. (Fleury in *Lavignac Encyclopédie de la Musique*, 1925a, 1525)

7.1 Structure and influences from *Principes* and *Rudiments*

A general difference between *Principes*, *Rudiments* and the Traverso methods by Corrette (1735 & 1773), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794) is that they have sections on basic music theory. Whereas *Principes* and *Rudiments* does not have such sections, and as Hotteterre pointed out, this knowledge can be found in standard treatises on basic music theory. Another difference when comparing *Principes* with the above mentioned Traverso methods including Mahaut (1759) is that *Principes* does not include a collection of tunes or duets, but that *Rudiments* has a collection of tunes similarly as to mentioned methods. This could in its turn, possibly, indicate that *Principes* is not to be read as a Traverso method as discussed in the Introduction of the present study, but as a detailed explication or manual of how a three-piece Traverso functions.

It is clear that *Principes* had a strong influence on generally all texts on Traverso playing during the 18th Century in France, which can be deduced when comparing Traverso playing technics, posture, playing positions, and fingering-charts as described in above mentioned methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794). In addition, this influence can be studied when comparing the structure and order of chapters in mentioned Traverso methods. A typical example of how *Principes* has influenced the structure of an 18th Century Traverso method is found in *Nouvelle Methode pour Apprende en peu de tems a joüer la Flûte Traversiere* (1759) by Mahaut. When comparing the structure and organisation of chapters in *Principes* with Mahaut's *Nouvelle Methode* it is clear that Mahaut generally follow the design of *Principes* (Fig. 71). Apart from that *Principes* has nine chapters and *Nouvelle Methode* has eight chapters, and the ninth chapter in *Principes* discusses *Des Flattements ou Tremblements Mineurs, & des Battements*, and Mahaut discusses the same subjects in his seventh chapter the overall structure is similar, apart from that Mahaut included a selection of tunes and duets at the end of his method.

HOTTETERRE 1707	MAHAUT 1759
TRAITÉ DE LA FLUTE TRAVERSIERE.	**NOUVELLE METHODE POUR APPRENDRE EN PEU DE TEMS A JOÜER DE LA FLÛTE TRAVERSIERE**
PRÉFACE	**INTRODUCTION**
CHAPITRE PRÉMIER De la situation du Corps, & de la position des Mains.	**CHAPITRE PREMIER** De la situation du Corps & de la positions des Mains
CHAPITRE II. De l'Embouchure	**CHAPITRE II.** De l'Embouchure
CHAPITRE III. Premiere explication de la premiere Planche sur les Tons naturels.	**CHAPITRE III.** Explication de l'Echelle de Tous les tons et demi Tons.
CHAPITRE IV. Prémiere explication de la deuxiéme Planche sur les Cadences naturelles.	**CHAPITRE IV.** Remarques sur quelques Tons et demi Tons.
CHAPITRE V. Seconde explication de la Prémiere Planche sur les Diézis & les Bemols	**CHAPITRE V.** Des Cadence ou Tremblemens.
CHAPITRE VI. Seconde Explication de la seconde Planche sur les Cadences.	**CHAPITRE VI.** Remaques sur quelques Cadences.
CHAPITRE VII. Remarques sur quelques demi-Tons, & sur quelque Cadences.	**CHAPITRE VII.** Des Flattements, Battements, du Martellement du Port de Voix et des Accents.
CHAPITRE VIII. Des coups de Langue, Ports-de-voix, Accents & doubles Cadences sur la Flute Traversiere & autres Instruments à vent.	**CHAPITRE VIII.** Des coups de Langue
CHAPITRE IX. Des Flattements ou Tremblements Mineurs, & des Battements.	**A selection of tunes and duets**

Figure 71 Comparison of the structure of chapters and contents in *Principes* (1707) and *Nouvelle Methode* (1759) by Mahaut.

Another example of influences from *Principes* regarding structure and content is found in *Méthode pour apprendre aisément à jour de la Flûte Traversière* (1735), and its later version *Méthode raisonnée pour apprendre aisément à jour de la Flûtte Traversière* (1773) by Michel Corrette. The content and explanations regarding—*Chapitre II. De la maniere de tenir la Flute Traversiere* and *Chapitre III. De la maniere d'acquerir l'Embouchure*—are influenced by *Principes*.

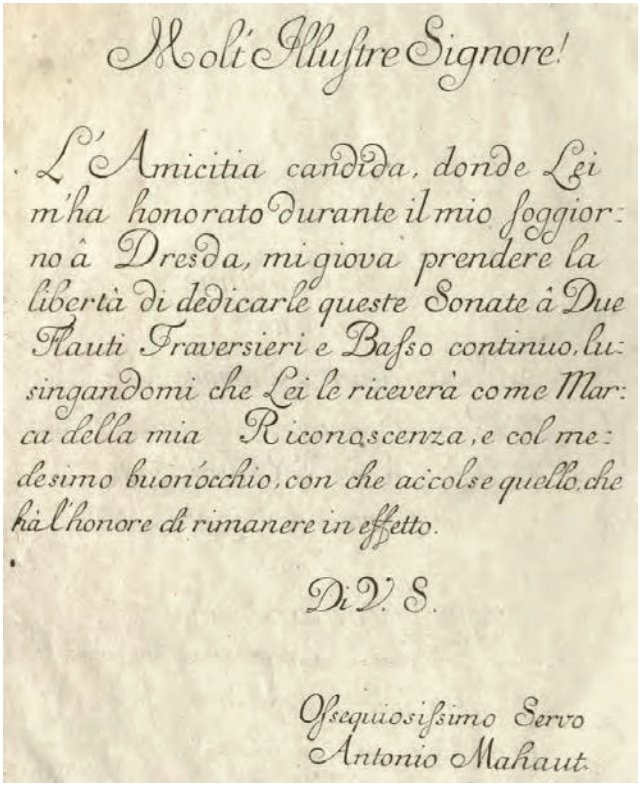
A revised edition of *Principes* was published in 1765 by the Parisian violinist and editor Antoine Bailleux (*c.*1720-*c.*1801) under the title *Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere, de la Flute à bec et du Haut- bois. Divisée en differents traités par Mr. Hotteterre, le Romain Flute de la Chambre du Roi.* When comparing this edition with *Principes* are its two first chapters—*CHAPITRE PRÉMIER* : *De la situation du Corps, & de la position des Mains* and *CHAPITRE II. De l'Embouchure*—identical with the two first chapters in *Principes*. That these sections described fundamental playing-techniques for the Traverso regarding posture, playing-position of the arms and hands, and embouchure literally in the same way as in *Principes* points on that these explanations had remained throughout the 18th Century in France.

Despite many and clear influences from *Principes* regarding Traverso-playing in France throughout the 18th Century, there is one significant difference regarding techniques of the embouchure and intonation when comparing the flute methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux (1765), and Devienne (*c.*1794). These sources don't really discuss the three positions *Outward—Normal—Inward* of the head-joint which will be discussed in section *7.3.3*. Other important differences between *Principes* when compared with mentioned methods are that the chapters on articulation and ornamentation are considerably longer and more detailed in later Traverso methods. Especially Devienne has extensive sections on articulation which will be discussed in section *7.4*. A further difference of importance is that Corrette (1735 & 1773) has brief chapters identifying if pieces are in major or minor *XII Pour apprendre a connoître si une piece est en mode majeur ou mineur*, on preluding *XIII De l'Art de Préluder*, on transposing *XIV De la maniere de Transposer*, and on how to transcribe virtuosic violin passages for the Traverso *XV Des Accords en batterie que l'on peut faire sur la Flute et la maniere de joüer les tons bas des Sonates de Violon sur cet Instrument*. The chapters XII-XIV has a distant resemblance to *L'Art de Préluder* (1719) by Hotteterre.

*

In the following will descriptions and suggestions as found in *Principes* and *Rudiments* regarding playing position, embouchure, articulation, fingerings, intonation, and resonance be discussed and compared with documents from French flute traditions of the 18th Century including traditions from the 19th Century and the early 21st Century, and in some cases sources such as *Lettres sur les hommes celebres, dans les sciences, la literature & les beaux arts, sous le regne de Louis XV* (1752) by Pierre-Louis d'Aquin de Chateau-Lyon (1720-1796), *Diapason général de tous les instrumens à vent avec des observations sur chachun d'eux auquel on a joint un projet nouveau pour simplifier la manière actuelle de copier* (1772-1785) by Louis-Joseph Francœur, *Essai sur la musique ancienne et modern* (1780) by Jean-Benjamin La Borde, *L'Encyclopédie Méthodique* (1785 & 1788), and *Lavignac Encyclopédie de la Musique* (1925a).

An important personality in the present context is the Traverso-player, composer, and editor Antoine Mahaut (1719-*c.*1785), who was born in the French spoken city of Namur, located in the Wallonia region in today's Belgium. Despite not being of French nationality he should be considered as a part of French Traverso traditions, because he was active and partly lived in France, together with that his Traverso method have had an impact on later French Traverso methods. Apart from Mahaut's influential *Nouvelle Methode pour Apprende en peu de tems a joüer la Flûte Traversiere* (1759), he was a prolific composer. He was by no means exclusively a "Traverso-composer", still he wrote 27 concertos—*Concerto a 5*—for Traverso solo and strings, numerous *Sonatas* for Traverso and Basso, *Trio Sonatas* for two Traversi and Basso, and further chamber music including the Traverso (Carr, 1998). A noteworthy factor is that when Mahaut visited Dresden, probably around 1745 (Carr, 1998), he seems to have developed a friendship with the famous French Traverso virtuoso Pierre-Gabriel Buffardin who at that time was playing in the court orchestra of Dresden. Mahaut dedicated two concertos to Buffardin—one concerto in d-minor and one in e-minor—for Traverso and strings, now in the collections of the Library *Conservatoire Royal de Musique* Brussels, further his *VI Sonata da camera a tre, due flauti traversieri, o due violini e violoncello o basso continuo* (1751) published in Augsburg by Johann Christian Leopold. On the frontispiece of this edition is a dedication to Buffardin: *Al Molti Illustre Signore Buffardin*, and on the first page is a text whereby Mahaut writes about when he was in Dresden and his friendship with Buffardin (Fig. 72):


Molt' Illustre Signore!

L'Amicitia candida, donde Lei m'ha honorato durante il mio soggiorno â Dresda, mi giova prendere la libertà di dedicarle queste Sonate â Due Flauti Traversieri e Basso continuo, lusingandomi che Lei le riceverà come Marca della mia Riconoscenza, e col medesimo buonócchio, con che accolse quello, che hà l'honore di rimanere in effetto.

Di V. S.

Ossequiosissimo Servo
Antonio Mahaut.

Figure 72 *The friendship with which you honoured me during my stay in Dresden, encourages me taking the liberty of dedicating these Sonatas for Two Flutes Traversieri and Basso continuo to you, hoping that you will receive them as a mark of my gratitude, and with the very same kindness with which you made me welcome. Your most respected servant Antonio Mahaut.*

Mahaut seems to have been well informed regarding Buffardin's innovations regarding the Traverso, which is described in detail in his Traverso method (1759). Considered Mahaut's friendship with Buffardin, it would not be surprising if the direct contact with one of the great and most famous Traverso virtuoso players of the first half of the 18th Century could have contributed to further enlarge Mahaut's knowledge and skills regarding the Traverso, and thus could have influenced the Traverso method (1759) by Mahaut. If so, Mahaut is indeed a valuable source mirroring top-class Traverso playing around 1750 in France and Germany.

7.2 A comparison of methods and texts regarding different flute models

In the following are fundamental parameters of flute-playing such as playing position, the lips and embouchure, articulation, fingerings, and intonation examined when comparing the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute covering the period from 1707 starting with *Principes* up to the present day. A further subject when comparing mentioned flute models is to identify possibly transitions of flute techniques. Each section will include tables with examples from important flute methods and texts relating to topics discussed in the respective sections.

7.2.1 Playing position and breathing

Having suggestions regarding playing position and posture from *Principes* in mind, these will in the following be compared with the Traverso methods which include engravings and illustrations of idiomatic playing positions (Corrette 1735 & 1773, Mahaut 1759, De Lusse *c.*1761, Bailleux-Hotteterre 1765, Devienne *c.*1794) together with methods for Multi-keyed conical flutes (Bigot 1832, Tulou 1851), *Ringklappenflöte* (Coche 1839), and the Boehm-flute (Altès 1880, 1956, 1979, Gaubert-Devienne 1908, Taffanel & Gaubert 1923/1958). Considered that any kind of a transverse flute will show striking similarities regarding posture and playing position due to the asymmetrical playing position it is still of interest to follow how French flute methods covering three hundred years and the four above mentioned flute models describe an idiomatic and similar playing position.

Apart from *Principes* and *Rudiments* representing the first explicit descriptions of a functional playing position is the Traverso method (1735 & 1773) by Michel Corrette (1707-1795)[1], considered being the first of its kind for the four-piece Traverso, are suggestions regarding playing position similar to the suggestions as found in *Principes*:

> […] il faut tenir le Corps droit, la tête un peu plus haute que basse, et la tourner vers l'épaule gauche. (Corrette, 1735 & 1773, 8)[2]

Corrette is stressing the importance of not making faces or odd postures, and that the Traverso is a noble instrument that should be played with ease and suppleness:

> Il faut observer de ne point faire de grimaces, n'y de postures ridicules; la Flûte ètant un instrument noble qui doit se joüer d'une maniere aisée (Corrette, 1735 & 1773, 9)[3]

Earlier mentioned Mahaut writes in his *Méthode* (1759) on playing position and literally quotes *Principes* adding that Hotteterre's suggestions certainly creates a graceful posture:

> Il est certain que cette attitude [as described in *Principes*] est tres gracieuse mais elle ne doit pas être génerale, chacun peut jouant de bout prendre l'attitude qui lui est la plus naturelle, et qui lui paraoit la plus noble. (Mahaut, 1759, 4)[4]

Mahaut continues and stresses like Hotteterre the importance of that all unnecessary movements should be avoided as just being bad habits:

> Tous mouvemens, soit du Corps, soit de la Tête, sont des mauvaises habitudes qu'il faut tacher de ne point contracter. Je souhaiterois même tres forte que l'on ne fit aucun mouvement du Pied, puis qu'il est certain que l'on peut jouer tres bien en mesure sans la battre, il faut pour cela connoitre parfaitement le partage de la mesure, et en avoir tous le tems dans la Tête. (Mahaut, 1759, 5)[5]

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1. Michel Corrette (1707-1795) was a French organist, composer, editor, and author of instrumental methods for many instruments such as Traverso (1735/1773), Violoncello (1741/1783), Viole (1748), Harpsichord (1749/1779), Accompaniment (1754/1762/1775), Singing (1758/1782), Guitar (1762), Mandoline (1772), Contra basso and Viole (1773), Harp (1774), Violin (1782).

2. […] you have to hold your body straight, your head a little higher than it is low, and turn it towards the left shoulder. (Corrette, *Méthode pour apprendre aisément à jour de la Flûte Traversière, c.*1740 & 1773, 8)

3. It is necessary to observe not to make faces, nor ridiculous postures; the Flute being a noble instrument which must be played with ease and suppleness. (Corrette, 1735 & 1773, 9)

4. It is certain that this attitude is very graceful but it should not be general, everyone can play from end to take the attitude which is the most natural to him, and which seems to him the most noble. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere,*1759, 4)[4]

5. All movements, whether of the Body or of the Head, are bad habits which must be avoided not to contract. I would even wish very much that we did not make any movement of the Foot, since it is certain that one can play very well in time without beating it, to do this one must know perfectly the division of time, and have all the time in one's head. (Mahaut, 1759, 5)

Charles De Lusse (*c.*1720-*c.*1774) gives in his *L'Art de la Flûte Traversiere* (*c.*1761) a short but clear suggestion regarding the playing position, referring to the importance of a general gracious posture:

> […] tenir la Flûte avec grace (De Lusse, *c.*1761, 3)[1]

The violinist and editor Bailleux-Hotteterre (*c.*1720-*c.*1800) quotes *Principes* (1707, 1-2) literally when describing posture and playing position, and does not add any further suggestions.

The Traverso virtuoso François Devienne (1759-1803)—one of the first teachers to teach Traverso in the newly founded *Conservatoire* in 1795 in Paris—wrote briefly on posture, and stressed similarly as in *Principes*, (1735 & 1773), Mahaut (1759) and Bailleux-Hotteterre (1765) the importance of playing the Traverso in a gracious manner:

> Deux choses aux qu'elles on fait peu d'attention et qui sont cependant de la plus grande conséquence sont l'aisance et la grace que de nécessité on doit avoir en jouant de la flute. (Devienne, *c.*1794, 5)[2]

As mentioned above, important sources regarding posture and playing position are the instructive engravings of Traverso-players found in cited methods, and the Traverso methods by Corrette (1735 & 1773), Mahaut (1759), and Bailleux-Hotteterre (1765) have engravings showing Traverso-players in playing position (Fig. 73):



Figure 73 From the left Corrette (1735 & 1773), Mahaut (1759), and Bailleux-Hotteterre (1765)

In *Musicus Autodidacticus* (1738 & 1762) a fragmentary German translation of *Principes* (Appendix XVI) — attributed to the German lawyer and music lover Johann Philipp Eisel (1698-1763)—is an engraving of a Traverso-player, which perhaps shows influence from the engraving in *Principes* (Fig. 74). The Traverso methods by De Lusse (*c.*1761) and Devienne (*c.*1794) have no engravings of Traverso-players, although the frontispiece of *L'Art de la Flûte Traversiere* by De Lusse shows a sitting mythological flautist playing on a Traverso with a similar playing position as in mentioned Traverso methods (Fig. 74):

[1]



Figure 74 From the left Eisel (1738 & 1762), and De Lusse (*c.*1761)

1. […] hold the Flute gracefully. (De Lusse, *L'Art de la Flûte Traversiere*, *c.*1761, 3)
2. Two things which we pay little attention to, and which are however of the greatest consequence are the ease and grace which of necessity one must have in playing the flute. (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte, c.*1794, 5)

When examining French paintings from around 1700 and some decades later, they often depict pastoral scenes with Traverso-players. Painters such as Antoine Watteau (1684-1721) represents the period of the three-piece Traverso, and often have motifs showing a three-piece Traverso (Fig. 75). Outside France are examples of Traverso-players who show a three-piece Traverso as in *Musicalisches Theatrum* by the German printer and engraver Johann Christoph Weigel (1661-1725) (*c.*1722; Fig. 75), and the famous portrait of the court musician and Traverso-player Josef Lemberger by the Czech painter Jan Kupetzky (1667-1740, *c.*1710; Fig. 75), all playing on a three-piece Traverso.



Figure 75 From the left Watteau (*c.*1706-1716, Cambridge: *The Fitzwilliam Museum*), Weigel (*c.*1722), and Kupetzky (*c.*1710, hand painted copy *c.*1900, Private collection)

When comparing shown examples of Traverso-players it is noticeable how similar the playing position is when compared with the engraving in *Principes*, which in combination with how the playing position is described in cited Traverso-methods generally have the same suggestions. Of course, it could be said that when comparing above shown examples with Traverso-players it is no wonder that they look similar, because a Traverso can't be hold and played in too many different positions. Still, it is noteworthy how the engraving by Picard (1707) in *Principes* seems to have been influential throughout the 18th Century.

Suggestions regarding posture and playing position in 19th Century methods for Multi-keyed conical flutes by Berbiguier (*c.*1818), Walckiers (*c.*1829), Kastner (1844), Tulou (1851, and Cornette (1855) has similar explanations as found in the 18th Century methods all stressing the importance of that the playing position is noble, *gracieuse*, and as a whole that the body is unconstraint. In the method for *Ringklappenflöte* by Coche (1839) is a similar and explicit explanation:

> Il faut éviter toute crispation dans les mains, parceque ce défaut non seulement nuit a la grâce; mais donne de la lourdeur et de la difficulté au trait […] Il faut encore éviter toute contorsion, ainsi que l'exagération ou la négligence dans la posture. (Coche, 1839/2005, 26)[1]

In methods for the Boehm-flute by Altès (1880), Remusat (1906), Devienne-Gaubert (1908), Taffanel & Gaubert (1923/1958), Altès-Caratgé (1880/1956), and Artaud (1972/1989) is the same suggestions regarding the importance of suppleness, naturalness, and elegance of the playing position together with the importance of that the body is unconstraint which considerable contributes to a developed technique and sonority.

In the influential *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert include clear explanations *Tenue Générale de l'exécutant—Position of the player* the general standing playing position together with an instructive drawing. It should be noted that similarly to *Principes* and *Rudiments* between Taffanel & Gaubert points on the importance that the playing position is comfortable for the player and agreeable for the listener both listening and seeing the flautist.

1. It is necessary to avoid any tension in the hands, because this defect and harms not only the grace; but gives heaviness and difficulty to the playing […] Further it is necessary to avoid any contortion, as well as exaggeration or negligence in the posture. (Coche, *Méthode pour Flûte*, 1839, 26)

As in *Principes* and *Rudiments* is the importance of practicing in front of a mirror highlighted by Taffanel & Gaubert because it enables to develop a harmonious playing position:

> La tenue générale doit être aisée et la ligne du corps harmonieuse. On ne saurait trop se garder d'une pose guindée, donc fatiguant, qui nuira fatalement à l'exécution, tout en choquant l'auditoire. Les coudes doivent rester détachés du tronc pour empêcher la compression des poumons, mais ils ne devront cependant pas en être trop écartés. Pour éviter une tenue défectueuse il faudra, dès le début des études, prendre l'habitude de jouer devant une glace afin de s'observer attentivement. (Taffanel & Gaubert, 1923/1958, 3)[1]

Regarding *Position des doigts sur la flute—Position of the fingers on the flute* is the instructive text illustrated with a drawing (Fig. 76)—which if the Boehm-flute and the costume would have been replaced to a three-piece Traverso and an early 18th costume looks like taken from *Principes*—aiming for an idiomatic finger technique recommending lifting the fingers one centimetre over the keys and that the right-hand thumb should be placed the F-key:

> Les doigts, placée sur les touches et devant les clés qui leur sont assignées, doivent tous, à l'exception des deux pouces et de la première phalange de l'index gauche, avoir une position arrondie, de façon à frapper les touches ou les clés avec l'extrémité des doigts qui ne doit pas se soulever au-delà d'un centimètre. Taffanel & Gaubert, 1923/1958, 3-4)[2]
>
> La main droite doit être placée de telle sorte que les doigts se trouvent naturellement au-dessus des plateaux, un peu arrondis afin de se mouvoir sans raideur. Le pouce se place sous le trou du Fa. (Taffanel & Gaubert, 1923/1958, 3)[3]
>
> La Flûte doit être placée dans la première phalange de l'index ; le pouce doit être allongé et se mouvoir avec souplesse, les autres doigts restants arrondis. (Taffanel & Gaubert, 1923/1958, 3)[4]

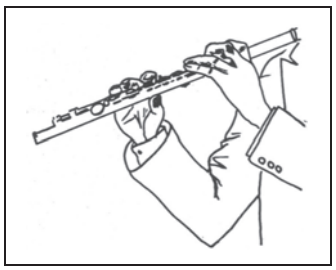


Figure 76 *Position des doigts sur la flute—Position of the fingers on the flute* (Taffanel & Gaubert 1923/1958, 3-4)

In the method by Altès (1880) are engravings of the hand positions (Fig. 77) which has a noticeable similarity to how the hands are shown in the famous engraving by Picard (1707) in *Principes* (Fig. 15)

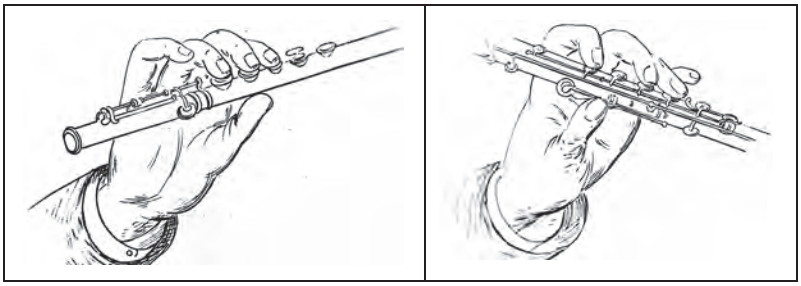


Figure 77 Hand positions of the right and left hand as shown in the method by Altès (1880, 18)

1. The position must be comfortable and the body in a natural position. A stiff attitude must be guarded against; it is fatiguing, harmful to the performer and distracts the listener. The elbows should be held away from the body to avoid compressing the lungs, but, however, not held too high. From the start it is necessary to assume the habit of looking in a mirror while playing. This will avoid a faulty posture. (Taffanel & Gaubert, 1923/1958, 3-4)
2. The fingers, placed on their respective keys, ought all, [with exception of the thumbs and the left phalange of the left index finger) to be rounded to touch the keys with the end of the fingers. The fingers ought not to be raised more than a centimetre. (Taffanel & Gaubert 1923/1958, 3-4)
3. The right hand must be placed so that the fingers rest naturally above the keys, slightly rounded in order to move without stiffness. The thumb is placed under the F key. (Taffanel & Gaubert 1923/1958, 3-4)
4. The Flute must be placed on the first phalange of the index finger; the thumb forward to move freely and the other fingers rounded. (Taffanel & Gaubert 1923/1958, 3-4)

In the explanation on *Position de l'embouchure—Position of the embouchure* and the instructive drawing (Fig. 78)—how the head-joint should be positioned—it is recommended that the head-joint should be parallel with the lips and that the flute should be slightly tilted downwards the head of the player should lean a little to the right and be turned slightly to the left, all suggestions is as if taken from *Principes* and *Rudiments*:



Figure 78 *Position de l'embouchure—Position of the embouchure* La flûte doit être tenue dans une direction absolument parallèle à la ligne des lèvres; mais comme elle doit être un peu inclinée vers le sol, il faut que la tête du flûtiste soit légèrement penchée à droite, le visage un peu tourné vers l'épaule gauche. (Taffanel & Gaubert, 1923/1958, 3-4)[1]

To conclude has French flute methods despite the different models Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and Boehm-flute strikingly similar suggestions and definitions which could be understand as a transition of concepts regarding idiomatic playing-techniques and aesthetics (Fig. 79).

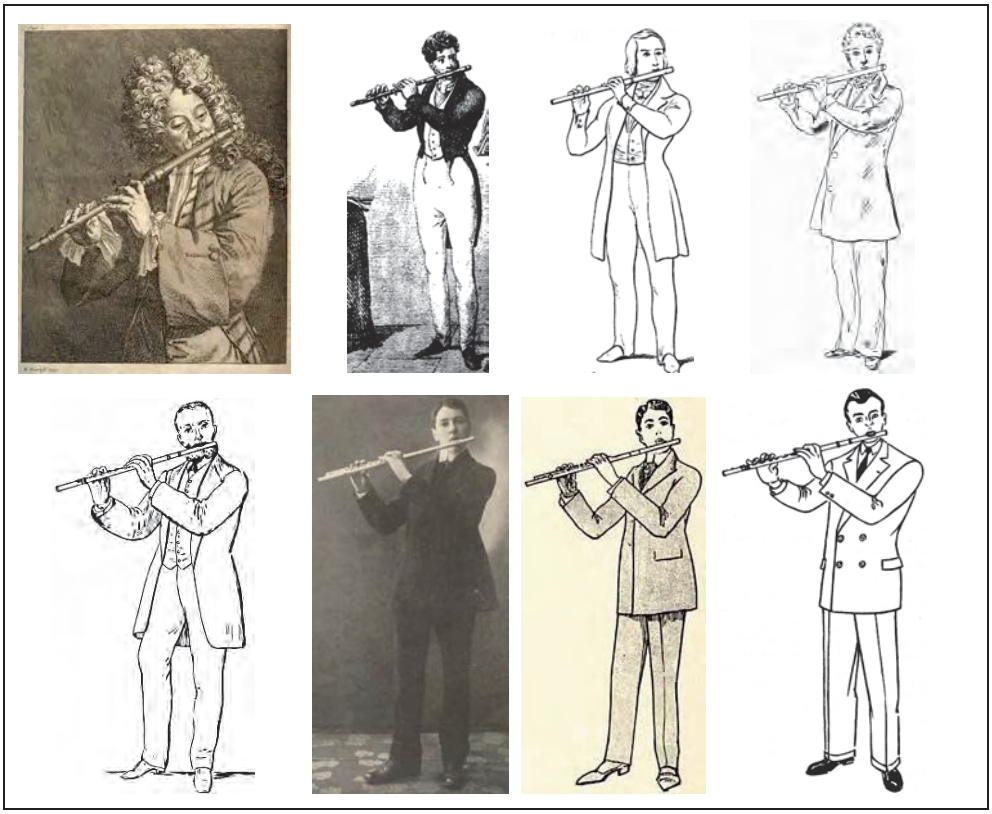


Figure 79 Examples of how the general playing position of a standing flautist has been shown in French flute methods and text on flute playing. The upper row from the left shows *Principes* (Traverso), Bigot, (1832, *Multi-keyed flute with four keys*), Coche (1839, *Ringklappenflöte*), Tulou (1851, *Multi-keyed conical flute*). The second row show different methods for the *Boehm-flute*: Altès (1880) & Altès-Rampal & Marion (1979), Devienne-Gaubert (1908), Taffanel & Gaubert (1923/1958), and Altès-Caratgé (1956).

1. The Flute must be held in an absolutely parallel direction to the line of the lips; but as the Flute ought to be inclined slightly downwards to the head of the Flutist must be a little tilted to the right, the face slightly turned towards the left shoulder. (Taffanel & Gaubert 1923/1958, 3-4)

Traverso

Cette attitude étant bien prise, est fort gracieuse, & ne prévient pas moins les yeux, que le son de l'Instrument flâte agréablement l'oreille. Hotteterre (1707, I: 2)

[…] il faut tenir le Corps droit, la tête un peu plus haute que basse, et la tourner vers l'épaule gauche. Corrette (1735 & 1773, 8)
Il faut observer de ne point faire de grimaces, n'y de postures ridicules ; la Flûte ètant un instrument noble qui doit se joüer d'une maniere aisée. Corrette (1735 & 1773, 9)

«Cette attitude étant bien prise, est fort gracieuse, et ne previent pas moins les yeux, que le son de l'Instrument flate agreablement l'Oreille.» Mahaut (1759/2003, 4) Il est certain que cette attitude (as described above and quoted from *Principes*] est tres gracieuse mais elle ne doit pas être generale, chacun peut jouant de bout prendre l'attitude qui lui est la plus naturelle, et qui lui paraoit la plus noble. Mahaut (1759, 4)

[…] tenir la Flûte avec grace. De Lusse (*c.*1761, 3)

Deux choses aux qu'elles on fait peu d'attention et qui sont ce pendant de la plus grande conséquence, sont l'aisance et la grace que de nécessité on doit avoir en jouant de la flute. **Devienne** (*c.*1794, 5)

[…] prendre des positions aisées et gratieuses, ce qui ne laisse pas que d'ajouter au mérite de l'Artiste.
Van der Hagen (1798, 7)

[…] il faut observer que tous les doigts doivent agir sans roideur. Peraut (*c.*1802, 3)

Multi-keyed conical flutes

Il est certain qu'une attitude noble et gracieuse previent singulièrement en faveur de l'exécutant. Berbiguier (*c.*1818/2005, 25)

Une attitude aisée et gracieuse previent singulièrement en faveur de l'éxécutant, et aide beaucoup au développement des moyens d'éxécution. Walckiers (*c.*1829, 4)

La position du corps doit être libre et dégagée. Kastner (1844, 6)

[…] si elle [la Flûte] conservait l'horizontalité, l'attitude serait affectée, gênante et manquerait de grâce. **Tulou** (1851, 6)

L'attitude doit être gracieuse […] Cornette (1855, 6)

Ringklappenflöte

Il faut éviter toute crispation dans les mains, parceque ce défaut non seulement nuit a la grâce; mais donne de la lourdeur et de la difficulté au trait […] Il faut encore éviter toute contorsion, ainsi que l'exagération ou la négligence dans la posture.
Coche (1839, 26)

Boehm-flute

[…] acquérir la souplesse et l'indépendance nécessaires pour bien jouer la Flûte. **Altès** (1880, I: 19);
Altès-Rampal & Marion (1880/1979, I: 9)

Le bras sera dans une position naturelle […] Une attitude aisée et naturelle simplifie beaucoup les moyens d'exécution, et prévient en faveur de l'exécutant. Remusat (1906, 7)

[…] d'une aisance et d'une élégance naturelles qui entreront pour beaucoup dans la perfection du jeu.
Devienne-Gaubert (*c.*1794/1908, I: 1)

La tenue générale doit être aisée et la ligne du corps harmonieuse. **Taffanel & Gaubert** (1923/1958, I: 3).

[…] sans la moindre contraction, et pour mieux nous faire comprendre, en employant les mouvements naturels à la conformation de la main. **Altès**-Caratgé (1880/1956, I: 14)

La position du corps doit être la plus naturelle possible […] L'essentiel reste de se sentir à l'aise et d'obtenir sa position plus naturelle Ceci est une condition primordiale pour éviter les contractions musculaires qui bloquent l'élève dans sa technique et sa sonorité. **Artaud** (1972/1989, 20)

Figure 80 Descriptions and suggestions regarding playing position from French flute methods covering the period 1707-1989. Names marked with bold indicates flute teachers at the *Conservatoire*. (Ljungar-Chapelon, 2008)

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In *Principes*, *Rudiments*, the methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), and Bailleux-Hotteterre (1765) are no direct comments regarding breathing, which could be interpreted that if the Traverso-player is vigilant regarding a general posture and an idiomatic playing position this altogether have the effect of creating the rudiments for a functional breathing. Corrette (1735 &1773) has a short comment on breathing referring to Blavet and his *Sonates Melées de Pieces Pour la Flûte Traversiere avec la Basse* Opus 2 (1732): […] *on reprend haleine ordinairement qu à la fin d'une phrase.* (Corrette, 1735 /1773, 20)[1].

1. Normally one takes a breath only when a phrase is finished. (Corrette, 1735 & 1773, 20)

In late 18th Century methods like Devienne (*c.*1794) and Van der Hagen (1798) and the early 19th Century method by Hugot & Wunderlich (1804) are explanations regarding breathing pointing on that the breathing action should be smooth, not forced and generally connecting to that breathing is connected to how to phrase. Further that it generally is better to breath often than playing too long phrases. The 19th Century methods for Multi-keyed conical flutes by Drouët (1827), Walckiers (1829), Bretonniere (1840), and Tulou (1851) includes suggestions of how-to breath from a physiological point of view. Drouët (1827) and Brettoniere (1840) points on the importance to breath in on the vowel *A* and that breathings should be done without being noisy, to breath in slowly and not making faces and all in a smooth manner. When the slow breathing is mastered, this has prepared for making fast breathings as often needed when performing. A general suggestion is to always breath in an unconstrained manner. Tulou (1851) suggested keeping the elbows in a natural position and away from the chest enabling a comfortable breathing position for the lungs. Walckiers (1829) explained that when breathing one should do as in normal life:

> Dans l'état habituel de la vie, le Ventre ressort en Aspirant; il rentre et la Poitrine se gonfle en chantant ou en jouant d'un instrument à vent. Par ce moyen l'Expiration est plus longue et moins fatiguante. (Walckiers, 1829, 5)[1]

The method for the *Ringklappenflöte* (1839) by Coche connects to methods for Multi-keyed conical flutes adding important advice that the expiration is the most important aspect of breathing technique because its influence on the sonority, and that one should keep a reserve of air in the lungs only using precisely what is need for what is played:

> L'aspiration doit se faire sans bruit, en gonflant et avançant la poitrine, et sans déranger la lèvre inferieure […] L'expiration est la plus importante des deux actions parce-qu'il s'agit de diriger convenablement la colonne d'air dans l'instrument, sans lui faire perdre de sa pléntitude; en la rejetant trop précipitament, ce qui amènerait des contresens dans l'exécution, tandis qu'en ménageant adroitement l'air dont on a aspiré une suffisante quantité, on n'expire absolument que ce qui est nécessaire pour exprimer la valeur des notes. (Coche, 1839, 36)[2]

Late 19th Century and the 20th Century methods for the Boehm-flute stresses the importance of a correct posture as the foundation for an efficient breathing, and that the flautist assures suppleness regarding the function of the lungs, in a manner noticeably close to normal speech as explained by Taffanel & Gaubert (1923/1958), further that its generally good to have a reserve of air although within limits. Fleury (1925a) stresses the importance of that breathing when playing the flute primarily is a tool for musical expression and should be used for musical phrasing. Later sources like Artaud (1972/1989) suggested having a yawning approach in the mouth and throat which connects to when Drouët (1827) and Brettoniere (1840) suggested to breath in on the vowel *A* aiming for keeping the mouth and throat cavities open. This connects to Altès (1880) when pointing on the importance of not be "blowing from the throat". An important statement is found in the revision of Altès' method (1880) by Fernand Caratgé (1902-1991) who wrote: *Le souffle s'appuyant alors sur le diaphragme* (1880/1956, I: 19)[3], which connects to pedagogical methods of today when teaching techniques relating to the Support. Caratgé's suggestion is an early example of using the term *Diaphragm*, so often used today in flute teaching environments. Finally, Rampal (1978) suggested that the flautist should breathe when needed, and when the music asks for it, pointing on the importance of naturalness, and to breath almost as when speaking. For an overview of a selection of important flute methods discussing breathing see Figure 81 and 82.

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1. In the habitual state of life and when breathing the belly and chest expands; and when singing and playing a wind instrument moves back to its initial position. By breathing like this the Exhalation becomes longer and less tiring. (Walckiers, *Méthode de Flûte op 30*, 1829 5)

2. The aspiration must be done without noise, by inflating and advancing the chest, and without disturbing the lower lip […] Exhalation is the more important of the two actions of breathing because it is a question of properly directing the column of air in the instrument, without making it lose its fullness; by rejecting it too hastily, which would lead to misinterpretations in the execution, while by skilfully sparing the air of which one has drawn in a sufficient quantity, one breathes out absolutely only what is necessary to express the value of the notes. (Coche, *Méthode pour Flûte*, 1839, 36)

3. The breath is resting and supported by and on the diaphragm. (Altès-Caratgé, *Célèbre Méthode Complète de Flûte. Nouvelle edition en quatre parties entiérement refondue, revisée, mise au courant de la technique moderne et considerablement augmentée et d'études par Fernand Caratgé*, 1880/1956, I: 19)

Traverso

[…] il faut surtout avoir le plus grand soin de ne pas pousser le vent avec la poitrine, ceci est de la plus grande conséquence, d'autant plus que cela ne servirait qu'à fatiguer sans produire aucun effet. **Devienne** (*c.*1794, 6)

Beaucoups d'écoliers ont le défaut de ne respirer que lorsque l'haleine leur manque totalement, ce qui les oblige alors a respirer indifferement, et très souvant dans le beau milieu d'une phrase très interessante qu'ils defigurent faute de prevoyance? Il ne faut donc jamais attendre cette extremité et respirer partout ou il est possible de le faire, par ce moyen on se fatigue moins, et l'on execute mieux. Van der Hagen (1798, 23)

Multi-keyed conical flutes

[…] le soufle sera poussé dans l'instrument sans saccade et sans efforts de poitrine. **Hugot & Wunderlich** (1804, 6)

[…] il faut aspirer lentement, la bouche placée comme elle le serait si l'on voulait prononcer la Voyelle **A** […] Il faut respirer de facon : qu'une personne à côté de vous puisse à peine l'entendre. Observez encore qu'en aspirant il faut faire rentrer le Ventre, et qu'en soufflant, il faut le faire un peu ressortir […] Quand vous saurez bien respirer lentement, sans faire ni grimace, ni bruit, ni effort fatiguant, tâchez de respirer tant soit peu plus vîte qu'a l'ordinaire, et d'acquérir par degré une telle promptitude dans la respiration, que vous ne mettiez plus qu'un quart de seconde d'intervalle entre chaque Note filée. Lorsque vous serez arrivé au point de savoir parfaitement respirer lentement, ou vîte et avec la plus grande promptitude, et, ce que je ne puis assez répéter, sans contorsions, ni effort; ni bruit, vous respirerez toujours posément […] et vous ne respirerez vîte que lorsque votre jugement vous en montrera la nécessité. Drouët (1827, 49-50)

Dans l'état habituel de la vie, le Ventre ressort en Aspirant; il rentre et la Poitrine se gonfle en chantant ou en jouant d'un instrument à vent. Par ce moyen l'Expiration est plus longue et moins fatiguante. Walckiers (1829, 5)

Je conseille donc aux écoliers de ne jamais attendre cette extrêmité, et de respirer partout où il est possible de le faire; par ce moyen on se fatigue moins, et l'on exécute mieux. (63) […] il faut aspirer lentement, la bouche placée comme si l'on voulait prononcer la voyelle A. Bretonniere (1840, 60)

[…] je détache naturellement les coudes du corps; les poumons peuvent alors agir aisément, la respiration devient facile. **Tulou** (1851, 6)

Ringklappenflöte

L'aspiration doit se faire sans bruit, en gonflant et avançant la poitrine, et sans déranger la lèvre inferieure […] L'expiration est la plus importante des deux actions parce-qu'il s'agit de diriger convenablement la colonne d'air dans l'instrument, sans lui faire perdre de sa pléntitude; en la rejetant trop précipitament, ce qui amènerait des contresens dans l'exécution, tandis qu'en ménageant adroitement l'air dont on a aspiré une suffisante quantité, on n'expire absolument que ce qui est nécessaire pour exprimer la valeur des notes. **Coche** (1839, 36)

Boehm-flute

2° qu'il faut que le souffle vienne de la poitrine et jamais de la gorge, et 3° qu'en respirant, il ne faut pas faire agir le ventre et qu'il fait éviter toute aspiration pouvant produire un bruit quelconque. Ces défauts sont tellement *anti-naturels* que je n'en aurais fait aucune mention si je ne les avait rencontrés chez quelques élèves.
Altès (1880, I: 20); **Altès-Rampal & Marion** (1880/1979, I: 10)

En premier lieu, une tenue correcte est une condition absolue dans l'acte de la respiration : le dos courbé, les épaules rentrées, la tête inclinée à l'excès sont autant d'entraves apportées au passage de l'air […] En principe il est bon d'avoir toujours le plus grand volume d'air en réserve; mais, d'autre part, il faut redouter la suffocation. Celle-ci se produit lorsque l'air devient irrespirable par un séjour trop prolongé dans les poumons; il faut alors laisser échapper le trop plein par le nez […] Il n'est donc pas toujours recommandable de retenir le souffle avec exagération […] L'exécutant s'assure ainsi un jeu aisé des poumons, qui se rapproche sensiblement de la normale. **Taffanel & Gaubert** (1923/1958, I: 52-53)

Le flûtiste doit se convaincre, en premier lieu, que la respiration n'a pas seulement pour but le renouvellement de l'air dans les poumons, mais qu'elle est aussi en moyen d'expression: le meilleur pour la mise en valeur des phrases musicales.
Fleury, (1925a, 1524)

L'élève devra aspirer l'air le plus naturellement possible et *sans bruit*, la bouche simplement entr'ouverte. Il devra s'abstenir de soulever les épaules pendant l'inspiration, seules les côtes devront se dilater. Le souffle s'appuyant alors sur le diaphragme […]
Altès-Caratgé (1880/1956, I: 19)

Inspirez vite et naturellement: bâillement; Ne montez pas les épaules; Cage thoracique et abdomen se gonflent légèrement […] L'expulsion doit être naturelle. **Artaud** (1972/1989, 7)

On aspire l'air quand on en besoin et lorsque la musique demande. Prenez-la souvent et naturellement: comme lorsque vous parlez. **Rampal** (1978, 22)

Figure 81 Descriptions and suggestions regarding breathing in French flute methods covering the period 1707-1989. Names marked with bold indicates flute teachers at the *Conservatoire*. (Ljungar-Chapelon, 2008)

Traverso

Il est donc bon de savoir dans qu'elle circonstance on peut respirer sans alterer la phrase, et qu'elles notes sont succeptibles d'être un peu retranchées, ainsi que celles qui ne permettent point d'interuption par example de la note Sensible a la note Tonique. Van der Hagen (1798, 22)

Multi-keyed conical flutes

La méthode de Phraser le chant musicalement dépend de la respiration. Il est nécessaire avant d'entrer en matière, de prévenir les élèves, que ce n'est pas generalement en gardant longtems la respiration qu'on acquiert l'art de bien Phraser, mais en sachant respirer à propos, et aux endroits indiqués par l'harmonie dans la Phrase musicale. **Hugot & Wunderlich** (1804, 15)

La manière de bien phraser dépend de la Respiration, et tient plus au goût et au sentiment qu'a la regle; cependant il est indispensable de s'attacher à un principe […] la respiration étant à la Musique ce qu'est au discours la Ponctuation. L'ecolier doit donc diriger son attention sur ce point, et chercher à se pénétrer du sens des phrases pour respirer convenablement. **Wunderlich** (*c.*1812, 19)

La Respiration ne peut pas se prendre indifférement après telle ou telle autre Note; il faut respirer qu'à de certains endroits […] l'intelligence de l'exécutant doit suppléer à ces omissions, comme un homme de goût remedirait à celles de quelques Virgules dans un Discours qu'il lirait tout haut. Drouët (1827, 50)

1.re Règle. Il faut respirer aux divers membres de la Période: c'est la **Respiration principale**. 2me Règle. On peut aussi respirer aux diverse divisions du membre; c'est la **Respiration secondaire**. Quoiqu'elle ne soit point de rigueur, il est cependant des cas où elle est une beauté; dans les longues divisions elle devient même indispensable. Walckiers (1829, 50)

La sagacité du maître doit indiquer les endroits ou l'élève peut faire des céçures sans altérer le chant; ainsi une personne bien pénétrée de ce principe doit évidemment se fatiguer moins qu'une autre, et son éxécution doit être plus agréable.
Bretonniere (1840, 61)

On m'a souvent dit, après m'avoir entendu jouer un morceau, qu'on ne comprenait pas comment je pouvais exécuter des phrases aussi longues sans respirer; cet éloge reposait sur une erreur; je respirais peut-être plus souvent qu'un autre; seulement j'avais le soin de mettre les *virgules* à leur place et mes phrases n'étant jamais mal séparées, se terminaient toujours d'une manière satisfaisante. **Tulou** (1851, 9)

La mélodie comme le discours a des repos pour diviser les différentes pensées dont une phrase musicale est composée […] que la ponctuation est a la phrase littéraire. Gatterman (1861, 33)

Ringklappenflöte

Le moyen le plus puissant pour obtenir une belle qualité de son et un jeu facile, c'est de respirer à propos afin de ne pas couper le sens des phrases, quelques longues qu'elles soient, et de trouver en toute occasion la force de faire vibrer l'instrument avec l'intention convenable […] En général, il faudrait ne jamais laisser épuisser entièrement la respiration. **Coche** (1839, 85)

La mélodie comme le discours a des repos pour diviser les différentes pensées dont une phrase musicale est composée […] que la ponctuation est a la phrase littéraire. Gatterman (1861, 33)

Boehm-flute

Ajoutons encore que la musique doit être ponctuée comme un discours […] il faut séparer les phrases, les membres des phrases, par des points ou les virgules et, pour ainsi dire, considérer la dernière note de ces phrases *comme un E muet*, c'est-à-dire, abandonner, éteindre cette dernière note avant la fin de sa valeur.
Altès (1880, III: 286); **Altès-Rampal & Marion** (1880/1979, II: 35)

[…] il existe des repos, des demi-repos, et même des petites suspensions que l'on peut faire sur certaines notes, sans que cela puisse nuire au chant. On n'a pu marquer ces repos ou demi-repos par des signes, comme dans la prose. **Devienne-Gaubert** (*c.*1794/1908, I: 26)

Ceci amène à dire que la respiration peut ne pas être imposée par une nécessité physique, et qu'il est des cas où elle s'impose simplement pour ponctuer le discours musical. **Taffanel & Gaubert** (1923/1958, I: 53)

Ajoutons encore que la musique doit être ponctuée comme un discours et qu'il ne faut point attendre, pour respirer que la fatigue y oblige; il faut séparer les phrases par des points c'est-à-dire par des respirations profondes et les membres de phrase par des virgules c'est-à-dire par de courtes respirations. **Altès**-Caratgé (1880/1956, II: 219)

Figure 82 Descriptions and suggestions regarding breathing and its relations to phrasing and musical punctuation in French flute methods covering the period 1707-1956. Names marked with bold indicates flute teachers at the *Conservatoire.* (Ljungar-Chapelon, 2008)

Conclusions regarding playing position and breathing

- A general finding is that topics relating to breathing technique generally is described from two points of view: a) a physical/anatomical perspective, b) as a tool for musical expression and musical phrasing.
- Methods from the late 19th Century and the 20th Century tend to develop the physical/anatomical perspective more than earlier sources, although the 18th Century sources when giving suggestions on posture and playing position as found in for example *Principes* and *Rudiments* indirectly show a profound awareness of the physical/anatomical perspective.
- When comparing suggestions regarding posture and playing position in the sources covering the period starting in 1707 with *Principes* up to the present day is the importance of naturalness, suppleness, avoiding of unnecessary tensions combined with elegans something that goes like a red thread through all examined sources.
- When studying engravings and depictions of flute players in the sources the posture of *Déhanchement–Contrapposto* (as discussed in Part II section *6.1*) this position has been maintained and recommended up to the present day.
- An observation of indirect character—according to examined sources and flute methods—is that if the body is unconstrained, in balance with suppleness this lead to a general and all-over beneficial *Tonus* which is mirrored in a singing, expressive sonority often called *Le Son naturel* within French aesthetics.
- It should be notated that generally all examined sources stress the importance of not exaggerate playing very long notes on one single breathing, but at the contrary recommend to breath in all possible places from a musical point of view, relating to breathing when speaking, explained by Rampal with the words *We breath when we need it and when the music calls for it. Breath often and naturally: like when you talk*:

  > On aspire l'air quand on en besoin et lorsque la musique demande. Prenez-la souvent et naturellement: comme lorsque vous parlez. (Rampal, *La Flûte*, 1978, 22)

  This is an opinion in line with Schwab & Schultze-Florey (2004) who have shown that flute playing generally consumes air in almost the same way as normal speech. French flute traditions have historically emphasized the importance of generally blow the airstream in a gentle way, and that one should never use more force than necessary regarding the airstream.
- The conclusion regarding posture and playing position is that suggestions regarding the general playing position when comparing examined sources discussing the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute over time is rather similar, which due to the asymmetrical playing position when playing any kind of a transverse flute was to be expected.

7.3 *Le Beau Son*

When discussing sonority—*Le Beau Son*—and the embouchure, it is of importance—as a starting point—to examine definitions as found in texts and methods regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. It could be assumed that there is a symbiosis between ideals of sonority and how this is realized through the embouchure and control of the airstream. Probably could similarities or changes of aesthetics regarding ideals of sonority be identified when examining methods for the above-mentioned flute models, in addition could perhaps transitions of ideals be identified (Fig. 83).

Traverso

L'embouchure est bonne, quand le son est rond, bien nourri, Egal et net, elle est belle quand outre cela ce son est moelleux, delicat, sonnore et gracieux. Mahaut (1759, 6)

La beauté des sons graves consiste à être pleins et sonores; celles des Tons aigus à être doux et nets. **Devienne** (*c.*1794, 6)

[…] un beau son qui soit mâle dans le bas, rond et velouté dans le haut. Van der Hagen (1798, 8)

Multi-keyed conical flutes

[…] ses sons, ceux de la Flûte sont essentiellement doux et ne doivent être que cela; mais il y a un éclat, une force, une rondeur, en moelleux, relatifs à la possibilité de l'instrument, qu'il faut chercher à acquérir, parce que ce sont ces qualités indispensables qui constituent les beaux Sons. **Hugot & Wunderlich (**1804, 4)

Sons PLEINS et MOËLLEUX dont le volume augmente, pour ainsi dire, la RONDEUR et la VELOUTÉ.
Berbiguier (*c.*1818, 26)

Ce qui constitue un beau Son, est 1° Une belle qualité de Timbre. 2do Un volume suffisant, pour être bien entendu, accompagné par un Orchestre, dans les plus grandes Salles de Spectacle. 3° Une grande égalité dans les Règistres. 4° Enfin une flexibilité des Lèvres par le moyen de la quelle vous puissiez passer du doux au fort, et du fort au doux, soit par gradations, soit brusquement, sans hausser, ni altérer la qualité du Timbre. Ce qui constitue un beau Son, n'est donc pas sa force, que son genre de Timbre. Drouët (1827, 47)

Un Son plein, mais agréablement timbré […] l'imperceptibilité dans le passage des Régistres, telles sont les qualités qui constituent un beau Son. Walckiers (1829, 19)

La beauté des sons graves consiste à être pleins et sonores, ceux des tons aigus à être doux et nets. Bretonniere (1840, 17)

Qu'est-ce un beau son sur la flûte? C'est le son qui se rapproche le plus de la voix humaine: or, pour obtenir sur la flûte la plénitude, la sonorité et le moelleux de la voix. **Tulou.** (1851, 2)

Ringklappenflöte

[…] d'un timbre sonore, agréable, toujours égal et juste. **Coche** (1839, 12)

Boehm-flute

Les sons graves doivent être pleins et sonores, les sons aigus nets et doux. Bousquet (1858, 11)

J'ai lu dans quelques Méthodes que la beauté des sons graves sur notre instrument consistait à ce qu'ils se rapprochassent des sons du *Hautbois*; cette erreur est préjudiciable à deux point de vue: d'abord, en ce que pour obtenir ces sons il faut couvrir à *moitié* l'embouchure ce qui, en les rapprochant du timbre du Hautbois, les rend maigres, chétifs et par cela, incapables de lutter avec la belle sonorité de cet instrument; puis, la suavité qui est le caractère dominant de la Flûte disparaît complètement.[1]
1. Ce n'est pas pour entendre une mauvaise imitation des sons *vibrants* du Hautbois, que MEYERBEER a écrit, en employant les sons graves de la Flûte le prélude du songe du *Prophète*, mais pour arriver à un effet de *sonorité voilée* que la suavité de notre instrument peut seule produire.
Altès (1880, II: 205), **Altès-Rampal & Marion** (1880/1979, I: 169)

[…] le son, (selon le genre des pièces qu'on interprète), soit tour à tour: *énergique, pathétique, plein d'ampleur, moelleux, velouté, suave*; enfin, il faut prendre garde que le timbre de l'instrument ne reste dans une uniformité qui pourrait le rendre *monotone*.
Altès (1880, III: 286); **Altès-Rampal & Marion** (1880/1979, II: 35)

Le son doit être large, doux, bien timbré et d'une grande égalité dans toute l'étendue de l'instrument. Remusat (1906, 7)

[…] un son clair et franc. **Devienne-Gaubert** (*c.*1794/1908, I: 4)

[…] une sonorité claire et ample. **Taffanel & Gaubert** (1923/1958, I: 54)

[…] un son clair et soutenu… (I : 17); […] un son ample et bien timbré. (I : 18); […] le timbre de sa sonorité ne devra pas rester uniforme, mais qu'il devra être tour à tour : énergique, pathétique, plein d'ampleur, mœlleux, velouté ou suave (II: 219); La première qualité d'une sonorité est la *couleur* ou le *timbre.* (II: 320) **Altès**-Caratgé (1880/1956)

Rechercher un son très pur et très égal sans à-coup dans l'intensité. **Artaud** (1972/1989, 13)

Figure 83 Definitions of sound ideals covering the period 1759-1989 and Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute as found in methods for these flute models. Names marked with bold indicates flute teachers at the *Conservatoire.* (Ljungar-Chapelon, 2008)

Possibly one of the reasons why the Traverso from the end of the 17th Century and onwards gradually marginalized the Recorder is that the Traverso easily can make differences regarding timbre and nuances. The essential difference between a Recorder and a Traverso is, of course, that the Traverso-player—as on any kind of a transverse flute—directly influences the direction of the airstream, the size of the opening between the lips shaping the airstream, which enables the player to make different nuances, sound colours, variations of timbre, and adjustments of intonation. These parameters are further combined with that the player without difficulty can control the direction of the airstream with the lips and lower jaw, which directly influences intonation and suppleness when playing in different registers. The size of the opening between the lips and the direction of the airstream are controlled with the lips and the lower jaw in a subtle interaction. The lips have a symbiotic relation to the airstream, because when the activity in the lips—their *Tonus*—is well balanced the elasticity and tissue of the lips will make a larger opening between the lips when the airstream is stronger and vice-verse due to the action of the diaphragm and ribcage (Support). When examining and comparing fundamentals regarding the lips, embouchure and how this is described in *Principes*, *Rudiments*, and in Traverso methods like Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), *L'Encyclopédie Méthodique* (1785 & 1788), Devienne (*c.*1794), Peraut (*c.*1802), and Balleron (1895) is the conclusion that this is over time described in a strikingly similar manner. The essential suggestion in *Principes* and mentioned Traverso methods regarding the lips is that they should be joined close together, somewhat stretched toward the corners of the mouth, making them smooth and even. A small opening should be formed in the middle between the lips, and the head-joint should be placed opposite this opening (see Appendix XVII). An enlightening explanation regarding the opening between the lips is described by Nancy Hadden (2010) relating to the Renaissance Traverso, but having strong bearing on all transverse flutes:

> [...] it is the airstream itself which forms the aperture in the lips, as it passes from the mouth. The resistance in the lip muscles determines the amount of air and the size of the opening which is formed by the air stream. The middle of the lips must remain soft and pliable in order to guide the subtle changes of speed and direction of air which are vital for controlling tone quality and intonation. The lips and the airstream must work together, and flexibility is paramount. [...] in order to direct the air precisely to the small mouth hole the lips must be joined firmly together, with slight muscle tension at the corners of the mouth and a very small lip aperture and well-focussed airstream. (Hadden, *From Swiss Flutes to Consorts: History, Music and Playing Techniques of the Transverse Flute in Switzerland, Germany, and France ca. 1470-1640*. 2010, 252-253)

In *L'Éncyclopédie Méthodique* (1785) is a section on *Flûte Allemande ou Traversière* and the beginning of the paragraph is explaining the embouchure which literally follows suggestions as found in *Principes*. Further are approximated measurements given regarding the size of the opening between the lips, probably aiming for the middle register around G2. Such measurements are not found in *Principes*. Considered that the context and the whole section on *Flûte Allemande ou Traversière* in many respects directly relates to *Principes* the following additions are noteworthy:

> […] il faut joindre les lèvres l'une contre l'autre, en sorte qu'il ne reste qu'une petite ouverture dans le milieu, large environ d'une demi-ligne[1], & longue de trois ou quatre: on n'avancera point les lèvres en devant, comme lorsque l'on veut souffler une chandelle pour l'éteindre: au contraire, on les retirera vers les coins de la bouche, afin qu'elles soient unies & applaties. (*L'Éncyclopédie Méthodique*, 1785 & 1788, 106)[2]

1. One (1) *ligne* corresponds to 2,2558 mm, and is usually rounded to 2,26 mm,

2. You must join the lips against each other, so that there is only a small opening left in the middle, about half a *demi-ligne* wide (1,13 mm), and a three or four *lignes* long (6,78 – 9,04 mm): you should not move the lips forwards, as when one wants to blow out a candle to extinguish it: on the contrary, withdraw the lips towards the corners of the mouth, so that they are even and flattened. (*L'Éncyclopédie Méthodique*, 1785 & 1788, 106)

In the influential *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne, is a similar description regarding the size of the opening between the lips. It should be noted that Devienne quoted *L'Éncyclopédie Méthodique* (1785) on several issues, and possibly are Devienne's suggestions regarding the opening between the lips influenced by *L'Éncyclopédie Méthodique*:

> Pour bien emboucher la Flûte, il faut joindre les lèvres, les tendre et les resserer aux deux extrémités, en sorte qu'il ne reste qu'une petite ouverture dans le milieu, large environ d'une ligne et longue de deux ou trois. (Devienne, *c.*1794, 6)[1]

Given measurements in *L'Éncyclopédie Méthodique* (1785 & 1788) and by Devienne (*c.*1794) thus reflects Traverso playing in France during the second half of the 18th Century and perhaps echoing *Principes*. Regarding early Multi-keyed conical flutes with four keys is a practical example given regarding the opening between the lips in the method by Hugot & Wunderlich (1804):

> Nous ne déterminerons pas qu'elle doit être la mesure de l'ouverture des lèvres, parcequ'elle est subordonné à leur conformation; mais comme les exemples les plus simples sont toujours ceux qui frappent davantage, nous dirons que le moyen dont on se sert pour siffler avec une clef forée, est celui qui doit être employé pour insufler ou introduire l'air dans la flûte; cette ouverture se resserera ou s'ouvrira davantage suivant que l'on devra faire les sons aigus ou les sons graves. (Hugo & Wunderlich, 1804, 5)[2]

A somewhat curious source regarding the size of the opening between the lips is the anonymous text *Découverte de l'Embouchure de la Flute Allemande, ou Traversiere, avec les Principes pour la bien prendre* (1756/2003). This text discusses that flautists sometimes experiences a certain instability regarding the embouchure when being in a good or less good shape. The anonymous author explains an innovation aiming for stabilizing the embouchure, which has similarities to constructions such as the *Reformplatte* and lip-plates with *Wings*, sometimes being used in the past as today on lip-plates for the Boehm-flute. The function of these innovations is to facilitate the centring of the blown airstream towards the sharp edge of the blowing-hole. In the text mentioned is described how it is possible to add two small "horns" of wax or wood on either side of the blowing-hole. The blowing-hole is marked with C having a diameter of *4 lignes* (9,2 millimetres). The two "horns" shape the airstream rather narrow, and when it hits the sharp edge of the blowing-hole its width is when measured about 2,5 millimetres on the engraving, but in the text indicated as *trois quatred lignes* which makes only 1,7 millimetres (Fig. 84).

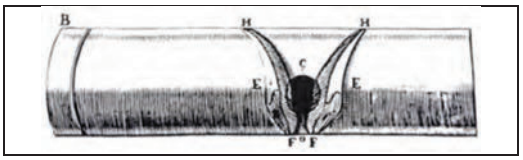


Figure 84 Engraving of the head-joint with its two pieces shaping the airstream on its passage toward the sharp edge of the blowing-hole which is marked **F o F**. (Anonymous, 1756/2003, 8/109)

In flute methods within French 19th and 20th Century flute traditions are suggestions sometimes found regarding the size of the opening between the lips for Multi-keyed conical flutes (Bretonniere, 1840) and the Boehm-flute (Taffanel & Gaubert, 1923/1958):

> […] il faut joindre les lèvres, les tendre et les resserrer aux deux extrémités, en sorte qu'il ne reste qu'une petite ouverture dans le milieu large environ d'une ligne et longe de deux ou trois. (Bretonniere, 1861, 1)[3]

> […] une embouchure dont les arêtes ne laissent entre elles qu'un vide de 6 à 7 millimètres. (Taffanel & Gaubert (1923/1958, 9)[4]

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1. Regarding the embouchure, you must join the lips, tender, and tighten them at both ends, so that there is only a small opening in the middle, about one *ligne* wide (2,26 mm), and two or three long (4,52 mm – 6,78 mm). (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte*, *c.*1794, 6)
2. We will not determine a measurement regarding the opening between the lips, because it is subordinated to their conformation; but as the simplest examples are always those which strike the most, we will say that the means used to whistle whilst blowing into a drilled key is the one which must be employed to blow or introduce the airstream into the flute; this opening will tighten or open depending on whether the high or low notes are to be played. (Hugo & Wunderlich, *Méthode de Flûte*, 1804, 5)
3. […] put the lips together, stretch them and relax them at both ends, so that there is only a small opening in the middle that is about one *ligne* wide (2,26 mm) and two or three long (4,52 mm – 6,78 mm). (Bretonniere, *Méthode complète, théorique et pratique pour la Flûte,* 1840, 1)
4. […] embouchure, the edges of which leave only a space of six or seven millimetres. (Taffanel & Gaubert, 1923/1958, 9)

A reflection is that recommendations regarding the opening between the lips in *L'Encyclopédie Méthodique* (1785 & 1788: Traverso), Devienne (*c.*1794; Traverso), compared with Bretonnière (1861: Multi-keyed conical flutes, Boehm-flute), and Taffanel & Gaubert (1923/1958; Boehm-flute) are rather similar. When comparing above shown suggestions regarding the lips and embouchure and how this is described in *La Flûte* (1978) by Rampal, which has a short and precise instruction combined with a photo (Appendix XI, Fig. 2), showing how that the lips should be drawn to the sides creating a small opening between the lips, it is noticeable how Rampal describes generally the same suggestions as found in *Principes* and French 18th Century methods:

> Les coins de la bouche doivent être tires vers les haut comme lorsque l'on souriz. (Rampal, 1978, 26)[1]

Conclusions regarding *Le Beau Son*

- When examining definitions of *Le Beau Son* as shown above in Figure 83 regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte,* and the Boehm-flute, and starting with the Traverso are expressions such as *rond, bien nourri, egal et net, moelleux, delicat, sonnores, gracieux, des sons graves consiste à être pleins et sonores, des Tons aigus à être doux et nets* used. Thus, 18th Century definitions corresponds to that the Traverso should have a sound being round, well nourished, even, precise, mellow, delicate, resonant, graceful, low notes are to be full and resonant, high notes to be soft and pure.
- Regarding Multi-keyed conical flutes of the 19th Century, we find definitions like *essentiellement doux, un éclat, une force, une rondeur, en moelleux, velouté, un volume pour être bien entendu, accompagné par une Orchestre, une grande égalité, une flexibilité passer du doux au fort, un son plein, agréablement timbré, la beauté des sons graves consiste a être pleins et sonores, ceux des tons aigus à être doux et nets.* This are descriptions of a a sonority being essentially soft, but having radiance and strength, roundness, a volume and projection to be well heard when accompanied by an orchestra, flexibility to pass from soft to loud, the beauty of the low notes consists in being full and resonant, high notes soft and pure. Further that the flute has a sound that comes close to the human voice with fullness, sonority, and the softness of the voice. Given examples corresponds well with described ideals for the *Ringklappenflöte* aiming for a sonorous timbre, pleasant, always with evenness and just intonation: *timbre sonore, agréable, toujours égal et juste.*
- For the Boehm-flute representing the later part of the 19th Century up to the present day we find a plenitude of definitions like *Les sons graves doivent être pleins et sonores, les sons aigus nets et doux, la suavité qui est le caractère dominant de la Flûte, le son soit tour à tour: énergique, pathétique, plein d'ampleur, moelleux, velouté, suave, il faut prendre garde que le timbre de l'instrument ne reste dans une uniformité qui pourrait le rendre monotone, le son doit être large, doux, bien timbré et d'une grande égalité dans toute l'étendue de l'instrument, un son clair, franc et ample, la première qualité est la couleur ou le timbre, un son très pur et très égal*: low notes must be full and sonorous, high notes pure and soft, sweetness is the dominant character, together with moods like energetic, pathetic, fullness, soft, velvety, suave, the flute sound should not remain in uniformity, perfect evenness regarding sound colour throughout the complete compass of the instrument, a clear sound, frank and ample, the first quality of a sonority is its timbre and sound colour.
- It is noticeable how similar the definitions are regarding the *Le Beau Son* when comparing the descriptions shown above, still it should be taken in account that a definition like *Des sons graves consiste à être pleins et sonores, des Tons aigus à être doux* suggested for all four flute models examined must be related to the model in question. The ideal of a strong full low register and a softer and sweet high register may in reality sound rather different depending and the flute model in question. This phenomenon is especially clear-cut when comparing the Traverso with the Boehm-flute, whereby the latter due to its cylindrical bore of its body and far bigger tone-holes than on the Traverso potentially has a far stronger sound as a whole and especially so in the low register compared with the Traverso.

1. The corners of the mouth should be pulled up like when smiling. (Rampal, *La Flûte*, 1978, 26)

7.3.1 Positioning the blowing-hole in relation to the tone-holes

The amount of covering the blowing-hole with the lower lip is influenced if the head-joint and its blowing-hole is positioned *Outwards* or *Inwards* or in the same line as the tone-holes of the flute in question. *Principes–Rudiments* gives no specific comments on this matter apart from that the technique for playing the note C#1 is to use the fingering for D1 and then turn the Traverso inwards:

[…] on tourne l'Embouchure en dedans suffisamment pour gagner un demi-Ton. (V: 17)	[…] by turning the Flute inwards, sufficiently to lower the Sound by half a Note (V: 12)

In section *6.5* has the technique how to play C#1 and D♭1 on the Traverso been examined with sources like La Barre (1702/1703), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), and Bailleux-Hotteterre (1765). From these explanations it can be deduced that if the positioning of the head-joint is rather *Inwards* it will not be possible to flatten D1 with a semitone, and if the head-joint is positioned rather *Outward* it is easily possible to flatten D1 a semitone downward, but intonation on remaining notes, quality and beauty of the sonority will suffer. From this can be concluded that when Hotteterre explained the three essential head-joint positions *Outward—Normal—Inward* they can only be functional when finding a position whereby the *Normal position* allows necessary corrections of intonation including the flattening of D1 down to C#1 and D♭1. Thus, indirectly Hotteterre has given a positioning of the head-joint in relation to the tone-holes and with precision. When examining the earlier mentioned painting *Réunion de Musiciens* (*c.*1710) by André Bouys, and the Traverso-player sitting holding an ivory Traverso—possibly Hotteterre himself—the six tone-holes on the middle joint of the three-piece Traverso in a straight line, and when an imagined line towards the blowing-hole is drawn through the middle of these six tone-holes the head-joint and its blowing-hole is turned somewhat inwards (Fig. 85). Considered that the painting *Réunion de Musiciens* is detailed almost as being a photography (Appendix IV), it could be assumed that the mounting of the ivory Traverso could be a faithful representation of how Traverso-players used to do in the beginning of the 18th Century in France.

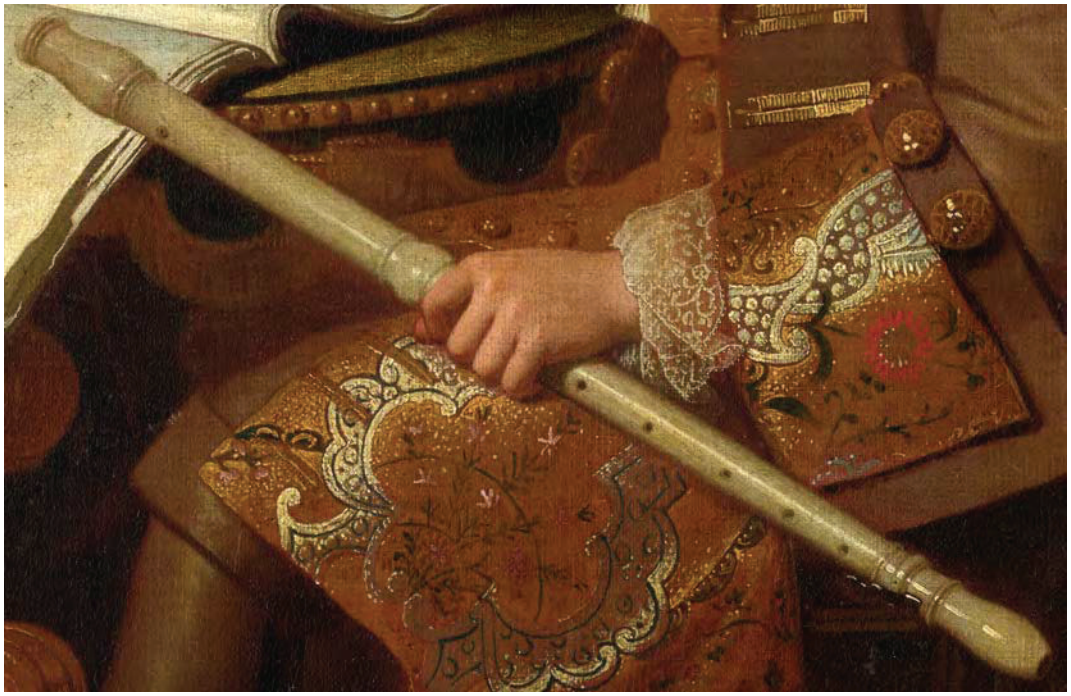


Figure 85 Observe the line of the tone-holes and the somewhat inward position of the blowing-hole on the head-joint as found on the painting *Réunion de Musiciens* (*c.*1710) by André Bouys. (*Musée des Beaux-Arts de Dijon*, France)

The Traverso methods such as Corrette (1735 & 1773), Devienne (*c.*1794), Peraut, *(c.*1802), Hugo & Wunderlich (1804) the latter for both Traverso and Multi-keyed conical flutes, methods for Multi-keyed flutes such as Tulou (1851), *Ringklappenflöte* like Dorus (1845), and Boehm-flute such as Altès (1880) have explanations regarding how the head-join and the blowing-hole should be positioned in relation to the tone-holes.

In *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne and the section *Article Premier Pour Monter la Flûte* is an advice that the three tone-holes of the left-hand joint, and the three tone-holes on the right-hand joint should be positioned in a straight line. Then should the head-joint be positioned so that the blowing-hole is about one *Ligne* (2,26 mm) inward, when compared with an imagined line drawn through the six mentioned tone-holes:

ARTICLE PREMIER

Pour Monter la Flute.

> Toutes les manieres de monter une Flute ne sont pas indifférente, une Flute dont le trou de l'embouchure se trouve monté sur la même ligne que ceux des autres Corps; force celui qui la joue, ou de lever le coude trop haut, ou de baisser la tête, ce qui à la longue fatigue l'un ou l'autre; il s'en suite de là que le bras se baisse, l'embouchure se dérange, le ton hausse et le son perd sa pureté; il faut en conséquence de ces observations tournes la tête de l'Instrument, de maniere que le trou se trouve en dedans à une ligne de différence des autres. Voyez-en l'Exemple à la tête de la premiere Game. (Devienne, *c.*1794, 5)[1]

Devienne added in the fingering-chart an engraving of a Traverso where the positioning of the head-joint and the blowing-hole is shown (Fig. 86):

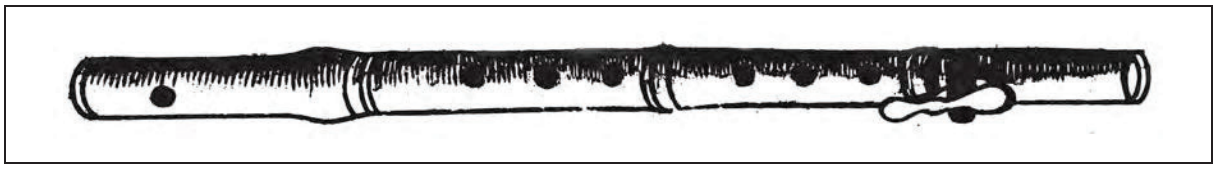


Figure 86 Observe the inward position of the blowing-hole compared with the six tone-holes. (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte*, *c.*1794, 2)

When comparing the engraving of a Traverso in *Méthode pour apprendre aisément à jour de la Flûte Traversière* (1735 & 1773, 9) by Corrette and *Chapitre II* with the engraving shown by Devienne (*c.*1794), Corrette suggested a similar manner of mounting the Traverso, although there are no further explanations apart from the engraving (Fig. 87):

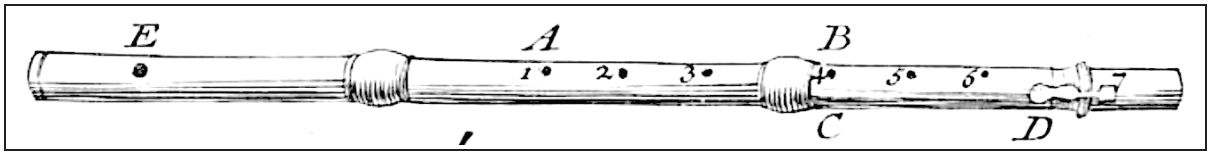


Figure 87 Observe the position of the blowing-hole compared with the six tone-holes and the picture shown by Devienne. (Corrette, *Méthode pour apprendre aisément à jour de la Flûte Traversière,* 1735 & 1773, 9)

In *Méthode pour la flûte* by Peraut (*c.*1802) is it suggested to turn the head joint of the Traverso considerably more inwards compared with suggestions by Corrette (1735 & 1773), and Devienne (*c.*1794) which can be seen in the fingering-chart and on the figure of the Traverso (Fig. 88)

> […] il faut d'abord ajuster le corps ou Pièce du milieu sur ces deux pièces, de manière que les trous se trouvent sur la même ligne, à l'exception de celui de la clef qu il faut tourner en dedans de 3 à 4 lignes, ensuite monter la Tête et ajuster l'embouchure sur la ligne de la clef. (Peraut, *c.*1802, 2)[2]



Figure 88 The Traverso shown in the fingering-chart with the blowing-hole clearly turned inwards. (Peraut, *Méthode pour la flute, c.*1802, 3)

1. All ways of mounting a Flute are not indifferent, a Flute whose blowing-hole hole is mounted on the same line as those of the tone-holes; forces the person playing to either raise their elbow too high or lower their head, which in the long run tires one or the other; It follows that the arm is lowered, the head-joint is disturbed, the tone rises and the sound loses its purity; As a result of these observations, it is necessary to turn the head-joint of the Instrument, in a manner so that the front edge of the blowing-hole is turned one *Ligne* (2,26 mm) inwards compared with the line of the six tone-holes. See the example at the beginning of the first Fingering-chart. (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte, c.*1794, 5)

2. […] you must first adjust the body or middle piece on these two pieces, so that the holes are on the same line, except for that of the key which must be turned within 3 to 4 *Lignes* [about 8 to 10 millimetres], then mount the head joint so the blowing-hole will on the same line as the key. (Peraut, *Méthode pour la Flûte*, *c.*1802, 2)

In the *Méthode de Flûte du Conservatoire* (1804) by Hugot & Wunderlich which is a method for both the Traverso and Multi-keyed conical flutes with four keys. In the fingering-charts for each flute is the position of the head joint turned inwards in the same manner, and similarly when compared with Corrette (1735 & 1773), and Devienne (*c.*1794) which points in the direction of a transition regarding embouchure techniques from the Traverso to early Multi-keyed conical flutes (Fig. 89).

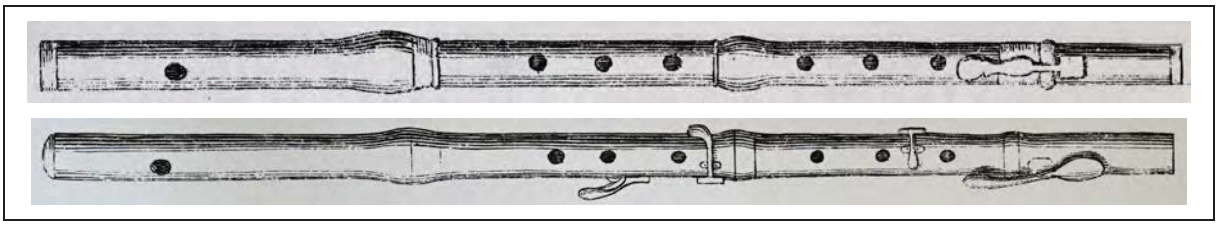


Figure 89 A Traverso and a Multi-keyed conical flute with four keys as shown in the fingering-charts in *Méthode de Flûte du Conservatoire* by Hugot & Wunderlich (1804, I & III). Observer that both flutes have the same position of the head-joint compared with the six tone-holes.

In a new edition of *Nouvelle Méthode Théorique et Pratique pour la Flûte* by Devienne (*c.*1794) published in 1816 by the editor Cotelle in Paris with the title *Méthode pour flûte*, is the same detailed explanation in *Article 1 Pour Monter la Flûte* as in the first edition of Devienne's method (*c.*1794) regarding how to mount the flute, it might be a Traverso or the same kind of Multi-keyed conical flute described by Hugot & Wunderlich (1804). This matter of fact sheds light on that a tradition with origins in the late 18th Century was continued when playing on Multi-keyed conical flutes in the first decades of the 19th Century.

In *Méthode de Flûte* by Tulou (1851) is a similar suggestion how much the head-joint should be turned inwards when compared with Corrette (1735 & 1773), Devienne (*c.*1794), and Hugot & Wunderlich (1804). When exemplifying how much the head-joint should be turned inwards Tulou show this with a picture of a Traverso together with fingering-charts for the Traverso. Considered that the six tone-holes are on the same place on a Traverso as on a Multi-keyed conical flute it facilitates to show the relation between the blowing hole and the six tone-holes showing a Traverso without the numerous keys on a Multi-keyed conical flute from around 1850. The manner Tulou recommends mounting the flute points in a direction of a French tradition regarding the positioning of the head-joint around 1850 with roots in the 18th Century that connects the Traverso with Multi-keyed conical flutes (Fig. 90):

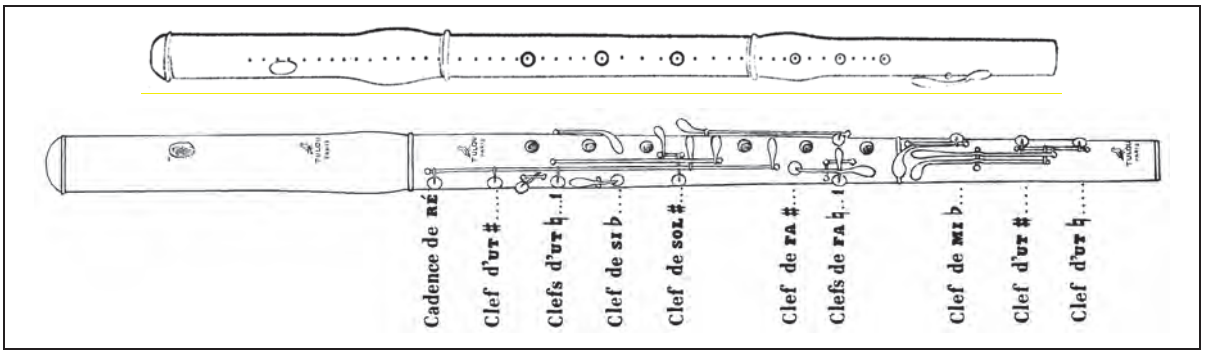


Figure 90 *Les trous sur la même ligne; l'embouchure tournée de manière à ce que le bord extérieure soit sur la ligne qui partage les trous.* (1851/1973, 5)[1], shown on a Traverso and Tulou's special model of the Multi-keyed conical flute called *Flûte Perfectionnée* with 10 keys as found in *Méthode de Flûte* by Tulou.

In *Méthode pour la flûte* (1828) by Drouët for Multi-keyed conical flutes is a similar explanation as given by Tulou regarding how the blowing-hole should be mounted in relation to the tone-holes:

> Le dehors de l'Embouchure doit se trouver un peu plus en dedans que les Trous du corps du milieu. (Drouët, 1828, 30)[2]

1. The tone-holes on the same line; the head joint turned so that its outer edge [of the blowing-hole] is on the line that divides the tone-holes. (Tulou, *Méthode de Flûte*, 1851, 5)
2. The outside of the blowing-hole [the sharp edge on which the airstream is directed] should be a little turned in in relation to the tone-holes on in the middle-joint. (Drouët, *Méthode pour la Flûte*, 1828, 30)

Dorus recommended in *L'Étude de la Nouvelle Flûte. Méthode progressive arrangée d'après Devienne* (1845) —which is an adoption of Devienne's original (*c.*1794) —for the *Ringklappenflöte* a somewhat inward positioning of the blowing-hole (Fig. 91):

MANIÉRE DE MONTER LA FLÛTE

> La Flûte doit être montée, de manière que le trou de l'embouchure se trouve en dedans à une ½ ligne environ de differences des autres trous. (1845, 6)[1]

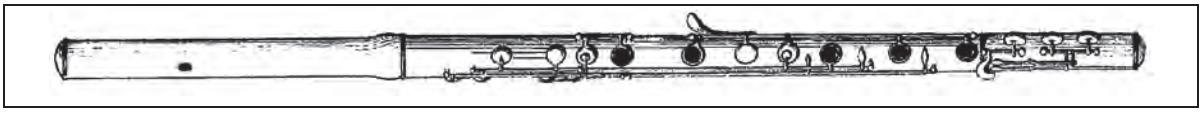


Figure 91 The *Ringklappenflöte* shown in the fingering-chart with the blowing-hole clearly turned somewhat inwards. (Dorus, *L'Étude de la Nouvelle Flûte. Méthode progressive arrangée d'après Devienne*, 1845, 7)

A similar way of mounting the flute compared with Tulou is found in the important *Méthode pour Flûte Systeme Boehm Contenant la Théorie complète de la Musique. Œuvre 31* (1880 & 1906) by Altès. Here is a picture of a Boehm-flute of the French *In-line model*, and a line is drawn through the centre of the keys up to the head-joint similarly as when compared with the flute method by Tulou (1851), indicating that the head-joint and its blowing-hole should be mounted slightly inwards (Fig. 92):

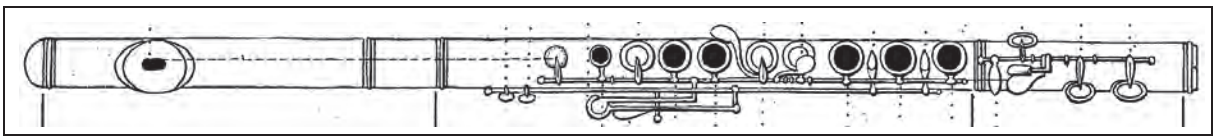


Figure 92 Drawing of how the head-joint should be mounted in the method by (Altès, *Méthode pour Flûte Systeme Boehm Contenant la Théorie complète de la Musique. Œuvre 31,* 1880 & 1906, 21)

Considered that Tulou was born in 1786 and that he possibly as a beginner played on a Traverso alternatively on Multi-keyed conical flutes with four or five keys, whereby the latter generally is rather like a Traverso with just some keys added for avoiding fork-fingered notes such as F, G#, A♭, A#, B♭, and especially so in the first octave. In addition, Tulou showed an engraving of a one-keyed traverso when explaining how to position the head-joint which could point on that fundamental embouchure techniques from the Traverso were adopted and modified to Multi-keyed conical flutes when they became common during the first half of the 19th Century, which as well was the flute model that Tulou taught at the *Conservatoire* until his retirement in 1860. Tulou was not in favour of the Boehm-flute and never taught it. The Boehm-flute became gradually accepted in French music life and was from 1860 the flute taught at the *Conservatoire*, and Dorus was thus the first flute teacher for the Boehm-flute in this institution. Altès who had studied Multi-keyed conical flutes at the *Conservatoire* (1840-1842) later changed to play the Boehm-flute, and in 1880 published his famous *Méthode Complete* and by then teaching the Boehm-flute at the *Conservatoire* (1868-1893). It is of interest that in the section explaining how to position the head joint Altès followed the suggestion as his teacher Tulou gave in his *Méthode* (1851) for the Traverso and Multi-keyed conical flutes. This shows a transition of essential playing-techniques migrating via the Traverso, Multi-keyed conical flutes to the Boehm-flute. In *Méthode Complète de Flûte* by Taffanel & Gaubert (1923/1958) is a similar description regarding how the body pf Boehm-flute should be mounted, but with a little difference compared with Altès (1880 & 1906) when it comes to the position of the head-joint and its blowing-hole, which is suggested to be somewhat more turned out than suggested by Altès:

> Normalement, la Flûte se monte toute droite, c'est-à-dire que les barres du bout, les anneaux et l'embouchure doivent se trouver sur une même ligne. Cependant, pour certaines conformations de lèvres, le trou de l'embouchure peut être ramené légèrement en dedans; il en est de même pour le bout de droite, qui peut être décentré d'un ou deux millimètres selon la longueur du petit doigt. (Taffanel & Gaubert, 1923/1958, 2)[2]

1. The Flute must be mounted so that the blowing-hole is about ½ *ligne* inward from the other holes. Dorus, *L'Étude de la Nouvelle Flûte. Méthode progressive arrangée d'après Devienne*, 1845, 6). [This suggestion equals to turn the blowing-hole slightly more than one-millimetre inwards in relation to the tone-holes, due to that 1 *Ligne* corresponds to 2,26 mm] (

2. Normally the Flute is assembled in a straight line: the rod in the foot joint in line with the centre of the keys, and the centre of the embouchure. However, for certain lips the hole of the embouchure might be slightly inclined: the same for the foot joint, which might be moved one or two millimetres according to the length of the little finger. (Taffanel & Gaubert, *Méthode Complète de Flûte*, 1923/1958, 3)

7.3.2 Covering of the blowing-hole with the lower lip

An essential aspect regarding the lips, embouchure, the head-joint is the amount of covering or uncovering of the blowing-hole by the lower-lip. As every flautist knows is a too covered blowing-hole not ideal for all registers, and the same applies to a too uncovered blowing-hole. When comparing *Principes* and mentioned Traverso methods are Mahaut (1759) and De Lusse (*c.*1761) giving more detailed indications on this subject, although in fairly different ways. Mahaut suggested that the blowing-hole should be almost uncovered:

> […] en apuyant la Flute contre la levre d'en bas, de façon que l'Embouchure de la Flute reste presque a decouvert. (Mahaut, 1759, 6)[1]

Mahaut continued explaining how the beginner should start to play the first sounds while not closing any tone-holes and experimenting while turning the head-joint out- and inwards in search of the *Veritable point*. When not closing any tone-holes the Traverso will play a C#2. When a good sound is found on that note then the suggestion is to start closing the first tone-hole of the left hand which will make the Traverso play a B1:

> Apres cela on souffle moderement le vent, et on chèrche a former le son, tournant la Flute plus ou moins en dehor ou en dedans pour trouver le veritable point. L'orsque l'on sera parvenu a Emboucher la Flute en commencera a poser les Doits, l'un apres l'autre en commencant par le premier de la main gauche […] (Mahaut, 1759, 6)[2]

Considered that Mahaut suggested that the blowing-hole should be almost uncovered for playing C#2, his suggestion should possibly be understood as an advice mainly for the beginner not to cover the blowing-hole too much.

De Lusse (*c.*1761) has a suggestion of indirect nature recommending that the distance between the upper-lip and the sharp edge of the blowing-hole should have a distance of about one *ligne* (2,26 mm) which has the result that the blowing-hole generally will be more covered than suggested by Mahaut (1759):

> […] il faut observer que les levres soient tendues & resserrées sur les dents, & qua la levre supérieure puisse couvrir à une ligne de distance ou à peu près, l'extérieur de l'embouchure de la Flute […] (De Lusse, *c.*1761, 3-4)[3]

Regarding the early model of the Multi-keyed conical flute with four keys (Hugot & Wunderlich, 1804) is a suggestion that the blowing hole should be placed a little below the opening between the lips, and that the lower lip should cover the blowing-hole with about a sixth of its diameter which in reality is very little and show a similarity with the suggestion given by Mahaut (1759):

> La Flûte étant appuyée sur la lèvre inférieure, le trou de l'embouchure doit se trouver placé un peu au dessous de l'ouverture que les lèvres former, pour introduire le souffle dans l'instrument, en observant que le bord de la lèvre inférieure recouvre le trou de l'embouchure d'environ un sixième de son diamêtre; cette précaution est indispensable pour bien diriger le souffle et éviter qu'il ne soit porté sur le bois. (Hugot & Wunderlich, 1804, 5)[4]

French 19th and 20th Century methods for Multi-keyed conical flutes, the *Ringklappenflöte*, and today's Boehm-flute are generally detailed and has as a standard recommendation that the lower-lip should cover from about 20 % to not more than 50 % (Ljungar-Chapleon, 2008). Especially earlier methods for Multi-keyed conical flutes such as Hugot & Wunderlich (1804), Drouët (1828), Walckiers (1829), Bretonniere (1840), and Tulou (1851) are interesting, because it could be assumed that influences and ideas about embouchure and how much of the blowing-hole should be covered when playing the Traverso possibly had some influence on these methods.

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1. […] resting the Flute against the under lip, so that the head-joint of the Flute remains almost uncovered. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere,* 1759, 6)
2. After that blow the air moderately, and try to form the sound, turning the Flute more or less out- or inwards find the veritable point. When having succeeded to play the first note, start to close the tone-holes starting with the first one with the left hand […] (Mahaut, 1759, 6)
3. […] it must be observed that the lips should be stretched & tightened against the teeth, and that the upper lip should be positioned at a distance of a *ligne* or so (= 2,26 mm), outside the blowing-hole of the Flute. (De Lusse, *L'Art de la Flûte Traversiere*, *c.*1761, 3-4)
4. The Flute is resting on the lower lip, the blowing-hole must be placed a little below the opening between the lips, to introduce the breath into the instrument, observing that the edge of the lower lip covers the blowing-hole by about one-sixth of its diameter; this precaution is essential to properly direct the airstream and prevent it from being carried on the wood. (Hugot & Wunderlich, *Méthode de Flûte*, 1804, 5)

In the flute method by Tulou (1851/1973) is an instructive drawing showing how the beginner could hold the flute searching for the *Veritable point*, which corresponds well to how Mahaut explained this first step finding how to blow and find the first sound on the flute (Fig. 93).

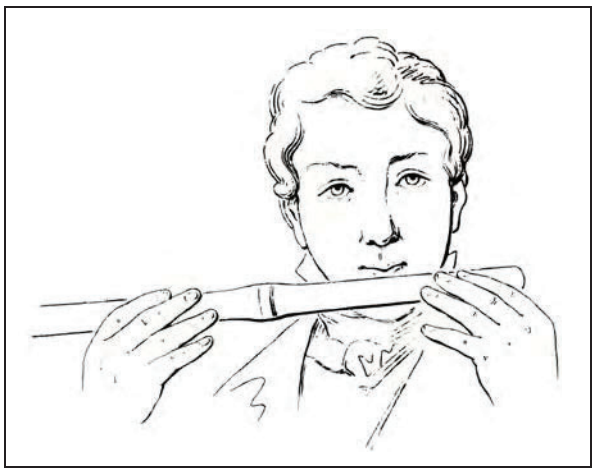


Figure 93 An instructive drawing on how to hold the flute when turning it out- and inwards searching for the *Veritable point*. (Tulou, 1851, 5)

*

Questions regarding the covering and uncovering of the blowing-hole was discussed in detail by Quantz (1752/1975/1983/1985: IV, § 14), and he suggested a technique based on different amounts of covering the blowing-hole relating to suppleness and ease of playing in all registers. We know that Quantz for a period of time studied the Traverso having the French Traverso virtuoso Pierre-Gabriel Buffardin as his teacher in Dresden, and perhaps Quantz' ideas regarding the blowing-hole were something he had learnt during his lessons with Buffardin?

Quantz' method was based on the technique of moving the lips forwards and backwards, which have effects of covering more or less of the blowing-hole. This technique was achieved through modifications of the opening between the lips with *Tonus* and muscular activity of the lips, while at the same time keeping the speed of the airstream generally constant. When playing in the low register D1-D2 the blowing-hole should, according to Quantz, be far less covered than in the high register. Quantz showed this technique with a detailed scheme of the blowing-hole (1752/1975/1983/1985, *IV Haupstück Von dem Ansatze Embouchure*; Fig. 94, Appendix XVIII)[1]. The diagonal line in the upper part of the blowing-hole shows the position and coverage of the lower-lip for the highest notes, the lines below stepwise shows positions and the uncovering down to the low octave and D1. Covering the blowing-hole more in combination with a constant speed of the airstream facilitates notes in the high register, which was discussed in the analogy to *Pascal's law* in section *6.2.2*.



Figure 94 Quantz, 1752 Tab: II, Fig. 2.

A further and important effect of covering more when ascending toward the high register in the manner described by Quantz is that the airstream gradually will be directed gradually downwards in relation to the sharp edge of the blowing-hole, and vice-verse when descending towards the low register. Apart from that the embouchure technique explained by Quantz is efficient regarding suppleness, there is one further factor to acknowledge, because a secondary effect of covering more or less of the blowing-hole with the lower-lip have effects on the evenness of sound, timbre, fullness of sound, together with nuances. Generally, mentioned sources suggested a position whereby the blowing-hole is covered to about 20-30%, in addition Tulou (1851) added a drawing clearly showing this amount of covering (Fig. 95).

1. The size of the blowing-hole on a Quantz' Traversi is on the original in Berlin 8.85 x 10 millimetres, and the original in New York 8.7 x 9.9 millimetres, both having a slightly elliptical shape that was kept on the Traverso of the later 18th Century.

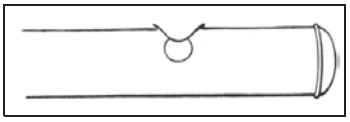


Figure 95 Drawing of how much the under lip should cover the blowing-hole on the Multi-keyed conical flute played and taught by (Tulou, 1851, 4).

In the method for the Boehm-flute by Altès (1880/1906) is shown a drawing of how much the lower-lip preferable should cover the blowing-hole (Fig. 96). It is noticeable to see the similarity between Altès' and Tulou's drawings regarding the lip-plate and how the covering of the lower-lip is marked. Altès' teacher at the *Conservatoire* was as mentioned above Tulou who taught Altès Multi-keyed conical flutes, consequently, Altès had a profound knowledge and skills regarding Multi-keyed conical flutes. This maybe sheds light on the process of transition between Multi-keyed conical flutes used before and parallel with the Boehm-flute during the second half of the 19th Century. Further it might imply that embouchure techniques used when playing the Boehm-flute during the second half of the 19th Century were influenced by embouchure techniques developed on Multi-keyed conical flutes, which in their turn had roots in embouchure techniques for the Traverso.

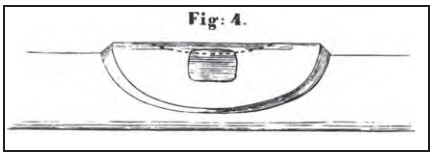


Figure 96 The scrupulous observation of this position of embouchure must be particularly insisted upon. It may strike beginners that the tone comes much easier by covering on half or three fourths of the mouth hole, but this defective method cannot produce the fullness of tone the instrument admits of, it sounds thin and this destroys the character of the Flute which should be by turns sweet, mellow, full, and sonorous; on the other hand , avoid falling into the other extreme by leaving the mouth hole entirely uncovered, because thus placed it cannot receive the quantity of air necessary to its full degree of power. (Altès, 1880/1906, 18)

The *Méthode pour Flûte (Grande et petite) Système Boehm. Contenant les tabulatures et doigtés des flutes à 1. 2. 3. 4. 5. 6. 7. 8. 9 et 10 clés* (1895) by the French flautist Louis Balleron (1869-1916) is of a special interest because this method describes conical flutes with one (Traverso) to ten keys including the Boehm-flute. This flute method indicates perhaps that conical flutes with everything from one to ten keys were played and coexisting with the Boehm-flute as late as around 1900 in France, although the Boehm-flute was taught at the *Conservatoire* and the flute used in professional environments. Balleron's *Méthode* is thus interesting because explanations and suggestions regarding the embouchure and articulations are presented in a manner that clearly suggests that Balleron did not consider it necessary to make special explanations for the different flute models. Thus, Balleron applies the same techniques to all flutes mentioned. As a flautist Balleron made a successful career in Paris after having studied at the *Conservatoire* having had Altès as his teacher, and was awarded a *Premièr Prix* in 1891. Balleron became principal flute in *L'Opéra Comique* (1900-1916), *La Garde Républicaine*, and *L'Orchestre Colonne*. It is perhaps not surprising that Balleron's recommendations are similar to Altès' ideas, when giving his suggestions regarding the embouchure, but even more interesting is that he gives the same suggestions for all above mentioned flute models as mentioned above:

> On doit placer la flûte sous la lèvre inférieure, l'embouchure juste au milieu des lèvres. La lèvre inférieure doit diminuer l'orifice de l'embouchure d'environ un quart. (Balleron, 1895, 9)[1]

In *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert is an almost identical explanation regarding how much the lower-lip preferable should cover the blowing-hole, which shows a consistent ideal among Parisian flautists in the late 19th Century and the beginning of the 20th Century:

> Placer l'embouchure sur le bord de la lèvre inférieure, de façon que celle-ci recouvre l'orifice de l'embouchure sur le quart environ de sa hauteur. (Taffanel & Gaubert, 1923/1958, 4)[2]

1. The flute should be placed below the lower lip, the lip plate just in the middle of the lips. The lower lip should cover the blowing-hole by about a quarter. (Balleron, *Méthode pour Flûte (Grande et petite) Système Boehm. Contenant les tabulatures et doigtés des flutes à 1. 2. 3. 4. 5. 6. 7. 8. 9 et 10 clés,* 1895, 9)

2. Place the embouchure on the edge of the lower lip so that this covers about a quarter of the hole of the embouchure. (Taffanel & Gaubert, 1923/1958, 5)

Flautist and teacher Louis Dorus (1812-1896) was the first to teach the Boehm-flute at the *Conservatoire* starting in 1860, after that Tulou was retired. In Dorus's flute method (1845) originally written for the *Ringklappenflöte*, is a description regarding the formation of the lips with similarity to above given examples, including a comment about the direction of the airstream together with an important suggestion that the head-joint should have a rather supple contact with the lower-lip without forcing:

> […] il faut que la naissante de l'embouchure soit légèrement sentie par le bas de la lèvre inférieure. Entre les lèvres faiblement tendues il doit se former une petite ouverture; on obtiendra le son, en soufflant presque horizontalement […] (Dorus 1845, 6)[1]

In the above-mentioned method by Taffanel & Gaubert is a similar comment regarding the suppleness regarding the contact between the chin, lower lip, and the lip-plate:

> […] les lèvres seules agiront, imprimant ainsi à la tête de la flûte un mouvement d'arrière en avant et vice versa par leur relâchement ou leur contraction. (Taffanel & Gaubert, 1923/1958, 6)[2]

Insisting on that the lip-plate should not be pressed against the lower-lip indicates that Dorus (1845) and Taffanel & Gaubert (1923/1958) must have advocated a similar embouchure technique being so supple and flexible that the smallest movements made by the lips would be enough to move the head-joint. It should be noted that when Taffanel studied at the *Conservatoire* his teacher had been Dorus. When following Dorus's suggestion the head-joint easily and effortlessly follows the movements of the lips and the under-jaw. A further observation is that when following Dorus regarding the benefits of […] *il faut que la naissante de l'embouchure soit légèrement sentie par le bas de la lèvre inférieure* and trying this combined with the suggestions given by Mahaut (1759)—only making necessary adjustments regarding intonation with the help of the lips, and to speed up the airstream on too flat notes reinforce—Dorus's suggestion is helpful. This could point in the direction that Mahaut used a similar technique not pressing the head-joint against the lower-lip and chin, even thou this is not mentioned in his method. It should be noted that Dorus' flute method was published in 1845, which were two years before Boehm had finished his work finalizing the Boehm-flute in 1847 (*Cylinderflöte*). This implicates that the flute Dorus wrote his method for is not the *Cylinderflöte* but the *Ringklappenflöte*, which had been finalized in 1832. This is notable because Dorus' method (1845) was later used without modification for the Boehm-flute. This indicates that essential playing-techniques—it might be a Traverso, Multi-keyed conical flutes, *Ringklappenflöte* or a Boehm-flute—are having important and essential similarities when it comes to the embouchure.

In addition, it should be remembered that the first generations of virtuoso players and teachers of the Boehm-flute at the *Conservatoire*, such as Dorus and Altès, as beginners learnt to play the flute and made their professional studies on Multi-keyed conical flutes. This stand of things makes it natural to assume that skills and knowledge regarding Multi-keyed conical flutes—which in a sense have evident similarities with the Traverso—in different ways had shaped playing-techniques and aesthetics regarding flute playing as a whole, and that elements from Multi-keyed conical flutes most likely were adapted to the Boehm-flute (Fig. 97).

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1. […] the lip-plate should be slightly felt by the rim of the lower-lip. Between the slightly stretched lips a small opening will be formed, and the sound is made by blowing almost horizontally. (Dorus, *L'Étude de la Nouvelle Flûte. Méthode progressive arrangée d'après Devienne,* 1845, 6)

2. […] only the lips move, so that the head of the flute shows a movement forward and backwards and vice versa produced by the relaxing or tightening of the lips. (Taffanel & Gaubert, 1923/1958, 6)

Traverso
[…] en apuyant la Flute contre la levre d'en bas, de façon que l'Embouchure de la Flute reste presque decouvert. Mahaut (1759, 6)
Multi-keyed conical flutes
[…] que le bord de la lèvre inferieure recouvre le trou de l'émbouchure d'environ un sixième de son diamêtre. **Hugot & Wunderlich** (1804, 5)
La lèvre inférieure doit couvrir l'embouchure de manière: à ce qu'il n'en reste plus couvert qu'environ trois lignes. Drouët (1827, 31)
Le bord de la lèvre inférieure ne doit recouvrir l'embouchure que d'environ un sixiéme de son diamêtre. Walckiers (*c.*1829, 5)
[…] couvrir l'embouchure de manière à ce qu'il n'en reste plus ouvert qu'environ trois lignes. Bretonniere (1840, 16)
La lèvre doit diminuer l'ouverture de l'embouchure d'un quart au plus. **Tulou** (1851, 4)
La lèvre inférieure doit couvrir a peu près un tiers de la superficie du trou. Gatterman (1861, 4)
Ringklappenflöte
Il est important de ne pas tourner l'embouchure en dedans; parceque l'on obtiendrait que des sons qui détruiraient le timbre de l'instrument. **Coche** (1839, 26)
La lèvre inférieure doit couvrir a peu près un tiers de la superficie du trou. Gatterman (1861, 4)
Boehm-flute
[…] l'appuyer contre le menton de manière que la lèvre inférieure sente la superficie du trou l'embouchure. Bousquet (1858, I: 11)
Appuyer la Flûte sous la lèvre inférieure de manière que celle-ci couvre le *quart* de l'embouchure. **Altès** (1880, I: 18); **Altès-Rampal & Marion** (1880/1979, I: 8)
Le bord de la lèvre inférieure ne doit couvrir l'embouchure que du quart de son diamètre. (Remusat, 1906, 7)
Il faut éviter de couvrir l'embouchure, dont les trois-quarts environ doivent rester à découvert. Ne pas trop appuyer la tête sur les lèvres, de manière à ce que celles-ci aient toute leur souplesse. **Devienne-Gaubert** (*c.*1794/1908, I: 2)
Placer l'embouchure sur le bord de la lèvre inférieure, de façon que celle-ci recouvre l'orifice de l'embouchure sur le quart environ de sa hauteur. **Taffanel & Gaubert** (1923/1958, I: 5)
La lèvre inférieure ne devra couvrir que le quart de l'embouchure. **Altès**-Caratgé (1880/1956, I: 15)
Le bord du trou doit coïncider avec le bord de la lèvre inférieure qui couvre ainsi à peu près le tiers. **Artaud** (1972/1989, 13)

Figure 97 Explanations and suggestions regarding how much to cover the blowing-hole with the lower lip covering the period 1759-1989 and Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute as found in methods for these flute models. Names marked with bold indicates flute teachers at the *Conservatoire*. (Ljungar-Chapelon, 2008)

Conclusions regarding the opening between the lips, positioning of the head-joint, and covering of the blowing-hole

- Three essential parameters that interacts are:
  a) The size of the opening for the airstream between the lips
  b) How the head-joint is mounted in relation to the tone-holes
  c) How much the lower lip covers of the blowing-hole.

  Examined sources have direct and indirect suggestions and advice on all three parameters. To start with the opening between the lips is the essential suggestion in *Principes* that the lips should be joined close together, somewhat stretched toward the corners of the mouth, making them smooth and even. A small opening will be formed by the airstream itself and in the middle between the lips, and the head-joint should be placed opposite this opening. This is the general explanation found in all examined sources for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute.
- In sources like *L'Éncyclopédie Méthodique* (1785), and flute methods by Devienne (*c.*1794), Bretonniere (1861), and Taffanel & Gaubert (1923/1958) we find measurements and recommendations regarding the size of the opening between the lips. These measurements are probably referring to the middle register played in a *Mezzo forte* nuance.

  Traverso: *L'Éncyclopédie Méthodique* gave a recommendation that the opening should be about 1 millimetre and a little bit higher and 6-9 millimetres large, Devienne recommended an opening being about 2,3 millimetres high and about 5-7 millimetres large.

  Multi-keyed-conical flutes: Bretonniere suggested an opening about 2,3 millimetres high and approximately 5-7 millimetres large,

  Boehm-flute: Taffanel & Gaubert suggested an opening about 6-7 millimetres large and we could assume about 2,5 millimetres high.

  These suggestions are similar, but it should be remembered that the blowing-hole on a Traverso also in the later decades of the 18th Century often were round and relatively small, for Multi-keyed conical flutes somewhat bigger and sometimes elliptical, and that the Boehm-flute have the largest blowing-hole of a somewhat square shape with rounded corners which all in all have influence regarding the size of the airstream.
- In *Principes* and *Rudiments* are no direct suggestions regarding how to mount the head-joint in relation the tone-holes, but the painting *Réunion de Musiciens* (*c.*1710) by Bouys clearly show what is found and described in Traverso methods by Corrette (1735 & 1773), Devienne (*c.*1794), Peraut (*c.*1802), and Hugot & Wunderlich (1804). Generally, the suggestion by Devienne is representative for above mentioned methods: *Turn the head-joint of the Instrument, in a manner so that the front edge of the blowing-hole is turned one Ligne* (2,26 mm) *inwards compared with the line of the six first tone-holes.* For Multi-keyed conical flutes both Hugot & Wunderlich and Tulou (1851) give the same suggestions as shown for the Traverso. Regarding the *Ringklappenflöte* described by Dorus (1845), and later Altès (1880) discussing the Boehm-flute both recommends that a line is drawn through the centre of the keys up to the head-joint and that this line indicates where the sharp edge of the blowing-hole should be, indicating that the head-joint and its blowing-hole should be mounted slightly inwards. Finally, Taffanel & Gaubert (1923 & 1958) suggested that normally the flute is assembled in a straight line: the rod in the foot joint in line with the centre of the keys, and the centre of the embouchure, but for certain shapes of the lips the blowing-hole might be slightly inclined.
- The final parameter regarding the amount of covering the blowing-hole with the lower lip is in indirect terms suggested in *Principes* and *Rudiments* with the suggestion how to play the C#1 through turning the head-joint inwards using the fingering for D1 until the semi-tone C#1 is reached, which in other terms indicate a coverage of about a third of the blowing-hole when not playing C#1. Mahaut (1759) suggested to keep the blowing-hole almost uncovered which possible should be understood as a common suggestion, and perhaps for the middle register. The general suggestion for the Traverso, Multi-keyed flutes, *Ringklappenflöte* and the Boehm-flute in all examined sources is a coverage of about a third or fourth of the blowing-hole, which all together points in a direction of a transition of embouchure techniques despite the four different flute models.

7.3.3 The embouchure and the three head-joint positions

As mentioned above, there is a significant difference regarding techniques of the embouchure and intonation when comparing *Principes* and *Rudiments* with Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux (1765), and Devienne (*c.*1794). These later sources discuss the three positions *Outward—Normal—Inward* of the head-joint very little when at all—with Peraut (*c.*1802) as an exception—compared with *Principes* and *Rudiments*, whereby Hotteterre gives suggestions for literally every note on the chromatic scale, including trills and indirectly for *Flattements* and *Battement*, regarding how to position the head-joint.

In this context is the fourth chapter *Remarques sur quelques Tons et demi Tons* in the method by Mahaut (1759, 9) interesting. There is a passage which sheds light on changes regarding embouchure techniques in relation to turning the head-joint *Outward* when correcting intonation on the somewhat flat notes E♭, D♭, C♭, F#2 and C#2, and *Inward* when flattening the too sharp notes F and G#:

> Le Mi Bemol, le Ré Bemol et l'Ut Bemol sont ordinairement un peu bas, aussi bien que le Fa Diezis et l'Ut Diezis qui est entre les Cinq lignes, plusieurs y remedient en tournant la Flute en dehors a chaqu'un de ces tons; mais il vaut mieux y supleer par l'Embouchure, en retirant les levres vers le coin de la Bouche; et forçant un peu le vent.
> Le Fa Naturel et le Sol Diezis sont generalement un peut hauts, on y remedie encore en tournant la Flute en dedans, mais il vaut toujours mieux d'y supleer par l'Embouchure, en Elargißant un peu l'ouverture des levres de façon que la levre d'enhaut avance tant soit peu. (Mahaut, 1759, 9)[1]

It should be noted that the notes needing adjustment regarding their intonation mentioned by Mahaut (E♭, D♭, F#2, C#2 being flat notes, and F and G# being sharp notes) were described in *Principes* and *Rudiments*. This points in the direction that the Traverso played by Mahaut and Hotteterre had significant similarities regarding the placements of their tone-holes. Before discussing Mahaut's suggestions regarding embouchure and intonation a short look at the *Introduction* of his method (1759, 2) Mahaut gives some clues while commenting on the changes regarding Traverso playing since *Principes* was published, secondly Mahaut discusses target groups for *Principes* and his own method:

> Differents Auteurs ont donné des Principes de Flute Traversiere M. Hotteterre le Romain a été le premier qui a traité cette matiere, ses *Principes* qui sont Excellents, ne laissoient rien a desirer dans le tems qu'ils ont parus, mais a present que la Flute est portée au plus haut degrez, et que la Musique Italiene a pris le deßus ces principes ne suffit plus […] (Mahaut, 1759, 2)[2]

Here is a clear statement that *Principes* was the first of its kind and excellent as such, but that things had changed over the past fifty years since *Principes* was published for the first time: musical ideals had changed toward an Italianization, and Traverso playing had developed to a higher degree according to Mahaut. Further Mahaut makes a statement that *Principes* was aiming for beginners, and that his own Traverso method was targeted to beginners, but as well for more advanced Traverso-players:

> […] l'on voit même que tous ces principes n'ont êtés faits que pour les Commençens, ceux qui sont parvenus a un certain degré n'y trouvent rien pour eux: nous tacherons de conduire pas a pas les premiers et d'être utile au second. (Mahaut, 1759, 2)[3]

Examining at how Mahaut described the flattening of notes being too sharp, due to the construction of the Traverso, he started with making references to what he identified as "the still used technique of turning the head-joint inwards". He continued saying that a better technique is to not turn the head-joint inwards but using the embouchure—in this context the term embouchure aims for the lips—making the opening between the lips larger and simultaneously slightly advance the upper lip.

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1. The E♭, the D♭ and the C♭ are usually a little low, as well as the F# and the C#, which is between the five lines, many correct this by turning the Flute outward on these notes; but it is better to correct them with the embouchure, drawing the lips towards the corner of the mouth; and strengthening the airstream a little. The F and the G# are generally a little high, this can be remedied again by turning the Flute inwards, but it is always better to correct with the embouchure, by enlarging the opening of the lips a little so that the upper lip advances ever so slightly. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere,* 1759, 9)
2. Different Authors have given principles for the Traverso Mr. Hotteterre was the first to deal with this subject, his *Principes* which are excellent, left nothing to be desired in the time they appeared, but now that the Traverso is carried at a higher level, and that Italian Music dominates, these principles are no longer sufficient [...] (Mahaut, 1759, 2)
3. […] we can see that all these principles were only made for the beginners, those who reached a certain degree didn't find anything for them: we will try to lead the beginner's step by step and to be useful to the more advanced. (Mahaut, 1759, 2)

When trying out this technique it shows to be efficient and easy to perform and makes the inward turning of the head-joint more or less superfluous. When analysing why this technique so efficiently flattens the too sharp notes the reasons are that the larger opening between the lips slows down the airstream which has the effect of flattening. In addition, the movement forwards of the upper lip change the direction of the airstream to become a direction a little bit more downwards which as well has the effect of flattening. The somewhat larger opening between the lips contributes to slightly slow down the speed of the airstream, when this is combined with the slight change of the direction of airstream these two techniques interact, and the note being too sharp will be in tune. What Mahaut did *not* mention is that when making the opening between the lips larger the natural way how to do this is to decrease the amount of *Tonus*—muscular activity—in the lips, and secondly that the movement forwards with the upper lip indirectly often causes a movement slightly back- and downwards with the lower jaw. The suggestion to move the upper lip forward has the same effect and results in flattening as has the turning the head-joint inwards, but in faster tempi is the turning of the head-joint somewhat awkward, and the technique suggested by Mahaut is when practiced faster and more efficient in a virtuosic texture. When it comes to adjust the intonation on the notes being too flat—due to the construction of the Traverso—Mahaut refers to that many Traverso-players correct these notes while turning the head-joint outwards, which for sure is an efficient technique for sharpening a too flat note. Anyhow, Mahaut recommends tightening the lips towards the corners of the mouth, and simultaneously speed up the airstream which he thinks is the better technique. When analysing why this suggested technique efficiently sharpens too flat notes is the reasons that a tightening of the lips—an increase of the *Tonus* in the lips—as described by Mahaut, will create a smaller opening between the lips, which in its turn results in a slightly faster airstream when the air-pressure is constant compared with the surrounding notes being in-tune. Then, when the airstream is consciously made faster this reinforces the already slightly faster airstream, and consequently and easily correct the too flat intonation. In addition, the movement when tightening the lips, as described by Mahaut, might often have an effect of mowing the lower jaw slightly forwards which in its turn having the effect of directing the airstream a little bit upwards, which results in a slight sharpening of the note. This technique suggested by Mahaut is faster in the same manner as his suggested technique for flattening too sharp notes. It should be noted that Mahaut only suggested to speed up the airstream—*forçant un peu le vent*—when sharpening too flat notes, which in practical terms would be made with the help of the diaphragm and ribcage (Support). But Mahaut did *not* suggest slowing down the airstream when flattening too sharp notes. This is an important detail, because indirectly Mahaut here said that the airstream generally should be constant apart from when playing too flat notes when using his embouchure technique. It seems that Mahaut's explications are efficient when it comes to creating an even and flexible timbre, and very much so when it comes to a virtuosic texture. Traverso music by for example La Barre and Hotteterre in the beginning of the 18th Century is as already mentioned less virtuosic when it comes to fast passages, when compared with Traverso music by Buffardin, Blavet and Mahaut himself. Therefore, the technique of turning the head joint as suggested in *Principes* and *Rudiments* seems to be functional in Traverso music with a less virtuosic texture. Described stand of things might shed light on why Mahaut, criticized the technique of simply turning the head-joint in- and outwards.

Within the frame of the present study have the embouchure techniques regarding intonation as suggested by Mahaut been tested on all the different models of Traversi as explained in section *1.2*. The result of testing is that Mahaut's suggestions functions very well and easily on all the Traversi from the three-piece models up to the Grenser model, covering the whole 18th Century. A conclusion is that Mahaut did explain techniques that possibly had been in use in the late 17th and earlier 18th Century, but not explained in *Principes* nor by Corrette, because as Mahaut wrote, he wanted to include and explain techniques for more advanced learners of the Traverso. It should be remembered that using the technique of turning the head-joint as suggested in *Principes* and *Rudiments* has effects apart from influencing at which angle the airstream hits the sharp edge of the blowing-hole. When turning the Traverso inward the length of the airstream is shortened, and when turning outward the airstream is prolonged. This has the effect that when turning outward, although the length of the airstream only gets some short millimetres longer, it needs to be slightly more focused which is achieved through making the opening between the lips slightly smaller with the help of *Tonus* in the lips. Another effect of turning the head-joint in and out is, of course, that the blowing-hole will be more or less covered by the under lip which apart from having effects on intonation it has influence on timbre and nuances. When following the suggestions in *Principes* and *Rudiments* regarding the adjustment of intonation through the positions *Outward—Inward* of the head-joint, is the *Normal* position used for notes having good intonation due to the placements of the tone-holes on the Traverso, and as a reference.

When turning *Inwards* for flattening too sharp notes and *Outwards* for sharpen too flat notes, the intonation is easily adjusted, although in faster tempi this is somewhat awkward. Still, considering that the fingerings in *Principes* and *Rudiments* compared with fingerings in the Traverso methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794) as a whole only show minor variations, in combination with that different models of the Traverso show more similarities than differences along the 18th Century, it seems unlikely that the technique of turning the head-joint—so often suggested in *Principes* and *Rudiments*—should have been completely abandoned around the middle of the 18th Century.

7.3.4 The airstream and the three octaves

When it comes to general descriptions regarding the airstream and how to blow it is striking to see how similar these descriptions are despite the four different flute models discussed in the present study. In the Traverso method by Corrette (1735 & 1773) it is explained—similarly when compared with *Principes* and *Rudiments*—that a gradual increase of the speed of the airstream is needed when playing an ascending scale from the low register and upwards:

> Il faut encore observer, qu'a mesure que les tons montent, l'on doit augmenter le Vent, mais par gradation imperceptible, pour la premiere Octave ré, mi, fa sol, la si, ut, ré. Mais pour faire les Octaves des notes cy dessus, on donne un peu plus de Vent, et toujours le ménager, de façon qu'il ne soit n'y trop fort, n'y donné par secousses. (Corrette, 1735 & 1773, 10)[1]

Corrette further explained that the second octave (D2-C3) need a gradually faster airstream, and when playing in the third octave (D3-A3) the lips need to be more pinched compared with the lower octaves:

> Il faut pour faire les tons et demi-tons de cette Octave donner le vent un peu plus fort. [...] Il faut bien pincer les lèvres pour faire les tons hauts [...] (Corrette, 1735 & 1773, 14-15)[2]

Suggestions as described by Corrette (1735 & 1773) are not found in Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794), but is seems more than likely that the same techniques must have been used due to the construction of the Traverso. The action of pinching the lips which is the same as using more *Tonus* and muscular activity in the lips and embouchure, results in a smaller opening between the lips, which when keeping the same air-pressure with help of the diaphragm and ribcage (Support), has the effect that a lesser amount of air—due to the smaller opening between the lips—will become a higher speed, which in its turn facilitates the high register.

In *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert is a similar explanation how the opening between the lips needs to be adjusted in relation to playing in different registers:

> Il faut donc pour monter chromatiquement depuis le dernier Mi [E2] de la portée jusqu'à la limite extrême de l'échelle, resserrer progressivement les lèvres (*pincer les lèvres*), dissent les flûtistes; jusqu'à ce que le souffle ne trouve plus pour issue qu'un passage aminci au maximum. (Taffanel & Gaubert, 1923/1958, 6)[3]

*

An interesting source regarding the relation between the size of the opening between the lips and different registers of the Boehm-flute is explained in the useful exercise book *Exercices journaliers pour la Flûte* (1975) by the French flautist Robert Hériché (1906-1991). Hériché worked for a lifetime in *L'Opéra de Paris* and was for many years playing at the side of Jean-Pierre Rampal (1922-2000) when the latter was principal flute in this orchestra. Hériché had been a student of Philippe Gaubert (1879-1941) and was awarded *Premier Prix* in 1920 at the *Conservatoire*. Gaubert had been taught by Taffanel, who in his turn had been taught by Dorus at the same institution, thus Hériché's ideas on embouchure, based on his studies with Gaubert, is a valuable source regarding the embouchure mirroring the second half of the 19th Century having roots in the very first teachings of the Boehm-flute by Dorus at the *Conservatoire*.

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1. It should also be observed that ascending, the wind must be increased, but by imperceptible gradation, for the first Octave D, E, F, G, A, B, C, D. But to make the Octaves of the notes above, we give a little more wind, and always in a manner, so that it is not too strong, nor given by jerks. (Corrette, *Méthode pour apprendre aisément à jour de la Flûte Traversière,* 1735 & 1773, 10)
2. To make the tones and semitones of this Octave, the wind must be a little stronger. […] You must tighten your lips to make the high notes […] (Corrette, 1735 & 1773, 14-15)
3. To ascend chromatically from the last E [E2] on the stave to the extreme limit of the scale, it is therefore necessary to tighten the lips progressively until only the smallest possible opening is left [between the lips] from which breath may emerge. (Taffanel & Gaubert, 1923/1958, 8)

Hériché's practice-book has an instructive explanation and diagram showing the size of the opening between the lips in relation to the three octaves and registers of the Boehm-flute (Fig. 98; Appendix XVIII). It is to be assumed that Hériché when making this diagram respectfully wanted to transmit the tradition and teachings he had received by Gaubert, thus this diagram is a valuable source, together with that it clearly stands in a French tradition regarding embouchure explanations having roots back to the 18th Century.

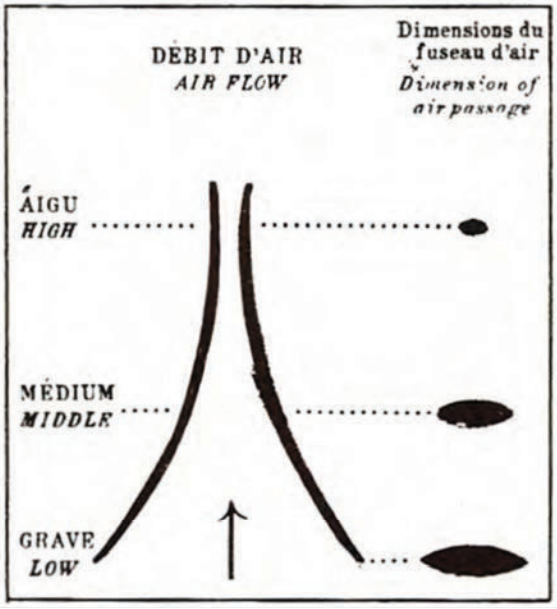


Figure 98 Diagram showing the size of the opening between the lips playing in low, middle, and high registers, from *Exercices journaliers pour la Flûte* (1975, 3) by Hériché.

A further dimension regarding the airstream—taught by Alain Marion (1938-1998), teacher at the *Conservatoire* (1977-1998)—was to be imaging to blow the airstream "*around*" the lip plate, as if to caress the lip-plate and the tube of the head-joint being a technique suggested when searching for a tender and poetic sound colour. For creating a more intense expression one should blow the airstream "*into and out*". (Ljungar-Chapelon, 2020, 30)

 Blow the airstream "*around*" the lip plate as if to caress the lip plate and the tube of the head joint. This is a technique suggested by Marion searching for a tender and poetic sound colour.	 Direct the airstream "*into and out*" as when a string player would play "*into the string*" and closer to the bridge. This is a technique suggested by Marion when searching for a more powerful expression and sound colour.

Both techniques have an affinity with string-playing in so far that imagine blowing the airstream "*around*" the lip plate could be associated with when a string-player play "*on the string*", and blowing the airstream "*into and out*" could be compared with as when a string player would play "*into the string*" and closer to the bridge. Even thou that Marion was making these suggestions for playing the Boehm-flute, the same concept has strong bearing on the Traverso. Marion did as well often refer to that the airstream should be blown in the manner of "*blow warm*" when searching for a mellow, tender, and melodic sound colour. This idea resembles earlier discussed *L'Art ou les Principes philosophiques du Chant* (1756) by Jean-Antoine Blanchet (1724-1778) describing that different speeds when expiring influences expression and character of the voice:

> Si on expire longtemps sur les sons, ils sont nourris et moëlleux; si on expire quelque temps et avec une certaine force, ils sont majestueux; si on expire long-temps et mollement, ils sont tendres […] (Blanchet, 1756, 38–39)[1]

1. If you breathe out a long time on the sounds they are nourished and soft; if you breathe out for some time and with a certain force, they are majestic; if we breathe out long and softly the sound become tender […] (Blanchet, *L'Art ou les Principes philosophiques du Chant*, 1756, 38-39)

7.3.5 *Sons filés*

> *L'art du Musicien est de donner à la mélodie des inflexions qui répondent à celles du langage; & l'art du Poëte est de donner au Musicien des tours & des mouvemens susceptibles de ces inflexions variées, d'où résulte la beauté du chant.*[1]
>
> Marmontel (1763, II: 334)

One of the essential techniques to master on the Traverso, as on all other models of transverse flutes, is the technique of making different nuances, inflexions, and sound colours. The supreme exercise is to master how to play *forte* and *piano*, and to make *crescendo* and *diminuendo* keeping perfect intonation and timbre alive, whereby the latter in methods for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute generally is called *Sons filés*.

The paramount artistic model for the instrumentalist to practice *Sons filés* is to be found in the human voice with all its inflexions and expressions, which since at least the 16th Century has been understood as the superior ideal for any musical instrument (Ganassi, 1553/1956; Labie, 1989; Ljungar-Chapelon, 2018). In the treatise *Essai sur le Beau* (1763/1770) by Hotteterre's contemporary Yves Marie André (1675-1764) is a typical example of how widely spread the importance of mastering tonal flexibility were referring to the human voice when discussing beauty of music:

> Dans le chant, combien d'inflexions de voix molles & délicates, combien de passage fins, de petits tons fuyans, d'accords même un peu altérés par l'adresse du Musicien, nous causent d'abord un plaisir plus piquant que des accens plus fermes ou plus réguliers! Cependant, qu'on nous les fasse revenir trop fréquemment, & coup sur coup, ces finesses de l'art, non-seulement les oreilles savantes, mais le peuple même, se récriera contre cette profusion ambitieuse de beautés harmoniques: voila pour le Beau musical. (André, 1763/1770, 222-223)[2]

A somewhat later source is found in *Causes de la Decadence du Gout sur le Theatre* (1768) by Louis Charpentier (17??-17??) discussing how music instruments were used in the Antiquity. Although the conception seems to be speculative it mirrors views regarding the relation between the human voice and flute playing around the middle of the 18th Century in France of interest because a flute by then is synonymous with Traverso:

> Les Anciens rafinoient tellement sur usage de la musique & des instrumens, dans les pieces Théatre, qu'ils y préféroint les flutes, parce qu'il n'est point d'instrument qui approche plus la parole & des mouvemens du gosier. Les joueurs de flutes servoient aux Acteurs à prendre, à soutenir ou à rétablir les inflexions de voix propres aux différentes passions qu'ils représentoient; ils les aidolent nous souffleurs secondant aujourd'hui leur mémoire. (Charpentier, 1768, 84-85)[3]

As has been shown above as in previous sections that the ideal it might be a Basse de Viole, Traverso, Recorder, or any instrument should be as expressive as the human voice when sung or spoken, having the flexibility of the voice as its model. This directly connects to the mastery of *Sons filés* within French flute traditions and is understood as one of the strongest tools for the development of musical expression and embouchure technique. Such skills regarding tonal flexibility are, of course, not a speciality for flautists but a fundamental techniques for all melody instruments regarding tone development and expressive playing. When *Sons filés* is applied on the Traverso o any other transverse flute this is—in a sense—a simple technique based on controlling the opening between the lips, the direction of the airstream in combination with the control of the speed or pressure of airstream with the diaphragm and ribcage (Support), in a similar manner as described above regarding playing in different octaves. The basis is that a larger opening between the lips allows a larger amount of air to hit the edge on the blowing-hole making the sound louder, and vice-verse.

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1. The art of the Musician is to give to the melody inflections which correspond to those of language; and the art of the Poet is to give the Musician turns and movements susceptible of these varied inflections, from which results the beauty of song. (Marmontel, *Poetique François*, 1763, II: 334)

2. In singing, how many inflections of soft and delicate voices, how many fine passages, little fleeting tones, chords even slightly altered by the skill of the musician, cause us at first a more piquant pleasure than accents firmer or more regular! However, if they are brought back to us too frequently, and time after time, these subtleties of the art, not only the learned ears, but the people themselves, will protest against this ambitious profusion of harmonic beauties: this is the *Beau musical.* (André, *Essai sur Le Beau*, 1763/1770, 222-223)

3. The Ancients refined so much on the use of music and instruments, in plays, that they preferred the flutes, because there is no instrument which comes closer to speech and the movements of the throat. The flute players served the Actors to pick up, sustain or re-establish the inflections of voice proper to the different passions they represented; they help the theatre prompters supporting their memory as today. (Charpentier, *Causes de la Decadence du Gout sur le Theatre,* 1768, 84-85)

The difficulty is that if the proportional size of the opening between the lips, the direction of the airstream and the pressure of the airstream is not well coordinated a loud dynamic risk to be too sharp and vice-verse. In addition, due to the construction of the Traverso and the placement of the tone-holes some notes are too sharp and others too flat. The technique of controlling the size of the opening between the lips with different amounts of *Tonus* and muscular activity of the lips is similar to what is described when mastering the size between the lips in relation to playing in all registers of the Traverso. In the present context are Mahaut's explanations useful on how to flatten too sharp notes while enlarging the opening between the lips and advancing the upper-lip slightly and sharpen too flat notes, drawing the lips towards the corner of the mouth and strengthening the airstream a little (Mahaut, 1759, 9). It should be noted that a minimum of pressure from the lip-plate on the lower-lip and chin significantly contributes to the suppleness and flexibility for practicing and playing *Sons filés*. If the head-joint is pressed too much against the lower-lip and chin it has a general effect of flattening the intonation, together with that the small necessary movements of the embouchure (lips and under jaw) will be impeded. Whereas if the lip-plate has a minimum of pressure against the lower-lip and chin, they are free to make supple movements, and the head-joint follows the movements of the lips and jaw. An accurate technical explanation how to do when making *crescendo* and *diminuendo* and *Sons filés* is found in the earlier mentioned fragment of the flute method by Atys (1758):

> […] il faut appuyer sur le son par degré, du sorte que le milieu de ce son soit plus enflé que le commencement & la fin; ce qui se fait aisément en lâchant les levres & les serrant par gradation. Le vent qui se trouve resserré, sort avec plus de force, & grossit naturellement le son. Pour régler votre embouchure dans le commencement, soufflez dans la flûte vis-à-vis une chandelle allumée; si la chandelle varie, la flûte n'est pas bien embouchée. (Atys, 1758, 172–173)[1]

Despite that practicing *Sons filés* as described by Atys in theory is simple, still it is one of the difficult techniques to master even after many years of practice. But, when mastered the sonority of the Traverso becomes flexible, and a tool of the highest degree regarding musical expression, interpretation, and intonation. Interestingly enough, the technique of *Sons filés* is not mentioned in *Principes*. But, when examining Hotteterre's compositions there are several indications regarding different nuances or dynamics, which clearly shows the importance of having these skills when performing Hotteterre's compositions. In the above mentioned Traverso method by Mahaut (1759) it is clearly described how important it is to practice *Sons filés* for the development of a refined playing of the Traverso:

> Il ne nous reste qu'a recommender a ceux qui veulent se perfectioner de se former de boneheure a tirer un Son net et bien soutenu […] de bien filer un son soit en l'augmentant ou en diminuant […] (Mahaut, 1759, 3)[2]

Both De Lusse (*c.*1761), and not the least Devienne (*c.*1794) clearly urge the Traverso-player to devote much time for the development of skills regarding *Sons filés*:

> […] la gradation & dégradation du son, employées alternativement; elles sont propres toutes expressions: la premiere se fait en enflant & soutenant le son graduellement, & la derniere en rétrogradant le son par raison contraire. (De Lusse, *c.*1761, 9)[3]

> […] faire beaucoup de Games en enflant et diminuant chaque Note […] (Devienne, *c.*1794, 7)[4]

A thought regarding *Sons filés* and how its technique is described above by Atys (1758), Mahaut (1759), De Lusse (*c.*1761), and Devienne (*c.*1794) is that advanced skills playing very soft nuances considerable develops skills playing with fullness and a sonorous sound in the low register, being an ideal by mentioned authors. To start practicing *Sons filés* with a very soft nuance in front of a lighted candle, whereby the flame should not flicker—as described by Atys (1758)—is indeed an excellent exercise for centring the airstream with a minimum amount of air, searching for the perfect direction, and hitting point of the airstream.

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1. […] it is necessary to give the sound different degrees, so that the middle of this note is stronger than the beginning and the end, which is easily done by releasing [stronger nuances] and tightening [softer nuances] the lips by graduation. When the lips are first tightened [for softer nuances] and then released the airstream goes out with more force [gives louder nuance], and naturally enlarges the sound. To set your embouchure in the beginning, blow into the flute in front of a lighted candle; if the flame flicker, the airstream is too strong. (Atys, *Mercure de France*, 1758, 172–173)

2. It only remains for us to recommend to those who want to improve their skills to practice from time to time, for achieving a clear and well-supported sound, to play each note while increasing and decreasing it [...] (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere,* 1759, 3)

3. […] gradation & degradation of sound, used alternately; they are suitable for all expressions: the first is done by gradually swelling & sustaining the sound, and the last by retrograding the sound for the opposite reason. (De Lusse, *L'Art de la Flûte Traversière*, *c.*1761, 9)

4. […] play a lot of scales while increasing and decreasing each Note […] (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte, c.*1794, 7)

When this is achieved, then releasing the lips gradually and reducing the amount of *Tonus* in the lips, at the same augmenting the amount of blown air keeping the same hitting point for the airstream, it becomes an almost surprising experience how easily a sonorous and large sound develops in the low register of the Traverso. To conclude, it could be said that practicing *Sons filés* is the supreme method for identifying a perfect direction of the airstream and its hitting point on the sharp edge of the blowing-hole. When a minimum of air creates a very soft but living sonority this is the result of having found and ideal interaction between the airstream and its hitting point—*le Veritable point*—being the ultimate tool for musical expression.

A different opinion regarding the benefits of practicing *crescendo* and *diminuendo* as suggested and explained by Atys (1758), Mahaut (1759), De Lusse (*c.*1761), and Devienne (*c.*1794) is expressed in the flute method by Tulou (1851). Contrary to mentioned authors Tulou questions the benefits of practicing *Sons filés* in the traditional manner and suggested instead to practice with a full but not forced sound from the start to the end of each note. It should be noted that Tulou stresses his opinion referring to the beginner flautist, which as such makes sense because practicing *Sons filés* is a difficult technique to master:

> Le meilleur travail qu'on puisse faire pour rendre l'embouchure facile et pour lui donner la plénitude désirable, est de *filer* des sons sur chaque note de la gamme: dans ce cas, il faut attaquer la note en donnant au son toute la plénitude possible, sans souffler avec trop de force pour ne pas altérer la qualité, et le soutenir plain jusqu'au la fin de la respiration. C'est un mauvais principe, surtout pour un élève dont l'embouchure n'est pas encore bien assurée, de faire commencer *Piano*, d'enfler le son au milieu et de finir *Diminuendo*. Cela ne peut que l'entraîner à jouer faux. (Tulou, 1851 19)[1]

A similar suggestion regarding how to practice the sonority was expressed by the Danish flute virtuoso and composer Joachim Andersen (1847-1909) in the autograph of *98 Posthumous Exercises & Preludes* (*c.*1890) whereby Andersen give the suggestion to practice with a full sound throughout each note in scales and starting each note with an accent (Ex. 21): *Med fuld og kraftig Tone, hver Takt med akcentueret Ansatz, Tonen holdt kraftful lige til Taktstregen.* (*c.*1890).



Example 21 With a full sound throughout starting each note with an accent and keep the fullness of sound until the bar line. (Andersen, *98 Posthumous Exercises & Preludes, c.*1890)

The almost identical suggestions given by Tulou and Andersen could possibly be interpreted as an endeavour aiming for making the flute sound larger, and thus perhaps an announcement regarding a change of aesthetics.

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1. The best to practice for making the embouchure supple and to give it the desirable fullness, is to play long notes on each note of the scale: in this case, you must attack the note by giving the sound all the fullness possible, without blowing with too much force for not altering the quality of the sound, and to support it plain until the end of the breath. It is a bad principle, especially for the beginner whose embouchure is not yet well assured, to start *Piano*, to swell the sound in the middle and to finish *Diminuendo*. This can only cause him to play out of tune. (Tulou, *Méthode de Flûte*, 1851, 19)

The French flautist and *Homme de lettres* Louis Fleury (1878-1926)—who had studied with Taffanel at the *Conservatoire* and awarded the *Première Prix* in 1900—wrote a long article in Lavignac's *Encyclopédie de la Musique* (1925a), based on notes by Taffanel. In this article is a section—*L'Art du flûtiste*—which discusses various aspects of flute technique and the embouchure. Fleury suggested two methods to develop control of the airstream: using a mirror or a lit candle held up close in front of the embouchure. Fleury gives a similar explanation as explained above regarding Atys (1758) about how to use the lit candle to control the airstream:

> L'émission idéale consisterait à utiliser entièrement le souffle projeté dans l'embouchure, mais il est à peu près impossible d'arriver à cette absolue perfection. Une certaine quantité d'air se perd toujours durant le passage de souffle. On en fera remarque en se plaçant devant un miroir ou une bougie allumée, placés très près de l'embouchure, face à l'exécutant. Le flûtiste qui parviendrait à jouer sans tenir la glace, ou sans faire vaciller la flamme de la bougie, aurait atteint le maximum de rendement. Un tel exercice peut servir à l'amélioration de l'émission. (Fleury, 1925a, 1523)[1]

The importance of finding a favourable angle of the airstream—*le Veritable point*—is discussed by Boehm (1847), that a characteristic of a good embouchure is that a major part of the airstream is directed so that it starts the vibrations of the air-column in the flute tube as when a violin-bow passes the strings:

> Der tonerregende Luftstrom muss stets unter einem, der Tonhöhe proportionalen Winkel gegen den obern scharfen Rand des Mundloches geblasen werden, an welchem er sich bricht oder vielmehr zertheilt. Hiedurch geht ein Theil dieses Luftstromes über das Loch hinweg; der grössere Theil hingegen, namentlich bei guten Ansatze, wirkt tonerregend auf die in Rohre eingeschlossene Luftsäule, indem er sie in wellenförmige Schwingung versetzt, beiläufig wie die Saite einer Violine durch das rechtwinkeliche Darüberstreichen des Bogens in transversale Schwingung geräth. (Boehm, 1847, 49)[2]

In the earlier mentioned exercise-book *Exercices journaliers pour la flûte* (1975) by Hériché, is a second diagram of high interest, clearly describing how the opening of the lips stands in relation to making *crescendo* and *diminuendo* (Fig. 99). Hériché explains that the lips should be slightly tightened—with more *Tonus* or muscular activity—when playing *piano*, and that the chin or lower jaw should be slightly raised at the same time. These suggestions are like when Atys (1758, 172–173) and Mahaut (1759, 9) suggested to tighten the lips when correcting a too flat note, because when tightening the lips as suggested this in most cases involves that the lower jaw will be slightly raised. Hériché's explanation suggests a similar use of tightening and releasing the lips and embouchure compared with French 18th Century Traverso methods. The author of the present study made in 1990 a longer interview with Hériché in his home in Paris. This interview was a unique opportunity to speak with a flautist who had been an outstanding student of Gaubert, when Gaubert was at his heights as a virtuoso. In addition, in the period when Gaubert taught Hériché he was finalizing the edition of *Méthode Complète de Flûte* which had been outlined by Taffanel but not finished because of Taffanel's death in 1908. Gaubert's editorial work and contributions were published in 1923 under the name *Méthode Complète de Flûte by Taffanel & Gaubert*.

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1. The ideal control of the embouchure would be that all blown air [the airstream] should generate sound, but it is almost impossible to reach this absolute perfection. A certain amount of air is always lost during the passage to the sharp edge of the lip-plate. This will be noticed by placing in front of a mirror or a lit candle, placed very close to the mouth, facing the performer. The flautist who manages to play without misting the mirror or making the flame flicker, a maximum of efficiency has been reached. Accordingly, this exercise is useful for the development of the flute sound (Fleury in *Lavignac Encyclopédie de la Musique* 1925a, 1523

2. The airstream that makes the sound must always be blown against the upper sharp edge of the mouth hole at an angle proportional to the pitch, at which point it breaks, or rather splits. A part of this airstream thereby passes over the hole; the larger part, on the other hand, especially when the embouchure is good, has a sonorous effect on the column of air enclosed in the tubes, by causing it to vibrate in a wave-like manner, incidentally like the strings of a violin vibrating transversely when the bow is passed across it at right angles. (Boehm, *Über den Flötenbau und die neuesten Verbesserungen desselben*, 1847, 49)

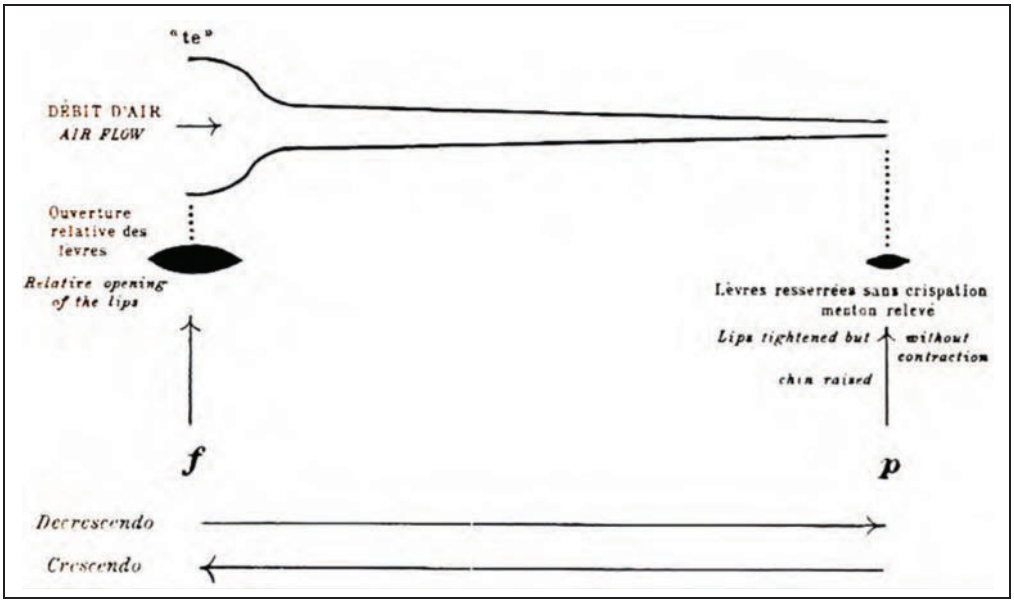


Figure 99 Diagram showing: a) the size of the opening between the lips attacking a note with the articulation **TE** or **TÜ** possible with French pronunciation in a *forte* nuance and then making a *diminuendo*; and b) making a *crescendo* from *piano* to *forte*, from *Exercices journaliers pour la flûte* (1975, 8) by Hériché.

Hériché said that after he had graduated and was awarded the *Première Prix* in 1920 at the *Conservatoire*, at the age of being fourteen years old, Gaubert had urged him to take private lessons with Marcel Moyse for a longer period. This is noteworthy because this period coincides with that Moyse just after World War I also was one of the notable flautists in Paris, just having started his important row of publications *Enseignement Complet de la Flûte*. Hériché told me that his impression when having lessons with Moyse, was that Moyse tried out many of the exercises which were intended to be published within *Enseignement Complet de la Flûte*. Hériché's two teachers Gaubert and Moyse, had in their turn have had Taffanel as their teacher when they were students at the *Conservatoire*, and consequently have had similar teachings regarding flute playing, which gives perspectives on Taffanel's teaching combined with Hériché's own contributions.

One of the subjects in the privileged interview setting mentioned above was to discuss the embouchure, and the interplay between the lips and the lower jaw, based on the following passages in *Méthode Complète de Flûte* by Taffanel & Gaubert (1923/1958) and *De la Sonorité* (1934) by Moyse:

> Pour leur exécution [larger intervals] l'élève devra éviter tout mouvement du menton; les lèvres seules agiront, imprimant ainsi à la tête de la flûte un mouvement d'arrière en avant et vice versa par leur relâchement ou leur contraction. (Taffanel & Gaubert, 1923/1958, 6)[1]

> […] la mâchoire inférieure que l'on doit corriger l'axe de la flûte par rapport aux lèvres et il à l'énorme avantage de laisser beaucoup de liberté aux lèvres […] (Moyse, 1934, 4)[2]

In *Méthode Complète de Flûte* by Taffanel & Gaubert (1923/1958) it is clearly suggested to do all necessary adjustments regarding the embouchure, intonation, and dynamics exclusively with the lips not involving the lower jaw. Whereas Moyse in *De la Sonorité* (1934) advocated that the lower jaw is the principal tool regarding the embouchure regarding intonation and dynamics, because this gives the lips more freedom. When I asked Hériché if Gaubert really made embouchure adjustments exclusively with the lips he smiled and explained that Gaubert—despite what is written in *Méthode Complète de Flûte* (1923/1958)—involved the jaw in a natural supple way, and that Moyse did far less movements with the lower jaw than might be expected from his suggestions in *De la Sonorité* (1934). Hériché's answer is clarifying because it enlightens aspects of essential embouchure techniques used and taught in Paris around 1900, and echoes Hotteterre's pragmatism regarding the embouchure, earlier described in section *6.2*.

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1. To produce these notes [larger intervals] the student should avoid any movement of the chin; only the lips move, so that the head of the flute shows a movement forward and backwards and vice versa produced by the relaxing or tightening of the lips. (Taffanel & Gaubert, 1923/1958, 9)
2. It is by means of the lower jaw, in fact, that one has to correct the axis of the flute in relation to the lips, and this has the enormous advantage of leaving a great deal of liberty to the lips […] (Moyse, *De la Sonorité: Art et Technique,* 1934, 4)

The conversation with Hériché clearly explained how the actions of the lower jaw and the lips in a sense are in symbiosis: when the lower jaw is moved the lips tend to move, when the lips are moving the lower jaw tends to move. In addition, both techniques are highly efficient tools, and for sure it is beneficial to practice each technique separate, and the becoming professional flautist will eventually develop a personalized embouchure with these tools. In the present context discussing embouchure techniques for the Traverso and the Boehm-flute are Hériché's answers of importance when connected to the suggestions regarding the embouchure given by Mahaut (1759). When Mahaut suggested to activate the lips from their corners with more *Tonus* for sharpening too flat notes it generally has the secondary effect of slightly raising the lower jaw. When Mahaut suggested to move the upper-lip forwards aiming for flattening too sharp notes, this generally have the secondary effect of slightly lowering the jaw. In a context discussing embouchure, *crescendo* and *diminuendo*—which indirectly to a large extent is a discussion regarding intonation—it is striking how similar suggestions for the Traverso as found in French 18th Century Traverso methods are with Hériché's diagrams, and that Hériché's explanations in a sense confirm French 18th Century embouchure techniques.

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A thought experiment in the footsteps of Hériché and his studies having had both Gaubert and Moyse as his teachers would be to imagine that Mahaut had some Traverso lessons with Buffardin during his visit in Dresden around 1745, and earlier lessons with Hotteterre in Paris. If so, it would have been exciting to have asked Mahaut if Hotteterre used his technique of rolling the Traverso in the three positions *Outward—Normal—Inward* of the head-joint as much as *Principes* and *Rudiments* could give the impression to pretend. Then to ask if Buffardin used this technique or an embouchure technique reminding Mahaut's explanations in his Traverso method (1759). Of course, this is a speculative scenario, still it would perhaps not surprise if Mahaut would have answered similarly to Hériché and explained that Hotteterre used the three positions *Outward—Normal—Inward* but not as much as his text could make us think, and that Buffardin used an embouchure technique like what Mahaut described in combination with a supple use of the three positions described by Hotteterre.

Traverso

[…] il faut appuyer sur le son par degré, du sorte que le milieu de ce son soit plus enflé que le commencement & la fin; ce qui se fait aisément en lâchant les levres & les serrant par gradation. Le vent qui se trouve resserré, sort avec plus de force, & grossit naturellement le son. Pour régler votre embouchure dans le commencement, soufflez dans la flûte vis-à-vis une chandelle allumée; si la chandelle varie, la flûte n'est pas bien embouchée. Atys (1758, 172–173)

Il ne nous reste qu'a recommender a ceux qui veulent se perfectioner de se former de boneheure a tirer un Son net et bien soutenu […] de bien filer un son soit en l'augmentant ou en diminuant […] Mahaut (1759, 3)

[…] la gradation & dégradation du son, employées alternativement; elles sont propres toutes expressions: la premiere se fait en enflant & soutenant le son graduellement, & la derniere en rétrogradant le son par raison contraire. De Lusse (*c.*1761, 9)

[…] faire beaucoup de Games en enflant et diminuant chaque Note […] **Devienne** (*c.*1794, 7)

[…] restés longtems sur chaque note enflés et diminués le son successivement, voila le seul moyen avoué par tous les artistes pour acquerir un beau son. Van der Hagen (1798, 9)

Alors on pourra enfler ou diminuer avec modération, pour que le son formé, soit doux, ou fort, ou moyen […] une fois l'embouchure bien appliquée à la place qui lui convient, il ne faut plus s'occuper du petit trou que forment les lêvres, c'est en soufflant sans force qu'il s'ouvrira plus ou moins grand […] Peraut (*c.*1802, 3)

Multi-keyed conical flutes

L'unique moyen d'acquérir un beau son […] est de filer des sons; les sons se filent en attaquant chaque note piano en enflant progressivement jusqu'au forte et en diminuant du forte au piano […] on observera de serrer un peu les lèvres pour le piano et de les ouvrir insensiblement à mesure que l'on enflera pour arriver au forte; les précautions inverses devront être observées en diminuant du forte au piano. **Hugot & Wunderlich** (1804, 19)

Une belle qualité de Son charme l'oreille comme une belle Voix, et comme elle, nous vient de la nature […] faut-il un travail opiniatre, qui consiste a filer des Sons. **Wunderlich** (*c.*1812, 9)

Pour parvenir à obtenir un beau SON, il faut SOUTENIR, ENFLER et DIMINUER le SON; cette règle est indispensable […] c'est le moyen le plus sûr, pour acquérir un beau SON. Berbiguier (*c.*1818, 28)

L'Exercice des Sons Filés est le plus propre à faire acquérir un beau Son. Drouët (1827, 54)

Les Sons se filent, en attaquant chaque note très-doux, en enflant progressivement jusqu'au Forté, et en diminuant jusqu'au pianissimo. Walckiers (1829, 18)

Il est d'une haute importance d'obtenir une perfection dans les sons filés, ces sons formant la partie principale d'une belle embouchure. Bretonniere (1840, 63/77)

[…] il faut attaquer la note d'abord très faiblement, puis enfler le vent progressivement et le laisser éteindre dans la même proportion […] Kastner (1844, 37)

Ringklappenflöte

L'étude des gammes exercées par note filée, donne de la sûreté d'intonation, forme l'embouchure et l'oreille. **Coche** (1839, 82).

[…] indique le crescendo et le decrescendo quand ce dernier signe accentue une seule note d'une longue durée, on dit alors qu'il faut filer le son. Gattermann (1861, 111)

Boehm-flute

Il faut pour acquérir une belle embouchure faire beaucoup des gammes lentement en enflant et diminuant toutes les notes sans que l'embouchure se dérange, par les moyens des lèvres, travail fort peu agréable mais de première nécessité pour acquérir une belle qualité de son. Bousquet (1858, 11)

[…] commencer *pianissimo* en les enflant progressivement jusqu'au *fortissimo* pour aboutir en les diminuant peu à peu, au *pianissimo*. **Altès** (1880, II: 204); **Altès**-Caratgé (1880/1956, I: 149); **Altès-Rampal & Marion** (1880/1979, I: 168)

[…] on devra jouer les gammes dans tous les tons, en enflant et diminuant les sons. Rémusat (1906, 7)

Pour arriver à obtenir des sons purs et mélodieux, il faut s'exercer à tenir une note pendant la longueur d'une respiration raisonnable, l'attaquer avec la plus grande douceur, l'enfler graduellement, et graduellement la diminuer et l'éteindre sans déranger l'embouchure […] C'est ce qu'on appelle *Filer les sons*. **Devienne-Gaubert** (*c.*1794/1908, I: 7)

Pour arriver à obtenir des sons purs et mélodieux, il faut s'exercer à tenir une note pendant la longueur d'une respiration raisonnable, l'attaquer avec la plus grande douceur, l'enfler graduellement, et graduellement la diminuer et l'éteindre. C'est ce qu'on appelle *Filer les sons*. Gariboldi-Merry (1882/1955, I: 7)

Tous les efforts de l'élève doivent tendre à acquérir une sonorité claire et ample : l'étude persistante des sons filés est le plus sûr moyen d'y parvenir mais cette étude est très difficile. **Taffanel & Gaubert** (1923/1958, I: 54)

Figure 100 Descriptions regarding *Sons filés* applied for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. and the Boehm-flute as found in methods for these flute models. Names marked with bold indicates flute teachers at the *Conservatoire*. (Ljungar-Chapelon, 2008)

Traverso
[…] soufflerd'un vent moderé […] Hotteterre (1707, II: 3)
[…] soufle moderement le vent […] Mahaut (1759, 6)
[…] soufflant doucement […] De Lusse (*c.*1761, 3)
[…] pousser le vent fort doucement […] Corrette (1735 & 1773, 9)
[…] souffler d'un vent moderé […] Mussard (1778, 5)
[…] souffler d'un vent modéré […] *L'Encyclopédie Méthodique* (1785 & 1788, 106)
[…] souffler modérement […] **Devienne** (*c.*1794, 6)
[…] souffler moderement […] Van der Hagen (1798, 7)
[…] le soufle, lequel doit être émis sans force et avec une quantité moyenne […] c'est en soufflant sans force. Peraut (*c.*1802, 3)
Multi-keyed conical flutes
[…] modérer le soufle […] **Hugot & Wunderlich** (1804, 6)
[…] souffler modérément dans la flûte […] Vaillant (1826, 5)
[…] souffler légèrement dans l'intérieur de la flûte. Drouët […] (*c.*1827, 31)
[…] soufler modérément […] Bigot (1832, 10)
[…] souffler dans l'instrument avec aisance et sans effort. […] Kastner (1844, 6)
[…] souffler sans force […] **Tulou** (1851, 5)
[…] souffler modérément […] Cornette (1855, 6)
Ringklappenflöte
[…] souffler modérement […] Camus (1839, 8)
[…] on n'expire absolument que ce qui est nécessaire pour exprimer la valeur des notes. […] **Coche** (1839 36)
Boehm-flute
[…] souffler modérément […] Bousquet (1858, I: 11)
[…] souffler toujours très légèrement, car en soufflant fort le son sort désagréable […] **Devienne-Gaubert** (*c.*1794/1908, I: 5)
[…] Il faut éviter de souffler avec effort. […] Remusat (1906, 7)
[…] que très peu de soufflé. […] **Taffanel & Gaubert** (1923/1958, I: 6)
[…] L'élève aura soin de souffler toujours très légèrement […] Gariboldi-Merry (1882/1955, I: 4)
[…] souffler doucement (I: 17); souffler légèrement […] **Altès**-Caratgé (1880/1956, I: 18)
Le flûtiste qui parviendrait à jouer sans […] vaciller la flamme de la bougie, aurait atteint le maximum de rendement. Un tel excercise peur servir à l'amélioration de l'émission. Fleury (1925a, 1523)
Blow warm. What I mean is called *calore*. This typical example when you want warm hands what do you do? If you blow warm you will have a warm sound. **Marion** (Ljungar-Chapelon, 2008, 134)

Figure 101 Suggestions regarding the *Airstream* applied for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute as found in methods for these flute models. Names marked with bold indicates flute teachers at the *Conservatoire.* (Ljungar-Chapelon, 2008)

Conclusions regarding positioning the head-joint, *Sons filés,* and the airstream

- The essential parameters regarding intonation, sound colour, nuances, and different registers are linked to the airstream and can be broken down in that airstream can be influenced in three layers: a) its direction, b) speed, and c) amount of air, and all three parameters are closely linked to the size of the opening between the lips and the coverage of the blowing-hole as discussed above.
- The head-joint positions *Outward—Normal—Inward* as described in *Principes* and *Rudiments* is practically a technique for directing the airstream *upwards*, *quasi forwards* and *downwards* through turning the Traverso with the hands/fingers. An alternative technique is also described based on that the Traverso-player has three head-positions *Up—Normal—Down* which has the same effect as when turning the Traverso in the positions *Outward—Normal—Inward*. Indirectly these techniques are based on that the airstream is blown in generally the same direction all the time, and the different positions of the Traverso alternatively the changes of head positions slightly modify the target point of the airstream against the sharp edge of the blowing-hole. As every flautist knows the three octaves of the flute needs certain corrections regarding the direction of the airstream and that is what Hotteterre explained in relation to the three-piece Traverso with the above-mentioned positions *Outward—Normal—Inward* alternatively *Up—Normal—Down*. Further has the direction of the airstream the well-known and direct influence on intonation: an airstream being directed more upwards has a sharpening effect and vice versa. In the methods by Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794) are the techniques *Outward—Normal—Inward* and *Up—Normal—Down* virtually abandoned. Instead, is a technique explained whereby the head-joint and the Traverso generally is in one position throughout, and the direction of the airstream is modified with help of the embouchure. Especially Mahaut (1759) explained in detail adjustments of the airstream with the lips in combination with modification of the speed of the airstream together with small adjustments of the lower jaw. Generally, all methods for Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute describes techniques regarding the direction for the airstream that the flute is in one position throughout and that modification are made with the lips and embouchure.
- Another essential technique of the embouchure is playing *crescendo*, *diminuendo,* and different nuances such as *pianissimo* and *fortissimo* and everything in between, often labelled as *Sons filés*. In essence is the technique from a theoretical point of view simple and based on controlling the size of the opening between the lips in combination with control of the speed and amount of the airstream with the diaphragm and ribcage (Support). The basis is that a larger opening between the lips allows a larger amount of air to hit the edge on the blowing-hole making the sound louder, and vice-verse. One difficulty is to calibrate the size of the opening between the lips with the speed and amount of the airstream. The technique of regulating the size of the opening between the lips is controlled with *Tonus* and muscular activity of the lips and embouchure, in combination with that the airstream—when the *Tonus* in the lips and embouchure is in balance—when it is stronger due to the elasticity of the tissue of the lips slightly makes the opening between the lips larger and vice-verse. A lack of balance like when the lips have a too strong *Tonus* in proportion to a higher speed of the airstream easily results in "cracking" notes, with a too low *Tonus* in relation to the speed of the airstream notes risks to "fall down". The technique as described above is the same for any kind of a transverse flute, and so for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute.
- The third parameter regarding the amount and speed of the airstream directely influences intonation, sound colours, and nuances. In *Principes*, *Rudiments* and all examined method for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute points on that playing in the lower register the airstream should be somewhat slower and larger compared with that the higher register is based on a higher speed and more narrow airstream, all controlled by the embouchure and its *Tonus*—a larger opening creates a slower speed of the airstream and vice-verse—in combination with the activity of the breathing muscles, diaphragm, and ribcage (Support). General suggestions are: *souffler d'un vent moderé* (*Principes*), *souffler sans force* (Tulou), *on n'expire absolument que ce qui est nécessaire* (Coche), *que très peu de souffle* (Taffanel & Gaubert), *Blow warm. What I mean is called calore. This typical example when you want warm hands what do you do? If you blow warm you will have a warm sound* (Marion). As can be seen there is a concordance since *Principes* up to the present day regarding the mastery of intonation, sound colour, nuances, and different registers despite different flute models.

7.3.6 Resonance: the mouth and throat cavities

A short comment in *Principes* and *Rudiments* regarding the note G2 in the middle register (second octave) of the Traverso could be understood in terms of how the mouth and throat cavities influences the sound quality:

Le *Sol* [G2] Ainsi pour adoucir les Tons hauts & les former plus facilement, ils auront soins de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent peu à peu. (III: 8)	[G2] […] to sweeten the high Notes, and fill them more easily, you must take care to close the lips more, and more, to contract them towards the corners of the mouth, to advance the tongue towards the lips, and increase the strength in blowing, by little, and little. (III: 6)

The suggestion "*to advance the tongue towards the lips, and increase the strength in blowing, by little, and little*" (III: 6) is a movement of the tongue that will shape the cavity of the mouth and upper throat cavities giving it a shape whereby the cavity in front of the mouth will be smaller and the cavity of the back of the mouth and beginning of the throat will be larger.

An 18th Century example which in direct terms discusses effects of shaping of the mouth and throat cavities in relation to the sound of the Traverso and perhaps as a tool is found in *Essai d'une Methode pour Apprendre à jouer de la Flute Traversiere–Versuch einer Anweisung die Flute Traversiere zu spielen* (1752) by Quantz and in Chapter IV *De l'Embouchure* and the paragraphs §. 8 and §. 25:

IV: §. 8

> En mettant la Flute à la bouche, il faut d'abord retirer les joues, afin que les levres deviennent unies. […] En pressant les levres & les dents trop ensemble, cela rend le son siflant; & en dilatant trop la bouche & le gosier, il devient obscur (Quantz, Chapitre IV, §. 8, 1752, 44-45)[1]

IV: §. 25

> Une ouverture proportionnée des dents & de la bouche, & un tel élargissement du gosier, effectuent un ton epais, rond & mâl; & on fait en avançant & en retirent les levres, le ton en même tems juste & agréable (Quantz IV: §. 25, 1752, 52)[2]

A late 18th Century example regarding resonance and the mouth cavity is found in the method and *Article 4 Des Coups de Langue en Général* by Devienne (*c.*1794) and similarly in an early 19th Century revision of the same method (*c.*1816) giving a comment when discussing articulation pointing on that in Devienne's opinion does the vowels *E* and *A* (French pronunciation) open the mouth cavity too much therefore is the French vowel *U* preferable:

> […] sa prononciation (comme je l'ai dit plus haut) doit être *tu* et non pas *te* out *ta*, par la raison qu'il faut ouvrir la bouche pour prononcer ces deux dernières sillabes. (Devienne, *c.*1794/2003, 7; *c.*1816, 14)[3]

A late 20th Century example regarding the importance of activating the cavities of the mouth and throat is expressed by Rampal when discussing the influence of the shape of mentioned cavities:

> Un son peu également varier selon les interprètes. Il dépend en grande partie, d'une part, de la forme du menton et les lèvres, d'autre part, de la cavité intérieure. Nous ne parlons jamais assez de celle-ci. Je pense personnellement que son influence est grande et qu'elle est en partie responsable de la différence entre deux flûtistes. (Rampal, 1978, 18)[4]

A similar opinion was expressed by Fleury in the article *La Flûte* (based on outlines by Taffanel) in *Lavignac Encyclopédie de la Musique* (1925a)

> […] Ce qui peut se constater facilement, lorsque on entend tour à tour plusieurs flûtistes, c'est que chaque exécutant possède une sonorité qui est personnelle […] (Fleury, 1925a, 1523)[5]

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1. Pressing the lips and teeth together too tightly makes a hissing sound, while dilating the mouth and throat too much makes a dull one. (Quantz, 1752/1985, 52; Trans. Reilly)
2. A proportional opening of the teeth and mouth, and expansion of the throat, produce a thick, round, and masculine tone quality. (Quantz, 1752/1985, 59; Trans. Reilly)
3. […] its pronunciation (as I said above) must be *tu* and not *te* out *ta*, because it is necessary to open the mouth too much when pronouncing these last two syllables (Devienne, *Nouvelle Méthode Théorique et Pratique pour la Flûte, c.*1794/2003, 7; *c.*1816, 14)
4. A sound can also vary depending on the performers and depends largely on the shape of the chin and the lips, on the other hand, of the inner cavity of the mouth and throat. We cannot talk enough about it. I personally think that the influence of the inner cavity is important and that it is partly responsible for the sound differences between two flautists. (Rampal, *La Flûte*, 1978, 18)
5. What can easily be seen, when we hear several flautists in turn, is that each performer has a sound that is personal. (Fleury in *Lavignac Encyclopédie de la Musique*, 1925a, 1523)

The French flute virtuoso René Le Roy (1898-1985), explained that advanced flute playing need a constant regulation of the oral cavities for the sake of sound quality and resonance:

> L'adaptation continuelle de la cavité buccale pendant le jeu est une nécessité. […] Il en résulte que l'adaptation des lèvres, si correcte soit-elle, n'est pas suffisante pour assurer l'ampleur du son, l'homogénéité et la qualité du timbre. (Le Roy, 1966, 20)[1]

Le Roy described that it is the interaction between the airstream, oral resonance, and the air column enclosed in the flute tube that signifies the rudiments for the flute sound, and pointing at that using force will not improve the qualities of the flute sound:

> L'accord parfait entre la cavité buccale, l'embouchure et le tuyau détermine un optimum à l'émission du son: *ce n'est donc pas la force avec laquelle on projet l'air qui assure l'ampleur du son mais cet équilibre parfait*. (Le Roy, 1966, 20)[2]

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As has been shown above there has been an awareness regarding the importance of the mouth and throat cavities on the flute sound and its resonance since the 18th Century, and in direct terms formulated by Quantz (1752), and perhaps in indirect terms in *Principes* and *Rudiments*. When it comes to Quantz it is a challenging thought that explanations and suggestions as found in *Essai d'une Methode pour Apprendre à jouer de la Flute Traversiere–Versuch einer Anweisung die Flute Traversiere zu spielen* (1752) possibly could have been influenced by Quantz' Traverso studies having had Pierre-Gabriel Buffardin as his teacher.

Choices of vowels for articulation syllables are connected and contributing to shaping the mouth and throat cavities. This points on that investigating different vowel positions also independently in relation to articulation could be a method to develop and activate resonance and shaping of the cavities of the face, mouth, and throat in search of a flexible and expressive flute sound (Ljungar-Chapelon, 1990; 2008, 2019). In the following section on articulation will be shown that French flute traditions since the 18th Century up to the present day as a matter of fact gives examples of systematic choices of vowels and generally choosing the same vowels which perhaps could indicate ideals and aesthetics of timbre over time. Even with the few examples given above it can be deduced that mentioned effects on the flute sound and its resonance by nature has similar effects on the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute.



1. The perfect harmony between the oral cavity, the head-joint, and the tube of the flute determines an optimum for the emission of sound: it is therefore not the force with which the air is projected which ensures the amplitude of the sound but this perfect balance. (Le Roy, *Traité de la Flûte*, 1966, 20)
2. Continuous adaptation of the oral cavity during play is a necessity. […] It follows that the adaptation of the lips, however correct it may be, is not sufficient to ensure the fullness of the sound, the homogeneity, and the quality of the timbre. (Le Roy, 1966, 20)

7.3.7 *Flattement—Tremblement flexible—Vibrato*

A discussion regarding *Flattement—Tremblement flexible—Vibrato* is facilitated by a set of general definitions by acousticians such as earlier mentioned Michèle Castellengo (2015) and Emil Leipp (1984) on the complicated phenomenon of vibrato and vibrato-like techniques:

> Le problème du vibrato préoccupe depuis longtemps les chercheurs: il s'agit en fait d'un phénomène apparemment bizarre. Lorsqu'on produit des fluctuations systématiques de hauteur (vibrato, vobulation), on «suit» la ligne mélodique ondulante avec facilité jusque vers 6 ou 7 ondulations par seconde. Subitement, le phénomène semble changer de nature et fusionne en une sensation de hauteur unique et fixe. Si on augmente encore la cadence des ondulations, il vient un point, où le son devient désagréable, chevrote de plus en plus. La cadence de «fusion» semble varier avec la tessiture des sons: pour les sons graves, elle se produit lorsqu'on «vibre» 5 ou 6 fois par seconde; pour les sons très aigu, 7 ou 8 fois. (Leipp, 1984, 127-128)[1]

> Le vibrato est une modulation lente du son, inférieure à huit modulations par seconde. Selon les instruments, cette modulation s'applique préférentiellement à l'amplitude et la fréquence. Dans tous les cas, le vibrato s'accompagne aussi d'une modulation du spectre. […] De façon générale, les instruments à vent peuvent produire d'importantes modulations d'amplitude résultant des variation résultants de débit aérien, toujours associées à des modulations de fréquence et des spectre. […] La production d'un vibrato en fréquence résulte d'un mouvement de la main (violon), d'un oscillation du larynx (voix) ou des variations de pression de l'air fourni par le musicien (flûte, hautbois). La plage des valeurs observées est donc aussi à mettre en relation avec la fréquence d'oscillation des systèmes physiologiques moteurs mis en jeu dans sa réalisation. (Castellengo, 2015, 266-268)[2]

From shown comments on vibrato it can be deduced that a vibrato or vibrato-like technique on a wind instrument—generally any kind of transverse flute—can be described as a phenomenon that includes an undulation regarding a micro-interval in relation to a given note, and that this undulation can be influenced regarding its speed and size. Further that the undulation has effects on the sound colour or *Timbre*. Thus, these parameters have practical importance for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute, although the techniques used can be of different character.

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As has been shown above (section *6.7 Des Agrémens: Ornamentation*; Appendix XXIII) embodies *Flattement* an essential tool and technique in relation to musical expression on the Traverso during the first part of the 18th Century in France, and was described in examined texts within the present study. But already the revision of *Principes* by Antoine Bailleux—*Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere, de la Flute à bec et du Haut-bois. Divisée en differents traités par Mr. Hotteterre, le Romain Flute de la Chambre du Roi*—(1765) has no chapter on *Flattement*, and it's the same in the influential *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne. In later methods including the Traverso such as Peraut (*c.*1802), Hugo & Wunderlich (1804), and Wunderlich (1812) none have sections on *Flattement* or similar techniques. The absence of descriptions regarding *Flattement* in these sources probably mirrors a shift in aesthetics, Traverso-techniques, and teaching in France during the late 18th Century. But could be understood as that *Flattement* or similar means of expression continued to be used, and possibly had become a natural part of musical expression and consequently no longer needed to be explained.

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1. The problem of vibrato has long preoccupied researchers: it is actually a seemingly bizarre phenomenon. When we produce systematic fluctuations in pitch (vibrato, *vobulation*), we "follow" the undulating melodic line with ease up to around 6 or 7 undulations per second. Suddenly, the phenomenon seems to change in nature and merge into a single, fixed feeling of pitch. If we further increase the rate of the undulations, there comes a point where the sound becomes unpleasant, and *chevrote* more and more. The rate of "fusion" seems to vary with the tessitura of the sounds: for lower sounds, it occurs when one "vibrates" 5 or 6 times per second; for very high register, 7 or 8 times. (Leipp, *Acoustique et Musique*, 1984, 127-128)

2. Vibrato is a slow modulation of the sound, less than eight modulations per second. According to the instruments, this modulation applies preferentially to the amplitude and the frequency. In any case, the vibrato is also accompanied by a modulation of the spectrum [Sound colour or *Timbre*]. In general, wind instruments can produce significant amplitude modulations resulting from variations in airflow, always being associated with frequency and spectrum modulations. The production of the frequency or speed of the vibrato results from the movement of the hand (violin), an oscillation of the larynx (voice), or variations in air-pressure supplied by the musician (flute, oboe). The range of speed observed is therefore to be related to the frequency of oscillation of the physiological motor systems involved in its production. (Castellengo, *Écoute Musicale et Acoustique Avec 420 sons et leurs sonagrammes décryptés,* 2015, 266-268)

In influential 19th Century methods for Multi-keyed conical flutes such as Berbiguier (1818), Tulou (1851), for the *Ringklappenflöte* by Coche (1838) and Dorus (1845), and the Boehm-flute by Altès (1880) there are no chapters on techniques that could be compared with *Flattement* or other vibrato-like expressions. An example discussing *Vibrato* is found in the method by Taffanel & Gaubert (1923), but it does not include explanations of technical nature, but rather critical comments on when vibrato is displaced. From these comments can be deduced that vibrato-like techniques and expressions probably were in use at least in the later part of the 19th Century in France.

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The human voice has as mentioned since long been regarded as the supreme model for instrumental playing and *Anleitung zur Singkunst* (1757/2002) by Johann Friedrich Agricola (1720-1774), a translation of *Opinioni de' cantori anthici e moderni o sieno osservazioni sopra il canto figurato* (1723) by Pier Franscesco Tosi (1653-1732), is an important text on singing within the present context. In the chapter on trills—*Von den Trillern*—Agricola described a vibrato-like technique—in German *Bebung*—as a microtonal fluctuation and embellishment that when used has a good effect on long notes and at the end of notes:

> Die Bebung auf einem und eben demselben Tone, welche man auf Bogeninstrumenten durch das Hin- und Herwanken eines Fingers, dessen Spitze aber doch auf dem gegebenen Tone liegen bleibt, und die den Ton weder höher noch tiefer, sondern nur etwas schwebend macher, ist auch eine Manier, die im Singen, besonders auf Haltung langer Noten, zumal wenn man sie erst gegen das Ende dieser Noten anbringt, ihre gute Wirkung thut. Es ist nicht wohl möglich sie durch Noten auszudrücken. Leichter kann sie aus mündlicher Unterweisung begriffen werden. (Agricola, 1757/2002, 121-122)[1]

In *Dictionnaire de Musique* (1768/1772) and the article *La Voix* by Jean-Jacques Rousseau, are comments on the concept of *Ondulation* which corresponds to *Vibrato*, stating that there is no difference between the sung voice and the sound of instruments. *Ondulation* is thus, according to Rousseau, a modification of pitch but not timbre, and exemplified as when a violinist presses a finger on the string and makes a slight movement backwards and forwards, slightly shortening and prolonging the string, creating two pitches, one slightly sharper one slightly flatter, having the same effect as a singer's *Ondulation*:

> Car, premiérement, on peut, à volonté, donner ou ôter à la *Voix* cette ondulation quand on file un Son tout uni sans aucune espece d'ondulation […] cette ondulation se forme dans le Ton & non dans le Timbre; la preuve est que, sur le Violon & sur d'autres Instrumens, on imite cette ondulation […] par un balancement du doigt sur la Corde, laquelle, ainsi raccourci & ralongée alternativement & presque imperceptiblement, rend deux Sons alternatifs à mesure que le doigt recule ou s'avance. Ainsi, l'ondulation [is] l'alternation plus ou moins fréquante de deux Sons très-voisins, & que les secousses alternatives sont trop rudes, alors l'ondulation devient chevrottement[3]. (Rousseau, Tome II, 1768/1772, 363-364)[2]

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In *L'Art de la Flûte Traversiere* (*c.*1761) by Charles De Lusse are explications regarding a technique called *Tremblement flexible* which resembles *Flattement* with the difference that when a *Flattement* generally is a microtonal undulation downwards from the note in question is *Tremblement flexible* a microtonal circling up and down around the note in question, thus resembling what today is called vibrato. When describing *Tremblement flexible* De Lusse's explanation show resemblance with the Italian term *Tremolo* and the *Close shake* as explained in *Art of Playing the Violin* (1751) by violinist Francesco Geminiani (1687-1762), and to *Du Tremolo ou Tremblement en François* described by Tartini (1771).

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1. The *Bebung* on one and the same note, which one makes on bowed instruments by waving a finger back and forth, but whose tip remains on the given note, and which makes the note neither higher nor lower, but only slightly floating, is also a manner that has its good effect in singing, especially when holding long notes, especially if you only use it towards the end of these notes. It is not possible to express them through notes. It can be more easily understood from oral instruction. (Agricola, *Anleitung zur Singkunst*, 1757/2002, 121-122)

2. Because, firstly, one can, at will, give or take away from the Voice this undulation when one spins a Sound all together without any kind of undulation […] this undulation is formed in the Tone and not in the Timbre; the proof is that, on the Violin & on other Instruments, this undulation is imitated, not by any swinging similar to the supposed movement of the larynx, but by a swinging of the finger on the String, which, thus shortened & lengthened alternately & almost imperceptibly, makes two alternate Sounds as the finger recedes or advances. Thus, the undulation [is a]more or less frequent alternation of two very close Sounds, and that the alternating jolts are too rough, then the ripple becomes a chevrotement. (Rousseau, *Dictionnaire de Musique*, 1768/1772, Tome II, 140)

3. Le *Chevrottement* est la désagréable ressource de ceux qui n'ayant aucun Trill en cherchant l'imitation grossiere ; mais l'oreille ne peut supporter cette substitution, & un seul *Chevrottement* au milieu du plus beau Chant du monde, suffit pour le rendre insupportable & ridicule. (Rousseau, *Dictionnaire de Musique*, 1768/1772, Tome I, 140)

Both descriptions by Geminiani and Tartini show resembles with a vibrato oscillating up and down around the note in question, which can be understood as a kind of vibrato in today's terminology. De Lusse showed the notation of *Tremblement flexible* with a wave-shaped line, and recommended that it should be used as often as possible, and explained that the reason why it is rarely notated is because good taste—*Le Goût*—indicates where and how to use *Tremblement flexible* (Ex. 22).



Example 22 Notation for *Tremblement flexible* in *L'Art de la Flûte Traversiere* by De Lusse (*c.*1761, 9).

De Lusse further explained that *Tremblement flexible* on the Traverso is technically made while rolling the Traverso slightly forwards and backwards with help of the left thumb, creating a microtonal raising and lowering of the note in question:

> […] il faut que le pouce gauche agisse par gradation de vîtesse, en roulant le corps de la Flûte, sans perdre l'embouchure […] (De Lusse, *c.*1761, 9)[1]

Rolling the Traverso as described is basically a technique that could be used for *Flattement*, with the difference that De Lusse aims for a microtonal deviation upwards *and* downwards on the same note in question. It should as well be noted that *Flattement* was generally a technique performed with different fingerings. De Lusse also described a technique—similar to how vibrato is sometimes taught on the Boehm-flute today—as a movement of the lungs, chest, and diaphragm influencing the airstream as when pronouncing *hou-hou-hou* which results in a microtonal raising and lowering of the note in question, which as well can be made in different speeds. According to De Lusse does *Tremblement flexible* add to musical expression because it makes melodies more tender and pleasant and can, depending on if it is made fast or slow, express a range of emotions such as seriousness, longing, sorrow, and sweetness. Since the beginning of the 18th Century as shown in the foregoing has flautists been inspired by violin techniques and De Lusse is a typical example (Ljungar-Chapelon, 2008). In German sources such as Quantz (1752) and Tromlitz (1791) is *Flattement* called *Bebung*, and in 1844 the same technique was called *Klopfen* and described in *Die Kunst des Flötenspiels* by Anton Bernhard Fürstenau (1792-1852). The same German sources did in addition explain a technique using a movement of the lungs, chest, and diaphragm influencing the airstream resembling De Lusse's explanation.

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Since long has French flute traditions been reluctant regarding explanations of what today is called vibrato, at the same time flute methods did sometimes comment on vibrato. One reason to reluctance seems to be that vibrato has been understood as an innermost, intuitive, and spontaneous respond to the music performed in the moment of performance, and as such beyond control in a stricter sense. Further—having singing-technique as the ideal—if the flautist's breathing-technique works well, a vibrato occurs naturally without intellectualization and direct practice of special exercises. In the influential flute method by Taffanel & Gaubert (1923/1958) and its chapter *Du Style* is a discussion regarding musical interpretation, including two comments on vibrato:

> Chez Bach [the *Adagio* in the *Sonata* for flute and obligato harpsichord in b-minor, BWV 1030], comme chez tous les grands maîtres classiques, l'exécutant doit observer la plus rigoureuse simplicité. On s'y interdira donc absolument le *vibrato* ou chevrotement, artifice qu'il faut laisser aux instrumentistes médiocres, aux musiciens inférieurs. La sonorité est la cause évocatrice de l'émotion musicale ou, si l'on veut, l'agent physique qui la transmet de l'âme de l'exécutant à celle de l'auditeur. Le vibrato, dénaturant le caractère naturel de l'instrument et faussant son expression, fatigue très vite une oreille délicate. C'est une faute grave, un impardonnable manque de goût que de traduire par des moyens vulgaires les pensées des plus hautes intelligences musicales. (Taffanel & Gaubert, 1923/1958, 186)[2]

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1. […] the left thumb must act by gradation of speed, by rolling the body of the Flute, without distorting the embouchure. (De Lusse, *L'Art de la Flûte Traversiere*, *c.*1761, 9)

2. With Bach as with all the great classical composers, the player must maintain the greatest simplicity. There should be no vibrato or any form of quaver, an artifice used by inferior instrumentalists and musicians. It is with the tone that the player conveys the music to the listener. Vibrato distorts the natural character of the instrument and spoils the interpretation fatiguing quickly a sensitive ear. It is a serious error and shows unpardonable lack of taste to use these vulgar methods to interpret the great composers. (Taffanel & Gaubert, 1923/1958, 186)

The second comment regards the famous flute solo *Scène des Champs-Élysées* in Gluck's opera *Orphée et Eurydice* (1774):

> Il faut jouer cet admirable fragment avec une expression contenue, sans emphase et sans vibrato, soigner la pûreté du son, éviter les nuances mesquines qui détruisent la grande ligne et rendent le style manière. (Taffanel & Gaubert, 1923/1958, 187)[1]

A definition of vibrato—representing French flute playing as taught at the *Conservatoire* at the end of the 19th Century by Taffanel—is found in the article *La Flûte* by Fleury in Lavignac *Encyclopédie* (1925a):

> La recherche du timbre, l'utilisation, dans ce but, d'un léger, presque imperceptible vibrato, relèvent bien plus d'un intelligent empirisme que de règles précis. Il est, d'ailleurs, bien difficile de définir avec certitude ce qu'il est convenu d'appeler un beau son. (Fleury, 1925a, 1523)[2]

A detailed description of vibrato and its use, was made by Caratgé in his revision of the flute method by Altès (1880/1956), which probably mirrors ideals and aesthetics in Paris around the 1950s:

> Vibrato is a means of expression which consists of a rapid and regular variation in the pressure of air, so as to produce a very slight variation in pitch of the note being played, a variation analogous to that which is obtained by a violin or a cello by the vibration of the finger on the string. It is impossible to give precise rules on how to obtain a good vibrato […] the artist must be able to produce at will on certain notes of a melody in order to enhance their expression. The speed of the vibrato must also be controlled by the artist, for it is obvious that a calm and sustained phrase calls for a slower vibrato than does a phrase of a passionate nature. In other words, it is the artist's sensitiveness which will determine the best use of this rich means of expression which must not be abused. (Altès-Caratgé, 1880/1956, 322)

Caratgé's description of vibrato, how it is used, combined with the comparison with vibrato on the violin and cello gives a picture of his views, and has similarities with how above-described 18th Century sources explained *Tremblement flexible*. However, the question remains *how* the vibrato is made. On this point, Caratgé gives no direct answers, and probably relies on that the *Conservatoire* student, by being systematically exposed to the teacher's playing, combined with a well-developed breathing-technique, finally by themselves spontaneously and intuitively "discover" how vibrato is made. Probably Caratgé's descriptions reflect aesthetics of his teacher Philippe Gaubert at the *Conservatoire* in the early 1920s.

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In the later part of the 20th Century has several flute teachers at the *Conservatoire* like Jean-Pierre Rampal (1978), Michel Debost (1996), Pierre-Yves Artaud (1996), Alain Marion (1997), and Philippe Bernold (2016) been discussing aspects of vibrato. From a technical point of view has Debost suggested that the vibrato could be practiced and developed through making rhythmical impulses of the airstream when playing for example long notes:

> […] il [the vibrato] peut être amorcé artificiellement en s'entraînant avec une sorte de fredonnement *mf* sur des notes faciles comme *ré* et *sol médium* (hmm… hmm… hmm…) en suivant un rythme de croches *a tempo giusto* […] (Debost, 1996, 331)[3]

Artaud gives a definition of that a good vibrato is something that is not noticed in explicit terms when it is in harmony with the personality of the flautist *Celui qu'on ne remarque pas: parce que qu'il est en accord avec la personnalité* (1996, 133). Further Artaud argues that the vibrato can't be explained *Le vibrato ne s'explique pas, il est la technique musicale où l'importance de l'imitation s'avère capitale* (1996, 133). Despite this opinion Artaud reluctantly suggested—*avec beaucoup de précautions néanmoins*—an exercise similar to the explanation given by Debost:

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1. This piece must be played with restraint, without emphasis or vibrato. Keep the tune pure avoiding any exaggerated nuances which spoil the line of the melody and makes the style affected. (Taffanel & Gaubert, 1923/1958, 187)

2. The search for timbre, the use, for this purpose, of a slight, almost imperceptible vibrato, is much more a matter of intelligent empiricism than of precise rules. It is, moreover, very difficult to define with certainty what is agreed to be a beautiful sound. (Fleury in *Lavignac Encyclopédie de la Musique*, 1925a, 1523)

3. […] it [the vibrato] can be developed by practicing with a kind of *mf* on easy notes like D and middle G (hmm…hmm…hmm…) making a subdivision in an eighth note rhythm [with diaphragm impulses] *a tempo giusto* […] (Debost, *Une simple flûte*…, 1996, 331)

> Visualiser le vibrato en produisant tout d'abord avec la main un mouvement de vague, puis en l'accompagnant du souffle, avec de petits à coups similaires à ce geste. Enfin avec l'embouchure seule ou sur une note simple de l'octave grave, reproduire ce mouvement du souffle sur des notes longues. (Artaud, 1996, 133)[1]

A somewhat different opinion regarding the origins and how to make vibrato is given by Philippe Bernold—current flute teacher at the *Conservatoire*—in his practice book *Le Souffle, le Son* (2016):

> Le vibrato naît d'un mouvement de la gorge et non de la colonne d'air. Ce mouvement n'est possible que lorsque la pression de l'air est moyenne. En effet une pression trop forte ou trop faible empêche ce mouvement. (Bernold, 2016, 67)[2]

A source within German flute traditions is Maximilian Schwedler (1853-1940) —like Fürstenau being one of the last German flautists not playing the Boehm-flute but conical flutes with complicated mechanisms—describes in the section *Die Bebung des Tones* (Vibrato) in his *Katechismus der Flöte und das Flötenspiels* (1897) and *Flöte und Flötenspiel* (1923), the importance of vibrato as a tool for musical expression, and that it is the supreme expression of emotion and that vibrato cannot be absent in musical performance, although its use should be limited:

> Die Tonbebung ist das Mittel des höchstens und innigsten Gefühlsausdruck im musikalischen Vortrag. Sie ist zur Steigerung ausdrucksvollen Spieles nicht zu entbehren, ihr gebrauch muß aber stets beschränkt bleiben […] (Schwedler, 1897, 72; 1923, 89)[3]

Schwedler explained that vibrato is the result of when the air passes the throat and whereby the vocal cords is making subtle movements, slightly narrowing, and widening the passage of air, influencing the airstream, and creating an expressive wave-like vibrato:

> Das zur Bebung erforderliche, wenn auch nur leichte Zusammendrücken der Stimmbänder und geringe Verengen der Stimmritze schafft Hemmnis genug, um auf die aus den Lungen hervortretende Luftsäule eine Pressung auszuüben. (Schwedler, 1897, 72; 1923, 89)[4]

Schwedler's explanation of how to practice vibrato is to play notes in the middle register and simultaneously shape the cavity of the mouth and using the vocal cords as when pronouncing vowels such as *E* in a sequence like *E-E-E-E*. Interestingly enough is this the same method suggested by James Galway in his book *Flute* (1982). Gärtner (1974) discusses and shows how the vocal-cords can make a wave-like movement slightly narrowing and widening the air passage through the larynx, creating a vibrato circling around the centre of a given note. According to Gärtner's research, there is a possibility for creating combinations of deliberately influencing the airstream with help of the support and chest muscles *and* the vocal-cords when the air passes the larynx. In other words, Schwedler (1897; 1923), Galway (1982), and Bernold (2016) described and suggested a similar vibrato technique whereby the vocal-cords are of importance.

A technique which seems to have similarities compared with Schwedler, Galway, and Bernold is described in *Méthode Raisonnée Pour Apprendre la Musique d'une façon plus claire et plus précise* (*c.*1755) by Toussaint Bordet (*c.*1721-1799), pointing at the possibility to influencing the airstream with the vocal-cords when it passes through the larynx:

> Elle peut aussi se jouer en tremblant doux d'Orgue, comme la précèdente; ce qui se fait par la palpitation du vent en sortant de la poitrine par passer par le gosier, qui forme l'effet de la soupape de l'Orgue. (Bordet, 1755, 30)[5]

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1. Visualize the vibrato by first making a wave movement with the hand, then accompanying it with the breath, with small impulses similar to this gesture. Finally, with the head-joint alone or on a single note of the lower octave, reproduce this breath movement on long notes. (Artaud, *Méthode élémentaire*, 1996, 133)
2. The vibrato is born from a movement of the throat and not from the column of air. This movement is only possible when the air-pressure is medium. Indeed, too much or too little pressure prevents this movement. (Bernold, *Le souffle, le son. Exercices, extraits d'œuvres du répertoire destinés à maîtriser la colonne d'air de la flûte et acquérir un beau son,* 2016, 67)
3. The vibrato [*Tonbebung*] as such is the means of the highest and most intimate expression of feeling in musical performance. It cannot be dispensed with to increase expressive play, but its use must always remain limited […] (Schwedler, *Katechismus der Flöte und des Flötenspiels ein Lerhbuch für Flötenbläser,* 1897, 72; 1923, 89)
4. When making vibrato [*Bebung*] is a slight compression of the vocal cords and slight constriction of the glottis required for exercise, if only slight, create enough restraint to exert pressure on the column of air emerging from the lungs. (Schwedler, 1897, 72; 1923, 89)
5. It [Vibrato-like effect] can also be made similarly to *Tremblant doux d'Orgue*, which is realized by the palpitation of the wind leaving the chest through the throat, which forms the effect of the valve of the organ. (Bordet, *Méthode Raissonée*, 1755, 30)

Perhaps Bordet pointed on an intentional use of the vocal-cords in combination with the support and chest muscles as discussed by Gärtner (1974). Thus, it seems possible that flautists since the 18th Century could have used the above-mentioned activating of the vocal-cords since long as a technique for making vibrato, and that Bordet, Schwedler, Galway, and Bernold are examples of when a technique or tradition gets documented.

*

Earlier mentioned René Le Roy has in explicit terms commented on how to prepare for a natural vibrato in a quasi-indirect manner:

> *On ne travaille pas le «vibrato»* et on ne doit surtout pas chercher à l'obtenir à l'aide d'une technique quelconque et anti-naturelle. Pour le trouver, il faut avant tout:
> 1° la décontraction des muscles du cou et de la gorge soit complète;
> 2° un parfait fonctionnement de diaphragme soit obtenu par l'assouplissement des muscles abdominaux;
> Et pour arriver à ce résultat, il faut:
> 1° Faire beaucoup d'exercices de respiration.
> 2° Parvenir à faire des «sons filés» sans aucune oscillation et travailler également de cette manière quelques mouvements lents de HAENDEL ou de BACH.
> La sonorité «droite» que l'on obtiendra ainsi transformera naturellement le jour où l'on aura libéré entièrement le diaphragme et la paroi du ventre de tout contraction. La chaleur du son sortira alors du «fond de soi-même» et l'on aura réussi à donner à sa sonorité une vibration naturelle et vivante. (Le Roy, 1966, 94)[1]

In connection to Le Roy might an experiment of thought be thinkable in so far that if the conditions described regarding what is called vibrato they could be understood as referring to French flute traditions over time, and Le Roy described a high level of flute playing which in his case is directed towards the Boehm-flute. Considered that Le Roy studied at the *Conservatoire* and graduated in 1918 having had flute teachers as Adolphe Hennebains (1862-1914, a student of Altès, graduating in 1880), Léopold Lafleurance (1865-1953, a student of Taffanel), and Philippe Gaubert (1879-1941, a student of Taffanel) as his teachers he is definitely to be seen as a carrier of French flute traditions going back to at least the second half of the 19th Century, possibly including elements of aesthetics regarding Multi-keyed conical flutes and the *Ringklappenflöte* in France. The conditions Le Roy described regarding vibrato could be assumed having generally the same relevance when playing the *Ringklappenflöte*, Multi-keyed conical flutes, and perhaps the Traverso regarding a professional standard of playing. Further it could explain points of view together with a certain reluctance regarding direct technical explanations of vibrato as shown above by Rampal, Debost, Artaud, Marion, and Bernold which seems to be based on similar foundations as described by Le Roy.

*

It is sometimes said that the best vibrato is imperceptible because it is an organic part of the expression as shown above. This is perhaps a reason why French flautists often claimed that vibrato cannot be explained and taught because it is the consequence of expression in the moment of performance. How vibrato is used today, when performing music from the 18th Century, is still a matter of *Le Goût*, and cannot be prescribed by rules. However, knowledge of earlier epochs and their sources could play a role in developing an intuitive sense of what might be musically relevant in any given situation, and 18th Century sources do not show a uniform idea of a musical performance and how to use for example *Flattement* or *Tremblement flexible*. The concept of *Le Goût* includes personalized interpretations and expression.

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1. *We do not work on the "vibrato"* and we must not try to obtain it using any unnatural technique. To find it, you must first of all:
   1° a complete the relaxation of the neck and throat muscles;
   2° a perfect functioning of the diaphragm is obtained by the relaxation of the abdominal muscles;
   And to achieve this result, it is necessary:
   1° Do a lot of breathing exercises.
   2° Manage to make "*sons filés*" without any oscillation and also work in this way on some slow movements by HAENDEL or BACH.
   The "straight" sound that we will obtain in this way will naturally transform the day when we have completely freed the diaphragm and abdominal muscles from any contraction. The warmth of the sound will then come out of "the depths of oneself" and one will have succeeded in giving its sound a natural and living vibration. (Le Roy, *Traité de la Flûte*, 1966, 94)

Considering that ideas regarding vibrato—defined as a micro-interval like the *Flattement* going downward from the note in question or as for *Tremblement flexible* a microtonal undulation around the note in question—suggest different techniques since the 18th Century, gives today's Traverso-players and flautists tools to experiment and develop skills which should and could be used freely and spontaneous for musical expression in the moment of performance.

*

A conclusion regarding *Flattement—Tremblement flexible—Vibrato* is that above discussed playing-techniques are altogether aiming for expressiveness having general similarities over centuries, and in the present context including the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. In the book *La Flûte* (1978) by Jean-Pierre Rampal, mainly directed to beginners, is a comment on vibrato that in a sense embraces the above-mentioned ideals and explanations regarding vibrato and how it can be made:

> Venant de notre diaphragme, le timbre de notre voix se nomme le vibrato. Nous en possédons tous un. Lorsque vous jouez de la flute, le vibrato obtenue est un vibrato naturel, semblable à celui de votre voix: il ne se remarque pas. Mais, au contraire, le mauvais vibrato est un vibrato qui se remarque. Soit parce qu'il est force, soit parce qu'il vient de la gorge. Il se transforme alors en chevrotement: cela s'observe parfaitement bien chez un mauvaise chanteur. A la fin de votre première année de flûte, dégagé de tous ces problèmes qui sont les réalités quotidiennes de tous les débutants, et dont il ne faut surtout pas vous cacher les difficultés, vous vous apercevrez que vous commencez à vibrer avec naturel, simplement par le fait que vous prendrez, alors, beaucoup plus de plaisir à jouer… (Rampal, 1978, 28)[1]

*

It is not farfetched to say that techniques of making vibrato-like expressions on a Traverso, Boehm-flute, or any other instrument, are probably all developed and refined to facilitate enriched musical expression connected to fundamental human emotions. To conclude are the words from Swedish-American psychologist and scientist Carl E. Seashore (1866-1949) who made extensive research regarding vibrato around 1930 reference points to the crucial influence of the spoken and sung voice on instrumental vibrato:

> In general, the vibrato in speech is like the vibrato in song in all its characteristics. In their origin instrumental vibratos are all imitations of vocal vibrato. (Seashore, 1931, 626)

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The final question is then: Is it stylistically appropriate to use vibrato when playing for example the Sonatas by Johann Sebastian Bach on the Boehm-flute?
The answer—based on above discussed sources—is partly a question of definitions: If the definition of vibrato is a microtonal deviation that can be influenced regarding its speed and size (amplitude) from the note in question like for example a *Flattement* or *Tremblement flexible*, the question can be answered with *Yes*. But if the vibrato is of a uniform mechanical nature on all notes the answer would probably be *No*.



1. Coming from our diaphragm, the timbre of our voice is called vibrato. We all have one. When you play the flute, the vibrato obtained is a natural vibrato, similar to that of your voice: it is not noticeable. But, on the contrary, the bad vibrato is a vibrato which is noticed. Either because it is forced or because it comes from the throat. It then turns into a *Chevrotement*: this can be observed perfectly well among bad singers. At the end of your first year of flute playing, freed from all these problems which are the daily realities of all beginners, and whose difficulties you must above all do not hide from yourself, you will realize that you are beginning to vibrate naturally, simply by the fact that you will then take much more pleasure in playing… (Rampal, *La Flûte*, 1978, 28)

7.4 Articulation

> […] *chaqu'un selon sa disposition naturelle; sans s'embaraßer d'aucune sillabe; doit chercher à former un coup de langue le plus net qu'il luy est possible* […][1]
>
> Mahaut (1759, 23)

Articulation is an informative parameter when examining potential transitions of playing-techniques over time when it comes to different transverse flutes as the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute because different articulation-syllables from *Principes* and *Rudiments* up to the present day are well documented. Further due to the similarities of how the flautist blow the airstream against the sharp edge of the blowing-hole on generally all kinds of transverse flutes. In this section will suggested articulation-syllables as found in texts and methods for the above four mentioned flute models be examined and compared. Articulations on wind instrument are generally made with the help of the tongue in interaction with the airstream enabling to make combinations of slurred and detached notes similarly to bowing techniques on the violin. A functional and expressive articulation could be compared with what pronunciation and diction is for a singer or actor. The examination will be realized in three steps: a) A historical overview, b) Phonetical aspects of consonants and vowels, and c) Examples of explanations regarding different suggestions.

Before examining the variety of articulation-syllables it might be useful with a brief outline of how an articulation function on a transverse flute. As every flautist knows an articulation-syllable consists of two parts, whereby the first segment is an explosive unvoiced consonant directly followed by an unvoiced vowel position. The function of the consonant is for a fraction of a second to close the passage of the airstream on its way to the sharp edge of the blowing-hole like a valve, immediately followed by an unvoiced vowel shaping the mouth and throat cavities having the function of a small resonance chamber. The French inventor Vaucanson (1738) explained that the tongue simply open and closes the passage for the airstream and pointed on that the tongue is essential for playing on all wind instruments, and its function is nothing more than to interrupt the airstream with the tip of the tongue stopping the flow of air for a fraction of a second:

> Il ne reste plus qu'à expliquer le coup de langue, qui est absolement necessaire pour le jeu de tous les Instrumens à vent. Le coup de langue n'est autre chose qu'une courte interruption du vent, cause par l'interposition du bout de la langue au passage que lui forment les lévres.[1] (Vaucanson, 1738/1742, 10)[2]

Some years later Quantz (1752, 1758) explained that the function of the tongue simply is to open and close the passage for the airstream, perhaps being familiar with Vaucanson's explanation regarding articulation:

> Denn es würde theils albern, theils beschwerlich, theils unmöglich seyn, den jeder Note mit dem Blasen aufzuhören. Zu diesem Spannen der Luft nun, hat die Natur nichts bequemers als die Zunge angewiesen. Diese kann die Luft auf kurze Zeit spannen und wieder los lassen. Sie vertritt die Stelle eines Ventils in der Orgel. (Quantz: in Marpurg, 1758, 170)[3]

Another example similarly comparing the function of the tongue with a valve, but relating to the Boehm-flute is found in *Traité de la Flûte* (1966) by the French virtuoso René Le Roy (1898-1985):

> L'air qui est maintenu sous pression à l'intérieur de la bouche est arrêté par la langue qui agit ainsi qu'une soupape. On retirera ensuite rapidement la langue à l'intérieur de la bouche. L'air liberé passera alors entre les lèvres, frappera, s'il est bien dirigé, le biseau de l'embouchure et produira le son. (Le Roy, 1966, 60)[4]

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1. […] each [flautist] according to its natural disposition; without bothering with any syllable; must try to form a lick as sharply as possible […] (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere*, 1759, 23)
2. What remains to explain is that stroke of the Tongue, which is necessary for playing on all Wind Instruments. The tonguing an Instrument is nothing else than a short Interruption of the Wind, by the Interposition of the End of the Tongue in the Passage of the Lips. (Vaucanson, *Le Mécanisme du fluteur automate,* 1738/1742/1979, 10)
3. For it would be partly silly, partly arduous, partly impossible to stop blowing [after] every note. Nature has instructed nothing more comfortably than the tongue to stretch the air in this way. This [the tongue] can tighten the air for a short time and let go again. It takes the place of a valve in the organ. (Quantz: in Marpurg, *Historisch-kritische Beyträge zur Aufnahme der Musik,* 1758, 170)
4. The air kept under pressure inside the mouth is stopped by the tongue, which acts as a valve. Then remove the tongue quickly inside the mouth, the air will be released and pass between the lips, strike—if it is well directed—the sharp edge of the lip plate and generate the sound. (Le Roy, *Traité de la Flûte*, 1966, 60)

The function of an articulation-syllable—as used in transverse flute playing—and from a phonetical perspective with its combination of an explosive consonant and vowel is described in *Les origins de la pronunciation modern ètudiées au XVIIe siècle* (1911) by Rosset. Indirectly Rosset's explanation clarifies how both the attack (explosive consonant) and sound colour (vowel position) depends on the choice of vowels for an articulation syllable. Rosset's explanation can then be applied on sound characteristics and sound colours for the flautist.

> […] en fait, l'articulation consonnantique n'est qu'une façon de préluder à un son vocalique, de le terminer, de le réunir à un autre son vocalique; les consonnes sont des auxiliaires des articulations vocaliques et s'y adaptent le plus possible. (Rosset, 1911, 312)[1]

The quote by Mahaut (1759) at the beginning of this section suggested that choices of functional articulations-syllables when playing the Traverso partly depends on the natural disposition (lips, teeth, chin, jaw) of the player. In addition, has also the spoken tongue of the flautist influence, an example is that the vowel *U* with French pronunciation for the English spoken flautist is something that perhaps must be learnt because *U* with French pronunciation is not a part a spoken standard English. It should thus be noted that choices of articulation-syllables have relations to the spoken language of the flautist. Regarding choices of articulation-syllables the French-Dutch virtuoso Louis Drouët (1792-1873) that played on Multi-keyed conical flutes stated that the choice of articulation-syllables relates to the spoken language of the flautist in question:

> [...] the syllable which I [Drouët] employ is *teu*, but *tu*, *te*, *tou*, are also good articulations (*Method of flute playing: intended for those, who have already made some progress on the instrument,* Drouët, 1830, 24).

In *A word or two on the flute* (1826/1982) by William Nelson James (1801-1854) is explained that Drouët when teaching in England used the English word *Territory* for single and double tonguing, and according to James this was possibly an adaptation to the English language for his students.

A later example connecting French and English Boehm-flute playing is the English virtuoso Peter Lloyd (1931-2018)—for many years principal flute of the *London Symphony Orchestra*—who also linked the spoken language of the flautist to choices of functional articulations-syllables, referring to his studies in 1953 for the French virtuoso Fernand Caratgé in Paris who recommended:

> You will find your own sound through your own language, in the way you say things (Ljungar-Chapelon, 2008, 133)

As a parallel to above shown ideas regarding the impact of the spoken tongue of the flautist is the Irish virtuoso James Galway (1939) that in his book *Flute* (1982) mentioned that a French pronunciation of articulation-syllables is to be preferred. Suggesting that everybody with some practice can learn an appropriate pronunciation of French consonants and vowels, which apart from being beneficial for the articulation has advantageous influence on timbre and sound colour.

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1. […] in fact, the consonantal articulation is just a way to prelude a vowel sound, to terminate it, to join it together with another vowel sound; consonants are aids to vocalic articulations and adapt to them as much as possible. (Rosset, *Les origins de la pronunciation modern étudiées au XVIIe siècle,* 1911, 312)

7.4.1 Consonants and vowels for single tonguing and mixed articulations 1707-2021

For single tonguing within a French context throughout the period from *Principes* and *Rudiments* to the early 21st Century (Bernold, 2021) has the consonant *T* been used for a clear-cut articulation, and for a softer articulation the consonant *D*—often called *Louré*—for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. The general difference regards the connected vowels, which generally has been *U, É, E, EU* all with French pronunciation (Fig. 102).

Single tonguing	Traverso	Multi-keyed conical flutes	*Ringklappenflöte*	Boehm-flute
Tu	Hotteterre (1707) Corrette (1735 & 1773) Mahaut (1759) De Lusse (*c.*1761) Bailleux-Hotteterre (1765) Lafite (1782) *L'Encyclopédie Méthodique* (1785 & 1788) **Devienne** (*c.*1794) Van der Hagen (1798) **Hugot** & **Wunderli**ch (1804) **Wunderlich** (*c.*1812) Kastner (1844) **Tulou** (1851) Balleron (1895)	**Hugot** & **Wunderlich** (1804) **Wunderlich** (*c.*1812) Berbiguier (*c.*1818) Vaillant (*c.*1826) Kastner (1844) **Tulou** (1851) Bousquet (1858) Bretonniere (1861) Gattermann (1861) Balleron (1895)	Cornette (1855) Gattermann (1851) Bousquet (1858) Gattermann (1861)	Bousquet (1858) Bretonniere (1861) **Altès** (1880/1906) Balleron (1895) Remusat (1906) **Devienne**-**Gaubert** (*c.*1794/1908) **Altès**-Caratgé (1880/1956) **Altès-Rampal** & **Marion** (1880/1979) **Debost** (1996) Luypaerts (2005)
Té	Van der Hagen (1798)	—	—	—
Te/Teu	Kastner (1844)	Walckiers (*c.*1829) Bretonniere (1840) Kastner (1844) Drouët (1827 Cornette (1855)	Camus (1839) **Coche** (1839) Bretonniere (1840) **Dorus** (1845)	**Taffanel** & **Gaubert** (1923/1958) **Moyse** (1928, 1964, 1974) ***** **Artaud** (1972/1989) **Bernold** (2021)
Du (*Louré*)	**Hugot** & **Wunderlich** (1804) **Wunderlich** (*c.*1812) **Tulou** (1851)	**Hugot** & **Wunderlich** (1804) **Wunderlich** (*c.*1812) Berbiguier (*c.*1818) Bretonniere (1840) **Tulou** (1851) Cornette (1855)	—	**Altès** (1880/1906) **Altès**-Caratgé (1880/1956) **Altès**-**Rampal** & **Marion** (1880/1979) Luypaerts (2005)
Du/Deu	—	Bretonniere (1840)	Bretonniere (1840)	—
De	—	—	**Coche** (1839)	**Artaud** (1972/1989) **Debost** (1996) **Bernold** (2021)

Figure 102 Consonants used for single tonguing are *T* and *D* combined with the vowels *U, É, E, EU* as described in French texts and methods on flute playing covering the period 1707-2021. *****Moyse only indicated consonants regarding articulation syllables in *École de l'Articulation* (1928), *Fifty Variations on the Allemande of Bach's Sonata for Flute Alone* (1964), and *Comment j'ai pu maintenir ma forme* (1974). Considered that Moyse studied with Taffanel at the *Conservatoire* and Taffanel suggested the vowel *E*, possibly Moyse used this vowel at the *Conservatoire*. Names marked with bold indicates flute teachers at the *Conservatoire*. (after Ljungar-Chapelon, 2008)

Mixed-articulations such as the 18th Century *Inégale*, punctuated rhythms, double- and triple-tonguing within a French context in the period from *Principes* and *Rudiments* up to the early 21st Century (Bernold, 2021) makes a display of a variety of combinations used for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute (Fig. 103). The most frequent combinations are *T-K, T-D, T-G*, *D-G,* and *T-K-T, D-G-D*. In the 18th Century is the combination *T-R* used frequently but appears also in the method by Taffanel & Gaubert (1923/1958) when playing punctuated rhythms. In *L'Art de la Flûte Traversiere* (*c.*1761) by De Lusse is a kind of double-tonguing explained with the syllables *Lou-Lou*.

Mixed tonguing	Traverso	Multi-keyed conical flutes	*Ringklappenflöte*	Boehm-flute
Inégale **Punctuated rhythm**	**Tu-Ru** Hotteterre (1707) Corrette (1735 & 1773) Mahaut (1759) Bailleux-Hotteterre (1765) *L'Encyclopédie Méthodique* (1785 & 1788) **Devienne** (*c.*1794)	—	—	**Te-Re** **Taffanel** & **Gaubert** (1923/1958) **Tu-Du** **Altès** (1880/1906) **Altès**-Caratgé (1880/1956) **Altès**-**Rampal** & **Marion** (1880/1979) Luypaerts (2005) **Te-De** **Bernold** (2001)
Double-tonguing	**Di-Del** Mahaut (1759) **Lou-Lou** De Lusse (*c.*1761) **Tu-Gu** Lafite (1782) **Dou-Gue** **Devienne** (*c.*1794) **Tu-Ku** Balleron (1895)	**Tu-Te** Drouët (1827) **Tu-Que** **Tulou** (1851) **Tu-Ku** Balleron (1895) **Te-Ke/Te-Que** **Coche** (1839) Gattermann (1861) **De-Re** **Coche** (1839) **Due-Reu** Drouët (1827) Bretonniere (1840)	**Dou-Gue** Berbiguier (*c.*1818) **Te-Ke/Te-Que** **Coche** (1839) **Dorus** (1845) Gattermann (1861) **De-Re** **Coche** (1839)	**Tu-Ku** **Altès** (1880/1906) Balleron (1895) **Devienne**-**Gaubert** (*c.*1794/1908) **Altès**-Caratgé (1880/1956) **Altès**-**Rampal** & **Marion** (1880/1979) Luypaerts (2005) **Te-Ke** **Taffanel** & **Gaubert** (1923/1958) **Moyse** (1928, 1964, 1974) ***** Le Roy (1966) **Artaud** (1972/1989) **Debost** (1996) **De-Ge** **Bernold** (2021)
Triple-tonguing	**Tu-Gu-Tu** Lafite (1782) **Tu-Tu-Ku** Balleron (1895)	**Tu-Tu-Ku** Balleron (1895) **Te-Que-Te** **Coche** (1839) **De-Re-De** **Coche** (1839)	**Te-Que-Te** **Coche** (1839) **De-Re-De** **Coche** (1839)	**Tu-Tu-Ku** Balleron (1895) **Tu-Ku-Tu** **Altès** (1880/1906) **Devienne**-**Gaubert** (*c.*1794/1908) **Altès**-Caratgé (1880/1956) **Altès**-**Rampal** & **Marion** (1880/1979) Luypaerts (2005) **Te-Ke-Te** **Taffanel** & **Gaubert** (1923/1958) **Moyse** (1928, 1964, 1974) ***** **Artaud** (1972/1989) **Debost** (1996) **De-Ge-De** **Bernold** (2021)

Figure 103 Consonants used for *Inégale*, punctuated rhythms, double- and triple-tonguing. *****Moyse only indicated consonants regarding articulation syllables in *École de l'Articulation* (1928), *Fifty Variations on the Allemande of Bach's Sonata for Flute Alone* (1964), and *Comment j'ai pu maintenir ma forme* (1974). Considered that Moyse studied with Taffanel at the *Conservatoire* and Taffanel suggested the vowel *E*, possibly Moyse used this vowel at the *Conservatoire*. Names marked with bold indicates flute teachers at the *Conservatoire*. (after Ljungar-Chapelon, 2008)

In *Principes* and *Rudiments* are the articulation-syllables for mixed tonguing and *Inégale Tu-Ru*. In flute methods by Mahaut (1759), De Lusse (*c.*1761), Corrette (1735 & 1773), Devienne (*c.*1794), Van der Hagen (1798), and *L'Encyclopédie Méthodique* (1785 & 1788, 107) is *Tu-Ru* mentioned, but also *Tou-Rou, Dou-Goe, Di-Del, Lou-Lou, Tu-Gu*, and *Tu-Gu-Tu*. Devienne (*c.*1794, 9) mentions *Tu-Ru* and *Tou-Rou* for double-tonguing but dismisses both (Fig. 104):

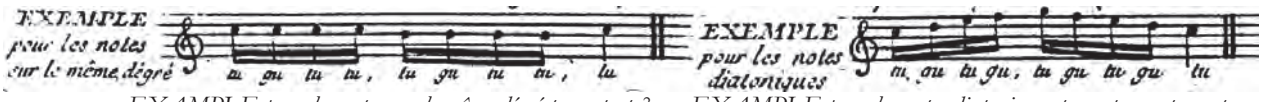
Mixed tonguing	Traverso
Tu-Ru	Hotteterre (1707) Corrette (1735 & 1773) Mahaut (1759) Bailleux-Hotteterre (1765) *L'Encyclopédie Méthodique* (1785 & 1788) **Devienne** (*c.*1794)
Tou-Rou	**Devienne** (*c.*1794)
Dou-Gue	**Devienne** (*c.*1794)
Di-Del	Mahaut (1759)
Lou-Lou	De Lusse (*c.*1761)
Tu-Gu	Lafite (1782)
Tu-Gu-Tu	Lafite (1782)

Figure 104 Articulations syllables for mixed tonguing mentioned in methods and pedagogical materials for the Traverso.

In *Airs Variés pour une Flûte seule ou avec accompagnement d'un Violon et Basse* by Lafite (1782; Ex. 23, 24) are examples of both double-tonguing and triple-tonguing together with explanations in a manner strikingly similar to how these articulations are realised today on the Boehm-flute:



Pour détacher les notes barrées par 4, il faut employer le double coup de langue qui se fait avec vitesse comme on volait articuler mes mots, tu gu tu tu, qui imitent le chant de la perdrix.[1]



EXAMPLE pour les notes sur le même dégré tu gu tu tu[2] *EXAMPLE pour les notes diatoniques tu gu tu gu, tu gu tu gu tu*[3]

Example 23 Examples of double-tonguing by Lafite (1782, 6)



Pour détacher les notes barées par 3 ou par 6, il faut employer le triple coup de langue qui se fait comme si on articulait les mots tu gu tu ; ce qui ne peut se faire qu avec vitesse, voyez L'Exemple cy dessous[4]

Example 24 Examples of triple-tonguing by Lafite (1782, 2)

1. To detach the notes grouped by 4, it is necessary to use the double tonguing which is done with speed as one articulates the words, *tu gu tu tu*, which imitate the song of the partridge. (Lafite, *Airs Variés pour une Flûte seule ou avec accompagnement d'un Violon et Basse,* 1782, 6)
2. EXAMPLE for notes on the same degree *tu gu tu gu.* (Lafite, 1782, 6)
3. EXAMPLE for diatonic notes *tu gu tu gu, tu gu tu gu tu.* (Lafite, 1782, 6)
4. To detach the notes grouped by 3 or by 6, you must use the triple tonguing which is done as if you were articulating the words *tu gu tou*; which can only be done with speed. (Lafite, 1782, 2)

The consonant *R*: double tonguing and dotted rhythms

As has been shown above are *Tu-Ru, Te-Re, De-Re, Due-Reu, Tou-Rou,* and *De-Re-De* often suggested in 18th Century sources regarding the Traverso. In these combinations is the pronunciation of *T* and *D* clear as discussed in the previous section, whereas how to use *R* need some comments. Explanations in historical sources and pronunciations of *R* points in the direction that a common French pronouncing of *R* in the late 17th and 18th Century was with the tip of the tongue against the hard palate just behind the upper front teeth. References are as shown in section *6.4* based on singing methods, treatises on grammar, and works like *Le Bourgeois Gentilhomme* (1670) by Moliere. In this context are recordings with conductor and artistic director Vincent Dumestre and works like *Cadmus & Hermione* (1673/2008) by Lully, *Le Bourgeois Gentilhomme. Comedie-Ballet* (1670/2005/2008) by Moliere & Lully, and *La Conversation* (1999) with music by Robert de Visée (1650-1725) and poetry by Théophile de Viau (1590-1626) of great interest. In these recordings is *R* pronounced as described by mentioned historical sources with the tip of the tongue. Such a pronunciation can still be heard in some regions of France and Canada, whereas *R* in common French today mostly is pronounced with a velar friction in the back of the mouth. In the facsimile of the French edition of *Essai d'une Methode pour Apprendre à jouer de la Flute Traversiere* by Quantz (1752/1975)—edited by French Traverso virtuoso Pierre Sechet—is a discussion whereby Sechet comments on how to understand Quantz' suggestion and how to understand the articulation *Ti-Ri* when playing fast passages. According to Sechet: *Le 'r' est bien sûr roulé et non grasseyé* (1975, 13), in other words *R* should be pronounced with the tip of the tongue. In *Interpretation of French Music from 1675-1775* (1973) by Betty B. Mather is a discussion regarding the syllables *Tu-Ru, Te-Re, De-Re, Due-Reu, Tou-Rou*, and *De-Re-De* including suggestions on how to pronounce the consonant *R*. A common way to pronounce *R* in the 18th Century according to Mather (1973) is that it was pronounced with the tip of the tongue, and argues for that a fast pronunciation of *Te-De* becomes similar to the combination *Te-Re*, which explains a possibility how to practically handle the consonant *R*.

An 19th Century source which sheds light on questions related to the consonant *R* is found in *Der einfache und besonders der Doppel-Zungenstoß bei dem Flötenspiel durch instructive Notenbeispiele mit erklärendem Text.* Opus 105 (1841) by the German flute virtuoso Caspar Kummer (1795-1870). Even though Kummer represents German traditions during the first half of the 19th Century are his comments and suggestion regarding articulation well anchored in a general European context. In addition, does Kummer's discussion on articulation syllables shed light on how Quantz explained the same topic. Considered that Quantz' *Versuch* (1752) was republished several times until the end of the 18th Century, and that he had studied with the French Traverso virtuoso Pierre Gabriel Buffardin in Dresden, this gives aspects on articulation, and possibly Kummer was familiar with Quantz' text. When Kummer discussed the consonant *R,* he explained that it should *not* be pronounced with a velar friction in the back of the mouth because this would result in —*das Schnarren*—being close to *Flatterzunge* (Flutter-tongue). Kummer discusses in section § 13 *Von der Flatterzunge* that this technique is not made with the tip of the tongue but further back in the mouth:

> […] wird durch das Schnarren eines *R*, während des Blasens, hervorgebracht. Es geschiet dieses aber nicht mit der Zungenspitze, sondern auf der Zunge. (Kummer, 1841, 6)[1]

When Kummer comments on the articulation *Ta-Ra* in section § 12 *Von dem Doppelzungenstoßs: Ta-Ra* it is explained that R is not pronounced in the back of the mouth:

> Man hüte sich aber, durch das *r* in der zweiten Silbe einen schnarrenden Ton hervor zu bringen. (Kummer, 1841, 6)[2]

To conclude, Kummer is an important source which sheds light on how to handle the consonant *R* in a flautist context with bearing on the late 18th Century up to the 20th Century, and playing-techniques for the Traverso, Multi-keyed flutes, *Ringklappenflöte*, and the Boehm-flute.

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1. […] it [Flutter-tonguing] is made by the snarling of an *R* while blowing. This is not done with the tip of the tongue, but on the tongue [further back]. (Kummer, *Der einfache und besonders der Doppel-Zungenstoß bei dem Flötenspiel durch instructive Notenbeispiele mit erklärendem Text. Opus 105,* 1841, 6)
2. But be careful not to use the *r* in the second syllable [*Ta-Ra*] to produce a snarling sound. (Kummer, 1841, 6)

Some comments regarding *R* are found in *Méthode complète de Chant ou Théorie pratique de cet Art* (*c.*1841) by Alexis de Garaudé (1779-1852) together with two exercises for learning how to pronounce *R* with the tip of the tongue. This are exercises that the famous actors François-Joseph Talma (1763-1826) and Théodore Michelot (1786-1856) recommended, which both were connected to *La Comédie française*:

> Le premier consiste à prononcer vivement et distinctement *te de te de*; cette prononciation continuée ainsi pendant longtems donne au bout du langue une certaine élasticité, qui finit par produire la vibration qui lui manquait. Le second moyen est de lire à haute voix, en remplaçant tous le *r* de chaque mot par *td*, en prononçant *tdaité*, *gtandeur*, *patdage*, au lieu de *traité*, *grandeur*, *parage*. Par le mécanisme de cette étude, on évitera absolument l'action de la gorge dans toutes les articulations de l'*r.* (Garaudé, *c.*1841, 245-246)[1]

In *Lavignac Encyclopédie de la Musique* (1925) and the article by the French opera singer and musicologist Jane Arger (1873-1960) are important comments regarding the pronunciation of *R* mirroring the late 19th Century and some decades of the early 20th Century pointing on that it is a major mistake to pronounce *R* in the back of the throat—*grasseyer, est une faute grossiere*—and strictly condemned in the past as in the beginning of the 20th Century. Further are several exercises and suggestions shown for learning how to pronounce the tip of the tongue *R* resembling the suggestions by Garaudé (1841)*:*

> On répète pendant une minute à peu près, en rythmant par deux: *De, De-De, De*, etc.; une autre minute par trois *De, De, De-De, De, De*, et, puis par quatre *De, De, De-De, De, De*, très légèrement, dans un mouvement de plus en plus rapide, mais laissant toujours tout l'appareil buccal extrêmement souple. Puis, on se repose une minute. On prononce alors sans raideur aucune, en se servant des rythmes par deux, trois, quatre, précédemment indiqué: *Dte* ou *Dlu* ou *Dli*, suivant que l'on sent une de ces combinaisons plus favorables à l'assouplissement de la langue. Certains élèves se serviront du *T* avec plus d'avantage que du *D*. (Arger in *Lavignac Encyclopédie de la Musique*, 1925, 1041)[2]

A comment regarding these exercises on how to develop suppleness and speed of the tongue is that they probably would be as efficient for a flautist playing the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and Boehm-flute as for an actor or opera singer.

*

Regarding *Tu-Ru* as suggested by Hotteterre (1707), *Te-Re* was suggested by Taffanel & Gaubert (1923/1958), and *Tu-Du* by Altès (1880/1906). When comparing mentioned sources, it seems to be clear that the pronunciation of *R* must be pronounced in the front of the mouth and the tip of the tongue touching the hard palate just behind the upper front teeth (section *6.4*). It should be noted that the contact point of the tip of the tongue for *R* is rather close to the contact point for *D*. This sheds light on that the articulation *Tu-Ru* (Hotteterre, 1707), *Te-Re* (Taffanel & Gaubert, 1923/1958), *Tu-Du* (Altès, 1880/1906) and that *Te-Re* possibly could be replaced by *Tu-Du*. Examinations regarding phonetics shows that the contact point between the tip of the tongue and the hard palate for *D* and *R* indeed are close to each other (Straka, 1965a, 1965b). The consequence is that *D* in a historical context and the Traverso possibly could be replaced by *R* and vice-verse which could be an explanation when Altès (1880/1906) suggested *Tu-Du* for punctuated rhythms. An early 20th Century example and use of *Te-Re* regarding the articulation of punctuated rhythms is as mentioned found in the section *Des Coups de Langue* (Tonguing), and in *Étude* 7 in E♭-major, among the *Vingt-quatre Études Progressives* in *Méthode Complète de Flûte* by Taffanel & Gaubert (1923/1958; Ex. 21) whereby the suggested articulation syllables are *Te-Re*. The combination of the consonants *T-R* is interesting because it echoes articulation techniques of the French 18th and sources as far back as *Principes*.

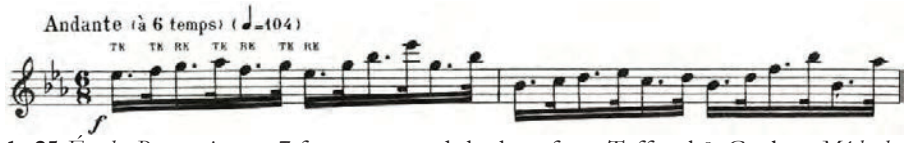
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1. The first [exercise] is to pronounce vividly and distinctly *te de te de*; this pronunciation thus continued for a long time gives the tip of the tongue a certain elasticity, which ends by producing the vibration which it lacked. The second way is to read aloud, replacing all the *r* of each word by *td*, pronouncing *tdaité, gtandeur, patdage*, instead of *traité*, *grandeur*, *parage*. By the mechanism of these exercises, the action of the throat in all its joints of the *r* will be absolutely avoided. (Garaudé, *Méthode complète de Chant ou Théorie pratique de cet Art, c.*1841, 245-246)

2. Repeat for about a minute, rhythmically in pairs: *De, De-De, De*, etc.; another minute by three *De, De, De-De, De, De*, and, then by four *De, De, De-De, De, De*, very slightly, in a faster and faster movement, but still leaving everything extremely flexible regarding the oral apparatus. Then rest for a minute. We then pronounce without any stiffness, using the rhythms by two, three, four, previously indicated: *Dte* or *Dlu* or *Dli*, depending on whether we feel one of these combinations more favourable to the relaxation of the language. Some students will use the *T* with more advantage than the D. (Arger in *Lavignac Encyclopédie*, 1925, 1041)

The explanation given by Taffanel & Gaubert (1923/1958; Ex. 25) where to place the tongue for the consonant *R* indicates a pronunciation with the tip of the tongue:

> Il faut faire cette articulation avec beaucoup de rudesse; pour obtenir cette rudesse il faut raider la langue qui frappe alors avec force *un peu au-dessus des dents*. L'attaque (*TE*) doit être très brève. On obtiendra ainsi la netteté et le mordant du staccato des violonistes. (Taffanel & Gaubert, 1923/1958, 90)[1]



Example 25 *Études Progressives* nr. 7 for punctuated rhythms from Taffanel & Gaubert *Méthode Complète de Flûte* (Taffanel & Gaubert, 1923/1958, II: 149).

In the method by Altès and its final section *26 Études Complémentaires* is a study for dotted rhythms (Nr. 6, 303) and an explanation starting with binary rhythms (Ex. 26) articulated with *Tu-Du*, and continuing with ternary rhythms (Ex. 27) articulated with *Tu-Du-Tu/Tu-Du-Tu*. The example in the study by Taffanel & Gaubert could be played with the articulation *Tu-Du*, and the examples from Altès could have been articulated with *Te-Re*, which point on that both types of articulation probably were in use in France around 1900.



Example 26 Study Nr. 6 for binary dotted rhythms using the articulation *Tu-Du* (Altès, 1880, 161).



Example 27 Study Nr. 6 for ternary rhythms using the articulation *Tu-Du-Tu* (Altès, 1880, 161).

1. This articulation must be roug; to obtain this the tongue is stiffened. It will then beat with force a little above the teeth. The attack (*TE*) must be very short. In this way the clearness and pungency of a violin staccato will be obtained. (Taffanel & Gaubert, 1923/1958, 90)

7.4.2 Articulation syllables and French pronunciations

In the method by Mahaut (1759) is a discussion regarding Hotteterre's suggestion using *Tu* and *Ru*, pointing on that these two syllables were what was needed for the music played in the period of Hotteterre, but that these syllables were not sufficient for the Traverso music of Mahaut's period:

> Ancienement on Exprimoit les Coups de langue par les deux Sillabes *Tu* et *Ru* cela suffisoit pour la Musique de ce tems la, ou on lioit presque toujours les nottes deux à deux; il n'en est pas de même dans la musique moderne qui pour l'expression des liaisons et des nottes détachées demande des Coups de langue de differentes especes; chaqu'un selon sa disposition naturelle; sans s'embaraßer d'aucune sillabe; doit chercher à former un coup de langue le plus net qu'il luy est possible, les differentes manieres de s'en server se peuvent acquerir par l'exercice des Examples qui suivent les Remarques suivantes. (Mahaut, 1759, 23)[1]

The phonemes *T, R, D* and *U* are already discussed above from primarily an 18th Century perspective which makes it essential to compare with explanations covering the late 19th Century and the first decades of the 20th Century as found in the article *Technique Vocale* by Jane Arger in *Lavignac Encyclopédie de la Musique* (1925). Considered that articulation syllables for the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute generally have used the consonants *T, D, K, G*, and *R* together with the vowels *E* and *U* all with French pronunciation these phonemes and their explanations as found in *Lavignac Encyclopédie de la Musique* (1925) have been examined (Fig. 105):

Phonemes	Explanations
T	**T** *linguo-dentale*. On lance la pointe de la langue contre les dents supérieures en rapprochant les maxillaires sans les réunir, puis le maxillaire inférieur avec la langue sont brusquement abaissés. (1925, 1041)
D	**D** *linguo-dentale*. On rapproche complètement de maxillaire inférieur du supérieur en lançant la langue contre les dents, en avant, puis on écarte vivement les maxillaires. (1925, 1040)
K & **G**	**K** & **G** *dur gutturale*. On rapproche la langue du palais puis on l'en écarte moins brusquement le G dur ou le K. (1925, 1041)
R	**R** gutturale dans la langue français moderne, sauf dans les provinces du Midi. La prononciation de cette consonne a toujours donné lieu à des remarques spéciales. En 1747, le docteur Lavaus[1] dit, en parlant de l'**R** […] prononcée du fond du gosier, que cette prononciation est vicieuse. Au contraire les fibres extrêmes de bout de la langue sont mises en jeu d'une manière ferme et élastique dans la prononciation mâle, c'est-à-dire l'**R** que nous dénommons «roulé». (1925, 1041)
E & **EU**	**E**, comme dans le mot *levant*, ou **EU** du mot *peur*, demande une ouverture buccale ronde plus petite que celle de **O** clair. Il faudra développer beaucoup les résonances naso-pharyngiennes. Car cette voyelle tient le milieu entre les «ouvertes» et les «fermées» (1925, 1038)
U	**U** français, de *lugubre*, quoique très appréhendé par les chanteurs qui ne savent pas se servir des résonances naso-pharyngiennes, est une excellente voyelle sur laquelle beaucoup de débutants trouvent leur timbre naturel sans fatigue. Mais il faut lui donner une ouverture buccale absolument ronde, quoique très petite, et bien surveiller la dilatation du naso-pharynx. (1925, 1939)

Figure 105 *Technique, Esthétique et Pédagogie: Technique Vocale* by Jane Arger in *Lavignac Encyclopédie de la Musique* (1925).

It seems to be clear that French flute traditions over centuries recycled phonemes from spoken French regarding articulation and resonance, and generally, it could be concluded that the articulation for single tonguing using *T* is, when pronounced in French and over time, a consonant that is pronounced in the very front of the mouth. The placement of the tip of the tongue when articulating *T* is described as between the lips, or just behind the upper front teeth in spoken French since the late 17th Century to the early 21st Century. From an expressive perspective is the character when using *T,* a precise, energetic, and clear articulation, whereas using *D* gives a softer character often used for what is called *Louré* in later French flute traditions. When articulating *D* in spoken French the contact point of tip of the tongue is described as somewhat further back and against the hard palate.

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1. Formerly the tonguing [articulation] were expressed by the two syllables Tu and Ru which were sufficient for the music of that time, where the notes are almost always slurred two by two; it is not the same in modern music, which for the expression of slurs and detached notes requires tonguing of different kinds; each according to its natural disposition; without bothering with any syllable; should seek to form an articulation as precise as possible, the various ways of using it can be learned by practicing the examples in the following. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere*, 1759, 23)

7.4.3 Practical examples regarding articulations

In the following will explanations and suggestions regarding the placement of the tip of the tongue for the single-tonguing *T* be shown as the general standard articulation-syllable, being the reference for all other articulations-syllables. French flute traditions since *Principes* up to the present day supported *T* as the basic articulation syllable, and *D* for a softer attack (*Louré*), connecting both *T* and *D* with the vowels *U* or *E*. Explanations on how to pronounce *T* in spoken French since Cordemoy (1668) to Straka (1965b) agree on that the tip of the tongue is placed in the very front of the mouth. In this context is Altès (1880/1906) important because of his explanation regarding the standard single tonguing when using the consonant *T* (see Appendix XX):

> […] advancing the tongue to the inner edge of the lips, never going beyond this, impart to it in withdrawing a movement short and quick similar to the pronunciation of the syllable *Tu.* (Altès, *Grand method for Flute Boehm Systeme*, 1880/1906, 20).

Within examined methods are generally four different contact-points suggested when articulating the consonant *T*: a) *Tip of the tongue just behind the upper front teeth against the hard palate*, b) *Tip of the tongue touching the back side of the upper front teeth*, c) *Tip of the tongue between the lips*, and *Tip of the tongue is placed just outside the lips.* (Fig. 106).

a) The tip of the tongue just behind the upper front teeth against the hard palate.	**Devienne** (*c.*1794) **Hugot & Wunderlich** (1804) **Wunderlich** (*c.*1812) Berbiguier (*c.*1818) **Dorus** (1845)
b) The tip of the tongue touching the back side of the upper front teeth.	**Taffanel & Gaubert** (1923/1958) **Rampal** (1989)
c) The tip of the tongue between the lips.	Cambini (*c.*1795) Berbiguier (*c.*1818) **Tulou** (1851) Gattermann (1861) **Altès** (1880/1906/1956) **Rampal** (1978) **Bernold** (2021)
d) *Langue sortie*: The tip of the tongue is placed just outside the lips.	**Moyse** (1934) **Rampal** (1978)

Figure 106 Explanations in flute methods from Devienne (*c.*1794) to the present day regarding the contact point for the tip of the tongue when articulation the consonant *T*. Names marked with bold indicates flute teachers at the *Conservatoire* covering the period 1795-2021.

Explanations regarding the contact point of the tip of the tongue for single tonguing within French flute traditions can thus be described as in the very front of the mouth, similarly as in spoken French over three hundred years. In the cases whereby the flute method doesn't give precise indications regarding the contact point for *T* it could with good reasons be assumed that what counts for spoken French during the period in question has bearing on *T* also for flute playing. It could be said that developing skills regarding playing very short notes on Traverso, Multi-keyed conical flute, *Ringklappenflöte* or Boehm-flute requires a perfect balance between the speed and direction of the airstream, because playing a very short note gives no time to correct whether speed nor direction of the airstream, and thus improves the search for *Le veritable point* regarding the hitting point of the airstream. Practicing articulation is an efficient exercise for tone development (Moyse, 1934). Even thou Rampal does not explicitly indicate the consonant *T*, this is the consonant to use because when Rampal & Marion (1880/1979) made a facsimile edition of Altès (1880) they did not comment on Altès' suggestion using *T*, which indicates that Rampal & Marion supported Altès' suggestion. The explanation given by Altès is important because he was an expert regarding Multi-keyed conical flutes, due to his studies at the *Conservatoire* with Tulou who played and taught the Multi-keyed conical flutes. When Rampal (1978) explained standard single tonguing, this resembles Altès' explanation:

> La langue se trouve placée entre les dents et va ainsi déterminer le départ de la colonne d'air. C'est aussi l'attaque du simple coup de langue. (Rampal, 1978, 32)[1]

1. The tongue is placed between the teeth and will thus determine the departure of the air column. This is also the attack of the single tonguing. (Rampal, *La Flûte*, 1978, 32)

Articulation not using the tongue

Articulate a note with an impulse by means of the abdominal and chest muscles (Support), without using the tongue is documented since the 18th Century. An example is found in *L'Art de la Flûte Traversiere* (*c.*1761) by De Lusse and is called *Du Tac aspiré* together with an explanation:

> On fait celui-ci par la seule action des poumons, en articulant la syllabe *HW*. Il est aussi désigné par des petits points couverts d'une liaison sur les notes qui l'exigent; mais il n'est jamais d'usage dans les mouvements lents & tendres. (De Lusse, *c.*1761, 4)[1]

In German language is the same articulation called *Hauchen* (Quantz, 1752; Kummer, 1841). This articulation not using the tongue is precisely as De Lusse (*c.*1761) explained based on making simple impulses with the airstream, and is within a Boehm-flute context often exemplified with impulses like *Ha-Ha* or *Hu-Hu* or like whistling (Artaud, 1996; Debost, 1996; Cohen, 2003; Marion in Ljungar-Chapelon, 2008). This technique is often used combining diaphragm-impulses with the tongue's articulation syllables on each note, every second note, every third note etcetera, depending on tempo and expression. This technique is based on the idea to keep the air moving and avoid a dry spitting when articulating, and it should be notated that when mastered the diaphragm impulses are rather supple as when whistling. An example where this technique is clearly described as a *Diaphragm articulation* is in *Wie Meister üben* (1967, 35, 43, 65, 67, 107), by the Swiss virtuoso and teacher Aurèle Nicolet (1926-2016), this technique was taught by among many Rampal and Marion at the *Conservatoire* (Cohen, 2003; Ljungar-Chapelon, 2008).

Langue sortie

A typical French articulation used for single tonguing is what is often called *Langue sortie* (Moyse, 1934), *French Détaché* (Bernold, 2021) or *Forward tonguing* (Lloyd in Ljungar-Chapelon, 2008). *Langue sortie* has often been of importance in later French flute traditions and explained by Moyse (1934) and Rampal (1978). This articulation is based on *T* extending the tongue towards the lips, positioning the tip of the tongue between the lips so that the very tip of the tongue will be seen (Fig. 107).

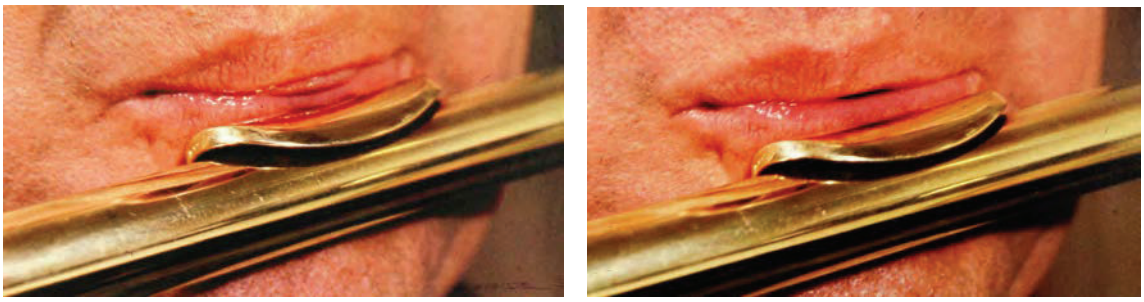


Figure 107 Rampal showing *Langue sortie* and how far out the tip of the tongue is placed between the lips when making the attack, and then the opening between the lips when the tongue is drawn back (Rampal, *La Flûte*, 1978, 33).

Rampal exemplified *Langue sortie* with the photo showed above in *La Flûte* (1978) showing where the tip of the tongue should be placed. When practicing articulation of very short notes there is no time to correct the start of the note which eventually develops a perfect balance between the direction of the airstream and the amount of blown air. This is probably the reason why Moyse added this typically French type of single-tonguing (Bernold, 2021) in his practice book *De la Sonorité: Art et Technique* (1934) discussing the practice of tone development, and how to play a note with *Langue sortie*:

> With the tongue out, try to get a consistent note, rather like a vibrating pizzicato; each note therefore short but not harsh; I a word, let it be as lively as possible in the shortest time. (Moyse, 1934, 15)

When Moyse's explanation is combined with Rampal's photo this represents a valuable testimony being a tool for developing articulation and embouchure techniques as often done within French flute traditions. Practicing short resonant attacks using *Langue sortie*, as described by Moyse and Rampal, develops preciseness and *Tonus* in the lips and embouchure, the direction and speed of the airstream, and is an efficient method for developing suppleness, which has been practiced within French flute traditions since long.

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1. This is done by the sole action of the lungs, by articulating the syllable *HW*. It is also designated by small dots covered with a slur on the notes that require it; but it is never used in slow & tender movements. (De Lusse, *L'Art de la Flûte Traversiere*, *c.* 1761, 4)

Langue sortie is thus an excellent articulation when it comes to starting the first note of a phrase, and the first note after a breathing, and of course in many more situations. The traditional methods of how to practice *Langue sortie* is to place the tongue between the lips as described by Moyse and Rampal and combine the action when the tongue is drawn back with a supple impulse from the diaphragm. This technique is efficient, but one must be observant and find a good balance between the action of the tongue and the impulse form the diaphragm. When referring to Moyse and Rampal this is linked to articulation techniques regarding the Boehm-flute, consequently it could be asked if *Langue sortie* is an articulation relevant for the Traverso, Multi-keyed conical flute, and the *Ringklappenflöte*. Sometimes *Langue sortie* could be misunderstood and performed as a hard "spitting" without having the coordination with the breathing muscles (Support), creating a too tense use of the tongue making the embouchure tight and stiff. In this context is Quantz' comments regarding functions of the tongue and articulation in an article in *Historisch-kritische Beyträge zur Aufnahme der Musik* by Marpurg (1758) of importance. This article includes sections whereby Quantz sometimes is more explicit than in *Versuch* (1752), including comments on an articulation technique that seems to have similarities with *Langue sortie*:

VI: §. 3

> Einige haben die Art, daß sie die Zunge zwischen die Lippen setzen, und den Stoß durch das Zurückziehen derselben Machen. Dieses halte ich für falsch. Denn dadurch wird, besonders in der Tiefe, der dicke, runde, und männliche Ton verhindert: die Zunge muß auch eine allzu weitläufige Bewegung, vor- oder rückwärts, machen; welches an der Geschwindigkeit hinderlich ist. (Quantz, 1752, VI: §. 3, 63)[1]

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When discussing potentially possible transitions of articulation syllables and techniques is the *Conservatoire* a most interesting object regarding flute traditions from when the *Conservatoire* was founded in 1795 until today because the vast documentation of which flutes has been taught in combination with that most of the flute teachers has written flute methods or practice-books. The different flutes taught makes a display of the Traverso (1795-*c.*1803: Devienne, Hugot, Wunderlich), Multi-keyed conical flutes (*c.*1803-1860: Wunderlich, Guiot, Tulou), *Ringklappenflöte* (1831-1841: Coche), and the Boehm-flute (1860-to present: Dorus, Altès, Taffanel, Hennebains, Lafleurance, Gaubert, Moyse, Crunelle, Rampal, Marion, Debost, Artaud, Bernold, Cherrier). In addition, has often a new appointed flute teachers succeeding the former teachers been a student at the *Conservatoire* which includes a certain transition of playing-techniques, teaching methods and aesthetics.

*

1. Some have a way of placing the tongue between the lips and making the stroke by withdrawing it. This I consider wrong. It prevents a full round, and masculine tone, particularly in the low register, and the tongue also must make an excessive forward and backward movement, which impedes quickness. (Quantz, trans. Reilly, 1752/1983, 63)

7.5 Fingerings

Focus for this section is a comparison of fingerings for the three-piece Traverso and the four-piece Traverso and fingering-charts for the chromatic scale, trills, *Flattement*, and *Battement* as shown in the Appendixes:

VII Three-piece Traverso (*Principes*, 1707) and the Renaissance Traverso D1-A3
VIII Three-piece Traverso (1707-1762) C#1-G3
IX Three-piece Traverso, Maier (1732 & 1741), C1-G3
XIII Three- and four-piece Traverso (1707-1895) for the chromatic scale C#1-D4
XVI Three-piece Traverso, Eisel (1738 & 1762), D1-G3
XXI Three- and four-piece Traverso (1707-1895) regarding the use of the D#-key
XXII Three- and four-piece Traverso (1707-*c.*1794) comparison of fingerings for trills C#1-A3
XXIII Three- and four-piece Traverso (1707-1759) regarding *Flattement* and *Battement* D1-A3

Appendix VII a comparison of standard fingerings as found in *Principes* (1707) for the three-piece Traverso and the Renaissance Traverso as found in *The Renaissance Flute A Contomporary Guide* by Clark & Markwick (2020).

Appendix VIII fingering-charts for the three-piece Traverso for the chromatic scale C#1-G3, covering the period 1707-1762 as found in *Principes* and its later French editions published Ballard, Rippert (1725), the Dutch translation *Grund-beginsel over de Behandeling van der Dvars-Fluit* (1728b), *Rudiments*, Prelleur (1731), and *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe* (1738 & 1762) by Eisel being a shortened German translation of *Principes*. When comparing these sources does all give mainly the same fingerings apart from Rippert (1725) that uses the D#-key on notes like G1, A1, B1, G2, A2, B2. Rippert indicates the fingering the F#-fingering 123/47 for G♭1, G♭2, F#1, and F#2. The fingering given in *Principes* and *Rudiments* for G♭1is 123/56 and 123/567 for G♭2 being considerably sharper than the F#-fingering. For G#2, C3, D♭3 and D3 Rippert indicated alternative fingering as found in *Principes* and *Rudiments*. The fingering-chart given by Eisel (1738 & 1762)—which depicts a three-piece Traverso (Appendix XVI)—is identical to fingerings in *Principes* up to its final note E3.

- The less complete fingering-chart is Eisel (1738 & 1762), who only indicate fingerings for sharps, for example D#1, D#2, and D#3, but for example E♭1, E♭2 and E♭3 are not given any fingerings, and the same counts for all enharmonic notes. Still, it seems to be clear that Eisel had *Principes* as its model.
- Generally, *Rudiments* and Prelleur (1731) gives the same fingerings with few exceptions, which points on that the latter possibly could be understood as a shortened version of *Rudiments*. Only fingerings for A♭1, G♭2 are different in Prelleur (1731) compared with *Rudiments*.
- To sum up are examined fingerings for the three-piece Traverso basically showing a striking resemblance and possibly the influence from *Principes* and *Rudiments* whereby Meier (1732) is an exception.

Appendix IX Meier (1732) show a Traverso with its fingering-chart which is a curios tree-piece Traverso having a C-foot with two keys, one for C, and probably the general D#-key. This fingering-chart indicate rather different fingerings for many notes compared with *Principes*, Rippert (1725), the Dutch translation *Grund-beginsel over de Behandeling van der Dvars-Fluit* (1728b), *Rudiments*, Prelleur (1731), and *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe* (1738 & 1762) by Eisel.

Appendix XIII a comparison of fingerings found in twelve fingering-charts for the Traverso in three- and four-pieces for the chromatic scale C#1/D♭1-D4, covering the period 1707-1798 as found in *Principes*, Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), including the method by Balleron (1895), all published in Paris.

- Generally, fingerings for the diatonic scale D1-G3 are similar.
- The use of the D#-key is more frequent in all fingering-charts after *Principes*.
- Notes with accidentals such as G♭1, A♭1, B#1, A♭2, B♭2, B#2, D♭3, D3, F3, F#3 show several slightly different fingerings.
- It seems to be a relation between Mahaut (1759) and Bailleux-Hotteterre (1765) only showing four different fingerings. For G♭1 Bailleux-Hotteterre give the same fingering as in *Principes*. For B♭2 Mahaut gives the fingering 12/4567 which is not found in Bailleux-Hotteterre, but in Devienne (*c.*1794), for B#2 Mahaut similarly gives the alternative 23/457 which is found in Devienne (*c.*1794). Finally, regarding F♭3 we find two different fingerings.

- The similarities between Mahaut (1759) and Bailleux-Hotteterre (1765) possibly indicate that described fingerings mirrors standard French fingerings in the second half of the 18th Century.

Appendix XXI a comparison of French fingerings regarding the use of the D#-key for the three-piece and four-piece Traverso for the chromatic scale C#1-C4 covering the period 1707-1895.

- The use of the D#-key is less frequent in *Principes* and *Rudiments* than in all later sources, but it should be noted that the trill-chart in *Principes* and *Rudiments* is the D#-key used more frequently than in the chromatic scale.
- Corrette (1735 & 1773), Mahaut (1759), Bailleux-Hotteterre (1765), and Balleron (1895) show several examples whereby it is optional to use the D#-key on notes such as G1, A1, B1, C2, C#2, D♭2, G2, A2, A#2, B♭2, B2 which indicates that the use of the D#-key became more frequent in France during the middle of the 18th Century.

Appendix XXII a comparison of fingerings for trills and the three-piece and four-piece Traverso for the chromatic scale C#1-B3, covering the period 1707 to *c.*1794 as found in *Principes*, Eisel (1738 & 1762), Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794).

- When comparing trill-fingerings are they generally identical or similar, some differences occur in the higher register. The similarity of fingerings is not surprising due to that a Traverso with its seven finger holes based on a diatonic scale has far reaching acoustical similarities.
- The relationship between Mahaut (1759) and Bailleux-Hotteterre (1765) is clear because these two sources are the ones showing alternative fingerings for many trills, and when shown Bailleux-Hotteterre follow Mahaut in detail.
- Unfortunately, Eisel's (1738-1762) fingering-chart for trills is incomplete, and trill-fingerings from B1 and upwards are lost, showed fingerings are identical to fingerings as found in *Principes*.

Appendix XXIII a comparison of fingerings for *Flattement* and *Battement* for the three-piece and four-piece Traverso for the chromatic scale D1-A3 covering the period 1707-1759. Generally, most fingerings are similar but with some exceptions, which might explain that the fingering-charts represent a short period of only 52 years.

Trills and the distance between the finger and its tone-hole

In CHAPITRE VII *Remarques sur quelques demi-Tons, & sur quelque Cadences* it is explained that the intonation of trill can be adjusted with the three positions turning the head-joint *Outward—Normal—Inward* as explained as a technique for refining intonation as a whole. In addition is the following suggestion given regarding making the trill A2-G#2 (*Note dix-neuviéme*), and the fingering needs an adjustment of its intonation because it is too sharp. The technique making this adjustment is easily applied:

Il faut aussi observer de ne pas beaucoup lever le Doigt en tremblant. (VII: 20)	[…] you must also observe not to raise the finger high in shaking […] (VII: 14)

This technique can be applied to all trills having a tendency of being too sharp, which points on that the distance between the finger and its tone-hole is an important technique to master, and perhaps for the Boehm-flute player somewhat unexpected.

Supporting-finger-technique

Principes and *Rudiments* systematically suggested to use what could be called a "supporting-finger-technique". This finger-technique has two elements a) how to use the right-hand little-finger (7) and b) the right-hand ring-finger (6). Regarding the right-hand little-finger it should be placed on the tube of the Traverso and close to the D#-key and generally stay in this position until the D#-key is used. The right-hand ring-finger is suggested to be placed between the fifth and sixth tone-holes on the Tube of the Traverso on all notes from A1-C#2, A2-C3, and when it is comfortable as for example G1 and G2. The reason for this "supporting-finger-technique" is to stabilize the Traverso when using the three head-joint-positions *Outward—Normal—Inward*, and because of that the stability created by the D#-key is absent when it is used on so few notes as suggested in *Principes* and *Rudiments*. This technique is not described in later 18th Century Traverso methods and seems to have been abandoned, possibly because that the use of the D#-key became more frequent and had a similarly stabilizing effect.

Partly covered tone-holes

For the standard diatonic and chromatic scales are partly covered tone-holes not used with the exception for F3. At the contrary are partly covered tone-holes used on many notes when playing *Flattement*. Regarding trills are partly covered tone-holes an exception. The comparison of fingerings once again showed the similarity between Mahaut (1759) and Bailleux-Hotteterre (1765) regarding the trills D3-C3, D♭3-C3, and F3-E3 showing the same fingerings with partly covered tone-holes.

Rolling the Traverso into the three positions

The observation that playing position and posture is natural, unconstrained, and elegant is advantageous from an ergonomic perspective. An example is when De Lusse (*c.*1761) in the section on *Tremblement flexible* —in today's terminology a vibrato like micro-tonal circling around the centre of a given note—suggested a technique of rolling the Traverso slightly forwards and backward with help of the left thumb. In practical terms this technique is impossible to use without the Traverso being well balanced:

> Pour l'exécuter [*Tremblement flexible*], il faut que le pouce gauche agisse par gradation de Vitesse, en roulant le corps de la Flûte, sans perdre l'embouchure. (De Lusse, *c.*1761, 9)[1]

Using the D#-key or not

In addition, fingering-charts for the four-pieces Traverso as shown in Traverso methods mentioned above as Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), and the revision of Hotteterre's *Principes* by Bailleux (1765), indicates that the D#-key was used for considerably more notes than in *Principes* fingering-charts. Now the little-finger of the right hand was used for the D#-key and the notes such as G1, A1, B1, C2, G2, A2, B2, and D3 which in *Principes* fingering-chart *Planche 1ere* is played without the D#-key. Consequently, when using the D#-key on mentioned notes a need for supporting the Traverso with the ring-finger and little-finger of the right hand placed directly on the Traverso seems to be of less importance. In *Chapitre III Explication de l'Echelle de Tous les tons et demi Tons* Mahaut suggest that on the above-mentioned notes it doesn't matter if the D#-key is used or not if the intonation is not harmed. This suggestion might be useful for the three-piece Traverso as well, on for the notes G1, A1, B1, C2, G2, A2, A#2, and B2, if it does not interfere with the intonation, which most often is not the case:

> Le Zero blanc avec un point au milieu 𝅗𝅥 donne a conoitre quil est indifferent que ce trou soit ouvert ou fermé (Mahaut, 1759, 8)[2]

*

When comparing fingerings and suggestions given in *Principes* and *Rudiments* with above mentioned methods covering the whole 18th Century of Traverso playing in France, a close reading just show minor differences which perhaps indicate how influential *Principes* and *Rudiments* has been. Fingerings for D1, E1, F1, F#1, G1, A1, B1, C2, D2, E2, F2, F#2, G2, A2, B2, C3, D3, E3, F#3 and G3 are with few exceptions identical. When comparing fingerings for the high register from C#3 to B3 later fingering-charts are more varied, and especially so when it comes to trills. Notes with accidentals such as A♭, B♭, A#, G# show some differences, and especially in the high register. Still, it should be noted that generally fingerings in *Principes* remain the same with smaller adjustments through-out the 18th Century in France and even in the very late method by Balleron (1895).

How to use discussed fingerings depends on which model of Traverso is used. Basically, older models such as the three-piece Traverso possibly works better when using earlier fingering-charts as found in *Principes* and *Rudiments*, and fingerings given by for example Devienne (*c.*1794) works better for later models of the Traverso. In addition, each flautist's style of playing and physiognomy play an important role, and a pragmatic approach based on the quality of sound colours, intonation, flexibility, and expression should be the guidelines when choosing fingerings.

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1. To execute it [*Tremblement flexible*], the left thumb must act by gradation of speed, by rolling the body of the Flute, without losing the embouchure. (De Lusse, *L'Art de la Flûte Traversiere*, *c.*1761, 9)
2. The white Zero with a point in the middle gives to know that it is indifferent whether this hole is open or closed. (Mahaut, *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere*, 1759, 8)

7.6 Intonation and *Notes Sensibles*

In *Principes* and *Rudiments* and its fingering-charts are detailed explanations and suggestions how to refine the intonation, some with the embouchure using the same fingering for generally all notes in relation to their function within a given tonality as for enharmonic notes like for example A#2-B♭2, or F#2-G♭2 with help of different fingerings. As shown in section *6.6 On Intonation and Temperaments* are these explanations in relation to different versions of *Meantone temperaments*. The technique of rolling the head joint *Out-* or *Inward* regarding fine adjustments of intonation is described in detail in *Principes* and *Rudiments*. Later sources like Mahaut (1759) described techniques for intonation abandoning the three head-joint positions as found in *Principes* and *Rudiments* replacing it with an embouchure-technique that show similarities with what is described in methods for Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute (section *7.3.3 The embouchure and the three head-joint positions*). The gradual change to Multi-keyed conical flutes around 1800, and later to *Ringklappenflöte* and the Boehm-flute are connected to changes of musical expression, expanded ideas regarding harmony and modulations directly having effects on tuning systems or temperaments. Initially were the addition of keys like the G#-key related to create an evenness of sound colour because the G#1 was on the Traverso played with a fork-fingering based on playing an A and flattening it a semi-tone whilst leaving the tone-hole for G open and closing one or more tone-holes of the right hand. Regarding intonation this technique works very well, but the sound colour on G#1 cannot be the same as on the surrounding A1 and G1. Later additions of keys had the same purpose but also making the flute into a more chromatic instrument, whereby the Boehm-flute (1847) is the culmination. The consequence of making the flute into a chromatic instrument was that the tone-holes had to be placed in a manner, so every semi-tone was equalized and generally was played with an open-fingering (section *6.3 Fingerings: Doigtés des fourches—Open-fingerings*). Such a construction still makes it possible to easily play in different temperaments as discussed in section *6.6 On intonation and Temperaments*.

It should be noted that playing *Notes sensibles* or leading notes rather sharp was gradually introduced during the early 19th Century, and described in methods by Berbiguier (*c.*1818), Drouët (*c.*1827), Coche (1839), Camus (1839), Dorus (1845), Tulou (1851), Altés (1880, 1906), and included fingering-charts for *Notes sensibles* (Fig. 108). The most extensive suggestions were given by Tulou showing fingerings for *Notes sensibles* on almost all notes of the chromatic scale from E1-B3 and his innovation the *Flûte perfectionnée* with ten keys. Considered that Coche, Dorus, Tulou, and Altès all were teachers at the *Conservatoire*, it can be assumed that using special fingerings for *Notes sensibles* were a technique expected to be known by professional flautists. This gives aspects on the interpretation of 19th Century French flute music, as for today's flautists playing this repertoire on the Boehm-flute. An observation is that Multi-keyed conical flutes have more possibilities and potentially can make sharp *Notes sensibles* on almost all notes in the chromatic scale, whereas this is not as easily done on the Boehm-flute due to its more complicated key-mechanism, and therefore mostly are made with help of the embouchure instead as with fingerings.

Authors	Methods	Flute model
Benoit Tranquille Berbiguier (1782-1835)	*c.*1818 *Nouvelle Méthode pour la Flûte*	Multi-keyed conical flute
Louis Drouët (1792-1873)	1827 *Méthode pour la Flûte* 1830 *Method of flute playing*	Multi-keyed conical flute
Paul Hippolyte Camus (1796-1850)	1839 *Méthode pour la nouvelle Flûte-Böhm*	*Ringklappenflöte*
Victor Coche (1806-1881) Taught at the *Conservatoire* 1831-1841	1839 *Méthode pour Flûte*	*Ringklappenflöte*
Louis Dorus (1812-1896) Taught at the *Conservatoire* 1860-1868	1845 *L'Etude de la nouvelle Flûte, méthode progressive arrangée, d'après Devienne*	*Ringklappenflöte*
Jean-Louis Tulou (1786-1865) Taught at the *Conservatoire* 1829-1859	1851 *Méthode de Flûte*	Multi-keyed conical flute
Henri Altès (1826-1895) Taught at the *Conservatoire* 1869-1893	1880 *Méthode pour Flûte Systeme Boehm* 1906 *Grand Method for Flute*	Boehm-flute

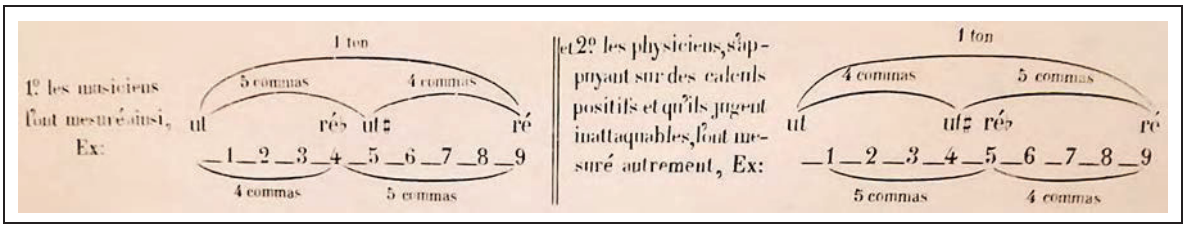
Figure 108 List of 19th Century flautists integrating fingering-charts for *Notes sensibles*.

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In *Méthode pour Flûte* by Altès (1880, 1906, *Chapitre 12* I: 89-97) are explanations regarding leading notes: *Notes sensibles*. Altès refers to *Leçons de lecture musicale: méthode complète de solfège* (1859) by Fromental Halévy (1799-1862, composer and teacher of composition at the *Conservatoire*) and his explanations regarding the nature and characteristics of *Notes sensibles*:

> Le *septième* degré a reçu le nom de *note sensible*, ou simplement *sensible*, parce que la note qui occupe ce degré, pas sa tendance naturelle à se porter vers la *tonique*, dont elle n'est éloignée que d'un *demi-ton*, fait *sentir* la tonalité, l'oreille n'étant satisfaite que lorsque la *note sensible* a accompli sa marche vers la *tonique*. (Halévy, 1859, 94-95)[1]

When Altès discussed *Notes sensibles* he referred to its *Tendence naturelle* leading to the *Tonic*, including a sharper intonation having the effect that the semi-tone interval between the leading note and its *Tonic* is somewhat narrower—four *Commas*—than when compared with other semi-tones. As a matter of fact, Altès' explanations connect to concepts of *Semitone majeur* and *Semitone mineur* (section *6.6.2 Semitone majeur and Semitone mineur*), and how these intervals consist of five alternatively four *Commas*, including the figure below visualising the differences between the semi-tones D♭ and C# (Altès, 1880, 1906, *Chapitre 12* I: 90):



Altès included a fingering chart *Tableau B Doigtés donnant plus de justesse à certaines notes sensibles tout en en rendant l'exécution plus facile* (1880, 1906, II: 119-121) which only works on Boehm-flutes having the *Open-hole* system because suggested fingerings are generally based on only partly covering the open holes on five of the keys on a Boehm-flute (left hand: middle finger and ring finger; right hand: fore-finger, middle finger, and ring finger). These fingerings contribute with surprising possibilities regarding sound colour and expressive intonation in *Dolce* and *Dolcissimo*, and especially so in soft nuances. In combination with Altès' fingerings for *Notes sensibles*, the flautist needs to develop a flexible embouchure and control of the airstream, sometimes combined with rolling the head-joint slightly inward because some suggested fingerings are very sharp.

In the article *La Flûte* by Fleury in *Lavignac Encyclopédie de la Musique* (1925a) are comments regarding *Notes sensibles*, and Fleury mentions that some standard fingerings—as for example C#2—due to the construction of the Boehm-flute facilitates a sharpening of the intonation. Fleury commented on that with help of the embouchure and airstream it is generally possible to adjust every note at least a quartertone up and down which corresponds to concepts of *Champ de liberté* as discussed in section *6.6 On intonation and Temperaments*, which in a sense makes it unnecessary to use special fingerings for *Notes sensibles*. Still, when using fingerings for *Notes sensibles* as shown by Altès they are tools for refined and expressive intonation, proberly having roots in traditions regarding intonation as explained in for example *Méthode pour flûte* by Tulou (1851).

In the revision of Altès' *Méthode pour Flûte* made by Caratgé in 1956 is a section *Tableau B Doigtés facilitant l'exécution tout en modifiant la hauteur de certains notes* including a fingering-chart for leading notes, although Caratgé does not use the term *Notes sensibles* (1880/1956, I: 92). In the following are mentioned fingerings for what in realty are *Notes sensibles* numerically notated according to common numerical notation of fingerings for the Boehm-flute (Fig. 109 and 110). An indicated finger should always be pressed down, fingers of the left hand are indicated at the left side of a slash, and fingers of the right hand at the right side of the same slash. Half covered tone-holes are marked large and bold. The amount of uncovering the hole in the key must be adjusted in relation to the intonation of each flute and flautist.

To conclude, when Altès added the fingering-chart for *Notes sensibles* this could be understood as a transition regarding aesthetics and playing-techniques from the Multi-keyed conical flute of his youth, studying with Tulou at the *Conservatoire*. This flute model was influenced of aesthetics and techniques used on the Traverso and flutes with four or five keys of the very late 18th Century as described in methods by for example Hugot & Wunderlich (1804) and Wunderlich (1812). The Traverso sometimes used techniques for intonation and sound colour based on half covering of tone-holes, in combination with rolling the flute *Out-* and *Inward*, together with a technique variate the distance between the fingers and its tone-hole, because making the distance shorter between the tone-hole and its respective finger has a flattening tendence and vice-verse.

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1. The seventh degree of the scale is called *note sensible*, or simply *sensible*, because the note on this degree, has a natural tendency to move towards the *tonique*, from which it is only a semitone away, makes *sentir* [feel] the tonality, the ear being satisfied only when the *note sensible* has completed its path towards the *tonique*. (Halévy, *Leçons de lecture musicale: méthode complète de solfège*, 1859, 94-95)

Left hand	Right hand
0 = no fingers used **1** = thumb **1♭** = thumb on the B♭-key **2** = fore finger **3** = middle finger **4** = ring finger **5** = little finger on the G#-key	**0** = no fingers used **2** = fore finger **3** = middle finger **4** = ring finger **5** = little finger on the D#-key **5#** = little finger on the C#-key **5 ㄣ** = little finger on the C-key **5B**= little finger on the low B-key **5 Gizmo** = little finger on the Gizmo **A** = first trill key **B** = second trill key

Figure 109 Standard numerical notation regarding fingerings for the Boehm-flute.

Notes	Standard fingering	Fingering *Notes Sensibles*	Notes	Standard fingering	Fingering *Notes Sensibles*
F#1	1234/45	1234/**4**5	**B#2**	2/5	134/235
G#1	12345/5	123**4**/5 *****	**C#3**	0/5	134/345 *****
A1	123/5	12**3**/25 *****	**D3**	134/5	1345/25 *****
A#1	12/25	12/**2**5	**D#3**	12345/2345	12345/23**4**5 *****
C#2	0/5	134/2345# ***** 0/234 ***** (The second fingering is only indicated by Caratgé)	**E3**	123/235	124/2345 *****
E#2	1234/25	1234/**2**45 *****	**E#3**	124/25	124/**2**45 ***** (Caratgé also indicated this fingering for F3)
F#2	1234/45	1234/**4**5	**F#3**	124/45	234/**2**5 *****
G#2	12345/5	123**4**/5 *****	**G#3**	345/5	1345/235 *****
A2	123/5	12**3**/25 *****	**A3**	13/25	13/2A5 *****
A#2	12/25	12/**2**5	**A#3**	1/2A 1/2A5	124/**2**AB5

Figure 110 Fingering-chart for *Notes sensibles* and the Boehm-flute by Altès (1880, 1906, II: 119-121), and Altès-Caratgé (1880/1956, I: 92) in numerical notation. Fingerings included by Caratgé are marked with *****. There are not fingerings for all notes because of the construction of the key-mechanism on the Boehm-flute. Fingerings for A#1, A#2, F#1, and F#2 does not always work on most Boehm-flutes of today which probably is the reason why Caratgé omitted them.

It should be noted that above mentioned open-hole system or *French key -system* has an aspect sometimes overlooked but explained by the acoustician Michèle Castellengo in Paris. In a research report *La Flûte Traversière* (1968, 27), is explained that there are differences between a flute having an open-hole system or not in relation to especially legato-playing. Having a flute with covered keys the opening and closing of keys is somewhat brusque or sudden. Whereas while having the open-hole mechanism the key having an open hole in the middle is when pressed down or opened and released taking place in two steps: first the finger closes the hole in the middle of the key, then the key is closed against its tone-hole on the flute tube, and vice-verse:

> Anneaux et plateaux. Il n'est pas indifférent de boucher un trou avec un plateau, ou avec le doigt + anneau. Dans le premier cas le bouchage et le débouchage sont francs et brusques. Dans le deuxième cas, l'opération se fait en deux temps: le doigt obture le centre de l'anneau maintenu relevé par un petit ressort, puis entraine celui-ci pour boucher complètement le trou. Or le mode d'obturation des trous conditionne les transitoires d'attaque et d'extension dans les passages joués en legato, donc le timbre, ce qui est confirmé par l'avis de nombreux musiciens. (Castellengo, 1968, 27)[1]

1. Open-hole keys and covered-keys. It is not indifferent to close a tone-hole with a covered key, or with your finger + the open hole key. In the first case, the closing and opening are frank and abrupt. In the second case, the operation is done in two stages: the finger closes the hole in the middle of the key, kept raised by a small spring, then closes the tone-hole completely while pressing down the key itself. However, the way of closing the tone-holes conditions the attack and extension transients in the passages played in legato and timbre, which is confirmed by the opinion of many musicians. (Castellengo, *La Flûte Traversière*, 1968, 27)

8 Transitions of aesthetics and playing-techniques

> *Non seulement l'intelligence ne peut rien pour nous pour ces résurrections, mais encore ces heures du passé ne vont se blottir que dans des objets où l'intelligence n'a pas cherché à les incarner.*[1]
>
> Proust (1908, 2)

It could be said that a pedagogical activity and research regarding musical learning—in the present context learning how to play and perform on the three-piece Traverso from the early 18th Century in France—could be studied as a separate object not having an imperative relation to artistic research investigating the process of musical expression and musical interpretation. The author of the present study disagrees with such an opinion because all instrumental skills, explanations, and suggestions how to play on the discussed models of transverse flutes only has one profound *Raison d'être*: Musical expression. This could be described with the metaphor of a coin having its two sides: a coin can't exist without its two sides. To take this one step further: despite the fascination of daily practice, penetrating deeper and deeper in the mastery of playing the three-piece Traverso, in combination over time to develop more and more advanced skills, including the idea that in a sense the devoted musician can never get enough skills, this makes no real sense without constantly aiming for being a servant of musical expression. Probably is one of the difficulties for a flautist today wanting to refine skills regarding musical expression on the Traverso from the period of Hotteterre and France of *l'Ancien Régime* to develop a profound, natural, spontaneous, and intuitive sense for aesthetics in relation to musical expression based on how the three-piece Traverso was understood in the late 17th Century and the first decades of the 18th Century in France.

When discussing possible transitions of aesthetics and playing-techniques as in the present context emerges questions if examined texts, artefacts, and pedagogical material has a retrospective alternatively an experimental character. Taking *Principes* as example, it gives the impression of a retrospective perspective in the sense that it describes a summary of an oral tradition regarding playing-techniques on the three-piece Traverso of the late 17th Century up to 1707 when it was published for the first time. At the same time *Principes* points on future Traverso-playing to come, whereby this text potentially could serve as a point of departure. It could be said that many instrumental methods and practice-books represents retrospective perspectives explaining achieved knowledge and standards about aesthetics, playing-techniques and how these can be taught. An early 20th Century example is the impressive body of *L'Enseignement Complet de la Flûte* (1921-1938) by Marcel Moyse (1889-1984), which in 21 volumes gives a display of flute-playing in France and at the *Conservatoire*. For sure has Moyse contributed substantially to the development of teaching flute-playing in the 20th Century on an international level, at the same time gives *L'Enseignement Complet de la Flûte* the impression of being a genuine documentation of an oral tradition and collective know-how regarding flute-techniques mirroring the late 19th Century and the first decades of the 20th Century in France and at the *Conservatoire*. If so, this does by no means diminish the grandeur of Moyse's legacy, as a matter of fact the conclusion is the contrary. A text that introduces new playing-techniques, but aiming for a refinement of newly established aesthetics is *Méthode de Flûte* (1804) by Hugot & Wunderlich, that will be discussed in the following with its explanations of the benefit using the three new keys for A#/B♭, G#/A♭, and F, together with exercises for the development of their use. An example of an experimental text pointing at potentially and perhaps possible future innovations of playing-techniques, aesthetics and musical expression is the book *New Sounds for Woodwind* (1967) by Bruno Bartolozzi (1911-1980) discussing the flute, oboe, clarinet, and bassoon in a context of extended techniques in relation to musical expression. This in a sense visionary text was connected with instrumental methods for each instrument in question, and for the flute with *Metodo per Flauto. Bruno Bartolozzi Nuova Tecnica per strumenti a fiato a legno* (1975) by Pier Luigi Mencarelli which directedly connected to the text by Bartolozzi.

*

When considering transitions of aesthetics and playing-techniques as in the present context including the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute are pedagogical material such as instrumental methods, practice-books invaluable sources. A complementary question is then to look over who taught whom.

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1. Not only can intelligence do nothing for us for these resurrections, but also these hours of the past will only nestle in objects where intelligence has not sought to embody them. (Proust, *Contre Sainte Beuve*, *Preface*, 1908, 2)

Further are documentations regarding formalized learning within the frame of higher education such as the *Conservatoire* an important source, and sheds light on who was teaching, and who had been teaching new teachers at the institution. In so far is the period from 1795 when the *Conservatoire* was founded up to the present day well documented. The period before 1795 is less documented, but sources like Goldberg (1906/1987), Bowers (1971), Dorgeuille (1983), Sillanoli (1984), Lenski & Ventzke. (1992), Giannini (1993), Powell (2002), Blakeman (2005), Lebez (2017), and Reede (2022) answers questions regarding who taught whom up to the foundation of the *Conservatoire* including important information regarding the interaction between flautists and flute-makers. Unfortunately, it has not been possible to identify much regarding who have been teaching the first generations of Traverso-players such as Rebillé *dit* Philbert, Descouteax, La Barre, and Hotteterre. But from about the middle of the 18th Century due to mentioned publications can many questions regarding Traverso teaching in Paris up to the foundation of the *Conservatoire* be answered. Perhaps is instrumental teaching within higher education and a formal learning structure like a conservatory or academy of music the strongest tools when it comes to maintain transitions of playing-techniques and connected aesthetics. Regarding French flute traditions is definitely the *Conservatoire* a good example when studying potential transitions of playing-techniques and aesthetics covering the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute. In addition, a study shows important moments as when for example Multi-keyed conical flutes replaced the Traverso around 1804, and when the Multi-keyed conical flutes were replaced by the Boehm-flute in 1860, which are examples of when new ideals regarding not the least aesthetics were established. In the following will some flute teachers at the *Conservatoire* who have had long reaching influences be examined regarding flute models, playing-techniques, and teachings.

*

A natural start when researching transitions regarding playing-techniques and aesthetics within the present study is to have the Traverso as a starting point. Probably were the beginnings of Traverso teachings in the last decades of the 17th Century of an aural nature, considered that *Principes* was the first printed and complete instructive text on how to play on a Traverso when published in 1707. It could be assumed that teachings of the Traverso in the late 17th Century and up to *Principes* probably included handwritten fingering-charts and maybe some exercise and it's like which unfortunately seems to have been lost. Further it could be supposed that teachings of the Renaissance Traverso might have had some influence on Traverso teaching up to the very beginning of the 18th Century, because most likely and for some time these two flute models coexisted, although it seems that the three-piece Traverso already in the late 17th Century had become the more popular transverse flute in at least France.

Michel Blavet (1700-1768) was one of the most famous musicians in France in the middle of the 18th Century, and seems to have been an sought-after teacher from the late 1720is and onwards. Who taught Blavet the Traverso is not clear—perhaps he was an autodidact?—but Blavet taught Felix Rault (1736-*c.*1806) which could have influenced the first generation of flute teachers at the *Conservatoire*. Rault himself became a respected Traverso virtuoso at the Paris Opera, and was the first to perform the famous flute solo in the Paris version of *Orphée et Eurydice* (1774) by Gluck. Rault in his turn taught Johann Georg Wunderlich (1755-1819), François Devienne (1759-1803), and Antoine Hugot (1761-1803), which is noteworthy because when the *Conservatoire* was founded in 1795 Wunderlich, Devienne, and Hugot were appointed as flute teachers. That these former students of Rault taught at the *Conservatoire* at the same time is an indication that the Traverso, maybe indirectly, had some influence up in the very early 19th Century. When comparing fingering-charts in the authorised flute methods used by the first generations of flute teachers at the *Conservatoire*—written by Devienne (*c.*1794), Hugot & Wunderlich (1804), and Wunderlich (*c.*1812)—they show that a change towards Multi-keyed conical flutes happened soon and seems to have been completed in the years around 1804. It should be noted that the Traverso method (*c.*1794) by Devienne has some, favourable, comments regarding additional keys on the Traverso but no fingering-charts including extra keys apart from the standard D#-key. In the method by Hugot & Wunderlich (1804) are fingering-charts for both the Traverso—*La Flûte ordinaire*—together with fingering-charts for a flute with three additional keys. This method has a section *Article once De l'avantage de se server d'une flute a trois petites clefs* (1804, 26) which explains the advantages of playing on flutes with additional keys compared with the Traverso. When the headline mentions *trois petites clefs* this should be understood that three keys for A#/B♭, G#/A♭, and F were added to the already existing D#-key on the Traverso:

> La Flûte étant percée de six trous ouverts, on la joua primitivement sans clefs, puis on en adapta une sur la patte pour faire le ré# ou mi♭, trois autres clefs ont été ensuite ajoutées, plusieurs professeurs en ont reconnu l'utilité qui a été conformée par quinze années d'expérience, nous en adoptons l'usage […] ainsi la Flûte se trouve actuellement percée de dix trous dont six ouverts et quatre bouchés par les clefs. (Hugot & Wunderlich, 1804, 2)[1]

This statement is noteworthy because it comments on a transverse flute that could be a Fife or a Renaissance Traverso with six tone-holes and no key, the Traverso with its key for D# or E♭, and finally the Multi-keyed conical flute around 1800 with all in all four keys. The comment that since about fifteen years ago these three keys started to be used indicate a period around 1790. This is interesting because it could explain why Devienne in his method (*c.*1794) was reluctant regarding additional keys simple because the innovation was so new that it had not have had the time to be proofed, and as well pointing at that this innovation was not present when Devienne was young and studied the Traverso. Considered that Rault—as mentioned above—had taught Wunderlich, Devienne, and Hugot makes it plausible that all three had studied exclusively the Traverso with Rault. If so, it makes it reliable that aesthetics and playing-techniques for the Traverso had influenced the first generation of flautists playing and teaching Multi-keyed conical flutes. Still there seems to have been a certain resistance and discussion around 1800 regarding these additional keys:

> L'usage des trois dernières clefs que nous adoptons a été trop légèrement repoussé par quelques personnes quo ont objecté que ses additions compliquaient le mécanisme de l'instrument, nous insistions sur leur emploie parce que nous les considérons comme un perfectionnement très utile, les avantages que l'on retire dans la justesse, l'égalité et la force de plusieurs sons, facilité qu'elles donnent pour faire les trilles et enfin la vigueur que l'on obtient dans quelques sons graves dédomagent suffisamment du léger travail de mécanisme que ces clefs nécessitent. (Hugot & Wunderlich, 1804, 3)[2]

Using these additional keys was a practical way to eliminate the somewhat weak and muted sound of the fork-fingerings for notes like A#/B♭, G#/A♭, and F (Fig. 111), and very much so in the low register. Further the keys facilitated trills, and the endeavour for more evenness of sound colour, timbre, and strength in the low register when compared with the Traverso just having the D#-key. When Hugot & Wunderlich (1804, 26) explained mentioned benefits this was made in a list with seven points (Fig. 112):

1. For all pieces that has several flats and sharps.
2. For the intonation on generally all semi-tones, and especially for the ones in the low register as B♭ and A# which by nature have a muted sound and out of tune.
3. To give more strengths and better intonation on F# as and F natural.
4. For equalizing the week notes and give them more strengths in the low register.
5. For all the octaves and especially in semi-tones.
6. For facilitating many passages which often are very difficult and thus without effect.
7. For the intonation of trills in semi-tones and whole-tones, and finally to add brilliance and perfection to this instrument

In *Principes Elémentaires et Gradués pour la Flûte* (*c.*1812) by Wunderlich is a fingering-charts for the same flute as in Hugot & Wunderlich (1804), including an additional fifth key for facilitating trills in minor keys, B1-C2, and B2-C3. Its *Discours préliminaire* shed light on the benefits of additional keys:

> […] la faveur particuliere des Amateurs et leur nombre est encore augmenté depuis l'adoption des petites Clefs, perfection qui donne a cet instrument un brillant qu'il n'avait pas auparavant. ***** Nota: Ce Mécanisme ingenieux en faisant disparoitre beaucoup de défauts attachés a cet Instrument, est un nouvel avantage qui doit nécessairement fixer son sort et garantir sa stabilité. (Wunderlich, *c.*1812, 1)[3]

---

1. The flute had six open tone-holes, and was originally played without keys, then one key was adapted on the foot-joint to make the D# or E♭, three other keys were then added, several teachers have recognized the usefulness of this and fifteen years of experience, we adopt these keys […] thus the flute is currently having ten tone-holes, six of which are open and four are closed by the keys. (Hugot & Wunderlich, *Méthode de Flûte*, 1804, 2)[1]

2. The use of the last three keys that we adopt has been too lightly rejected by some people who objected that its additions complicated the mechanism of the instrument, we insist on their use because we consider them as a very useful improvement, the advantages that one withdraws in the accuracy, the equality and the force of several notes, the facility which they give to make trills and finally the vigour which one obtains on some low notes compensate sufficiently for the little work of practice that these keys require. (Hugot & Wunderlich, 1804, 3)

3. […] the particular favour of the Amateurs and their still increasing number since the adoption of the small Clefs, which gives a perfection and brilliance to this instrument which it did not have before. ***** Note: This ingenious mechanism, eliminating many of the defects attached to this Instrument, is a new advantage which will guarantee its stability and fate must. (Wunderlich, *Principes Elémentaires et Gradués pour la Flûte c.*1812, 1)

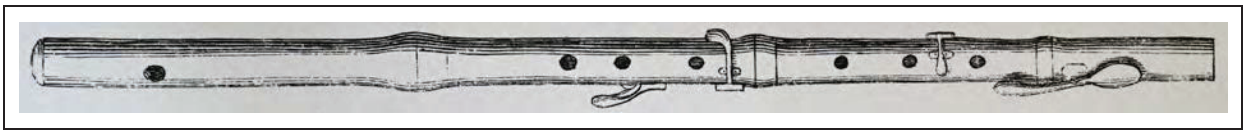
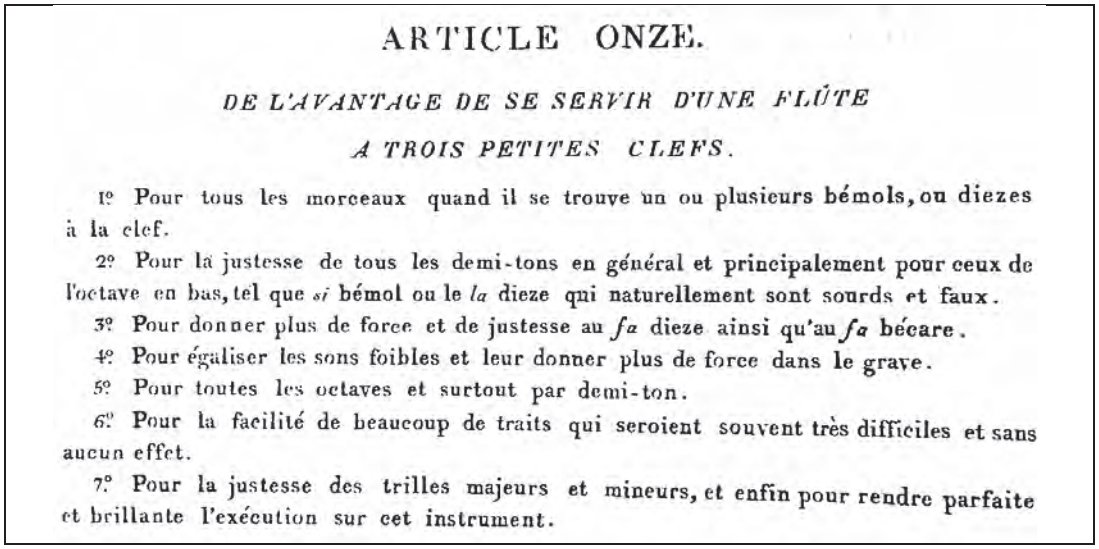


Figure 111 A Multi-keyed conical flute with its three additional keys, and explanations of which fingers are used for each key, from left to the right: […] *ces trois clefs que l'on nomme du fa du sib et du lab sont placées, celle du sib au centre du corps du milieu à la portée du pouce de la main gauche ; celle du lab à l'extrémité du corps du milieu et à la portée du petit doigt de la même main; celle du fa su la petit corps à la portée de l'annuaire de la main droite* […] (Hugot & Wunderlich, 1804, 2)[1]



ARTICLE ONZE.

DE L'AVANTAGE DE SE SERVIR D'UNE FLÛTE A TROIS PETITES CLEFS.

1º Pour tous les morceaux quand il se trouve un ou plusieurs bémols, ou diezes à la clef.

2º Pour la justesse de tous les demi-tons en général et principalement pour ceux de l'octave en bas, tel que *si* bémol ou le *la* dieze qui naturellement sont sourds et faux.

3º Pour donner plus de force et de justesse au *fa* dieze ainsi qu'au *fa* bécare.

4º Pour égaliser les sons foibles et leur donner plus de force dans le grave.

5º Pour toutes les octaves et surtout par demi-ton.

6º Pour la facilité de beaucoup de traits qui seroient souvent très difficiles et sans aucun effet.

7º Pour la justesse des trilles majeurs et mineurs, et enfin pour rendre parfaite et brillante l'exécution sur cet instrument.

Figure 112 Seven explanations regarding benefits of the three additional keys as described by Hugot & Wunderlich (1804, 26).

In Wunderlich's *Discours préliminaire* is a foot-note explaining more about Devienne and the additional keys on the Traverso:

> ***** a L'egard des petites Clefs, je ne puis passer sous silence les observations de mon ancien Ami et Collegue feu Devienne qui, en les désapprouvant, leur assigne cependant un rang dans L'adagio; Certes il n'auroit pas tenu ce langage, s'il avait examiné de plus près la simplicité de ce Mécanisme et s'etoit familiarisé d'avantage avec son utilité reconnue dans les Morceaux les plus vifs. Je me plais à croire qu'il se seroit convaincu que la Complication qui l'a frappé au premier abord n'etoit qu'apparente. Mais une aussi legere erreur n'est-elle pas excusable chez un Artiste si distingué […] (Wunderlich, *c.*1812, 1)[2]

This respectful disagreement regarding Devienne's disapproval of the additional keys points in the direction that the one-keyed Traverso had finished to be the instrument for upcoming generations of professional flautists at the *Conservatoire* and around 1812. To conclude, when comparing mentioned methods by Devienne (*c.*1794), Hugot & Wunderlich (1804), and Wunderlich (*c.*1812) it indicates that the Traverso coexisted with Multi-keyed conical flutes for some years at the *Conservatoire*, but that the Traverso lost more and more ground and around 1804 was not the preferred instrument anymore being replaced by the above described Multi-keyed conical flute with four keys.

*

1. […] these three keys, which are called the F, B♭ and A♭, are placed so that of B♭ is in the centre of the body of the second joint within reach of the thumb of the left hand; that of A♭ at the end of the second joint and within reach of the little finger of the same hand; that of the F on third joint within reach of the directory of the right hand […] (Hugot & Wunderlich, *Méthode de Flûte*, 1804, 2)

2. With regard to the little keys, I cannot pass over in silence the observations of my former friend and colleague, the late Devienne, who, while disapproving of them, nevertheless assigns them a rank in the adagio; Certainly, he would not have held this opinion, if he had examined more closely the simplicity of this mechanism and had become more familiar with its recognized usefulness in the liveliest pieces. I like to believe that he would have been convinced that the complication which struck him at first sight was only apparent. But isn't such a slight error excusable in such a distinguished Artist? (Wunderlich, *Principes Elémentaires et Gradués pour la Flûte c.*1812, 1)

The next generation of flute teachers at the *Conservatoire* is represented by Joseph Guillou (1787-1853) and Jean-Louis Tulou (1786-1865). Considered that both Guillou and Tulou had studied at the *Conservatoire*—Guillou had been a student of Devienne and Wunderlich, and Tulou studied with Wunderlich—makes it plausible that a certain familiarity with the Traverso was still present. But Guilllou and Tulou taught Multi-keyed conical flutes which indicates changings regarding playing-techniques and aesthetics, although the earlier models of Multi-keyed conical flutes with just a few keys have pronounced similarities with the Traverso. Considered that more keys started to be added on the Traverso in the late 18th Century (Tromlitz, 1791; Devienne, *c.*1794), it could be assumed that Devienne, and Wunderlich had transmitted elements of Traverso-playing to Guillou and Tulou but the latter's played on Multi-keyed conical flutes. As mentioned above, Devienne did comment on additional keys for the notes G#/A♭, A#/B♭, and F natural as being useful, and especially so in the low register because they improved evenness of sound colour and timbre but that he never used them himself. Thus, Devienne seems to have been that last teacher at the *Conservatoire* to not use additional keys, and the impression is that he exclusively played the Traverso as on the famous portrait painted in 1792 by Jacques-Louis David (1748-1825; Humblot, 1909/1982).

*

The generation after Guillou and Tulou is represented by Louis Dorus (1812-1896) who have had Guillou as his teacher at the *Conservatoire*, and at that time played on Multi-keyed conical flutes. It should be remembered that when Dorus made his final examination at the *Conservatoire* in 1828 whether the *Ringklappenflöte* (1832) nor the Boehm-flute (1847) had been invented. The flute method by Dorus was published for the first time in 1845, and was intended for the *Ringklappenflöte*, although it later without any problem could be used for the Boehm-flute. In 1860 when Tulou retired Dorus became the new flute teacher at the *Conservatoire*, which is an important date because Dorus introduced the newly constructed Boehm-flute as the standard flute taught at the institution. When Dorus was retired he was replaced by Henri Altès (1826-1895) that had been a student of Tulou, and when Altès retired he was replaced by Paul Taffanel (1844-1908) that in his turn had been a student of Dorus. As can be seen in this brief outline of flute teachers and flute models taught at the *Conservatoire* is that in a period when the institution was founded in 1795 there have been a real familiarity, knowledge and playing skills regarding the Traverso and its aesthetics, but that the Traverso was replaced with Multi-keyed conical flutes already in the first decade of the 19th Century (Fig. 113).

The above discussed *Méthode de Flûte* (1804) by Hugot & Wunderlich is an important document when it comes to identifying when the Traverso was not anymore the preferred flute taught at the *Conservatoire*. In its introduction is an announcement regarding the adoption of the flute with four keys. The evaluation of the method was made by a commission—all members of staff at the *Conservatoire*—with composer François-Joseph Gossec (1734-1829), horn-player Heinrich Domnich (1767-1844), composer Charles-Simon Catel (1773-1830), clarinet-player Jean-Xavier Lefèvre (1763-1829), oboe-player Antoine Sallantin (1754-after 1813), and Wunderlich (1755-1819). Considered that the oldest commission member Gossec was born in 1734, and youngest was Catel born in 1773 this would assure that all members of the commission were familiar with the Traverso. And in addition, could have a deeper familiarity with the Traverso as a reference when examining the method by Hugot & Wunderlich (1804) and its systematic use of the keys for G#/A♭, A#/B♭, and F natural, aiming for developing and facilitate evenness of sound colour, timbre, and intonation. The adoption of the method was signed by the president of the *Conservatoire* Bernard Sarrette (1765-1858) on April 11, 1804 (21 Germinal, An [Year] 12 in the Revolutionary Calendar):

> La Méthode de Flûte rédigée par la Commission, sur les matériaux préparés par feu A. Hugot, et revus par Mr. Wunderlich, ayant été adoptée par les membres du Conservatoire, servira de base à l'enseignement dans les classes du Conservatoire de Musique. SARRETTE (Hugot & Wunderlich, 1804)[1]

*

1. The Flute Method prepared by the Commission, on the materials planned by the late A. Hugot, and reviewed by Mr. Wunderlich, has been adopted by the members of the Conservatory, and should serve as the basis for teaching in the classes [Flute] of the Music Conservatory. (Hugot & Wunderlich, *Méthode de Flûte*, 1804)

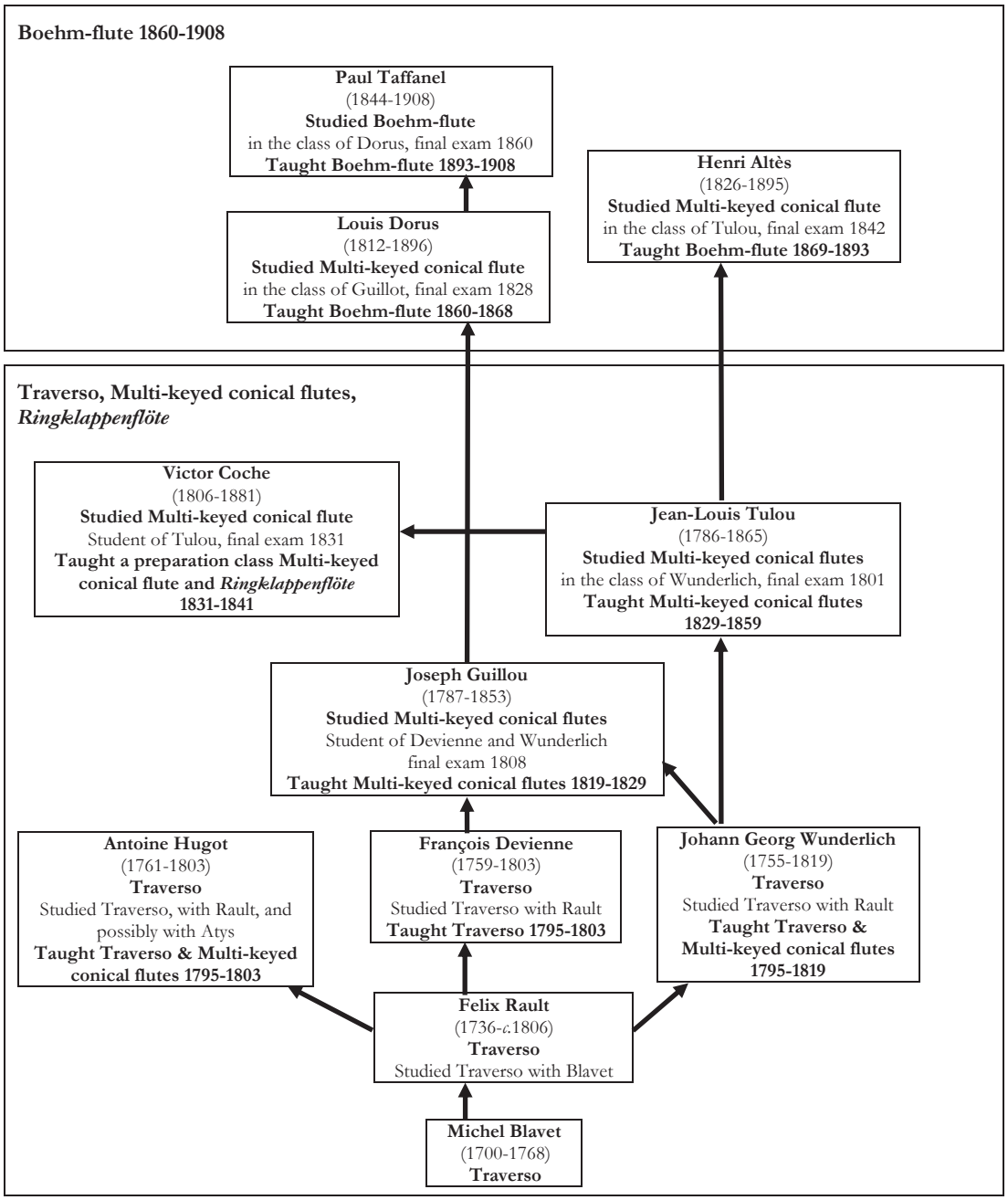


Figure 113 Brief outline regarding flute teachers and flute models taught at the *Conservatoire* in the period when the *Conservatoire* was founded in 1795 until the introduction of the Boehm-flute.

*

As described above there was a gradual move around 1804 from the Traverso towards Multi-keyed conical flutes which then were taught until 1860, and from that date the Boehm-flute became the flute taught at the institution. It would be surprising—considered that the Traverso was still in vogue around 1800—if there would not have been remains of playing-techniques and aesthetics of the Traverso only about 60 years later when Dorus introduced the Boehm-flute at the *Conservatoire*. Considered that Blavet taught Rault, and Rault in his turn taught Devienne, Hugot, and Wunderlich still it should be taken with prudence apropos if a specific Traverso style was influencing flute teaching at the *Conservatoire* when it was founded in 1795, whivh should be combined with that aesthetics regarding musical styles changed considerably at the end of the 18th Century compared with the mid 18th Century in France. But even so it seems to be unavoidable that elements with roots in French Traverso-playing of the mid 18th Century had been resonating for some decades into the 19th Century.

Above have the Traverso, Multi-keyed conical flutes and the Boehm-flute been discussed but not the *Ringklappenflöte*. As a matter of fact, the *Ringklappenflöte* was taught at the *Conservatoire* by Victor Coche (1806-1881) who had been a student of Tulou and by then played on Multi-keyed conical flutes. Coche taught the *Ringklappenflöte* for a preparatory class at the *Conservatoire*, but only in the years 1831-1841.

Final questions are how flautists like Hugot and Wunderlich—having studied the Traverso with Rault—learnt to master Multi-keyed conical flutes, and later how Dorus and Altès—having studied Multi-keyed conical flutes at the *Conservatoire* with Guillot and Tulou—did learn how to master the *Ringklappenflöte* (Dorus), and Boehm-flute (Dorus and Altès). It has not been possible to find detailed information answering such questions, so probably the learning of how to play on the new flute models was realized within formalized studies but without teachers, and thus being a process of self-teaching and *automaieutics* (Ljungar-Chapelon, 2008; 2012). As already discussed in section *6.9.5 Interpretation and translation: Madame Dacier* it could be imagined that the learning process regarding new flute models was a pragmatic transition of adapting functional elements from Traverso-playing to Multi-keyed conical flutes, and similarly adapt functional elements from Multi-keyed conical flutes to the *Ringklappenflöte* and later to the Boehm-flute. The successive changes regarding flute models includes that the flute in question—by virtue of its construction and elicits intrinsic possibilities—in a sense "plays itself" when the flautist embraces the new model with an open mind in combination with an activating of already present skills and mastery. This process can be likened with the maieutic method and Socrates' famous metaphor that the teacher with questions makes the asked person to discover an already present knowledge in their own mind. In the present context that would be that the flute shows the flautists how it wants to be played by the flautist. If so, maybe a reversed pragmatic transition of elements from Boehm-flute playing could be a possible path for today's flautists to encounter and embrace the Traverso in combination with an in-depth study of 18th Century Traverso methods, and not the least *Principes* and *Rudiments*.

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A further step aiming for a contextualization of French aesthetics regarding the Traverso around 1700 in France is an examination of how the powers of expression regarding the Traverso was described in French 18th Century in sources as texts on musical interpretation and performance, such as Bollioud de Mermet, Abbé Carbasus, and Denesle. Further the original repertoire in combination with high quality copies of originals of the three-piece Traverso, including a discussion regarding aesthetics and the Traverso, and questions relating to instrumental virtuosity. Finally, can texts which relates to performances of important Traverso-players such as René Pignon Descoteaux (*c.*1645-1728), Michel de La Barre (1675-1745), Michel Blavet (1700-1768), and Pierre Gabriel Buffardin (1693-1768) give important aspects of mentioned players. The repertoire suggested in *Principes* are *Suites en Duo et en Trio pour les flûtes et pour les violons* (1707) by Gautier de Marseille, and *Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue Œuvre IIa* (1708) by Hotteterre himself. The latter possibly distributed to private students as copies already in 1707. This kind of French Traverso music together with works by Michel de La Barre such as *Pieces pour la Flute Traversiere, avec la Basse-Continue Œuvre Quatrieme* (1703) and works by Pierre Danican Philidor (1681-1731) such as *Premier Œuvre Contenant III. Suittes a II. Flûtes traversieres Seules avec III. Autres Suittes Dessus et Basse, pour les Hautbois, Flûtes, Violons, &c.* (1717) fulfils criteria's set by Bollioud de Mermet, and thus represents Traverso music from the very end of the 17th Century and the first decades of the 18th Century. When Bollioud de Mermet criticized his contemporaries and took distance to ideals of the period around 1750 he gave examples on how a decline regarding *Bon Goût* could be found in instrumental music:

> L'on accoutume la main sur l'Instrument à des positions génantes, à des situations forcées, à des progressions épineuses, à des modes transposée […] (Bollioud de Mermet, 1746, 41)[1]

Considered that the fingerings for the Traverso when compared with fingerings for the Boehm-flute are relatively similar, and for a well-trained flautist playing the Boehm-flute the Traverso fingerings should not be an obstacle. As has been shown is the general embouchure rather similar on any kind of transverse flute and for a well-trained flautist playing the Boehm-flute it is also not an obstacle when being interested in the Traverso, and the same counts for playing position and articulation.

1. One gets used to the hand on the Instrument to awkward positions, forced situations, thorny progressions, transposed modes […] (Bollioud de Mermet, *De la Corruption du Goust dans la Musique Françoise*, 1746, 41)

When comparing with what a Boehm-flautists must learn today, practice, and develop regarding fingerings and unusual combinations studying and performing a solo works like *Cassandra's Dream Song* (1970) and *Unity Capsule* (1975) by British composer Brian Ferneyhough (1943) does the Traverso by far not represent equal difficulties from a technical point of view. Therefore, possibly is the real difference and difficulty to be found in *how* the aesthetics of the Traverso and its powers of expression was understood and applied by its virtuoso players, composers, and of course the listener and audience. When Castellengo et al. (1968; 1978) from a scientific and analytical approach brings forth that the differences between the Traverso and the Boehm-flute are smaller than their similarities this points on by nature given similarities between any kind of a transverse flute, but not necessarily on aesthetics connected to certain model of a specific model of a transverse flute.

As a matter of fact, can a gradual change of aesthetics regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute easily be identified in examined sources, a study of the different flute models, and the repertoire studied and performed. It should be remembered that an advanced virtuosity of the Traverso was developed and reaching its heights around the middle of the 18th Century. Examples are found in the output of earlier mentioned Pierre-Gabriel Buffardin and his *Concerto* for Traverso in e-minor, and a *Concerto* in f-minor attributed to Buffardin. The latter is indeed an example of extraordinary virtuosity, but it seems that authors like Bollioud de Mermet (1746) and D'Aquin de Chateau-Lyon (1752) were favouring an earlier aesthetics regarding *Bon Goût* and the Traverso, and preferred a melodic singing style of playing, tonal qualities and expression as found in the works by La Barre, Gaultier de Marseille and Hotteterre. Reasons could possibly have been that the Traverso in a sense is a more supple instrument regarding tonal flexibility compared with the Recorder, due to that the Traverso-player directly shapes the airstream with the lips and embouchure. When comparing virtuosity as developed in Italy during the first decades of the 18th Century in the style of writing for the Recorder as in the *Concerto* in c-minor (*c.*1730, RV 441) and the three concertos for Traverso *La Tempesta di Mare*, *La Notte* and *Il Gardellino* (*c.*1727, Opus X: 1-3) by Vivaldi it is clear that Vivaldi's writing for the Recorder in the beginning of the 18th Century were indeed virtuosic, whereas his writing for the Traverso far less virtuosic.

Focus for the present study is *Principes* and *Rudiments*, including musical expression and character of the three-piece Traverso whereby Hotteterre gives suggestions and clues in indirect terms. An example are explications and suggestions regarding posture in relation to breathing technique. In explicit terms we don't find many definitions in *Principes*, neither direct suggestion in relation to affects, emotional dimensions and musical interpretation. Therefore, has *L'Art de Preluder* (1719) and Hotteterre's compositions been an important source and discussed in the foregoing, connecting to words of character and expression. These clues suggest applying principles of the *Hermeneutical circle* as a method, and the idea that the internality mirrors the part, and the part mirrors the entirety as described by Gadamer (1960/1990). Further the necessity to establish a historical contextual horizon of understanding in the spirit of Schleiermacher (1838/1977).

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Considered that Hotteterre in *Principes* and *Rudiments* generally suggested not to play above E3—apart from being an obvious advice of pedagogical importance for a beginner learning the Traverso—this could possibly be interpreted as having roots in aesthetics connecting to *Bon Goût* as formulated around 1700. Because, when examining the repertoire by La Barre, Hotteterre and Philidor the highest register above E3 is almost never used. Further this, perhaps, echoes above mentioned Bollioud de Mermet (1746) disliking that the instruments are played in awkward positions, forced situations, thorny progressions, transposed modes. Because playing notes over E3 up to A3, maybe with the exception for F3, can with some practice easily and with suppleness be played on a good copy of a three-piece Traverso.

Tons Forcez Les Tons au dessus du *Mi*, sont des Tons forcez & ne peuvent entrer naturellement dans aucune Piece; cependant comme on ne laisse pas d'en glisser toûjours quelques uns dans le Prélude, je mettray icy ceux que j'ay pû découvrir. Au reste, il ne faut point s'obstiner à les vouloir trouver dans les commencements, c'est une peine que l'on doit s'épargner jusques à ce qu'on soit fort avancé. Il sera même à propos, pendant les premiers jours, de ne point passer le *Sol* [G2], qui est la Note dix-huitiéme, à moins que l'on ne se trouvât une grande facilité à emboucher. Alors on pourroit monter plus haut, mais avec discretion, autrement ce seroit se donner beaucoup de peine sans se procurer aucun avancement, parcequ'il faut absolument commencer par bien former les Tons bas, avant que de faire les autres. (III: 9)	The tones above **E-la-mi** are forc'd tones, and are seldom us'd however since sometimes they happen in Preludes, I shall shew you such as I cou'd discover, yet you must not Plague yourself with them at first, till you are further advanc'd, nor will it be necessary during the first days to ascend higher then **G-sol-re-ut** [**G2**], which is the 18th. Note, unless you find them very easy to fill, then you may ascend higher, but with discretion, otherwise you'll give yourself much trouble to little purpose, because you must fill your low Notes perfectly well, before you can fill the others. (III: 6-7)

Finding evidence for if the Renaissance Traverso perhaps could have influenced Traverso-playing in the second part of the 17th Century is problematic even thou there are sources like Jambe de Fer (1556/2005) and Marin Mersenne (1636/2003), not the least because these sources are far less detailed when compared with *Principes* and all later sources (Allain-Dupré, 2000). This lack of sources regarding the Renaissance Traverso makes preserved original instruments and faithfully made copies and perhaps together with elements from *Principes* like the chapters on posture, embouchure, and the technique turning the flute inwards and outwards for correcting intonation to potential tools for tracing playing-techniques of the Renaissance Traverso. Unfortunately, are for sure important knowledge regarding playing-techniques for the Renaissance Traverso probably lost forever. Still, it does not seem to be far-fetched that elements of playing-techniques and aesthetics from the Renaissance Traverso in the first half of the 17th in some ways have survived to the period of Philippe Rebillé *dit* Philbert (1639-*c.*1717) and René Pignon Descoteaux (*c.*1645-1728), which possibly could have had some influence on Hotteterre and *Principes*.

When examining potentially possible transitions of aesthetics within French flute traditions from the Traverso and onwards emerges a picture that there really has been transitions of aesthetics and playing-techniques, and especially so in the very early 19th Century having roots in Traverso-playing of the mid and late 18th Century to Multi-keyed conical flutes in the period when the *Conservatoire* was founded. This influence is documented in flute methods by Devienne (*c.*1794), Hugot & Wunderlich (1804), and Wunderlich (*c.*1812). It could maybe be supposed that *Principes* bridges the late 17th Century into the beginning of second half of the 18th Century, and that the method by Devienne (*c.*1794) bridges the second part of the 18th Century with reach up to the early 19th Century until Multi-keyed conical flutes became the standard professional flute. Maybe were Devienne having some influence even later when thinking about that Philippe Gaubert (1879-1941) made a revised version of Devienne's method for the Boehm-flute in 1908. The next bridging regards changes from Multi-keyed conical flutes to the *Ringklappenflöte* and especially the Boehm-flute which happened in 1860 when Dorus succeeded Tulou at the *Conservatoire*, and later was continued when Altès succeeded Dorus, and Taffanel succeeded Altés

The first French monumental method for the Boehm-flute is *Méthode pour Flûte Systeme Boehm Contenant la Théorie complète de la Musique Œuvre 31* (1880/1906) by Altès. It could be supposed that this method includes some elements and aesthetics from the late 18th Century, the beginning of the 19th Century and at the same time being a major work mirroring the period when the Boehm-flute was becoming the dominant flute in France after 1860. Altès included in his flute method music by Georg Friedrich Händel (1685-1759), Christoph Willibald Gluck (1714-1787), Joseph Haydn (1732-1809), and Ludwig van Beethoven adapted for two flutes. The next full-scale method for the Boehm-flute is *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert including several transcriptions of music by Johann Sebastian Bach such as solo works for the violin (BWV 1002 *Double Presto*, BWV 1003 *Allegro*, BWV 1004 *Giga*, BWV 1005 *Allegro Moderato*), two-part inventions for the harpsichord arranged for two flutes (BWV 772, 779, 781, 784), and a discussion on the *Adagio* in the b-minor Sonata BWV 1030. Further a discussion on the flute solo in the opera *Orphée et Euridice* (1774) by Gluck, piano pieces by Robert Schumann arranged for two flutes such as *L'Oiseau Prophète* from *Waldszenen* Op. 82 (1850-51), and *Les Elfes* and *Berceuse* from *Albumblätter* Op. 124 (1853).

In addition, two *Etudes* and two *Preludes* for the piano by Frederic Chopin arranged as virtuosic studies for flute (I G♭-major: *Etude* 11 in G♭-major from Op. 25, 1837; II F-major: *Prelude* 16 in F-major from Op. 28, 1839; III b♭-minor: *Prelude* in b♭-minor from Op. 28; IV a-minor: *Etude* in a-minor Op. 10, 1833). It should be noted that French methods for the Traverso, Multi-keyed conical flutes, and the *Ringklappenflöte* such as Corrette (1735 & 1773), Mahaut (1759), Devienne (*c.*1794), Hugot & Wunderlich (1804), Wunderlich (*c.*1812), Berbiguier (1818), Coche (1839), Tulou (1851), and Dorus (1845) included a vast repertoire of duets and musical examples that generally were taken from music contemporary to its author. Thus, when Altès (1880/1806), and Taffanel & Gaubert (1923/1958) added music in their flute methods by Bach, Handel, Gluck, and Haydn this represents a new interest in music of the 18th Century. Examined flute methods includes and introduces a musical heritage contemporary to their authors, and in methods like Altès (1880/1906) and Taffanel & Gaubert (1923/1958) is music from the 18th Century introduced and expanding musical expression. Perhaps it could be said that the 18th and 20th Century has one thing in common when it comes to flute playing, and that is that both Centuries were dominated by generally one type of flute, the 18th Century by the Traverso, and the 20th Century by the Boehm-flute. Whereas the 19th Century was a period of searching for new constructions in relation to homogeneity and evenness of sound colour, including facilitating playing in all keys with Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute which in their turn in many respects were governed by changes of musical expressions and aesthetics of the 19th Century.

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In Part II and Part III of the present study has parameters like for example posture, embouchure, articulation, tuning systems, and ornamentation been discussed having *Principes* and *Rudiments* as points of departure, for then being compared with sources from the 18th Century together with sources from the 19th up to the 21st Century. Thinking about transitions of aesthetics, musical expression, and playing-techniques is a perspective based on the distance in time between when pedagogical materials were published of interest. An example is that it was only 86 years between the publication of *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne for the Traverso and *Méthode pour Flûte Systeme Boehm Contenant la Théorie complète de la Musique. Œuvre 31* (1880) by Altès for the Boehm-flute. Another example, now in 2023 it is 100 years since *Méthode Complète de Flûte* (1923) for the Boehm-flute by Taffanel & Gaubert was published for the first time, and its *17 Grands Exercices Journaliers de Mécanisme* and especially its scale system covering all major and minor keys including modulations (EJ 4; see Ex. 27) belongs to the back-bone of today's teaching material world-wide. The practice-book *De la Sonorité: Art et Technique* (1934) by Moyse—today 89 years after its publication—is on an international level often used and understood as one of the very important practice-books for the development of sonority and nuances of the flute sound. Altogether these examples point in the direction that transitions on different levels and character most likely has been the case together with, of course, distinct changes of not the least aesthetic ideals. In the following will the attempt be made to make a short summarize of observations which possibly could imply some cases of transitions regarding aesthetics and basic elements of playing-techniques, as well as examples of definite changes and differences.

Posture and playing position

When playing any kind of transverse flute this includes by nature an asymmetrical playing position which is described in all examined sources (sections *6.1* & *7.2.1*), being something that simply is to be expected when comparing the Traverso with the Boehm-flute. The point when discussing transitions is thus how idiomatic playing position of the whole body, arms, hands, and fingers has been described in examined sources. These descriptions are similar and, in several cases, almost identical which points on that there have been influences in an interaction between different sources, and so far, it could be said that descriptions of posture and playing position have elements of transitions over time.

Embouchure

As with posture and playing position any kind of transverse flute includes by nature that the lips shape the airstream blown towards the sharp edge of the blowing-hole, and this can fundamentally only be done as described in *Principes* despite if it is a Traverso, Multi-keyed conical flutes, *Ringklappenflöte* or Boehm-flute (sections *6.2* & *7.3*, Appendixes XVII, XVIII). Thus, descriptions regarding the embouchure and their basic features are rather similar over time, and it could be said that this is an example of transition imposed by the nature of functionality.

Articulation

Regarding articulation is the base that the tongue has two functions a) open and stop the passage of the airstream between the opening between the lips, b) to shape the cavities in the mouth and throat. The former is made with a consonant, the latter with what could be described as unvoiced vowel-positions. To some extents are choices of especially vowels connected to the spoken tongue of the player, and so far, is it perhaps not surprising that the French flute traditions show a consistency. As has been shown in the foregoing are the consonants *T*, *D*, *K*, and *G* the most often used, and *U* and *E* the most common vowels over time. These phonemes work well for a French spoken person due to the manner these consonants and vowels are pronounced in French over time since the early 18th Century and *Principes*, and has repeatedly been recommended in French methods and practice books up to the present day (sections *6.4* & *7.4*). When comparing with for example German and British methods and practice-books suggesting alternative articulation syllables (especially regarding vowels) it seems to be clear that the field of articulation within French flute traditions over time regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* or Boehm-flute is an example of transitions.

Tuning systems and intonation

Regarding intonation and tuning systems does a comparison over time starting with *Principes* up to the present day show a variety of alternatives. As has been shown (section *6.6 On intonation and Temperaments*) and the fingering-charts as explained in *Principes* the intonation clearly indicates tuning systems based on Meantone temperaments dividing the given scale unequally compared with the *Equal 12 division* (12-ET), whereby the latter divides each semitone—as for example C-D♭ or enharmonically C-C#—always corresponding to 100 Cent. In the first half of the 19th Century are Meantone temperaments gradually replaced by tuning systems equalizing all intervals in the direction of *Equal 12 division* (12-ET) although with variations. The Boehm-flute was constructed for giving each note in the chromatic scales its own tone-hole in the first two octaves which clearly amplifies a tuning system towards *Equal 12 division* (12-ET). Still, as has been shown regarding the concept of *Champ de liberté* generally all notes on the Traverso, Multi-keyed conical flutes, *Ringklappenflöte,* and the Boehm-flute can with the embouchure and airstream be played about a quarter tone up and down from the centre of a given note. A change regarding intonation is that *Notes sensibles* were intonated flatter in the 18th Century compared with from around 1820 until the present day, when the leading notes systematically have a sharp intonation. A transition of tuning systems is present from *Principes* to the late 18th Century. The gradual change of temperaments in the direction of *Equal 12 division* (12-ET) in the very late 18th Century and within a flautistic context culminating with the construction of the Boehm-flute (1847) and its dominance in France from 1860 is an example of gradual transitions of changes regarding intonation and tuning system up to the present day.

Flattement–Tremblement flexible–Vibrato

Flattement is described as an essential tool and technique in relation to musical expression on the Traverso and was described in sources like *Principes*, *Rudiments*, Corrette (1735 & 1773), Mahaut (1759), and De Lusse (*c.*1761) describing *Tremblement flexible* which can be understood as a modified version of *Flattement*. In the revision of *Principes* by Bailleux (1765), as in *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne and all later methods including the Traverso such as Peraut, (*c.*1802), Hugo & Wunderlich (1804), and Wunderlich (1812) have no sections on *Flattement* or similar techniques. 19th Century methods for Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute have no chapters of any techniques explaining vibrato-like techniques. An early 20th Century example discussing vibrato is found in the method by Taffanel & Gaubert (1923/1958) but it does not include explanations of technical nature. A detailed description of vibrato and its use was made by Caratgé (1880/1956) in his revision of the method by Altès (1880) but without technical explanations on how to develop and practice vibrato. Flute teachers at the *Conservatoire* like Jean-Pierre Rampal (1978), Michel Debost (1996), Pierre-Yves Artaud (1996), and Philipp Bernold (2021) have discussed vibrato in several texts but with few technical explanations. From a technical point of view, it has been suggested that the vibrato could be practiced and developed through making rhythmical impulses with the diaphragm and breathing muscles influencing the airstream when playing long notes and scales. It is said that the best vibrato is imperceptible because it should be an organic and natural part of the expression because vibrato is the spontaneous consequence of expression in the moment of performance. The conclusion is that *Flattement*, *Tremblement flexible*, vibrato, and similar techniques can be understood and representing a transition over centuries, and in the present context includes the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, the Boehm-flute, although the most explicit technical explanations were given for the Traverso.

Le Beau son and character

When comparing definitions of *Le Beau Son* as found in methods (section *7.3*), it should be notated that definitions such as in the examples below covering the four flute models Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute in a period of two hundred years from the late 18th Century to the late 20th Century, formulated by flute teachers at the *Conservatoire* should be read with some prudence. Expressions such as *Pleins et sonores* (Devienne, *c.*1794, 6) describing the Traverso and its qualities in the late 18th Century is not necessarily aiming at the same qualities as when compared with *Une sonorité claire et ample* (Taffanel & Gaubert, 1923/1958, I: 54) whereby the latter regards the Boehm-flute of the late 19th and early 20th Century. This questioning should also be applied to aesthetics regarding the flute sound for Boehm-flute playing of the late 19th Century when compared with Boehm-flute playing now in the beginning of the 21st Century. Reasons for prudence are changes—sometimes radical—of aesthetics and styles of music, subtle changes of the meaning of words together with minor changes of the instrument. Still, criticism should preferable be balanced by potential effects of transitions over time, and especially so when the sources are relatively close in time and from the same environment as shown below with flute teachers at the *Conservatoire* (Fig. 114). It could be assumed that definitions regarding sound qualities on the Traverso and Multi-keyed conical flutes has important similarities because of the construction whereby, generally, these two models have a similar conical structure, and the main difference is that Multi-keyed conical flutes due to more keys potentially generates a more uniform sound than the Traverso with its fork fingered notes. Thus, it can be deduced that the most important differences regard the Traverso and the Boehm-flute.

Traverso
La beauté des sons graves consiste à être pleins et sonores; celles des Tons aigus à être doux et nets. Devienne (*c.*1794, 6)
Traverso & Multi-keyed conical flutes
[…] ses sons, ceux de la Flûte sont essentiellement doux et ne doivent être que cela; mais il y a un éclat, une force, une rondeur, en moeleux, relatifs à la possibilité de l'instrument, qu'il faut chercher à acquérir, parce que ce sont ces qualités indispensables qui constituent les beaux Sons. Hugot & Wunderlich (1804, 4)
Multi-keyed conical flutes
Qu'est-ce un beau son sur la flûte? C'est le son qui se rapproche le plus de la voix humaine: or, pour obtenir sur la flûte la plénitude, la sonorité et le moelleux de la voix. Tulou (1851, 2)
Ringklappenflöte
[…] d'un timbre sonore, agréable, toujours égal et juste. Coche (1839, 12)
Boehm-flute
[…] le son, (selon le genre des pièces qu'on interprète), soit tour à tour : *énergique, pathétique, plein d'ampleur, moelleux, velouté, suave*; enfin, il faut prendre garde que le timbre de l'instrument ne reste dans une uniformité qui pourrait le rendre *monotone*. Altès (1880, III: 286)
[…] une sonorité claire et ample. Taffanel & Gaubert (1923/1958, I: 54)
Rechercher un son très pur et très égal sans à-coup dans l'intensité. Artaud (1972/1989, 13)

Figure 114 Definitions of *Le Beau Son* as found in methods by flute teachers at the *Conservatoire* covering *c.*1794-1989. (Ljungar-Chapelon, 2008)

Sons filés and scales

Since the mid 18th Century has the practice of *Sons filés*—long notes played with *crescendo* and *diminuendo*—on all notes of the scale together with the practice of scales in different articulations been understood as the foundation when it comes to building a solid fundament regarding basically all aspects of flute playing as has been discussed in the foregoing (section *7.3*). Of course, scales can be organized in many ways, and a scale system which still today often is recommended are the scales found in *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert and the section *17 Grands Exercices Journaliers de Mécanisme,* and especially *Exercice 4* (EJ4). This well-known scale system starts in C-major followed by a short modulation to a-minor, followed by a short modulation to F-major etcetera through all 24 keys (Ex. 28).



Example 28 *Exercice Journaliers* 4 (EJ4) from *17 Grands Exercices Journaliers de Mécanisme* (1923/1958, 119) by Taffanel & Gaubert.

This wonderful arabesque-like scale system that Taffanel created, and especially so the beautiful minor scales, has forerunners showing precisely the same design regarding the major scales. The oldest model is found in *Méthode pour la flûte* by Drouët (1828) which Taffanel for sure had been familiar with (Ex. 29):



Example 29 Scale system from *Méthode pour la flûte* (1828, 151)by Drouët

Drouët's scales covers two octaves and a fifth compared with that Taffanel's scales covers two octaves, and is similar compared with Taffanel's design up to the double octave (C3). Finally, is an almost identical version found in *L'Art du Violon* by Baillot (1834) apart from that Baillot make a stop on the double octave, a short rest and then continues (Ex. 30):



Example 30 Scale system from *L'Art du Violon* (1834, 38) by Baillot.

The relation between Taffanel and *L'Art du Violon* by Baillot is noteworthy because in the *Preface* to *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert is explained that Taffanel had planned to write a flute method having *L'Art du Violon* by Baillot as its model. Unfortunately, Taffanel died in 1908 and never had the opportunity to realise his book. Taffanel's notes and outlines were split in two, Philippe Gaubert became in charge of writing the flute method what we now know as *Méthode Complète de Flûte* (1923/1958) by Taffanel & Gaubert. Louis Fleury who had been a student of Taffanel at the *Conservatoire* became in charge of the long article *La Flûte* in *Lavignac Encyclopédie de la Musique* (1925a). These examples regarding scales show a transition from the first decades of the 19th Century and the Multi-keyed conical flute to the Boehm-flute around 1900 to the present day.

Ornamentation

A sometimes perhaps overlooked aspect found in the methods for the Boehm-flute of the late 19th Century and early 20th Century are that they include sections which in detail explain ornamentation together with exercises and etudes for *Appogiatura, Trille, Brisé petite trille sans terminaison, Mordant, Gruppetti* (Altès 1880/1906); *Petite note, Ports de voix: Appoggiatures ou Petites Notes d'expression, Gruppetti, Trille ou Cadences, Trilles avec les petites Notes de Terminaison* (Gaubert-Devienne, 1908);

Trille, Mordant, Gruppetti, Petite note, Appogiature (Taffanel & Gaubert 1923/1958), which altogether show links to flute methods and methods for Multi-keyed conical flutes such as Hugot & Wunderlich (1804), Wunderlich (*c.*1812), Berbiguier (1818), and Tulou (1851), which in their turn have links to the second part of the 18th Century and methods for the Traverso by Mahaut (1759), De Lusse (*c.*1761), and Devienne (*c.*1794). Thus, it could be said that mentioned sections and explanations regarding ornamentation as found in Altès (1880/1906) and Taffanel & Gaubert (1923/1958) are examples of transitions regarding musical expression with roots in the past.

Phrasing: *Ponctuation musicale*

Punctuation and phrasing in speech and writing has been an essential model for musical expression since long (Mattheson (1713, 1737, 1739, 1740), Quantz (1752), Rousseau (1768/1772), Sulzer and Schultz (1779), Türk (1789), Beriot (1858), Boehm (1871), Harnoncourt (1985), and in consequence also within French flute traditions (Ljungar-Chapelon, 2015). Practical examples regarding flute playing can be traced back to the first part of the 18th Century and followed up until the present day, some examples are: Blavet (1732, *c.*1744), Atys (1760, 1763), Van der Hagen (1798), Hugot & Wunderlich (1804), Wunderlich (*c.*1812), Drouët (1827), Walckiers (1829), Coche (1839), Brettoniere (1840), Tulou (1851), Gatterman (1861), Altès 1880/1906/1956/1979), Devienne-Gaubert (1908), Taffanel & Gaubert (1923/1958), Rampal (1978), Debost (1996), and Bernold (2021). There are generally three parameters described when discussing and explaining the development and refinement of musical punctuation and phrasing: a) breathing, b) articulation, and c) flexibility of nuances. Regarding breathing is often the suggestion: *Breath as while speaking.* To breath as when speaking stands in clear opposition to: *Breath in as much as you can and play as long as possible on one breath!* sometimes suggested. Of course, it is a good exercise to develop skills regarding playing very long on one single breath. But the classical flute repertoire by J. S. Bach, C. P E. Bach, Devienne, W. A. Mozart, Franz Schubert, Carl Reinecke up to works by composer such as André Jolivet, Prokofiev, Messiaen, and Boulez rarely include phrases that asks for that the flautist should play for about 25-30 seconds in one breath. Regarding articulation this is often compared with diction and pronunciation in speech and for this has French flute traditions developed a variety of techniques using different articulation syllables that could be compared with advanced bowing-techniques on the violin or cello (sections *6.4* & *7.4*). Finally, is the technique *Sons filés* (section *7.3.5*) an essential tool when refining phrasing through subtle changes of sound colours, nuances, *crescendo* and *diminuendo*. To conclude is a finding that musical phrasing has been explained and discussed having spoken and written language as a strong reference within French flute traditions regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute, hence an example of transitions of techniques for musical expression.

Repertoire and aesthetics

A field whereby differences between the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute is very pronounced is each model's repertoire. It has already been mentioned that the French repertoire for the Traverso around 1700 and the first decades of the 18th Century was not characterized by a flamboyant virtuosity but rather by a singing melodic playing as described in sources like Carbasus (1739). Mahaut pointed in the *Introduction* to his method (1759) on that Traverso-playing in the middle of the 18th Century had become more virtuosic than in the period of La Barre and Hotteterre in the beginning of the 18th Century. Gradually ideals changed and Traverso-players like Blavet and Buffardin contributed to the development of virtuosity, and in the methods by De Lusse (*c.*1761) and Devienne (*c.*1794) we encounter a fully developed virtuosity, then in the 19th Century being adopted to Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute. The development of advanced instrumental skills should be understood as something in the air in connection with changes of musical expression. An instrument that early had developed virtuosic skills is the violin and not the least in Italy with personalities like Arcangelo Corelli (1653-1713) and Antonio Vivaldi (1678-1741).

It seems to be clear that the violin virtuoso with its powerful repertoire in combination with that the violin has a palette of expressions from the softest *cantabile* to a powerful heroic and dramatic expression from the early 18th Century to the present day has been a source of inspiration for most instruments, and so for flautists. Already in the method by Corrette (1735 & 1773) are examples and suggestions on how to adopt violin pieces for the Traverso as has been discussed in the foregoing (section *6.8 Accomodées au gout de la flute traversière: Transcribing violin music to the Traverso*), similar suggestions were given by Rameau (1741), and Hotteterre made publications based on transcriptions of Italian violin music.

In addition, the original repertoire for the Traverso with works like concertos by Blavet and Buffardin undoubtedly show influence from virtuosic violin writings. In the 19th and 20th Centuries up to the present day the influence on flautistic expression from the violin and its repertoire is easily found. Some well-known examples are that Theobald Boehm was as all his contemporaries immensely impressed by Niccolò Paganini (1782-1840; Schmid, 1981), and when working with the innovation and construction of the Boehm-flute Boehm wanted to make his flute able to perform passages and trills in all keys like a violin (Boehm, 1847). In the virtuosic compositions by flute virtuoso players like Tulou, Jules Auguste Demersseman (1833-1866), Giulio Briccialdi (1818-1881) and many more this search for virtuosity is immediately recognized. An even stronger influence are flute transcriptions from the late 19th Century up to today in the beginning of the 21st Century of violin concertos and sonatas by composers like Antonio Vivaldi, Ludwig van Beethoven, Felix Mendelssohn, Niccolò Paganini, Louis Spohr, César Franck, Gabriel Pierné, Felix Fauré, Johannes Brahms, Jean Sibelius, Richard Strauss, Aram Khachaturian and many more. This approaching to the violin repertoire has in many respects shaped today's aesthetics of the Boehm-flute. An example of changes regarding what is recognized as appropriate regarding expression and aesthetics of the Boehm-flute is the transcription of the *Sonate* in A-major for violin and piano (1866) by César Frank which was published for the first time around 1910 in Paris, and probably aiming for the same purpose as when Beethoven's symphonies were published for two pianists playing at home for pleasure. When comparing how Fleury (1925a) formulated aesthetics regarding the Boehm-flute—based on outlines by Taffanel—it seems unlikely that the *Sonate* in A by Franck had been performed in public by leading flute soloists when the transcription was published. The A-major *Sonate* by Franck became a standard work for flautists due to Jean-Pierre Rampal around 1960.

It should be mentioned that music for the Boehm-flute since *Sonatine pour flûte et piano* (1946) by Pierre Boulez, *Sequenza I* (1958) by Luciano Berio, *Cassandra's Dream Song* (1970) and *Unity Capsule* (1975) by Brian Ferneyhough, *Voice* (1971) by Toru Takemitsu, works by George Crumb, Karlheinz Stockhausen, and many more profoundly have enlarged flautistic aesthetics and means of expression far away from the early 20th Century, then not to mention aesthetics of the 18th Century. But there are examples of when an 18th Century technique "returns" which regards for example *Flattement*—when defined as a microtonal oscillation down and back to a given note—being the same musical expression of a micro-tonal trill as used in master works for the Boehm-flute like above mentioned *Cassandra's Dream Song* (1970) by Ferneyhough, and *Voice* (1971) by Takemitsu, just giving two important examples. That the same technique and expression has been integrated in flute music of the second part of the 20th Century can't be described as a deliberate transition of *Flattement* over centuries, but maybe as a curiosity and an example of an expression and technique being an inherent possibility on any transverse flute instrument (Ljungar-Chapelon, 2018). The conclusion is that aesthetics regarding musical expression, idiomatic writing, and repertoire for Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute historically show elements of transitions until the very early 20th Century, but since 1945 rather independent pathways regarding the Boehm-flute.

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Intuition is the final stage of processes regarding learning, development of thinking and skills, research, and much so regarding the Arts, artistic creation, and musical performance in the explosive unforeseeable moment of the instance. An example is when Marcel Proust in *À la Recherche du Temps perdu* and the novel *À l'ombre des jeunes filles en fleurs* (1918) described how the imaginary painter Elstir goes about when painting. When painting Elstir turns of a discursive stepwise process, reflection, and his experience's ability to intellectualize to instead let an intuitive creation in the instant of the moment take precedence:

> L'effort qu'Elstir faisait pour se dépouiller en présence de la réalité de toutes les notions de son intelligence était d'autant plus admirable que cet homme qui avant de peindre se faisait ignorant, oubliait tout par probité (car ce qu'on sait ne pas à soi), avait justement une intelligence exceptionnellement cultivée. (Proust, 1913-1927/1988, 196)[1]

Proust's Elstir has affinity with Rameau's descriptions in *Observations sur notre Instinct pour la Musique* (1754) regarding the very moment of musical performance, whereby the musician ideally should be carried away by the emotion that inspires the music, without thinking but relying on instinct and intuition:

1. The effort that Elstir made to discard himself in the presence of reality of all the notions of his intelligence was even more admirable because this man who before painting made himself unknowing, forgot everything out of truthfulness (for what you know you do not own), had an exceptionally cultivated intelligence. (Proust, *À la recherche du temps perdu,* 1913-1927/1988, 196)

> […] il faut, au contraire, se laisser entraîner par le sentiment qu'elle inspire, cette Musique, sans y penser, sans penser en un mot, & pour lors ce sentiment deviendra l'organe de notre jugement. Quant à la raison, elle est à présent entre les mains de tout le monde, nous venons de la tirer du propre sein de la Nature; nous avons prouvé, même, que l'Instinct nous la rappelle à tout moment, & dans nos actions, & dans nos discours […] (Rameau, 1754/2004, 62/259)[1]

The examples from Rameau and Proust describes how sophisticated artistic creation involve voluntary distancing from intellectual calculations, and instead rely on spontaneous and involuntary processes. In a sense is the attempt to study an instrument like the Traverso of the early 18th Century in France and its repertoire like searching for lost time, and rediscovering time to paraphrase Proust, closing the circle exploring *Les Traditions en Mouvement.*

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Thinking about musical performance, its preparation and practicing related to interpretation and its artistic dimensions (*mimesis* and *poiesis*) raise the question: What happens within the framework of an artistic performance in its unforeseeable, explosive instant of the moment? Plato/Socrates discussed closely related questions in the dialog *Ion* (Plato, 2001), while analysing the craft and performance by a rhapsode. A rhapsode was in Ancient Greece a professional singer reciting Homer's *Iliad* and *Odyssey*. Maybe we could "transcribe" the crafts and arts of a rhapsode to a musician of today as the past, and ask questions regarding *what* musicians *does* and *expresses* in the unforeseen moment and instant of performance? In the dialogue *Ion* (2001) Plato/Socrates described two elements, which connects to the above-mentioned questions:

1) The rhapsode is in the moment of performance influenced and "possessed" by the muses or gods and is consequently not fully aware of how the performance gets its final shape.
2) A discussion around the *magnetism* and how an artwork leads trough Homer, to the rhapsode, and finally to each person in the audience:

> […] there is a divinity moving you, just as in the stone which Euripides calls a magnet, but which is commonly known as the stone of Heraclea. This stone not only attracts iron rings, but it also imparts to them the same power of attracting other rings, and sometimes you will see a number of pieces of iron and rings suspended from one another so that they form a very long chain: and all of them derive the power of suspension from the original stone. Similarly, the Muse herself first makes some men inspired; then from these inspired people a chain is suspended as still other people receive the inspiration. For all good poets, epic as well as lyric, compose their beautiful poems not by art, but because they are inspired and possessed. (Plato, 2001, 10-11)

An observation based on Plato/Socrates is that the *Iliad* and *Odyssey*—the 'scores' for the rhapsode—go through a metamorphosis in the instant of performance, including elements of *improvisation* (Latin: *improvisus,* unforeseen), caused by the rhapsode being "magnetized" by Homer's text. These elements are transformed by the rhapsode, which in its turn makes the audience "magnetized" by the performance of Homer's text. This idea from Plato/Socrates has a relation to when Rameau (1754/2004) wrote that musicians should not think during the act of performing music but be "taken away" by the emotion which inspires the music: *don't think but let the emotion be your judgments compass* (1754/2004, 62/259). Such an opinion leads our thoughts back to Proust (1908; 1913-1927/1987) and aesthetics regarding *intuitive processes*, the emotional *involuntary memory*, and the famous metaphor of the *Madeleine cake.*

For German philosopher and philologue Friedrich Ast (1778-1841) did the essence of musical expression represent the art-form that high-lighted inner emotion caused by sounding music. He explained by saying that in the same manner that a sound is the result of when a sound body is set in motion like when a bell is struck by a hammer, and that the bell will remain silent until it will be struck and sound because the hammer made the metal of the bell vibrate. The same phenomenon counts for all musical instruments like for example the violin-string does not give any sound before the violinist makes a pizzicato or uses the bow.

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1. [...] on the contrary, we must let ourselves be carried away by the feeling it inspires, the Music, without thinking about it, without thinking in a word, & for then this feeling will become the organ of our judgment. As for reason, it is now in everyone's hands, we have just drawn it from Nature's own bosom; we have even proved that Instinct reminds us of it at all times, & in our actions, & in our speeches [...] (Rameau, *Observations sur notre instinct pour la musique*, 1754/2004, 62/259)

This is to be understood as a metaphor: sounding music makes the inner emotion of the listener vibrate like when the bell is struck by the hammer:

> Die Musik, als Kunst des inneren Sinnes oder der Empfindung und Leidenschaft […] stellt die Regungen des Inneren durch innerlich vernehmbare, d. h., hörbare Bewegungen und Schwingungen, also durch Töne, objektiv dar. Denn der Schall oder Klang ist der Ausdruck der erregten Kraft eines erschütterten Körpers, und so thut auch das erregte Gemüth, das Centrum und der Schwerpunkt der inneren Kraft im Menschen, seine Bewegungen durch des bewegliche, schwungreiche Element der Töne kund. (Ast, 1805, 90-91)[1]

From a perspective based on artistic activity and expression is the idea as expressed in *Über die Wahre Art das Klavier zu spielen* (1753) by Carl Philipp Emanuel Bach (1714-1788) significant because he asserts that the musician who perform a piece of music must be emotionally moved and absorbed by the music performed, for that the listener should be moved by the emotional expression of the music being performed:

> Indem ein Musickus nicht anders rühren kann, er sey dann selbst gerührt; so muß er notwendig sich selbst in alle Affekten setzen können, welche er bey seinen Zuhörern erregen will; er giebt ihnen seine Empfindungen zu verstehen und bewegt sie solchergestallt am besten zur Mit- Empfindung. (C. Ph. E. Bach, 1753, I: 122, § 13)[2]

The emotional impact of sounding music is thus the result of a metamorphosis of the inner feeling caused by sounding music, as explained by Ast, and when C. Ph. E. Bach described the paramount importance that the performing musician should be moved by the expression of the performed music in the moment of performance. That music through the performance moves the listeners inner emotions as described above could be compared with when tuning an instrument to another instrument. The process of tuning may well be interpretated as an image relating to *The Interpretation of Dreams* (I.56, 2nd Century AD/2020) by the Greek Artemidoros living in the 2nd Century AD, and that tuning one instrument to another can be understood as an image or emblem of the idea of harmony (Svenbro, 2015, 197). An example from the Antiquity is found on an Attic vase (*c.*470-420 BC, *Le Louvre*) depicting a young woman tuning a Kithara (Fig. 115; Svenbro, 2015).



Figure 115 A young woman tuning a Kithara hold with her left arm having a second Kithara on her right knee, detail on an Attic vase, *c.*470-420 BC (Le Louvre, Paris).

1. Music, the art of the inner sense of emotion and passion [...] represents the inner impulses through inwardly perceptible, i.e., audible movements and vibrations, through tones. Because the sound or timbre is the expression of the power of a vibrating body, and so does the mind, the centre and focus of the inner power in the human being, its Movements, emotions, and passions created by the vibrating element of tones. (Ast, *System der Kunstlehre oder Lehr- und Handbuch der Aesthetik*, 1805, 90-91)

2. In that a musician cannot move otherwise, he is himself moved; so, he must necessarily be able to put himself into all the affects that he wants to excite in his listeners; he gives them to understand his feelings and, in this way, moves them best to sympathize. (C. Ph. E. Bach, *Versuch über die wahre Art, das Clavier zu spielen*, 1753/1981, I: 122, § 13)

A final example of when vibrations from a played note can set another element in vibration is a sound exercise aiming for fullness of sound explained in *Physiologie des professions Le Violoniste. Art–Mécanisme–Hygiène* (1905) by Georges Demeny (1850-1917). When playing an A1 on for example a violin—or any other instrument including the voice—having a tuning fork pitched A1 mounted on a little resonance box the fulness of the violin sound makes the tuning fork resonate with a clear sound of A1 (Fig. 116):

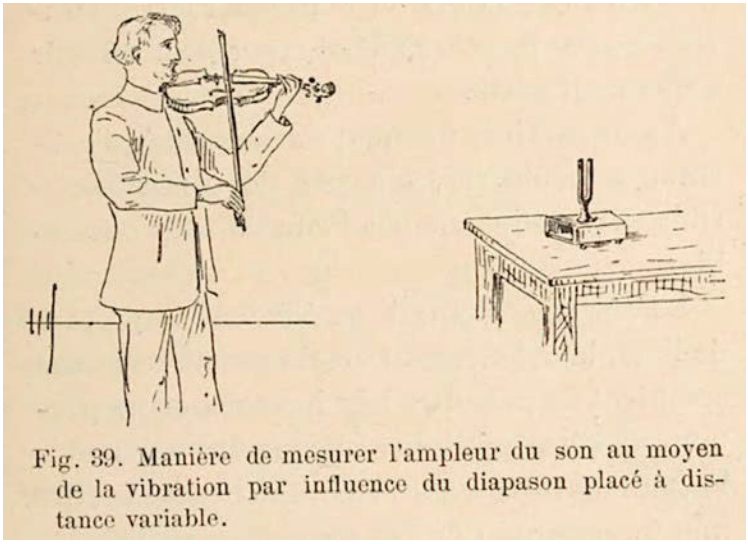


Fig. 39. Manière de mesurer l'ampleur du son au moyen de la vibration par influence du diapason placé à distance variable.

Figure 116 How to practice and develop fullness of sound—*Ampleur du Son*—with help of a tuning fork mounted on a little resonance box (Demeny, 1905, 85).

Although the above given examples—Rameau, Proust, Plato/Socrates, Ast, C. Ph. E. Bach, Artemidoros, Svenbro and Demeny—are not directedly connected to the early French 18th Century and Traverso-playing they have an impact that goes beyond time, and possibly shedding light on what Pierre-Louis D'Aquin de Chateau-Lyon wanted to explain when saying: *La Flûte, cet instrument si doux, si flatteur, si charmant, & qui parloit autrefois au cœur* […] (1752, 147).



LIVRE DE DIFFERENTS TROPHÉES REPRESENTANT L'AMOUR DES ARTS.
A Paris chez Mondhare Rue S. Jacques a l'Hotel Saumur

9 *Musique ancienne* in Paris, late 19th Century to 1925: Taffanel and Fleury

It stands out that there is a relationship between French late 18th Century methods for the Traverso and 19th Century methods for Multi-keyed conical flutes, *Ringklappenflöte*, as there is a connection between 19th Century methods for the two mentioned flute models and methods for the Boehm-flute. These mutual relations imply essential aspects of flute playing such as posture, embouchure, articulation, and aesthetics regarding expression and character of the instruments, which all together raises questions how informed leading French flautists playing the Boehm-flute in the late 19th Century and the first decades of the 20th Century were regarding earlier epochs flute-playing. Before trying to find some answers to this question in a flautistic context it is helpful for a moment to look at regular music life in Paris at the end of the 19th Century and if there were an interest in *Musique ancienne*.

One example is that associations were set up being devoted to the performance of music by mainly French composers of the 18th Century. In 1895 did the French pianist, composer, harpsichordist, and since 1887 teacher at the *Conservatoire* Louis Joseph Diémer (1843-1919) establish *Société des Instruments ancien*s, and in 1901 was the association *La Société de Concerts des Instruments anciennes* established by violinist, composer, and editor Henri Casadesus (1879-1947; Baumont, 2022). The latter association had the composer Camille Saint-Saëns connected to their ranks. The monumental edition of the *Œuvres complète* by Jean-Philippe Rameau was edited under the direction of Saint-Saëns and published by Durand in Paris, in the years 1895-1924. A brief summery as shown above indicates that there was indeed and interest to create platforms for performing and editing music of the 18th Century at the end of the 19th Century and beginning of the 20th Century in France.

When thinking about interest in *Musique ancienne* and looking for documents within a French context including the flute are two personalities noticeable: Paul Taffanel (1844-1908) and Louis Fleury (1878-1926). Articles like *The Flute and Flutists in the French Art of the Seventeenth and Eighteenth Centuries* (1923), *The Flute and its Powers of Expression* (1922), and *Music for two Flutes without Bass* (1925b) by Fleury gives important insights mirroring the reception of the Traverso, its repertoire and aesthetics at the end of the 19th Century and the beginning of the 20th Century. A key document in this context is the article *La Flûte* published in *Lavignac Encyclopédie de la Musique & Dictionnaire du Conservatoire* (1925a, 1483-1523). This long article is based on detailed outlines by Taffanel and edited by Fleury, covering the Renaissance Traverso to the Boehm-flute around 1900. When reading this article, it is striking how well informed Taffanel and Fleury have been.

It is noteworthy that in the above-mentioned article is described that Taffanel has made a detailed examination of a Traverso (Appendix XXV) from the collections of the music museum of the *Conservatoire* (today *Musée de la Musique*) in combination with the fingering-chart as found in *Principes*. The Traverso in question was made by the Parisian instrument maker Christophe Delusse (1729-1794) being active in Paris in the years 1783-1789 (Waterhouse, 1993). This Traverso seems to be the same instrument as the Traverso now having the inventory number E.1368 which became a part of the music museum at the *Conservatoire* in 1890. The Traverso is made of boxwood without rings, having a key made of brass, a blowing-hole being slightly elliptical, a pitch of A1=430/435 Hz, and possibly made around 1760 alternatively in the years 1783-1789. It is somewhat surprising that Taffanel used the fingering-chart from *Principes* and not for example fingerings as found in the method by Devienne (*c.*1794), which possible would have been a natural choice considered that the four-piece Traverso made by Christoph Delusse represents the later part of the 18th Century. In the fingering-chart reproduced in the article is the fingering for D3 absent and probably by mistake, F3 is not marked although there is a fingering for this note in *Principes*. Despite Taffanel's detailed exploring of the described Traverso his conclusions and findings are surprisingly critical:

> Il suffit de voir la tablature d'Hotteterre pour comprendre à quel point la flûte était imparfaite. L'emploi continuel des «fourches» rendait les gammes les plus simple excessivement compliquées. Quant à la justesse, elle était plus qu'approximative. On pouvait, il est vrai, corriger la justesse des notes par le moyen des lèvres, mais telle devait être la difficulté à vaincre, que des rares artistes devaient en être capables. (Fleury, 1925a, 1493)[1]

1. It is enough to look at Hotteterre's fingering-chart to understand how imperfect the flute was. The continual use of "forks" made the simplest scales excessively complicated. As for intonation, it was more than approximate. One could, it is true, correct the intonation by means of the lips, but such must have been the difficulty to overcome, that rare artists must have been capable of it. (Fleury in *Lavignac Encyclopédie de la Musique,* 1925a, 1493)

Thinking about that Taffanel made this examination of the Traverso, even thou with quite critical opinions, is still remarkable because the Traverso was around 1900 an instrument not in use within professional music life in France, which points on Taffanel's ambition to make a profound research regarding transverse flutes and French music life over centuries. Therefore, it is significant that when a new edition of *Versuch* (1752) by Quantz was edited in 1906 by German musicologist Dr. Arnold Schering (1877-1941) all chapters and sections discussing the Traverso from a technical point of view regarding playing position, embouchure, and articulation were cut out which sheds light on Taffanel's innovative approach to research the flautistic past:

> Der Zweck der Neuausgabe, Musikern, Musikfreunden und Musikhistorikern ein nützliches Lehr- und Orientierungsbuch zu bieten, legte hier und da Kürzungen und Zusammenziehungen des Originals nahe. Betroffen wurde davon namentlich der instrumentaltechnische Teil des Buches, der den praktischen Flötenunterricht (Hauptstück II-VI) einschließt. Er ist heute veraltet und unbrauchbar und konnte unbeschadet der wohlproportionierten Anlage des Buches fortgelassen werden. (Quantz, 1752/1906, VIII)[1]

Further examples of Taffanel's interest in French music of the 18th Century is his *Fantaisie sur Les Indes Galantes* (1877/2004) for flute and piano, based on melodies from the *Opéra-ballet Les Indes Galantes* (1735) by Rameau. In the *Exposition Universelle 1889* in Paris, Taffanel performed *Pièces en Concert* (1741) by Rameau in the setting flute, basse, and harpsichord (Blakeman, 2005). On this occasion Taffanel as usually played on the Boehm-flute, but according to the composer Julien Tiersot (1857-1936) who wrote about this performance Taffanel modified his playing to an aesthetic relating to earlier ideals and softened the flute sound:

> […] surtout les délicieuses *Pièces en Concert* de Rameau, pour clavecin, flûte et basse, où M. Taffanel, sur la même flûte dont sait faire à l'occasion un véritable instrument de bravoure, s'appliquait à adoucir les sons pour donner l'impression des flûtes douces d'autrefois […] (Tiersot, 1889, 10; for the complete quote see Appendix XXIV)[2]

Another example is from December 1891 and a recital organized by the association *Le Cercle Saint-Simon* founded in 1883 that used to have their arrangements in a residence at 215 Boulevard Saint-Germain in Paris where Taffanel again excelled with music by Rameau:

> Et cette démonstration était d'autant plus péremptoire que les exécutants étaient d'une égale supériorité et tiraient chacun le meilleur parti possible de leurs instruments respectifs: MM. Diémer, Van Waefelghem et Delsart, auxquels, auxquels s'était adjoint M. Taffanel avec sa flûte moderne. *Les Pièces en concert* de Rameau, pour clavecin, flûte et basse, sont vraiment de petites merveilles. (*Le Ménestrel*, 1891, December 13, 397; for the complete quote see Appendix XXIV)[3]

When Taffanel three years later was appointed teacher at the *Conservatoire* in 1894 he enlarged the repertoire, and introduced the Traverso Sonatas by J. S. Bach, and the flute Concertos by Mozart. A final example of Taffanel's interest in the 18th Century is the section on interpretation—*Du Style*—in *Méthode Complète de Flûte* (1923, II: 176-178/1958, II: 184-186) having noteworthy comments regarding the second movement in the *Sonata* in b-minor BWV 1030 for Traverso and obligato Harpsichord by J. S. Bach, and the famous flute solo in the Paris version of the opera *Orphée et Euridice* (1774) by Gluck. Taffanel's ideas altogether reveals ties to French aesthetics on musical interpretation of the 18th Century.

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Fleury in his turn wrote articles discussing music and aesthetics of the 18th Century up to music for the Boehm-flute such as *Syrinx ou La Flûte de Pan* (1913) by Claude Debussy, and *Pierrot Lunaire* Opus 21 (1912) by Arnold Schoenberg. As an editor Fleury published *Sonates Melées de Pieces Pour la Flûte Traversiere avec la Basse Œuvre* 2 (1732) by Blavet in a version for flute and piano in 1912.

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1. The purpose of this new edition is to offer musicians, music lovers and music historians a useful text, here and there abridgements and shortened compared with the original. Shortened sections particularly regards the instrumental part of the text, and practical considerations on flute teaching and learning (mainly Part II-VI). These sections are obsolete and unusable and could be omitted without prejudice to the text's all-over disposition. (Quantz, 1752/1906, Preface: VIII)
2. […] especially the delicious *Pieces en Concert* by Rameau [1741], for harpsichord, flute, and bass, where Mr. Taffanel, on the same flute [Boehm-flute] which can make a real instrument of bravery on occasion, applied himself to softening the sounds to give the impression of the softer flutes of the past […] (Tiersot, *Musiques pittoresques, promenades musicales à L'Exposition de 1889*, 10)
3. And this occasion was even more convincing in that the performers were of equal superiority, and each made the best possible use of their respective instruments: MM. Diémer, Van Waefelghem and Delsart, to whom Mr. Taffanel had joined with his modern flute. Rameau's *Pieces in concert*, for harpsichord, flute, and bass, are truly small marvels. (*Le Ménestrel*, 1891, December 13, 397)

Fleury was an active performer and the flautist playing *Syrinx ou La Flûte de Pan* for the first time on December 1, 1913, within the performances of the play *Psyché* (1913) by Gabriel Mourey (1865-1943) at the theatre of Louis Mors in Paris (Ljungar-Chapelon, 1991b; 1997; 1998), further he played *Pierrot Lunaire* (1912) in several ensembles including on a tour in Italy (1924) together with Schoenberg as the conductor. Several composers dedicated works to Fleury and an example is the *Sonatine* for flute and piano (1922) by Darius Milhaud.

The three articles mentioned above *The Flute and its Powers of Expression* (1922), *The Flute and Flutists in the French Art of the Seventeenth and Eighteenth Centuries* (1923), and *Music for two Flutes without Bass* (1925b) are of special interest in a context regarding the 18th Century. When Fleury wrote about Traverso music of the 18th Century the general impression is that his focus is the music and connected aesthetics, and that the Traverso as an instrument was of less interest for him. When reading mentioned articles, the impression is clearly that Fleury did research 18th Century sources and the output by earlier mentioned Gaultier de Marseille, Michel de La Barre, Jacques Hotteterre *Le Romain*, Michel Blavet, and François Devienne to mention the maybe most important of these sources. To put it short: Fleury was well informed! The article *The Flute and its Powers of Expression* (1922) starts with a retrospective of flute-playing of the 19th Century and a rather critical opinion regarding how flute virtuoso-players of the 19th Century despite their mastery of playing the flute has given the flute a bad reputation due to a virtuosic repertoire of variations based on popular operas and it's like:

> It would be true to say that the great virtuosos of the last century—men like Berbiguier, Tulou, Demersseman, Nicholson and Drouet—did more harm to their instrument, in spite of their undoubted mastery of it, than the clumsiest amateur could have done. As long as the flute was a true pastoral instrument, of tender pathos or graceful agility, the greatest composers—Handel, Bach, Haydn, Mozart and to some extent Beethoven—cared for it and wrote masterpieces for it. But the moment flautists tried to compete with violinists, giving themselves over to fireworks and the expression of hectic sentiment, people of good taste would have no more to do with it. (Fleury, *The Flute and its Powers of Expression*, 1922, 383-384)

In the section *The character of the flute* Fleury makes a characterisation of aesthetics and what the flute naturally express in three layers: *Melancholic sweetness*, *Pathos*, and *Wit and Gaiety* which is clearly under the influence of the 18th Century and the original repertoire for the Traverso (Fig. 117).

Character	Composer	Work	Flute model
Melancholic Sweetness	J. S. Bach (1685-1750)	*Siciliano* from Sonata Eb-major BWV 1031	Traverso
There is the same gentleness, the same melancholy, the same simplicity […] in these three, characteristic and peculiarly examples [Bach, Blavet, Stanley] of what we might call, in XVIIIth century phrase, music "de tendres plaints". […] he [Debussy] has a long-breathed phrase, he employs the lower octave, he indulges in no temperamental explosions, he confines himself to the severest and soberest expression of great mental suffering. (1922, 387-388)	Michel Blavet (1700-1768)	*Sicilienne* from Sonata IV in g-minor *Œuvre* 2 (1732)	Traverso
	John Stanley (1712-1786)	*Sicilienne* from Solo I in a-minor (1745)	Traverso
	Claude Debussy (1862-1918)	*Syrinx ou La Flûte de Pan* (1913)	Boehm-flute
Pathos	J. S. Bach	*Adagio* from Sonata b-minor BWV 1030	Traverso
Must we say that the expression of more intense feelings are beyond the powers of the flute? No; the flute can reach pathos too, but the instances are rare that I can think only of two in which it compassed the sublime. (1922, 389)	Ch. W. Gluck (1714-1787)	Flute solo from the opera *Orphée et Euridice* (Paris version 1774)	Traverso
Wit and Gaiety	J. S. Bach	*Allegro* from Sonata E-major BWV 1035	Traverso
The flute is, as anyone can see, a nimble instrument, ready to conquer any difficulty and entirely in its place in undertaking rapid and brilliant passages. […] It is inadmissible to ask of it anything like force or majestic pomp, but wit we may ask; and of witty sentiments there are plenty of examples. (1922, 390)	J. S. Bach	*Badinerie* from Suite b-minor BWV 1067	Traverso
	Leonardo Vinci (1690-1730)	*Allegro* from Sonata in D-major (1746)	Traverso
	W. A. Mozart (1756-1791)	*Minuet* from *Quartet* in A-major K. 298 (1786-1787)	Traverso
	Felix Mendelssohn (1809-1847)	Flute solo in *Scherzo* from a *Midsummer Night's Dream* (1826)	Multi-keyed conical flute
	Camille Saint-Saëns (1835-1921)	Flute solo in the opera *Ascanio* (1890)	Boehm-flute

Figure 117 Fleury's suggestions regarding characterisation and examples of works in which the flute naturally express *Melancholic sweetness*, *Pathos*, and *Wit and Gaiety* as described in *The Flute and its Powers of Expression* (1922).

Fleury is, of course, right that composers like for example Felix Mendelssohn, Robert Schumann and Johannes Brahms did not write anything for the flute apart from what can be found in these composers scores for the orchestra. Further does Fleury discuss transcriptions of violin music for the flute, and has a negative point of view based on that the flute—the Boehm-flute—when playing violin transcriptions of the 19th Century must make a display of a too dramatic expression which does not fit the natural character of the flute.

When giving examples of the three natural characters of expression which suits the Boehm-flute it is striking that out of twelve examples are nine from the 18th Century and written for the Traverso, one for Multi-keyed conical flutes, and two for the Boehm-flute. This is interesting because as has been shown above Taffanel understood the Traverso as: *Il suffit de voir la tablature d'Hotteterre pour comprendre à quel point la flûte était imparfaite* (1925a, 1493), and similarly Fleury does not give the impression of being interested in the Traverso as an instrument, but the more in aesthetics and ideals connected to the Traverso as formulated in the 18th Century. The impression is thus that Fleury, possibly under the influence of his former teacher Taffanel at the *Conservatoire*, dismissed an abuse of virtuosity for its own sake and became interested in the 18th Century and found sources pointing on lyrical and less flamboyant dimensions of flute-playing. Still, it is surprising that Fleury did not give further examples of how the Boehm-flute was employed by for example his contemporary Maurice Ravel (1875-1937) and in works like *Schéhérazade Trois Poèmes pour Chant et Orchestre* (1903) with its lyrical flute solo in the second song *La Flûte Enchantée*, and the ballet *Daphnis et Chloé* (1911) with its famous and expressive flute solo.

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One more example of an interest for earlier epochs of French flute playing is when Gaubert in 1908 made a revised edition of *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne now adapted for the Boehm-flute, with the title *Célèbre Méthode complète de flûte par Devienne* (1908). Gaubert followed the original closely regarding little duets, exercises, four duets by Devienne thus shaping a frame for a French classicistic aesthetic. Gaubert added many music examples by composers like Gluck, W. A Mozart, Grétry, Boccherini, Beethoven, Rossini, Bellini, Mendelssohn, and Chopin, but also French composers from the 19th Century like Adolphe Adam (1803-1856), Charles Gounod (1818-1893), Théodore Dubois (1837-1924), Benjamin Godard (1849-1895), Xavier Leroux (1863-1819), Émile Pessard (1843-1917), together with Gaubert's own compositions like *Chanson de Printemps* (1906) and *Divertissement Grec* (1908). Further Gaubert contributed with sections on flute technique, exercises, and studies which partly is a precursor of his editing of what in 1923 became the *Méthode Complète de Flûte* by Taffanel & Gaubert. Regarding Devienne's influential *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) there are several reeditions and revisions made throughout the 19th Century for Multi-keyed conical flutes and *Ringklappenflöte* such as Leplus (1835) Dorus (1845), and Camus (*c.*1850) mirroring the gradual change towards the Boehm-flute in France. It should be noted that in Gaubert's revision of 1908 are fingering-charts for the complete chromatic scale and trills for Multi-keyed conical flutes—*L'Ancienne Flûte*—which perhaps not exclusively is added as a historical reference but as a tool for flautists playing on this kind of flutes in the beginning of the 20th Century.

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The above shown interest in French 18th Century music and different flutes among personalities such as Altès, Taffanel, Fleury, and Gaubert together with that the 19th Century was a period of transition regarding different flute models, combined with striking similarities regarding suggestions and methods for developing playing position, embouchure, and articulation makes it reasonable to assume that elements of late 18th Century Traverso playing in France possible have ecchoed far up into the 19th Century. One essential reason for these influences are the gradual transitions of traditions and playing-techniques as taught at the *Conservatoire* starting with the Traverso (1795-1803), to Multi-keyed conical flutes (1803-1860), *Ringklappenflöte* (*c.*1831-1841), to the Boehm-flute taught from 1860 and onwards (Dorgeuille, 1983/1986). This process of transition was enforced because, as the example given above, a flautist like Altès when being a student at the *Conservatoire* was taught how to play Multi-keyed conical flutes by Tulou—that in his turn probably have had direct knowledge of playing skills regarding the Traverso—and that Altès first later as a professional flautist changed to play the Boehm-flute, possibly as an autodidact. A final example of transitions regarding musical expression, character, and aesthetics of the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute as found in dictionaries and works on instrumentation covering the period 1757-1925 is shown in Figure 118:

Traverso

[…] elle sera donc mieux placée dans les morceaux tendres & pathetiques, dans les accompagnemens, dans les petits airs & les brunettes […] Ancelet (1757, 27)

[…] un son doux (quoique fort) noble et moëlleux. Garsault (1761, 152)

Le son de la flûte allemande est tendre & triste. Il convient à la douleur & aux plaintes. Bethisy (1764, 60)

La beauté des tons graves consiste à être pleins & sonores; celles des tons aigus, à être doux & nets. *L'Encyclopédie Méthodique* (1785 & 1788, 111)

Multi-keyed conical flutes

La sonorité […] est douce dans le médium, assez perçante à l'aigu, très caractérisée au grave […] S'il s'agit par exemple, de donner à un chant triste un accent désolé, mais humble et résigné en même tems, les sons faibles du médium de la flûte, dans les tons *d'Ut* mineur et de *Ré* mineur surtout, produiront certainement la nuance nécessaire [...] Et la mélodie de Gluck est conçue de telle sorte que la flûte se prête à tous les mouvements inquiets de cette douleur éternelle […] (154); Les sons graves de la flûte sont peu ou mal employés par la plupart des compositeurs […] elles donnent la nuance adoucie d'une couleur sombre. Berlioz (1844, 157)

Ringklappenflöte

La sonorité […] est douce dans le médium, assez perçante à l'aigu, très caractérisée au grave […] S'il s'agit par exemple, de donner à un chant triste un accent désolé, mais humble et résigné en même tems, les sons faibles du médium de la flûte, dans les tons *d'Ut* mineur et de *Ré* mineur surtout, produiront certainement la nuance nécessaire. […] Et la mélodie de Gluck est conçue de telle sorte que la flûte se prête à tous les mouvements inquiets de cette douleur éternelle […] (154); Les sons graves de la flûte sont peu ou mal employés par la plupart des compositeurs […] elles donnent la nuance adoucie d'une couleur sombre. Berlioz (1844, 157)

Boehm-flute

Il en est résulté un retour à un style plus sobre. C'est, en effet, l'extrême sobriété du style que nous nous permettrons de préconiser. Il nous parait, qu'avec une technique solide et une sonorité riche et variée, l'exacte observance des désirs de l'auteur conduit à l'interprétation idéale, celle qui met l'instrument au service de la musique, et non pas la musique à celui du virtuose. Lavignac: Fleury (1925a, 1525)

His work [Reinecke: *Undine Sonata for flute & piano, op. 167,* 1883], is essentially graceful, charming, and flexible – with the exception of the finale, in which he demands of the flute a greater degree of passion than it is able to express […] (402); […] the delicate tones of the flute […] (403); […] the penetrating sweetness of the lover octave of the flute… [Debussy: *Sonate pour flûte, alto et harpe,* 1915]… (404). The real master of the flute prefers to seek variety, and the picturesque, and they write "leggiero". The criterion of success is the feeling of ease of the flautist […] the composer [Milhaud: *Sonatina for flute & piano,* 1922], brings in the gentle tone of the flute with a kind of soothing effect […] What Milhaud has so perfectly understood is the power of the flute to express emotions of tender melancholy (405). Fleury in *Cobbett's Cyclopaedic survey of chamber music* (1929)

Figure 118 Descriptions of musical expression, character and aesthetics of the Traverso, Multi-keyed conical flutes, *Ringklappenflöte*, and the Boehm-flute as found in dictionaries and works on instrumentation covering the period 1757-1925. (Ljungar-Chapelon, 2008)

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Thinking about the Traverso in a broader context over time it's like a curiosity that the very last public performance given by the earlier mentioned Danish flute virtuoso Joachim Andersen (1847-1909) was in Copenhagen, February 6 in 1898. On this occasion Andersen played movements from a flute Sonata written by the Traverso-playing King Fredrick the Great of Prussia (1712-1786) on a flute with one key, although with double-tone holes for G and G#, and tone-holes for F and B♭ for the thumbs! This instrument was made by the flute-maker Jean Daniel Holtzapffel (1770-1843), who lived and worked in Paris from 1812 and onwards (Friis, 2012).

FIN



10 References

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11 Appendixes

Appendix I
Air Nouveau that precedes the announcement of Hotteterre's *Principes de la Flute Traversiere ou Flute d'Allemagne* in the Parisian gazette *Mercure Galant* (April 1707, Tome IV: 269-271).

Appendix II
Chronology of French writings on music, dance, theatre, rhetoric, grammar, philology, philosophy, aesthetics, dictionaries, composers, methods for Musette, Singing, Basse de Viole, Traverso, Harpsichord, Violin, music theory, dance, and art in the period 1620-1800 covering the epoch of Jacques Hotteterre *Le Romain* (1674–1763). In addition are flautists like Quantz, Tromlitz, and Fürstenau, together with composers like J. S. Bach, C. Ph. E. Bach, Telemann, Corelli and Vivaldi integrated in the chronology.

Appendix III
The painting *A Pair of Shoes* (1886) by Vincent van Gogh (1853-1890) connecting to *Der Ursprung des Kunstwerkes* (1935-1936) by Martin Heidegger (1889-1976).

Appendix IV
The painting *Réunion de Musiciens* (*c.*1710) attributed to the French painter André Bouys (1656-1740).

Appendix V
Drawing in red chalk with a Traverso, Recorder, Oboe and Bassoon (*c.*1705), on the back of the drawing is the name Dupuis inscribed, who was a wind instrument maker being active in Paris (*c.*1692). This date comes from *Le Livre commode des adresses de Paris pour 1692* (1878) in which Dupuis is listed as *Maître pour le Jeu et pour la Fabrique des Instruments à Vent.*

Appendix VI
Theatrum instrumentorum (1620, Book II, Plate IX) by Michael Praetorius (1571-1621), and the engraving with the transverse flutes—Renaissance Traverso—to which Quantz referred (1752, I: §4).

Appendix VII
Comparison of fingerings for the three-piece Traverso and the Renaissance Traverso. Fingerings for the Traverso covering C#1-G3 are taken from *Principes*, fingerings for G#3 and A3 are not given by Hotteterre and hence taken from Mahaut (1759) which generally works on a Traverso Model-Hotteterre. Fingerings for Renaissance Traverso are taken from *The Renaissance Flute A Contomporary Guide* by Clark & Markwick (2020).

Appendix VIII
Comparison of standard fingering-charts for the three-piece Traverso and the chromatic scale C#1-G3 as found in *Principes*, Rippert (1725), the Dutch translation *Grund-beginsel over de Behandeling van der Dvars-Fluit* (1728b), *Rudiments*, Prelleur (1731), and *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe* (1738 & 1762) by Eisel being a shortened German translation of fragments from *Principes*.

Appendix IX
Maier, Joseph F. (1732). Fingering-chart for a three-piece Traverso with C-foot and two keys from *Museum Musicum. Theoretico-Practicum das ist: Neu-eröffneter Theoretsich- und Praktischer Musik-Saal.* Nürnberg: Maier.
Maier, Joseph F. (1741). *Neu-eröffneter Theoretsich- und Praktischer Musik-Saal.* Nürnberg: Cremer.

Appendix X
Examples of the posture of *Déhanchement—Contrapposto*: *Singer in The Modern Musick-Master* by Prelleur (1731), *Blue boy* (*c.*1770) by Thomas Gainsborough, and *David* (1501-1504) by Michelangelo.

Appendix XI
Rampal, Jean-Pierre. (1978). *La Flûte.* Paris: Denoël. *Playing position and embouchure.*

Appendix XII
Champ de liberté covering the complete chromatic scale D1-G3

Appendix XIII
Comparison of fourteen French fingering-charts for the for the three- and four piece Traverso and the chromatic scale C#1/Db1-D4, covering the period 1707 to 1895 as found in *Principes*, Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), and Balleron (1895), all published in Paris. A fingering-chart by Valentin Roeser (1777) is identical with Corrette (1735 & 1773), and an anonymous fingering-chart (*c.*1790) is identical with Mussard (1778).

Appendix XIV
Hotteterre, Jacques. (1708). *Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue. Œuvre II*: Paris J. B. Christophe Ballard. The movement *Echos* with marked nuances *Forte* and *Piano.*

Appendix XV
Écrits de Musiciens XVe-XVIIIe siècles (1912, 242-245) by the French musicologist Jacques-Gabriel Prod'homme (1871-1956), and the article about the Parisian Traverso virtuoso and composer Michel de La Barre (*c.*1675-1744).

Appendix XVI
Eisel, Johann Philipp. (1738, 81-87; 1762, 63-69). *Musicus Autodidacticus.* Erfurt: Johann Michael Funcken.

Appendix XVII
Descriptions regarding the lips and embouchure all in relation to the one-keyed Traverso as described in *Principes*, *Rudiments*, Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), *L'Encyclopédie Méthodique* (1785 & 1788), Devienne (*c.*1794), Peraut (*c.*1802), and Balleron (1895).

Appendix XVIII
Chart combining aspects regarding the opening between the lips, embouchure *Tonus* and activity of the lips, and the airstream based on *Principes* (1707), *Rudiments* (1729), Quantz (1752), Altès (1880/1906), and Hériché (1975).

Appendix XIX
The anonymous text for the Brunette *L'autre jour ma Cloris* and a free English translation of the same.

Appendix XX
Descriptions regarding the placement of the tip of the tongue and the articulation syllable **T** for single tonguing. Names marked with bold indicate flute teachers at the *Conservatoire* covering the period 1795-2021.

Appendix XXI
Comparison of twelve French fingering-charts regarding the use of the D#-key for the for the three- and four-piece Traverso and the chromatic scale D1-C4, as found in *Principes*, Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), and Balleron (1895), all published in Paris.

Appendix XXII
Comparison of fingerings for trills regarding the three- and four-piece Traverso and the chromatic scale C#1-A3, covering the period 1707 to *c.*1794 as found in *Principes*, Eisel (1738 & 1762), Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794).

Appendix XXIII
Comparison of fingerings for *Flattement* and *Battements* for the three- and four-piece Traverso and the chromatic scale D1-A3, covering the period 1707 to 1759 as found in *Principes*, *Rudiments*, Corrette (1735 & 1773), and Mahaut (1759).

Appendix XXIV
Documents regarding Paul Taffanel (1844-1908) performing music by Rameau in the *World Exhibition* in Paris 1889, and two recitals in December 1891 in Paris.

Appendix XXV
Section on the Traverso in the article *La Flûte* by Louis Fleury (1878-1926) in *Encyclopédie de la Musique et Dictionnaire du Conservatoire* (1925a, 1492)

Appendix XXVI
Impressions and ideas regarding Hotteterre, La Couture-Boussey, historical contexts, and Traverso-making by Alain Weemaels.

Appendix XXVII
Print after a drawing of *Pan's wedding with Flora* (*c.*1670) by Claude Lorrain (*c.*1604-1682), coloured *Mezzotinto* print (1775), Nr. 108 by R. Earlom in *Liber veritas* by Lorrain.

Appendix XXVIII
The complete text of *Syrinx ou l'Origine de la Flute Poeme. A Messieurs Naudot, Blavet, Lucas* (1739) by Denesle. At the end of the poem is a reference to a *Le Fluteur Automate de M. de Vaucanson* created by Jacques Vaucanson (1709-1782) a famous French inventor, and in the present context Denesle refers to his music automate from 1737, which was made as a shepherd—in full life size—playing a transverse flute and a drum.

Appendix XXIX
Portrait of Philippe Rebillé *dit* Philbert (1639-1717) as found in *Mercure de France* (June 1725, 1081-1085) describing his character and formidable skills as a flautist, singer, imitator, and gardener. At the end is a poem by Alexandre Lainez (*c.*1650-1710) portraying Philbert, shown as a facsimile from *Poësies de Lainez* (1753).

Appendix XXX
Three prints from *The Musical Entertainment* (1737-1739, London: Charles Corbett by George Bickham Jr. (*c.*1706-1771). Vol. I: nr. 31 (18th Century hand coloured version) and 100, Vol. II: nr. 67. (Private collection)

Appendix XXXI
Engraving of a lathe from *L'Art de tourner Ou De faire en perfection toutes sortes d'ouvrages au tour* (1701) by Charles Plumier (1646-1704). Three engravings by Robert Bénard (1731-1794) of an Instrument-maker workshop, a Lathe, and Tools for making wood-wind instruments from *L'Encyclopédie Méthodique: Art du faiseur d'instruments de Musique et Lutherie* (1785) by Diderot et d'Alembert. (Private collection)

Appendix XXXII
On harmonics for the Traverso (De Lusse (1751, *c.*1761, 1769, Bordet 1755), and the Boehm-flute (Mahillon (1882).

Appendix I

This is the *Air Nouveau* that precedes the announcement of Hotteterre's *Principes de la Flute Traversiere ou Flute d'Allemagne* in the Parisian gazette *Mercure Galant* (April 1707, Tome IV: 269-271). In the beginning of the announcement is the kinship between singing and Traverso-playing stressed with the words *Les Chansons & les Flutes ayant beaucoup de rapport ensemble, l'article qui suit se trouve bien placé.*

AIR NOUVEAU	
Bergers, ajustez vos Musettes; Voici le Printemps de retour, Le doux Zephir, par ses plaintes secretes, Aux naissantes Fleurettes, Exprime son amour; Et les Oyseaux par mille Chansonnettes, Repetent tour à tour, Bergers, ajustez vos Musettes, Voicy le Printemps de retour.	Shepherds, adjust your Musettes; Here comes the return of Spring, The sweet Zephyr, by its secret complaints, To the budding Fleurettes, Expresses its love; And the Birds by a thousand Songs, Repeat in turn, Shepherds, adjust your Musettes, Spring is back.



Appendix II

Chronology of French writings on music, dance, theatre, rhetoric, grammar, philology, philosophy, aesthetics, dictionaries, composers, methods for Musette, Singing, Basse de Viole, Traverso, Harpsichord, Violin, music theory, dance, and art in the period 1620-1800 covering the epoch of Jacques Hotteterre *Le Romain* (1674–1763). In addition are flautists like Quantz, Wendling, Tromlitz, and Fürstenau, together with composers like J. S. Bach, C. Ph. E. Bach, Telemann, Corelli, Vivaldi, Mozart, and Beethoven integrated in the chronology.

Decade	Authors, philosophers, translators, aesthetics, grammar, philology, poetry, rhetoric, dictionaries	Flautists	Selected list of publications	Composers, instruments, voice, dance, theatre, art, architecture
1600	**Madeleine de Scudery** (1607-1701) Femme de lettres, author			**Claude Lorrain** (1604-1682) Painter **Pierre Corneille** (1606-1684) Theatre
1610				**Louis Le Vau** (1612-1670) Architect, Versailles **André Le Notre** (1613-1700) Landscape architect, Versailles, Fontainebleau
1620	**Jean de La Fontaine** (1621-1695) Author, Member of the Académie Française **Marie de Sévigné** (1626-1696) Femme de lettres, author **Blaise Pascal** (1626-1662) Mathematician, inventor, philosophy, theology **Gérard de Cordemoy** (1626-1684) Historian, philosopher, lawyer **Charles Perrault** (1628-1703) Author, Member of the Académie Française			**Bénigne de Bacilly** (1621-1690) Singing and voice **Molière** (1622-1673) **Thomas Corneille** (1625-1709) Theatre **Louis Couperin** (*c.*1626-1661) Harpsichord, composer **Jean-Henri d'Anglebert** (1629-1691) Composer, harpsichord, organ
1630	**César de Rochefort** (1630-1691) Lawyer, author lexicography **François Le Gallois** (1633-1693) Author **Nicolas Boileau-Despréaux** (1636-1711) Author, poet, aesthetics, philosophy, upholding Classical ideals in literature		**Mersenne** *Harmonie universelle* (1636) **Corneille** *Le Cid* (1637)	**Nicolas Lebèque** (*c.*1631-1702) Composer, harpsichord, organ **Jean-Baptist Lully** (1632-1687) **Charles-Emanuel Borjon de Scellery** (1633-1691) Musette **Martin Hotteterre** (*c.*1635-1712) Maker of Traverso and other woodwind instruments in Paris Father to Jacques Hotteterre *Le Romain*

	King Louis XIV (1638-1715)	**Philippe Rebillé dit Philbert** (1639-1717) Traverso		**Philippe Quinault** (1635-1688) Poet, theatre, opera **Jean Racine** (1639-1699) Theatre **Roger de Piles** (1635-1709) Painter
1640	**Bernard Lamy** (1640-1715) Mathematician and author **Anne Le Fèvre Dacier** (1645-1720) Author, philology, translator, commentator, and editor of the Classics **Jean de La Bruyère** (1645-1696) Philosopher, author **François de Salignac de la Mothe-Fénelon** (1648-1717) Catholic archbishop, theologian, poet, author	**René Pignon Descoteaux** (*c.*1645-1728) Traverso Possibly the teacher for La Barre (1675-1745)	**Juigné-Broissinière** *Dictionnaire théologique, historique, poétique et cosmographique* (1643)	**Sainte-Colombe** (*c.*1640-*c.*1700) Basse de Viole, composer **Christophe Ballard** (1641-1715) Printer of music, editor **Gaultier de Marseille** (1642-1696) Composer **Marc-Antoine Charpentier** (1643-1704) **Jean Rousseau** (1644-1699) Basse de Viole **Jean-Jacques Rippert** (1645-1724) Maker of Traverso and woodwinds in Paris **Jules Hardouin-Mansart** (1646-1708) Architect, *Surintendant des Bâtiments du Roi*, Versailles **Charles Plumier** (1646-1704 Craftsman of the lathe and author
1650	**Étienne Dubois De Bretteville** (1650-1688) Theologian, rhetoric			**Arcangelo Corelli** (1653-1713) Composer, violin virtuoso **Sébastien de Brossard** (1655-1730) Music theorist, lexicographer, bibliophile **Marin Marais** (1656-1728) Basse de Viole, Composer **André Bouys** (1656-1740) Painter **Michel Richard Delalande** Composer (1657-1726)
1660	**Mathieu Marais** (1665-1737) Lawyer, editor, author		**Corneille** *Trois Discours sur le poème dramatique* (1660) **Moliere** *Tartuffe* (1664) **Moliere** *Le Misantrope* (1666) **Racine** *Andromaque* (1667/1668)	**André Campra** (1660-1744) **Robert de Vizée** (*c.*1660-*c.*1733) Guitar & Théorbe **Élisabeth Jacquet de La Guerre** (1665-1729) Composer, harpsichord

			Moliere *L'Avare* (1668) **Madame de Scudery** *La Promenade de Versailles* (1669) **La Fontaine** *Les Amours de Psyché et de Cupidon* (1669) **Racine** *Britannicus* (1669/1670)	**Michel Pignolet de Montéclair** (1667-1737) Composer, music theory **François Couperin** (1668-1733) Harpsichord, composer **Louis Marchand** (1669-1732) Organ, harpsichord
1670	**Antoine de La Motte** (1672-1731) Author, poet **Yves Marie André** (1675-1764) Philosopher, mathematician, author **Nicolas Ragot de Grandval** (1676-1753) Author, poetry **Nicolas Gedoyn** (1677-1744) Author, translator, Member of the Académie Française **Gabriel Girard** (1677-1748) Grammarian, Catholic priest	**Jacques Hotteterre *Le Romain*** (1674-1763) Traverso, composer **Michel de La Barre** (*c.*1675-1745) Traverso, composer Possibly a student of Descoteaux (*c.*1645-1728)	**Molière** *Le Bourgeois Gentilhomme* (1670) **Pascal** *Pensées* 1670 **Borjon de Scellery** *Traité de la Musette* (1672) **Lully** *Cadmus & Hermione Tragédie lyrique* (1673) **Moliere** *Le Malade imaginaire* (1673) **Boileau** *Oeuvres complètes de Boileau. Traité du sublime* (1674) **Corneille** *Surena* (1674) **Lebèque** *Les Pièces de Clavecin* (1676) **Racine** *Phèdre* (1677) **Lully** *Alceste* (1677) Descoteaux played Traverso in the orchestra **Bénigne de Bacilly** *L'Art de bien Chanter* (1679)	**Antoine Forqueray** (1672-1745) Basse de Viole, composer **Bernard Picard** (1673-1721) Artwork **Pierre Rameau** (1674-1748) Dance **Iohannes Hyacintus Rottenburgh** (1672-1765) Traverso maker **Jean-Jacques-Baptiste Anet** (1676-1755) Violinist, composer **Antonio Vivaldi** (1678-1741) Composer, violin virtuoso
1680		**Pierre Danican Philidor** (1681-1731) Traverso, composer	**Le Gallois** *Lettre de Mr le Gallois a Mademoiselle Regnault de Solier touchant la Musique* (1680) **Lully** *Triomphe de l'Amour* (1681) Rebillé played Traverso in the orchestra **Jean Rousseau** *Méthode Claire Certaine et Facile Pour apprendre à chanter la Musique* (1683) **Charpentier** *Pour un Reposoir* (1683) H.523 The work includes two *Flûte allemand* & *Basse de flûte* **Delalande** *Motets* & *Te Deum* (1684)	**Louis-Antoine Dornel** (1680-1757) Composer **Louis de Caix-d'Hervelois** (1680-1759) Composer **Pierre Danican Philidor** (1681-1731) Flautist, oboist, composer **Georg Philipp Telemann** (1681-1767) **Jean-Philippe Rameau** (1683-1764) **Johann Mattheson** (1681-1764) Composer, theorist, author **Antoine Watteau** (1684-1721) Painter

			Rochefort *Dictionnaire général des mots les plus usités de la langue française, avec les étymologies* (1684) **La Guerre** *Les Pièces de Clavecin* (1687) **Jean Rousseau** *Traité de la Viole* (1687) **Lebèque** *Second livre de Clavessin* (1687) **Charles Perrault** *Querelle des anciens et des modernes* January 27, 1687 **La Bryère** *Les Caractères* (1688) **Lamy** *La Rhétorique, ou L'Art de parler* (1688) **Bretteville** *L'Eloquence de la chaire et du barreau,selon les principes les plus solides de la Rhétorique sacrée et profance* (1689) **D'Anglebert** *Pièces de clavecin* (1689)	**Johann Sebastian Bach** (1685-1750) **Joseph Bodin de Boismortier** (1689-1755) Composer, flautist
	Charles-Louis De Secondat Montesquieu (1689-1755) Author, philosopher			
1690	**Jean-Baptiste-Louis Crevier** (1693-1765) Professorship in rhetoric **Francois-Marie Arouet Voltaire** (1694-1778) Author, philosopher	**Jean-Christophe Naudot** (*c.*1690-1762) Traverso, composer **Pierre-Gabriel Buffardin** (1693-1768) Traverso, composer Teacher for Quantz and Johann Jacob Bach (1682-1722) **Johann Joachim Quantz** (1697-1773) Traverso, composer	**Sainte-Colombe** *Pour la Basse.* Manuscript M.3 (*c.*1690) **Louis Couperin** *Bauyn Manuscript* (*c.*1690) **Marais** *Pieces en Trio Pour les Flutes, Violon, & Dessus de Viole* (1692) **Fénelon** *Les Aventures de Telemaque, fils d'Ulysse* (1699) **Roger de Piles** *Abregé de la vie des Peintres, Avec des reflexions sur leurs Ouvrages, Et un Traité du Peintre parfait, de la connoissance des Desseins, & de l'utilité des Estampes.* (1699)	**Nicolas Lancret** (1690-1745) Painter **Thomas Stanesby Jr** (1692-1754) Traverso maker **Johan Helmich Roman** (1694-1758) Composer **Jean-Marie Leclair** (1697-1764) Violinist, composer
1700		**Michel Blavet** (1700-1768) Traverso, composer Teacher for Rault **Jean-Daniel Braun** (17??-*c.*1740) Traverso, composer	**La Barre & Antoine de La Motte** Libretto for *Le Triomphe des Arts* (1700) music by La Barre **Jean Hotteterre** *Air serieux. J'Ecoûtois autrefois sous ces feulliages sombres* (1701) **Plumier** *L'Art de tourner Ou De faire en perfection toutes sortes d'ouvrages au tour* (1701) **Campra** *Tancréde Tragédie lyrique* (1702) **Marchand** *Livre Premier & Livre Second* for harpsichord (1702) **Ballard** *Brunettes ou petits Airs Tendres, avec les doubles et la Basse-Continue ; mêlées de Chansons à danser* (1703) **La Barre** *Œuvre Quatrieme* (1703) including suggestions on fingerings and interpretation for Traverso **Brossard** *Dictionnaire de Musique* (1703)	**Jean-Laurent Bethisy** (1702-1780) Composer, author **François Boucher** (1703-1770) Painter

			Ballard *Brunettes ou petits Airs Tendres, avec les doubles et la Basse-Continue ; mêlées de Chansons à danser* (1704) **Thomas Corneille** The comedy *L'Inconnu* (1704) **Anonymous** Drawing in red chalk with a Traverso (*c.*1705), on the drawing is the name Dupuis a wind instrument maker active in Paris (*c.*1692) **La Barre & Antoine de La Motte** *La Venetienne Comédie-Ballet* (1705) **Dacier** *Les Comedies de Terence* (1706) **Watteau** Drawing of a Traverso-player (*c.*1706) **Hotteterre** *Principes de la Flute Traversiere ou Flute D'Allemagne Œuvre I* (1707) **Picard** Engravings for Hotteterre's *Principes* (1707) **La Barre** *Troisieme Livre des Trios pour les Violons, Flutes, et Hautbois, mélez de Sonates pour la Flute Traversiere* (1707) **Gaultier de Marseille** *Suites en Duo et en Trio pour les flûtes et pour les violons* (1707) **Hotteterre** *Pieces pour la Flute Traversiere Œuvre II* (1708) including suggestions on ornamentation **Montéclair** *Méthode facile pour apprendre à jouer du violon avec un abrégé des principes de la Musique* (1711-1712)	**Peter Prelleur** (1705-*c.*1758) Composer, organist, editor **Michel Corrette** (1707-1795) Composer, editor of instrumental methods **Jacques de Vaucanson** (1709-1782) Inventor of music automats
	Louis Bollioud-Mermet (1709-1796) Author, musician			
1710			**Bouys** *Réunion de Musiciens* (*c.*1710) Painting **Dornel** *Suites pour La Flûte Traversiere* (1711) **Dacier** *Homère L'Iliade* (1711) **Ballard** *Brunettes ou petits Airs Tendres, avec les doubles et la Basse-Continue ; mêlées de Chansons à danser* (1711) **Dornel** *Suites pour la Flûte Traversiere avec la Basse* with the movements: *Prelude, L'aimé de M^r. de la Barre, Sarabande La Descosteaux, Sicilienne La Hotteterre* (1711) **Hotteterre** *Sonates en trio pour les flûtes traversières et a bec, violon, hautbois Œuvre III* (1712) **Hotteterre** *Première suitte de pièces suite de pièces à deux dessus, sans basse continue. Pour les flûtes-traversières, flûtes à bec, violes Œuvre IV* (1712) **Montéclair** *Cantates Pan et Sirinx. IV Cantate a Voix seule avec un dessous de Violon, de Hautbois, ou de Flute* (1713) **Dacier** *Des causes de la corruption du goust* (1714) **Mathieu Marais** *Journal et Mémoires* (1715-1737) **Hotteterre** *Premier Livre de Pieces Pour la Flûte-traversière Œuvre V* (1715)	**Jean-Baptiste-Antoine Bérard** (1710-1772) Singing and voice **Toussain Bordet** (*c.*1721-1799) Composer, editor of instrumental methods **Jean-Joseph Cassanéa de Mondonville** (1711-1772) Violinist and composer **Christoph Willibald von Gluck** (1714-1787) **Carl Philip Emanuel Bach** (1714-1788)
	Christian Ludwig von Hagedorn (1712-1780) Art-theoretician **Jean-Jacques Rousseau** (1712-1778) **Ancelet** (*c.*1712-*c.*1764) Author, *Mousquetaires* **Denis Diderot** (1713–1784) **Étienne Bonnot de Condillac** (1715-1780)	**Atys** (1715-1784) Traverso, composer Possibly the teacher for Hugot		

	Joseph-Antoine-Toussaint Dinouart (1716-1786) Rhetoric **Jean Le Rond D'Alembert** (1717-1783) Philosophy, music **Nicolas Beauzée** (1717-1789) Linguist, L'Encyclopédie de Diderot & D'Alembert **Denesle** Author (17??-1767)	**Antoine Mahaut** (1719-*c.*1785) Traverso, composer Friendship with Buffardin	**Crousaz** *Traité du Beau* (1715) **Dacier** *Homère L'Odyssée* (1716) **François Couperin** *L'Art de Toucher le Clavecin* (1716) **Hotteterre** *Deuxième suite de pièces à deux dessus pour les flûtes-traversières, flûtes à bec, violes, etc... avec une basse adjoutée et sans altération des dessus, laquelle on y pourra joindre pour le concert Œuvre VI* (1717) **Gedoyn** *L'Institution de L'Orateur Quintilien* (1718) **Hotteterre** *L'Art de Preluder Œuvre VII* (1719)	
1720	**Pierre-Louis D'Aquin de Chateau-Lyon** (1720-1796) Author **Louis Charpentier** (17??-17??) Author **Jean-François Marmontel** (1723-1799) Author, philosophy	**Charles De Lusse** (*c.*1720-*c.*1774) Traverso, composer **Johann Baptist Wendling** (1723-1797) Traverso, composer Principal flute in the Mannheim Orchestra, composer, and personal friend with W. A. Mozart **Johann George Tromlitz** (1725-1805) Traverso & Multi-keyed conical flutes, composer	**Montesquieu** *Lettres persanes* (1721) **Johann Sebastian Bach** *Brandenburgische Konzert V* BWV 1050 (1721) including solo Traverso **Hotteterre** *Sonates à deux dessus par le Sigr. Roberto Valentine, opera quinta. Accomodée à la flûte traversière par Mr. Hotteterre le Romain. et se peuvent exécuter sur les autres instrumens de dessus* (1721) **Hotteterre** *Airs et Brunettes a deux et trois dessus pour les Flutes Traversieres* (*c.*1721) **Hotteterre** *Troisième suite de pièces à deux dessus Œuvre VIII* (1722) **Hotteterre** *Pièces pour la muzette qui peuvent aussi se jouer sur la flûte, sur le haut-bois &... oeuvre posthume; plus une suitte de pièces paraccords par M. Hotteterre le Romain; en outre, la guerre, pièce de muzette laquelle n'a point été im-primée jusqu'à présent Avec des œuvre de Jean Hotteterre* (1722) **François Couperin** *Concerts Royaux Les Goûts-Réunis* (1722) **Hotteterre** *Sonates à deux dessus par le signor Francesco Torelio Recueillies et accomodées au goût de la flûte traversière par Mr Hotteterre le Romain Et se peuvent exécuter sur les autres instrumens de dessus* (1723) **Johann Sebastian Bach** *Partita für Flöte Solo* BWV 1013 (*c.*1724) **Madame de Sévigné** Posthumous edition of the letters by Madame de Sévigné by her granddaughter Pauline de Simiani (1725) **Pierre Rameau** *Le Maître à Danser* (1725) **Jean-Jacques Rippert** *Brunettes ou Petits Airs a II Dessus, a l'usage de ceux qui veulent apprendre a joüer de la Flûte Traversiere* (1725) including fingering-charts for Traverso **Jean-Philippe Rameau** *Nouveau Système de Musique Theorique* (1726) **Boismortier** *Six Concerts pour cinq flûtes* Op. 15 (1727) **Roman** *12 Sonate a Flauto Traverso, Violone e Cembalo* (1727) **Vivaldi** *La Tempesta di Mare, La Notte, Il Gardellino* Op. X: 1-3 Concertos for Traverso and orchestra (*c.*1727)	**Antoine Bailleux** (*c.*1720-*c.*1801) Violinist, editor **August Grenser** (1720-1807) Traverso maker **François-André Danican-Philidor** (1726-1795) Composer and chess-player **Jean-Georges Noverre** (1727-1810) Dance, author **Joseph Touchemoulin** (1727-1801) Composer

			Telemann *Zwölf Methodische Sonaten für Querflöte (Violine) und Basso Continuo* (1728) ***The Rudiments or Principles of the German flute*** (1729)	
1730	**Claude-Joseph Dorat** (1734-1780) Author	**Jean-Baptiste Hotteterre** (1732-1770) Traverso, composer, son of Hotteterre *Le Romain* **Félix Rault** (1736-*c.*1800) Traverso, composer Student of Blavet Teacher for Wunderlich and Devienne	**Prelleur** *Modern Musick-Master or The Universal Musician* (1731) **Hotteterre** *Pièces et sonates pour la flûte allemande: Le Rossignol, trio. Œuvre IX* (1731?) *LOST?* **Hotteterre** *Pièces et sonates pour la flûte allemande: Trio d'Albinony* (1731?) *LOST?* **Blavet** *Sonates Melées de Pieces Pour la Flûte Traversiere avec la Basse* (1732) including suggestions on breathing for Traverso **Telemann** *Douze Fantaisies pour flute traversierès sans Basse.* (*c.*1732) **Grandval** *Essai sur le bon Goût en Musique* (1732) **Voltaire** *Lettres philosophiques* (1734) **Corrette** *Méthode pour apprendre aisément à jour de la Flûte Traversière* (1735 &1773) **Montéclair** *Principes de Musique divisez en quatre parties* (1736) **Johann Sebastian Bach** *Sonata* in b-minor BWV 1030 for Traverso and obligato Harpsichord (*c.*1736) **Girard** *Synonymes François* (1736/1769) **Hotteterre** *Méthode pour la Musette Œuvre X* (1737) **Naudot** *Concertos for Traverso à sept parties* (1737) **Leclair** *Concerto for Traverso* Op VII : 3 (*c.*1737) **Mattheson** *Kern melodischer Wissenschaft* (1737) **Vaucanson** *Le Mécanisme du fluteur automate* (1738) **Mondonville** *Les Sons Harmoniques Sonatas à Violon Seul avec La Basse Continue. Œuvre IV* (*c.*1738) **Denesle** *L'Aristippe Moderne* (1738/1764) **Abbé Carbasus** *Lettre de Monsieur l'Abbé Carbasus, a Monsieur*** auteur du temple du goust Sur la Mode des Instruments de Musique* (1739) **Denesle** *Syrinx ou l'origine de la Flûte Poeme a Messieurs Naudot, Blavet, Lucas* (1739)	**Robert Bénard** (1731-1794) Engraver, artwork **Joseph Haydn** (1732-1809) **Jean Honoré Fragonard** (1732-1806) Painter **Jean-Benjamin de La Borde** (1734-1794) Composer, historian **François Joseph Gossec** (1734-1829) Composer **Louis-Joseph Francœur** (1738-1804) Violinist, composer, administration at the Opera in Paris
1740			**Buffardin** *Concerto for Traverso in e-minor* (*c.*1740) **Le Blanc** *Défense de la Basse de Viole* (1740) **Blavet** *Concerto* for Traverso in a minor (*c.*1740) **Corelli** Anonymous French transcription *Ier. Partie du Cinquième Œuvre de Corelli, Ajustée à la Flûte Traversiere avec la Basse* (Opus V, 1700) (*c.*1740)	**Hubert Le Blanc** Writings on Basse de Viole and Blavet Active 1740

			Braun *Sonate de Mr Braun a Flute Traversiere et Basse.Suivie de differentes Pieces sans Basse composée expres pourformer l'embouchure et accoutumer la main aux dificultes* (1740) **Jean-Philippe Rameau** *Pieces de Clavecin en Concerts, avec un Violon ou une Flute, et une Viole ou un deuxieme Violon* (1741) **Boismortier** *Six sonates pour flûte* Op. 42 (1742) Dedicated to Blavet **Buffardin** *Concerto for Traverso in f-minor* (*c.*1742) attributed to Buffardin **D'Alembert** *Traité de dynamique* (1743) **Blavet** *Trois Recueils pour deux flûtes* (1744) including suggestions about breathing and articulation **De Mermet** *De la Corruption du Goust dans la Musique Françoise* (1746) **Simpson** *The complete tutor for the German flute,containing the best and easiest instructions for learners to obtain a proficiency..* (*c.*1746) **C. Ph. E. Bach** *Sonata per il Flauto traverso solo senza Basso* in a-minor Wq.132 (*c.*1747)	**André Ernest Modeste Grétry** (1741-1813) Composer, auteur
1750		**Johann Georg Wunderlich** (1755-1819) Traverso, Multi-keyed conical flutes, composer Student of Rault **Teacher at the *Conservatoire* 1803-1816** Teacher for Tulou at the ***Conservatoire***	**Buffardin** *Sonata a Violino, Flauto et Basso* (*c.*1750) **De Lusse** *Six Sonates pour la Flûte traversière avec une Tablature des Sons Harmoniques Œuvre I* (1751) **Diderot** *Encyclopédie ou Dictionnaire raisonné des sciences, des artset des métiers* (1751–1765) **Corrette** *Le Maitre de Clavecin Pour l'Accompagnement* (1752) **Jean-Philippe Rameau** *Réflexions de M. Rameau sur la manière de former la voix, & d'apprendre la Musique* (1752) **D'Alembert** *Eléments de Musique, Théorique et Pratique, suivant les Principes de M. Rameau* (1752) **Quantz** *Essai d'une Methode pour Apprendre à jouer de la Flute Traversiere* (1752) **D'Aquin de Chateau-Lyon** *Letters sur les Homes Celebres, Dans les Sciences, la Littèrature & les Beaux Arts, sous le Regne de Louis XV* (1752) **C. Ph. E. Bach** *Versuch über die wahre Art, das Clavier zu spielen* (1753) **Jean-Philippe Rameau** *Observations sur notre instinct pour la musique* (1754) **Condillac** *Traité des sensations* (1754) **Bérard** *L'Art du Chant* (1755) **Bordet** *Méthode Raisonnée Pour Apprendre la Musique d'une façon plus claire et plus précise.* (1755) including fingering-charts for Traverso and harmoniques **Blanchet** *L'Art ou les Principes Philosophiques du Chant* (1756) **Ancelet** *Observations sur la musique,les musiciens, et les instrumens* (1757)	**Wolfgang Amadeus Mozart** (1756-1791) **Bernardo Mengozzi** (1756-1800) Singer **Teacher at the *Conservatoire* 1795-1800**

		François Devienne (1759-1803) Traverso, composer Student of Rault **Teacher at the *Conservatoire* 1795-1803**	**Atys** *Nouvelle méthode courte et facile pour apprendre à jouer de la flûte traversière avec des préludes Traverso* (1758) **Mahaut** *Nouvelle Methode pour Aprendre en peu tems a Joüer de la Flute Traversiere* (1759) **Voltaire** *Candide, ou l'optimiste* (1759)	
1760		**Antoine Hugot** (1761-1803) Traverso, Multi-keyed conical flutes, composer **Teacher at the *Conservatoire* 1795-1803**	**Jean-Philippe Rameau** *Code de Musique Pratique* (1760) **Atys** *Six Sonates en Duo Avec des Signes pour diminuer et augmenter les sons par degrees, dans les endroits neccessaires Œuvre IV* (1760) **De Lusse** *L'Art de la Flûte Traversiere Including a fingering-chart for quarter-tones* (*c.*1761) **Dinouart** *L'Eloquence du corps ou l'Action du Prédicateur* (1761) **Hagedorn** *Betrachtungen über die Mahlerey* (1762) **J. J. Rousseau** *Émile, ou de l'Éducation* (1762) **J. J. Rousseau** *Du Contrat social* (1762) **Atys** *Clef facile et methodique, pour apprendre en peu de tems à battre la lesure, a distinguer les modulations, à préluder, et à phraser la musique par le moyen de la ponctuation grammaticale et typhographique. Œuvre V* (1763) **Marmontel** *Poetique Françoise* (1763) **Bethisy** *Exposition de la Theorie et dela Pratique de la Musique* (1764) **Voltaire** *Dictionnaire philosophique portatif* (1764) **Bailleux-Hotteterre** *Méthode pour apprendre a joueren très peut de tems de la Flûte traversiere* (1765) **Crevier** *Rhétorique Françoise* (1765/1767) **Dorat** *La Déclamation théâtrale, poëme didactique en quatre chants* (1767) **Charpentier** *Causes de la Decadence du Gout sur le Theatre* (1768) **J. J. Rousseau** *Dictionnaire de Musique* (1768/1772)	**Étienne Méhul** (1765-1817) Composer **Rodolphe Kreutzer** (1766-1831) Violinist **Teacher at the *Conservatoire* 1795-1826**
1770		**Georg Bayr** (1773-1833) Austrian flautist, composer who wrote a method for Multiphonics in 1831 Traverso, Multikeyed conical flutes	**Diderot** *Paradoxe sur le Comédien* (1770) **Francœur** *Diapason général de tous les instrumens à vent avec des observations sur chachun d'eux auquel on a joint un projet nouveau pour simplifier la manière actuellede copier* (1772-1785) **J. J. Rousseau** *Le Printems de Vivaldi arrangé pour une Flute sans accompagnement* (1775) **Mussard** *Nouveau principes pour apprendre a jouer de la flûtte traversiere* (1778 **Mozart** *Concerto for Traverso and orchestra in G-major* K. 313 (285c) (1778)	**Ludwig van Beethoven** (1770-1827) **Pierre Baillot** (1771-1842) Violinist **Teacher at the *Conservatoire* 1795-1842** **François-Adrien Boieldieu** (1775-1834) Composer **Alexis de Garaudé** (1779-1852) Singer and composer **Teacher at the *Conservatoire* 1816-1841**

1780		**Benoit Tranquille Berbiguier** (1782-1838) Traverso, Multi-keyed conical flutes, composer **Jean-Louis Tulou** (1786-1865) Traverso, Multi-keyed conical flutes, composer Student of Wunderlich 1796-1801 at the ***Conservatoire*** **Teacher at the *Conservatoire* 1829-1859** **Joseph Guillou** (1787-1853) Traverso, Multi-keyed conical flutes, composer Student of Devienne and Wunderlich 1797-1803 at the ***Conservatoire*** **Teacher at the *Conservatoire* 1819-1829**	**La Borde** *Essai sur la Musique Ancienne et Modern* (1780) **Joseph Lafite** *Airs Variés pour une Flûte* (1782) including suggestions on articulation for Traverso **Voltaire** *Traité de métasphysique* (posth. 1784-1789) **Devienne** *Trois Sonates pour le Clavecin ou le Piano-forte avec accompagnement de Flûte oblige* (1785) ***L'Encyclopédie Méthodique*** (1785) **Bénard** Engravings of an instrument-maker workshop, a lathe, and tools for making wood-wind instruments for *L'Encyclopédie Méthodique* (1785) **Grétry** *Mémoires ou Essai de la Musique* (1789)	**Daniel Auber** (1782-1871) Composer **Director of the *Conservatoire* 1842-1871** **Beginning of the *French Revolution*** (1789)
1790		**Anton B. Fürstenau** (1792-1852) Multi-keyed conical flutes, composer **Louis Drouët** (1792-1873) Multi-keyed conical flutes, composer **Eugéne Walckiers** (1793-1866) Multi-keyed conical flutes Private lessons for Tulou, composer **Theobald Boehm** (1794-1881) Inventor of the *Ringklappenflöte* and Boehm-flute (*Cylinderflöte*), composer **Paul-Hippolyte Camus** (1796-1870) Multi-keyed conical flutes, *Ringklappenflöte,* composer Student of Wunderlich at the ***Conservatoire***	**Tromlitz** *Ausführlicher und Grundlicher Unterricht die Flöte zu Spielen* (1791) Traverso, Multi-keyed conical flutes **Devienne** *Nouvelle Méthode Théorique et Pratique pour la flûte* (*c.*1794) Traverso **Devienne** *Concerto No VII* in e-minor for Traverso and orchestra (*c.*1795) **Rault** Trois Sonates pour la Flûte avec accompagnement de Basse (*c.*1797)	**Foundation of the *Conservatoire* in Paris** (1795) **Fromental Halévy** (1799-1862) Composer **Teacher of composition at the *Conservatoire* 1822-1854**
1800			**Peraut** *Méthode pour la flûte* (posth. *c.*1802) Traverso **Hugot & Wunderlich** *Méthode de Flûte* (1804) Traverso & Multi-keyed conical flutes **Mengozzi** *Méthode de Chant du Conservatoire de Musique* (posth. 1804)	**Hector Berlioz** (1803-1869)

		Victor Coche (1806-1881) Multi-keyed conical flutes, *Ringklappenflöte*, composer Student of Tulou at the ***Conservatoire*** **Teacher of a preparation class for flute at the *Conservatoire* 1831-1841** **Louis Dorus** (1812-1896) Multi-keyed conical flutes, *Ringklappenflöte,* Boehm-flute, composer Student of **Guillou** at the ***Conservatoire*** **Teacher at the *Conservatoire* 1860-1868** **Henri Altès** (1826-1895) Multi-keyed conical flutes, Boehm-flute, composer Student of Tulou at the ***Conservatoire*** **Teacher at the *Conservatoire* 1869-1893** **Paul Taffanel** (1844-1908) Boehm-flute, composer Student of Dorus at the ***Conservatoire*** **Teacher at the *Conservatoire* 1893-1908**	**Wunderlich** *Principes Elémentaires et Gradués pour la Flûte* (*c.*1812) Traverso & Multi-keyed conical flutes **Berbiguier** *Nouvelle Méthode pour la Flûte* (*c.*1818) Multi-keyed conical flutes **Walckiers** *Méthode de Flûte, opus 30* (1829) Multi-keyed conical flutes **Bayr** *Erster Theil der Schule für Doppeltöne auf der Flöte* (1831) Multi-keyed conical flutes **Halévy** *Leçons de lecture musicale: méthode complète de solfège* (1859)	

Appendix III

The painting *A Pair of Shoes* (1886) by Vincent van Gogh (1853-1890) connecting to *Der Ursprung des Kunstwerkes* (1935-1936) by Martin Heidegger (1889-1976).

A Pair of Shoes, 1886 by Vincent Van Gogh



Courtesy of www.VincentVanGogh.org

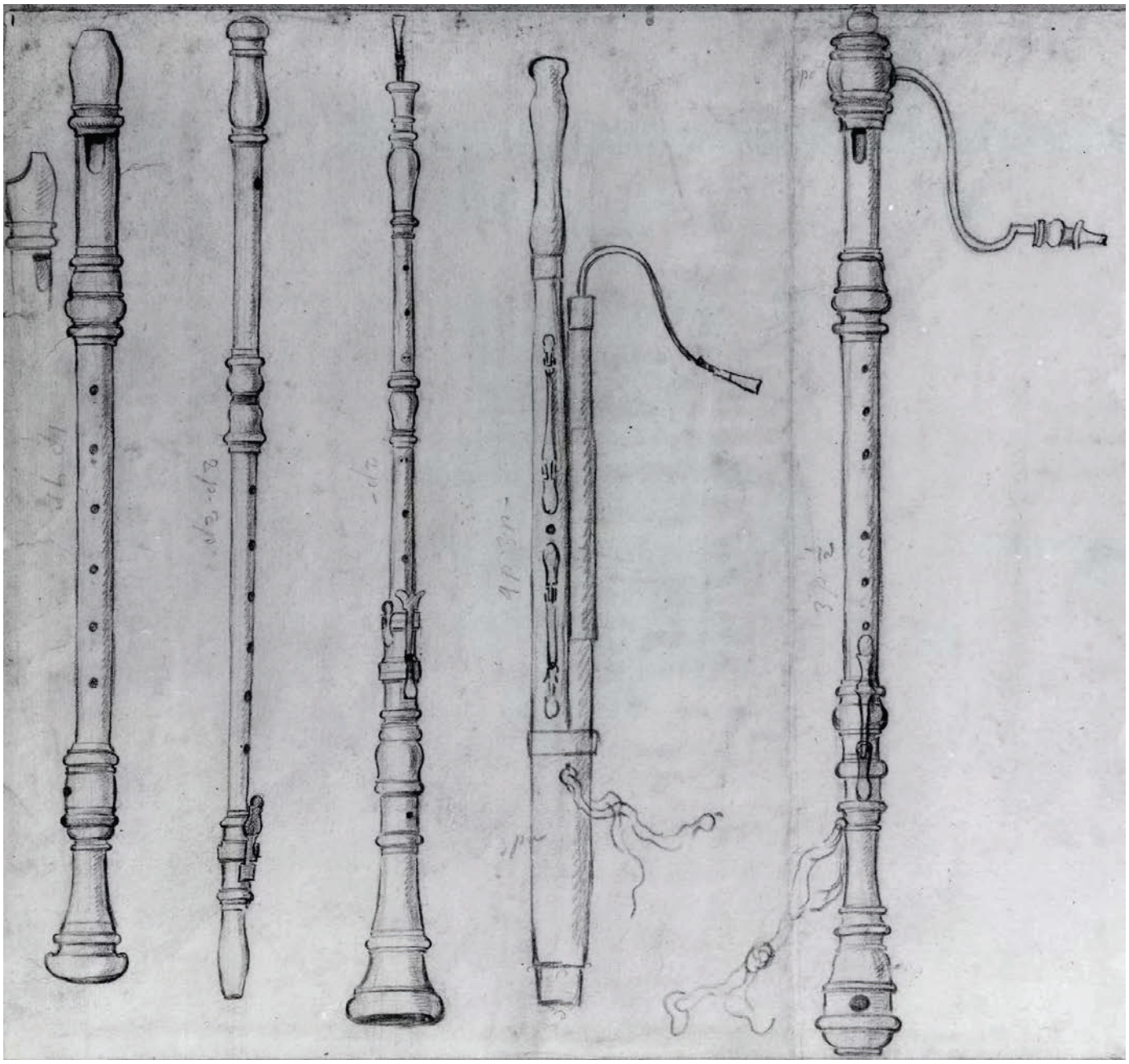
Appendix IV

The painting *Réunion de Musiciens* (*c.*1710) attributed to the French painter André Bouys (1656-1740). *Musée des Beaux-Arts de Dijon*, France.



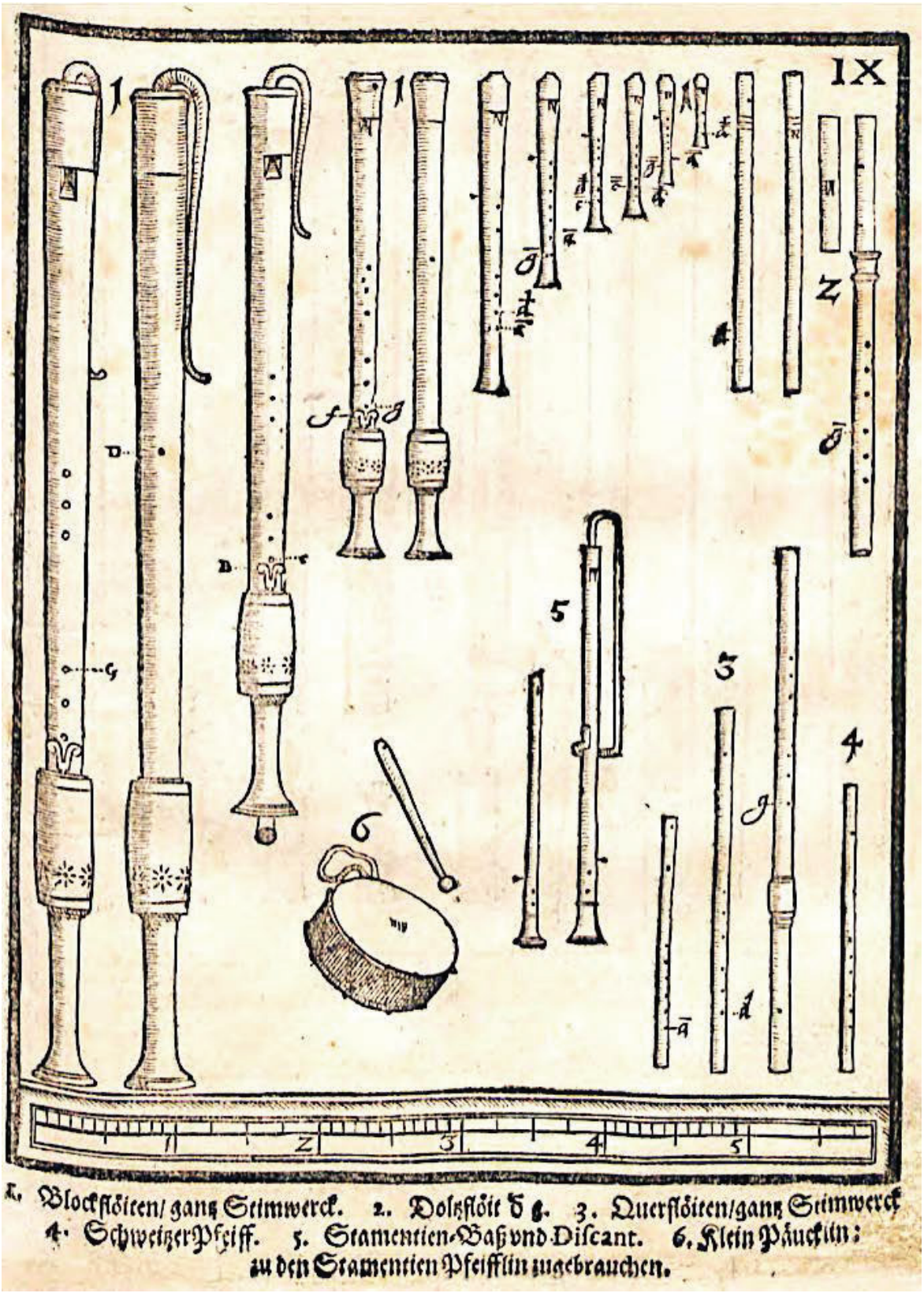
Appendix V

Drawing in red chalk with a Traverso, Recorder, Oboe and Bassoon (*c.*1705). On the back of the drawing is the name Dupuis inscribed, who was a wind instrument maker being active in Paris (*c.*1692). This date comes from *Le Livre commode des adresses de Paris pour 1692* (1878) in which Dupuis is listed as *Maître pour le Jeu et pour la Fabrique des Instruments à Vent*. (Private collection)



Appendix VI

Theatrum instrumentorum (1620, Book II, Plate IX) by Michael Praetorius (1571-1621), and the engraving with the transverse flutes—Renaissance Traverso—to which Quantz referred (1752, I: §4). Quantz did own a flute of this model which according to him was made around 1690. Observe 3. *Querflöten/Ganz Stimmwerck*.



Appendix VII

Comparison of fingerings for the three-piece Traverso and a Renaissance Traverso. Fingerings for the Traverso covering D1-G3 are taken from *Principes*, fingerings for G#3 and A3 are not given by Hotteterre and hence taken from Mahaut (1759) which generally works easily on a three-piece Traverso of *Model I* and *Model II*. Fingerings for the Renaissance Traverso are taken from *The Renaissance Flute A Contemporary Guide* by Clark & Markwick (2020).

- Notes marked with ***** indicate differences when comparing fingerings for the three-piece Traverso (*Model I* & *Model II*) and the Renaissance Traverso.
- When a finger is marked large and bold it indicates that its finger hole should be half covered. The amount of how much a half-covered tone should be covered depends on the characteristics of the particular used three-piece Traverso (*Model I* & *Model II*) and Renaissance Traverso.

Note	*Principes* *Rudiments*	*The Renaissance flute* Clark & Markwick (2020)
D1	123/456	123/456
D#1	123/4567	–
***E♭1**	123/4567	123/45**6**
E1	123/45	123/45
F1	123/46	123/46
***F#1**	123/47	123/4
G1	123/0	123/0
G#1	12/456	12/456
A♭1	12/456	–
A1	12/0	12/0
A#1	13/45	–
B♭1	13/45	13/45
B1	1/0	1/0
***C2**	23/0	23/456
C#2	0/0	0/0
D♭2	0/0	–
D2	23/456	23/456
D#2	123/4567	–
***E♭2**	123/4567	123/45**6**
E2	123/45	123/45
F2	123/46	123/46
***F#2**	123/47	123/4
G2	123/0	123/0
***G#2**	12/4	12/4 12/46
A♭2	12/4	–
***A2**	12/0	12/456
A#2	13/0	–
***B♭2**	13/0	13/456
***B2**	1/0	1/45
***C3**	2/45	3/456
***C#3**	0/4567	23/4
D3	23/456	23/456
D#3	123/567	–
***E♭3**	123/567	12/46
***E3**	12/567	12/0
***F3**	12/4**5**7	1/6
***F#3**	13/456	1/4
***G3**	13/0	13/0 3/456
G#3	[3/0]	3/0
A3	[23/45]	23/45

Appendix VIII

Comparison regarding fingering-charts and explications regarding the three head-joint positions for the three-piece Traverso and the chromatic scale C#1-G3 as found in *Principes* (1707) and its later French editions published by Ballard, including the edition *Principes* (1728a) in French published by Estienne Roger in Amsterdam, which all show the same fingerings. Further fingering-charts by Rippert (1725), the Dutch translation *Grund-beginsel over de Behandeling van der Dvars-Fluit* (1728b), the English translation *Rudiments* (1729), Prelleur (1731) having far reaching similarities with *Principes*, and *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe* (1738 & 1762) by Eisel which is a fragmentary German translation of some sections as found in *Principes*.

- The Dutch translation (1728b) follows *Principes* (1707) closely.
- The English translations *Rudiments* (1729) and Prelleur (1731) generally follows *Principes* (1707), but when differences are found the same fingerings are given in both translations as for the notes G♭1, G♭2, A♭2, D♭3, D#3, G3, and a similar relation is found regarding probable misprints, which are marked with ***** because these fingerings do not give the intended notes clearly, alternatively not at all.
- The German fragmentary translation by Eisel (1738 & 1762) follows *Principes*, but it should be noted that fingerings for enharmonic notes only are given with sharps in the standard fingering-chart. In contrast are both sharps and flats used in the chart for trills in the first octave, and in the following are these fingerings marked within square brackets, considered that Eisel use the same fingerings for enharmonic notes in the trill-chart have these been added in italics within square brackets.

Suggestions regarding positioning of the head-joint are marked as recommended in *Principes* (1707), *Rudiments* (1729) and the Dutch translation (1728b). Prelleur (1731) gives some suggestions as found in *Principes* (1707), whereas Rippert (1725), and Eisel (1738 & 1762) don't give comments regarding the positioning of the head- joint.

The first fingering shown on top is considered as the standard fingering for each note, fingerings below are alternatives generally found in the fingering-charts for trills and other detailed explanation of fingerings in each source mentioned above.

Note	***Principes*** **French Paris 1707**	**Rippert French Paris 1725**	***Principes*** **Dutch Amsterdam 1728b**	***Rudiments*** **English London 1729**	**Prelleur English London 1731**	**Eisel German Erfurt 1738 & 1762**
C#1	123/456 *Turn the head-joint very much inwards for C#1*	—	123/456 *Turn the head-joint very much inwards for C#1*	123/456 *Turn the head-joint very much inwards for C#1*	—	—
D♭1	—	—	—	—	—	—
D1	123/456 **Normal position**	123/456	123/456 **Normal position**	123/456 **Normal position**	123/456	123/456
D#1	123/4567 **Normal position**	123/4567	123/4567 **Normal position**	123/4567 **Normal position**	123/4567	123/4567
E♭1	123/4567 **[Outward position]**	123/4567	123/4567 **[Outward position]**	123/4567 **[Outward position]**	123/4567	[123/4567]
E1	123/45 **[Normal position]**	123/45	123/45 **[Normal position]**	123/45 **[Normal position]**	123/45	123/45
E#1	123/46 **Inward position**	—	123/46 **Inward position**	123/46 **Inward position**	123/46 **Inward position**	123/46
F♭1	—	—	—	—	—	—
F1	123/46 **Inward position**	123/46	123/46 **Inward position**	123/46 **Inward position**	123/46 **Inward position**	123/46
F#1	123/47 **Outward position**	123/47	123/47 **Outward position**	123/47 **Outward position**	123/47	123/47
G♭1	123/56 **Inward position**	123/47	123/56 **Inward position**	123/47 **Inward position**	123/4	[123/56]
G1	123/0 **Normal position**	123/7	123/0 **Normal position**	123/0 **Normal position**	123/0 **Normal position**	123/0
G#1	12/456 **Inward position**	12/456	12/456 **Inward position**	12/456 **Inward position**	12/456	12/456

A♭1	12/456 **Inward position but not too much**	12/456	12/456 **Inward position but not too much**	12/456 **Inward position but not too much**	12/6 *****	[12/456]
A1	12/0 **Normal position**	12/7	12/0 **Normal position**	12/0 **Normal position**	12/0	12/0
A#1	13/45 *13/4567* **Inward position**	13/45	13/45 *13/4567* **Inward position**	13/45 *13/4567* **Inward position**	13/45	13/45
B♭1	13/45 **Inward position**	13/45	13/45 **Inward position**	13/45 **Inward position**	13/45	[*13/45*]
B1	1/0 **Normal position**	1/7	1/0 **Normal position**	1/0 **Normal position**	1/0	1/0
B#1	23/0 *23/4* **Normal position**	—	23/0 *23/4* **Normal position**	23/0 *23/45* **Normal position**	23/4	[*23/0*]
C♭2	1/0	—	1/0	1/0	1/0	—
C2	23/0 2/45 *23/56* **Normal position**	23/0	23/0 2/45 *23/56* **Normal position**	23/0 2/45 *23/56* **Normal position**	23/0	23/0
C#2	0/0 **Very outward position**	0/0	0/0 **Very outward position**	0/0 **Very outward position**	0/0	0/0
D♭2	0/0 *0/4567* **Very outward position**	0/0	0/0 *0/4567* **Very outward position**	0/0 *0/4567* **Very outward position**	0/0	[*0/0*]
D2	23/456 **Normal position**	23/456	23/456 **Normal position**	23/456 **Normal position**	23/456	23/456
D#2	123/4567 **Normal position**	123/4567	123/4567 **Normal position**	123/4567 **Normal position**	123/4567	123/4567
E♭2	123/4567 **Outward position**	123/4567	123/4567 **Outward position**	123/4567 **Outward position**	123/4567	[*123/4567*]
E2	123/45 **Normal position**	123/45	123/45 **Normal position**	123/45 **Normal position**	123/45	123/45
F♭2	123/45 **Normal position**	—	123/45 **Normal position**	123/45 **Normal position**	123/45	—
E#2	123/46 **Inward position**	—	123/46 **Inward position**	123/46] **Inward position**	123/46 **Inward position**	[*123/46*]
F2	123/46 **Inward position**	123/46	123/46 **Inward position**	123/46 **Inward position**	123/46	123/46
F#2	123/47 **Outward position**	123/47	123/47 **Outward position**	123/47 **Outward position**	123/47	123/47
G♭2	123/567 **Very inward position**	123/47	123/567 **Very inward position**	123/47 **Very inward position**	123/47	[*123/567*?]
G2	123/0 *123/7* **Normal position**	123/7	123/0 *123/7* **Normal position**	123/0 *123/7* **Normal position**	123/0	123/0
G#2	12/4 *12/467* *12/4***5** **Inward position**	12/467	12/4 *12/467* *12/4***5** **Inward position**	12/4 *12/467* *12/4***5** **Inward position**	12/4	12/4
A♭2	12/4 12/4**5** *12/467* **Inward position**	12/467	12/4 12/4**5** *12/467* **Inward position**	12/457 ***** 12/4**5** *12/467* **Inward position**	12/457 *****	[*12/4*]
A2	12/0 **Normal position**	12/7	12/0 **Normal position**	12/0 **Normal position**	12/0	12/0
A#2	13/0 *12/4567* **Inward position**	13/0	13/0 *12/467* **Inward position**	13/0 *12/467* **Inward position**	13/0	13/0

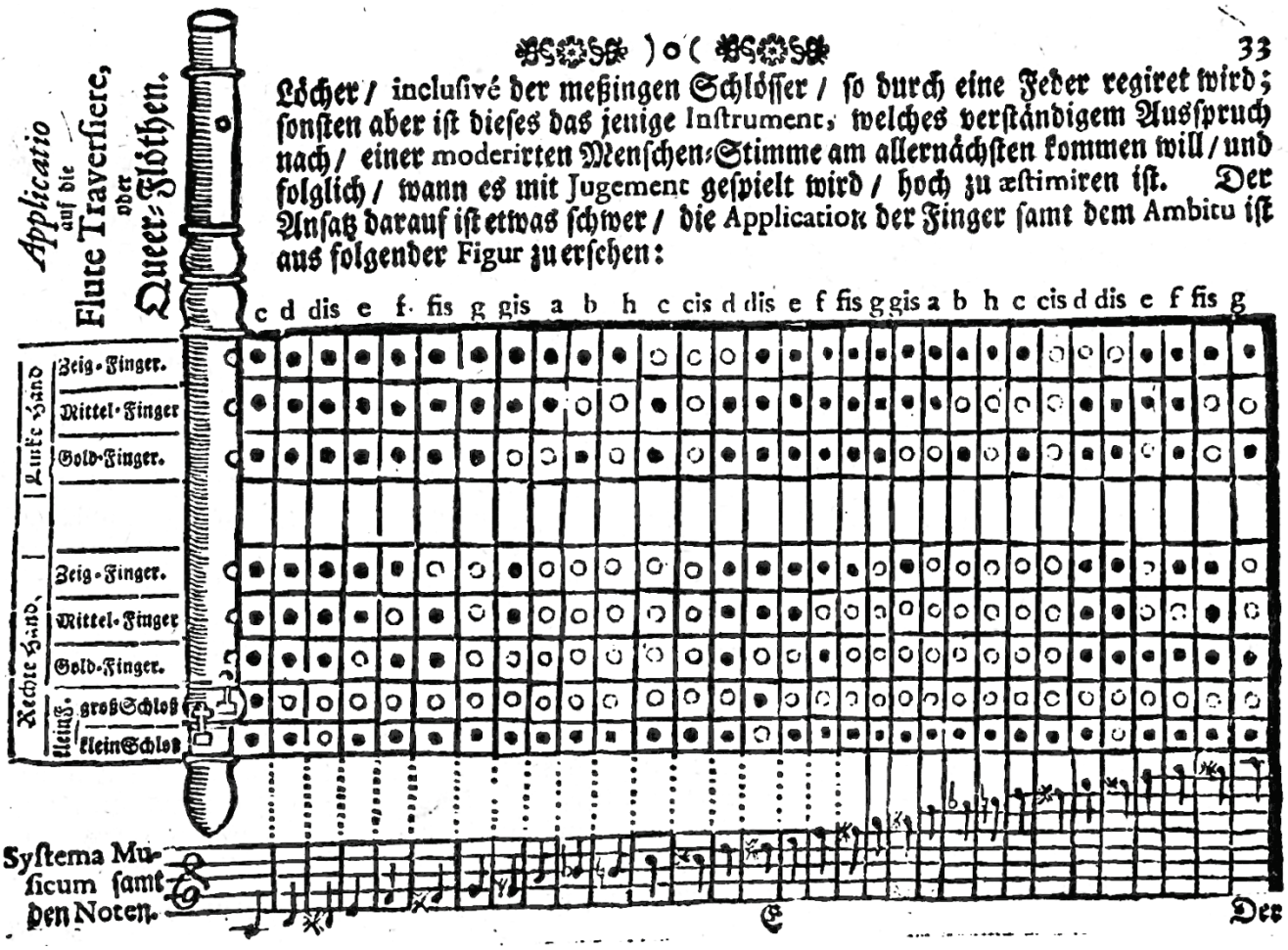
B♭2	13/0 13/7 *12/4567* *12/5* **Outward position**	13/7	13/0 13/7 *12/4567* *12/5* **Outward position**	13/0 13/7 *12/4567* *12/5* **Outward position**	13/0	[*13/0*]
B2	1/0 *1/7* *1/456* **Normal position**	1/7	1/0 *1/7* *1/456* **Normal position**	1/0 *1/7* *1/456* **Normal position**	1/0	1/0
B#2	*2/4567* *23/4567* **Outward position**	—	*2/4567* *23/4567* **Outward position**	*2/4567* *23/4567* **Outward position**	23/456 **Outward position**	[*2/4567*]
C♭3	—	—	—	—	—	—
C3	2/45 2/456 2/4567 *3/56* **Normal position** or **Inward position** *23/4567* **Normal position**	2/4567	2/45 2/456 2/4567 *3/56* **Normal position** or **Inward position** *23/4567* **Normal position**	2/45 2/4567 *3/56* **Normal position** or **Inward position** *23/4567* **Normal position**	2/45	2/45
C#3	0/4567 *0/46* *23/47* **Outward position** 3/47 **Inward position**	23/47	0/4567 *0/46* *23/47* **Outward position** 3/47 **Inward position**	0/4567 *23/46* *23/47* **Outward position** 3/47 **Inward position**	23/47 0/4567	0/4567
D♭3	23/467 0/4567 **Outward position** 3/47 **Inward position**	23/47	23/467 0/4567 **Outward position** 3/47 **Inward position**	0/4567 **Outward position** 3/47 **Inward position**	0/4567	[*0/4567*]
D3	23/456 23/46 **Normal position** or **Outward position** *23/7* **Outward position**	23/7	23/456 23/46 **Normal position** or **Outward position** *23/7* **Outward position**	23/456 **Normal position** or **Outward position** *23/7* *23/46* **Outward position**	23/456 23/7	23/456
D#3	123/567 **Normal position** or **Outward position**	123/567	123/567 **Normal position** or **Outward position**	23/567 **Normal position** or **Outward position**	23/567	123/567
E♭3	123/567 **Normal position** or **Outward position**	123/567	123/567 **Normal position** or **Outward position**	123/567 **Normal position** or **Outward position**	123/567	[*123/567*]
E3	12/567 **Outward position**	12/567	12/567 **Outward position**	12/567 **Outward position**	12/567	12/567
E#3	—	—	—	—	—	—
F♭3	—	—	—	—	—	—
F3	12/457 **Normal position**	—	12/457 **Normal position**	12/457 **Normal position**	—	—
F#3	13/456 *13/45* **Normal position**	—	13/456 *13/45* **Normal position**	13/456 *13/45* **Normal position**	13/456	13/456
G♭3	—	—	—	—	—	—
G3	13/0 **Normal position**	—	13/0 **Normal position**	13/46 * **Normal position**	13/46 *	13/0

Appendix IX

Maier, Joseph F. (1732, 33). *Museum Musicum. Theoretico-Practicum das ist: Neu-eröffneter Theoretsich- und Praktischer Musik-Saal.* Nürnberg: Maier.

Maier, Joseph F. (1741, 45). *Neu-eröffneter Theoretsich- und Praktischer Musik-Saal.* Nürnberg: Cremer.

Fingering-chart for an unusual model of a three-piece Traverso with two keys making it possible to play the low note C1. The engraving is the same in the edition of 1732 as in the edition of 1741.



Appendix X

Examples of the posture of *Déhanchement* in the painting *Blue boy* (*c.*1770) by Thomas Gainsborough, and the sculpture *David* (1501-1504) by Michelangelo.



Blue Boy (*c.*1770) by Gainsborough



David (1501-1504) by Michelangelo

Appendix XI

Rampal, Jean-Pierre. (1978). *La Flûte.* Paris: Denoël. *Playing position and embouchure.*



Figure 1 La position des doigts. Bonne position. Les doigts sont bien arrondis, de manière que les muscles et les nerfs des mains travaillent librement. (Rampal, 1978, 24)[1]



Figure 2 La positions des lèvres. Les coins de la bouche doivent être tirés vers le haut, comme lorsque l'on sourit. (Rampal, 1978, 26)[2]



Figure 3 Les lèvres doivent être parallèles à l'embouchure. (Rampal, 1978, 27)[3]

1. The position of the fingers. Good position. The fingers are well rounded, so that the muscles and nerves of the hands work freely.
2. The positions of the lips. The corners of the mouth should be pulled up, like when you smile.
3. The lips should be parallel with the embouchure [lip plate and head-joint]

Appendix XII

Chart regarding *Champ de liberté* covering standard fingerings for the complete chromatic scale D1-G3. All notes are played on two top-quality copies of the three-piece Traverso *Model I* (A1=392 Hz, one made of Ivory, one made of Grenadilla) and three top-quality copies of the three-piece Traverso *Model II* (A1=400 Hz, one made of *Buis Ondé* (Boxwood), one of Cocos wood, and one of Ebony) by Alain Weemaels (Bruxelles). All notes are played in the nuance of *Mezzo forte,* with kept quality of sound. All figures are given in Cent and should be understood as approximations depending on the Traverso-player and the Traverso in question, still does given data contribute with a tendency regarding the *Champ de liberté* on all notes shown and explained in *Principes,* that potentially give the Traverso a strong tool for a rather refined intonation.

Note	Basic fingerings in *Principes*	Position	Suggestions as given in *Principes*	*Champ de liberté* upwards	*Champ de liberté* down wards	Entire *Champ de liberté*
D1	123/456	Normal	Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas (III: 6)	**+15**	**–40**	**↓↑ 55**
D#1	123/4567	Normal		**+20**	**–30**	**↓↑ 50**
E♭1	123/4567	Outward		**+20**	**–30**	**↓↑ 50**
E1	123/45	Normal		**+20**	**–30**	**↓↑ 50**
E#1	123/46	Inward		**+30**	**–30**	**↓↑ 60**
F1	123/46	Inward	Ce ton veut être ajusté avec l'embouchure, en tournant la Flute en dedans pour le baisser, parce qu'il est naturellement un peu haut à cause que le *Diézis* se fait sur le même trou Chapitre. (III: 7)	**+30**	**–30**	**↓↑ 60**
F#1	123/47	Outward	Pour ajuster ce Ton, on doit tourner la Flûte en dehors, & lever un peu la tête. Par ces termes, tourner la Flute, ou tourner l'embouchure, on doit entendre la même chose. (V: 13-14)	**+10**	**–40**	**↓↑ 50**
G♭1	123/56	Inward	Le *Sol Bemol,* est different du *Fa Diézis* aussi-bien que son Octave. On doit l'ajuster de même en tournant la Flute en dedans. Plusieurs personnes ne font point cette difference. (V: 16)	**+40**	**–10**	**↓↑ 50**
G1	123/0	Normal		**+20**	**–30**	**↓↑ 50**
G#1	12/456	Inward	[…] on tournera la Flute en dedans pour l'ajuster. (V: 14)	**+40**	**–40**	**↓↑ 70**
A♭1	12/456	Inward	Le *La Bemol*, comme le *Sol Diézis*. Il ne faut pas tant tourner la Flute en dedans. (V: 16)	**+40**	**–40**	**↓↑ 70**
A1	12/0	Normal	Il faut augmenter le vent, peu à peu, à mesure que l'on monte. (III: 7)	**+30**	**–30**	**↓↑ 60**
A#1	13/45	Inward	[…] on la tournera en dedans pour le *La Diézis:* On peut encore baisser ce demi-Ton, en ajoûtent quelques Doigts, (V: 14)	**+35**	**–30**	**↓↑ 65**
B♭1	13/45	Inward		**+35**	**–30**	**↓↑ 65**
B1	1/0	Normal	On la remettra pour le *Si* & l'*Ut* naturel. (V: 14)	**+30**	**–30**	**↓↑ 60**
B#1	23/0	Normal		**+30**	**–30**	**↓↑ 60**
C2	23/0	Normal	On la remettra pour le *Si* & l'*Ut* naturel. (V: 14)	**+30**	**–30**	**↓↑ 60**
C#2	0/0	Very Outward	On tournera ensuite la Flute en dehors, le plus qu'on pourra pour l'*Ut Diézis*. (V: 14)	**+20**	**–30**	**↓↑ 50**
D♭2	0/0	Very Outward	Le *Ré Bemol,* comme l'*Ut Diézis*. On ne sçauroit tourner la Flute trop en dehors, pour ajuster ce demi-Ton. (V: 16)	**+20**	**–30**	**↓↑ 50**
D2	23/456	Normal	On doit pour lors augmenter le vent ; ensorte que le son aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il faut. (III: 8)	**+15**	**–25**	**↓↑ 40**
D#2	123/4567	Normal		**+15**	**–25**	**↓↑ 40**
E♭2	123/4567	Outward	Il faut tourner la Flute en dehors. (V: 16)	**+15**	**–25**	**↓↑ 40**
E2	123/45	Normal	[…] en soutenant le vent toûjours un peu ferme; ainsi que dans les Tons suivants. (III: 8)	**+25**	**–25**	**↓↑ 50**
E#2	123/46	Inward		**+45**	**–30**	**↓↑ 75**

F2	123/46	Inward	Il faudra tourner encore sur ce Ton, l'embouchure de la Flute en dedans. (III: 8)	**+45**	**–30**	**↓↑ 75**
F#2	123/47	Outward	Pour ajuster ce Ton, on doit tourner la Flûte en dehors, & lever un peu la tête. Par ces termes, tourner la Flute, ou tourner l'embouchure, on doit entendre la même chose. (V: 13-14)	**+15**	**–40**	**↓↑ 55**
G♭2	123/567	Very Inward	Pour ajuster, il faut tourner la Flute beaucoup en dedans. Ce demi- Ton est fort peu usité, & ne se rencontre que dans des Tons fort chromatiques, sur lesquels on ne compose guere pour cet Instrument. (V: 16)	**+40**	**–15**	**↓↑ 55**
G2	123/0	Normal	[…] ils auront soins de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres, & d'augmenter le vent […] (III: 8)	**+20**	**–20**	**↓↑ 40**
G#2	12/4	Inward		**+40**	**–20**	**↓↑ 60**
A♭2	12/4	Inward		**+40**	**–20**	**↓↑ 60**
A2	12/0	Normal	[…] en soûtenant toûjours le vent. (III: 8)	**+20**	**–25**	**↓↑ 45**
A#2	13/0	Inward		**+25**	**–30**	**↓↑ 55**
B♭2	13/0	Outward	Il faut tourner la Flute en dehors, ce qui fait quelque difference du *Si Bemol* au *La Diézis*, & il faut à quelques Flutes déboucher le septiéme trou pour faciliter ce Ton. (V: 15)	**+25**	**–30**	**↓↑ 55**
B2	1/0	Normal	Si naturel en haut, (Note vingt-deuxiéme,) que l'on peut la faire en bouchant les trois trous de la main d'en-bas [...] mais il est un peu trop haute ; il faut donc tourner l'embouchure en dedans pour l'ajuster. (VII: 21)	**+15**	**–30**	**↓↑ 45**
B#2	23/4567	Outward		**+20**	**–30**	**↓↑ 50**
C3	2/45	Normal or Inward	Ce Ton est un peu délicat à ajuster, car il y a des Flutes où il est haut, & d'autres où il est bas. L'expedient dont on peut se servir pour le baisser, c'est d'adoucir & de tourner la Flute en dedans. Si cela ne suffit pas, il faut boucher le sixiéme trou à demi sans rien changer aux autres (III: 8-9)	**+25**	**–20**	**↓↑ 45**
C#3	0/4567	Outward	Et on la tournera en dehors pour l'*Ut Diézis*. (V: 15)	**+10**	**–25**	**↓↑ 35**
D♭3	23/467	Outward	Le *Ré Bemol*, se pourroit faire aussi comme l'*Ut Diézis*: mais il est plus parfait de la manière que je démontre dans la Tablature. (V: 15)	**+15**	**–20**	**↓↑ 35**
D3	23/456	Normal or Outward	Il faut forcer un peu le vent, & serrer les Levres. (III: 9)	**+10**	**–25**	**↓↑ 35**
D#3	123/567	Normal or Outward	On remettre la Flute pour le *Ré* naturel & *Diézis,* à moins qu'ils ne fussent trop bas, comme ils le sont à quelques Flutes: En ce cas, il faudroit la tourner toûjours en dehors. Ces Tons hauts sont difficiles à ajuster; il faut pour cela de l'oreille & de la pratique. (V: 15)	**+5**	**–30**	**↓↑ 35**
E♭3	123/567	Normal or Outward	*Mi Bemol*, On doit forcer le vent […] (VII: 22)	**+5**	**–30**	**↓↑ 35**
E3	12/567	Outward		**+10**	**–20**	**↓↑ 30**
F3	12/4**5**7	Normal	[…] en donnant le vent fort aigu. (III: 9-10)	**+10**	**–20**	**↓↑ 30**
F#3	13/456	Normal	Le *Fa Diézis* se fait plus aisement (III: 10)	**+20**	**–20**	**↓↑ 40**
G3	13/0	Normal		**+15**	**–20**	**↓↑ 35**

Appendix XIII

Comparison of fourteen French fingering-charts for the three- and four-piece Traverso and the chromatic scale C#1/D♭1-D4, covering the period 1707 to 1895 as found in *Principes* (1707), Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), and Balleron (1895), all published in Paris. A fingering-chart by Valentin Roeser (1777) is identical with Corrette (1735 & 1773), and an anonymous fingering-chart (*c.*1790) is identical with Mussard (1778) therefore not listed below. When comparing fingerings, the main differences is the use of the D#-key, together with fingerings for enharmonic notes such as for example A# and B♭. In the fingerings by Bordet, Mahaut, Bailleux-Hotteterre, and Mussard it is suggested as optional to use the D#-key for G1, A1, B1, C2 and C#2. It should be noted that fingerings as found in *Principes* generally are similar to fingering-charts throughout the 18th Century despite modifications of the Traverso in combination with important changes of musical styles and aesthetics.

Note	*Principes* 1707 Three-piece Traverso	Rippert 1725 Three-piece Traverso	Corrette 1735 & 1773 Four-piece Traverso	Bordet 1755 Four-piece Traverso	Mahaut 1759 Four-piece Traverso	De Lusse *c.*1761 Four-piece Traverso	Bailleux-Hotteterre 1765 Four-piece Traverso	Mussard 1778 Four-piece Traverso	Devienne *c.*1794 Four-piece Traverso	Cambini *c.*1795 Four-piece Traverso	Van der Hagen 1798 Four-piece Traverso	Balleron 1895 Four-piece Traverso
C#1	123/456*[1]	—	123/456*[2]	123/456*[3]	123/456*[4]	—	123/456*[5]	123/456*[6]	—	—	—	—
D♭1	—	—	—	123/456*[7]	123/456*[8]	—	123/456*[9]	123/456*[10]	—	—	—	—
D1	123/456	123/456	123/456	123/456	123/456	123/456	123/456	123/456	123/456	123/456	123/456	123/456
D#1	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567
E♭1	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567
E1	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/457
E#	123/46	—	—	123/46	123/46	123/46	123/45	123/46	123/46	—	123/46	123/46
F♭1	—	—	—	—	123/45	123/45	123/45	—	123/45	—	123/45	—
F1	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46
F#1	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47 123/567	123/47
Fx1	—	—	—	—	—	—	—	—	—	—	123/7	—
G♭1	123/56	123/47	123/47	123/47 123/567	123/567	123/4	123/56	123/47 123/56	123/47	[123/47]*	123/567	123/47
G1	123/0	123/7	123/7	123/7 123/0	123/7 123/0	123/7	123/7 123/0	123/7 123/0	123/0	123/7	123/7	123/7 123/0
G#1	12/456	12/456	12/456	12/456	12/456	12/4567	12/456	12/4567	12/4567	12/4567	12/4567	12/456
A♭1	12/456	12/456	12/456	12/456	12/456	12/456	12/456	12/4567	12/4567	[12/4567]	12/4567	12/456
A1	12/0	12/7	12/7	12/7 12/0	12/7 12/0	12/7	12/7 12/0	12/7 12/0	12/0	12/7	12/7	12/7 12/0
A#1	13/45	13/45	13/45	13/45	13/45	13/457	13/45	13/45	13/45	13/45	13/45	13/457
B♭1	13/45	13/45	13/45	13/45	13/45	13/45 13/46	13/45	13/45	13/45	[13/45]	13/45 13/0	13/45 13/457
B1	1/0	1/7	1/7	1/7 1/0	1/7 1/0	1/7	1/7 1/0	1/7 1/0	1/0	1/7	1/7	1/7
B#1	23/0	—	—	23/0 23/7	23/0 23/7	23/7	23/0 23/7	23/0 23/67	23/0	—	23/7	23/7 23/0
C♭2	—	—	—	—	1/7	1/0	1/7	—	—	—	1/7	—
C2	23/0	23/0	23/7	23/0 23/7	23/0 23/7	23/0	23/0 23/7	23/7	23/0	23/7	23/7	2/4567
C#2	0/0	0/0	0/7	0/7 0/0	0/0	0/0 0/456	0/7	0/7	0/0	0/7	0/0	0/7 0/4567
Cx2	—	—	—	—	—	—	—	—	—	—	23/456	—
D♭2	0/0	0/0	0/7	0/7 0/0	0/0	0/7	0/7	0/7	0/0	0/7	0/0	0/7 0/4567
D2	23/456	23/456	23/456	23/456	23/456	23/456	23/456	23/456	23/456	23/456	23/456	23/456
D#2	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	23/4567	123/4567	123/4567	23/4567
E♭2	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	123/4567	23/4567	123/4567	123/4567	23/4567
E2	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45	123/45
F♭2	—	—	—	—	123/457	123/45	123/45	—	123/45	—	123/45	—
E#2	123/46	—	—	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46
F2	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46	123/46
F#2	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47	123/47 123/567	123/47 123/4
Fx2	—	—	—	—	—	—	—	—	—	—	123/7	—

G♭2	123/567	123/47	123/47	123/47 123/567	123/567	123/4	123/567	123/567	123/567	[123/47]	123/567	123/47 123/4
G2	123/0	123/7	123/7	123/7 123/0	123/7 123/0	123/7	123/0 123/7	123/7	123/7	123/7	123/7	123/7 123/0
G#2	12/4	12/467	12/467	12/467	12/467	12/47	12/467	12/47 12/467	12/47	[12/47]	12/467	12/47
A♭2	12/4	12/467	12/467	12/467	12/467	12/467	12/467	12/47 12/467	12/47	12/47	12/467	12/47
A2	12/0	12/7	12/7	12/7 12/0	12/7 12/0	12/7	12/0 12/7	12/7	12/7	12/7	12/7	12/7 12/0
A#2	13/0	13/0	13/7	13/7	13/7 13/0	13/7	13/0 13/7	13/7	13/7	13/7	13/7	12/4567
B♭2	13/0	13/0	13/7	13/7 12/4567*[15]	13/7 12/4567	12/4567 13/0	13/0 13/7 12/4567	13/7 12/4567	12/4567	12/4567	12/4567 13/7	12/4567
B2	1/0	1/7	1/7	1/7 1/0	1/7 1/0	1/7	1/7 1/0	1/7	1/7	1/7	1/7	1/7 1/456
B#2	2/4567	—	—	2/4567	23/457	23/457	2/4567	2/4567	23/4567	[2/4567]	23/457	2/4567 23/457
C♭3	—	—	—	—	1/7	1/456	1/7	—	—	—	1/7	—
C3	2/45	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567	2/4567 23/457
C#3	0/4567	23/47	23/47	23/47	23/47	23/47 0/7	23/47	23/47	23/467	23/47	23/47	23/4
Cx3	—	—	—	—	—	—	—	—	—	—	23/7	—
D♭3	23/467	23/47	23/47	23/47	23/47	23/467	23/47	23/47	23/467	[23/47]	23/47	23/4
D3	23/456	23/7	23/7	23/7	23/7	23/7	23/7	23/7	23/7	23/7	23/7	23/7
D#3	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567 23/567
E♭3	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	123/567	[123/567]	123/567	123/567 23/567
E3	12/567	12/567	12/567	12/567	12/567	12/567	12/567	12/567	12/567	12/567	12/567	12/567
E#3	—	—	—	12/47	12/47	123/45	12/47	12/47	12/47	[12/47]	12/47	12/47
F♭3	—	—	—	—	12/67	12/567	12/567	—	—	—	12/567	—
F3	12/457*[1]	—	123/45*[12]	12/47 *[16]	12/47	12/47	12/47	12/47	12/47	12/47	12/47	12/47
F#3	13/456*[11]	—	13/45 *[13]	12/4	12/46 13/45	123/4	12/4	12/4	12/4	12/4	12/4	1/47
Fx3	—	—	—	—	—	—	—	—	—	—	13/0	—
G♭3	—	—	13/45	12/4	12/46 13/45	12/4	12/4	12/4	12/4	[12/4]	12/4	1/47
G3	13/0 *[11]	—	13/0 *[13]	13/0 *[6]	13/0	13/0	13/0	13/0	13/0	13/0	13/0	13/7
G#3	—	—	3/7 *[14]	3/0	3/0	3/7	3/0	3/0	3/567	13/7	3/0	3/67 23/567
A♭3	—	—	3/7	3/0	3/0	3/7	3/0	3/0	3/567	[13/7]	3/0	3/67 23/567
A3	—	—	23/45 *[13]	23/45 *[16]	23/45	23/45	23/45	23/45	23/45	23/45	23/45	23/45
A#3	—	—	—	12/47	12/47 *[18]	12/47	12/47 *[19]	12/47	—	—	12/47	2/4
B♭3	—	—	—	12/47	12/47 *[18]	12/47	12/47 *[19]	12/47	—	—	23/4	2/4
B3	—	—	—	12/47 *[17]	12/47 *[18]	—	12/47 *[19]	12/47	—	—	—	1/7
B#3	—	—	—	13/5	13/5 *[18]	—	13/5 *[19]	13/5	—	—	—	13/57
C♭4	—	—	—	—	12/47 *[18]	—	12/47 *[19]	—	—	—	—	—
C4	—	—	—	13/5 *[17]	13/5 *[18]	—	13/5 *[19]	13/5	—	—	—	13/57
C#4	—	—	—	3/5	3/5 *[18]	—	3/5 *[19]	3/5	—	—	—	—
D♭4	—	—	—	3/5	3/5 *[18]	—	3/5 *[19]	3/5	—	—	—	—
D4	—	—	—	23/456*[17]	23/456*[18]	—	23/456*[19]	23/456	—	—	—	—

* Considered that the fingering-chart by Cambini (*c.*1795) and that not all enharmonic notes are given fingerings are notes in question marked within square brackets. An example is that Cambini indicates the fingering for G#1 but not for A♭1, thus is in the present fingering chart the same fingering given for both notes and A♭1 within square brackets.

***1.** […] on tourne l'embouchure en dedans suffisamment pour gagner un demi-Ton. (*Principes*, V: 17)	[…] the embouchure is turned in sufficiently to reach a half step. (*Rudiments*, V: 12)
***2.** L'ut# d'embas, se peut faire en bouchant tous les trous, comme pour le ré d'embas, et en tournante l'embouchure de la flute en dedans (Corrette, 1735 & 1773, 50)	The low C# [1] can be made by closing all the tone-holes, as for the low D[1] and by turning the embouchure of the flute inwards. (Corrette & 1773, 1735, 50)
***3.** En tournant seulement l'embouchure en dedans. (Bordet, 1755, 17)	The low C[1] and the D♭[1] are made like the natural D by turning only the head-joint inwards.
***4.** […] tourner la Flute en dedans et Elargir l'ouverture des levres a l'embouchure par ce moyen on baiße le son d'un demi ton. (Mahaut, 1759, 7)	[…] turning the flute inwards and widen the opening between the lips and by these means, lowering the note [D1] by a semitone.
***5.** […] tourner la flute en dedans et élargir l'ouverture des lévres à l'embouchure par ce moyen on baisse la notte d'un démi-ton. (Bailleux-Hotteterre, 1765, 8)	[…] turning the flute inwards and widen the opening between the lips and by these means, lowering the note [D1] by a semitone.
***6.** L'Ut# et le Re♭ en bas se font comme le re naturel en tournant l'embouchure en dedans mais ils sont rarement bon. (Mussard, 1778, 7)	C#1 and D♭1 are played like the natural D1 by turning the head-joint inwards but they are rarely good.
***7.** En tournant seulement l'embouchure en dedans. (Bordet, 1755, 17)	The low C[1] and the D♭[1] are made like the natural D by turning only the head-joint inwards.
***8.** […] tourner la Flute en dedans et Elargir l'ouverture des levres a l'embouchure par ce moyen on baisse le son d'un demi ton. (Mahaut, 1759, 7)	[…] turning the flute inwards and widen the opening between the lips and by these means, lowering the note [D1] by a semitone.
***9.** […] tourner la flute en dedans et élargir l'ouverture des lévres à l'embouchure par ce moyen on baisse la notte d'un démi-ton. (Bailleux-Hotteterre, 1765, 8)	[…] turning the flute inwards and widen the opening between the lips and by these means, lowering the note [D1] by a semitone
***10.** L'Ut# et le R♭ en bas se font comme le re naturel en tournant l'embouchure en dedans mais ils sont rarement bon. (Mussard, 1778, 7)	C#1 and D♭1 are played like the natural D1 by turning the head-joint inwards but they are rarely good.
***11.** Les Tons au dessus du Mi, sont des Tons forcez & ne peuvent entrer naturellement dans aucune Piece; cependant comme on ne laisse pas d'en glisser toûjours quelques uns dans le Prélude, je mettray icy ceux que j'ay pû découvrir. Au reste, il ne faut point s'obstiner à les vouloir trouver dans les commencements, c'est une peine que l'on doit s'épargner jusques à ce qu'on soit fort avancé. Il sera même à propos, pendant les premiers jours, de ne point passer le Sol, qui est la Note dix-huitiéme, à moins que l'on ne se trouvait une grande facilité à emboucher. Alors on pourroit monter plus haut, mais avec discretion, autrement ce seroit se donner beaucoup de peine sans se procurer aucun avancement, parcequ'il faut absolument commencer par bien former les Tons bas, avant que de faire les autres. (Hotteterre, 1707, III: 9)	The tones above E-la-mi are forc'd tones, and are seldom us'd however since sometimes they happen in Preludes, I shall shew you such as I cou'd discover, yet you must not Plague your self with them at first, till you are further advanc'd, nor will it be necessary during the first days to ascend higher then G-sol-re-ut, which is the 18th. Note, unless you find them very easy to fill, then you may ascend higher, but with discretion, otherwise you'll give your self much trouble to little purpose, because you must fill your low Notes perfectly well before you can fill the others. G-sol. is made by stopping the first and 3d. holes, and opening all the rest; we might find Notes yet higher than these, but they are so forced, and so useless, that I wou'd not advice any one to trouble himself about 'em. (*Rudiments*, 1729, III: 6)
***12**. Les anciens joueurs de flute n'ont jamais fait le fa naturel de la troisieme octave. (Corrette, 1735 & 1773, 16)	The ancient flute players never played the natural F of the third octave.
***13.** Tons que les anciens ont toûjours ignoré sur la Flute. (Corrette, 1735, 16)	Tones that the ancients have always ignored on the Flute.
***14.** Ces tons ne se font guere qu'en préludant. (Corrette, 1735 & 1773, 16)	These tones are hardly ever made except as when preluding.
***15**. Lorsque de l'ut naturel de la 2e octave on descend au si♭ ou que du si♭ on monte à l'ut, le si♭ doit se faire comme il est marqué à ce signe * cette seconde position est non seulement plus juste, mais encore elle conduit à celle de l'ut plus facilement. (Bordet, 1755, 17)	When coming from C natural of the 2nd octave we go down to B♭ or when from B♭ we go up to C, the B♭ must be done as it is marked with this sign ***** this second fingering is not only more just, but still, it leads to C more easily.
***16**. Tons peu usités (Bordet, 1755, 17)	Notes rarely used
***17**. Les tons si, ut, re de la 3e 8ve ne se font pas également sur toutes les Flutes, plus elles sont basses plus il est facile de les y faire, on les tirera aisement avec une corps d'Amour et encore plus aisement avec une Basse de Flute traversière. (Bordet, 1755, 17)	The tones B, C, D of the 3rd 8ve are not playable on all Flutes, the lower they are the easier it is to make them there, they will be played easily with a body of Flûte d'Amour and even more easily with on a Basse de Flute traversière. (Bordet, 1755, 17)
***18**. Les tons suivants ne se trouvent que sur les Flutes d'Amour et les Flutes de Baße quelques flutes ordinaires montent jusqu'au si. (Mahaut, 1759, 7)	The following tones are only found on the low Flutes and the Bass Flutes some ordinary flutes can play up to B3.
***19.** Les tons suivants ne se trouvent que sur les Flutes d'Amour et les Flutes de baße quelques flutes ordinaires montent jusqu'au si. (Bailleux-Hotteterre, 1765, 8)	The following tones are only found on the low Flutes and the Bass Flutes some ordinary flutes can play up to B3.

Appendix XIV

Hotteterre, Jacques. (1708). *Pieces pour la Flute Traversiere, et autres instruments, avec la Basse-Continue. Œuvre II*a. Paris J. B. Christophe Ballard. The movement *Echos* with marked nuances *Forte* and *Piano*.



Appendix XV

Écrits de Musiciens XV^e-XVIII^e siècles (1912, 242-245) by the French musicologist Jacques-Gabriel Prod'homme (1871-1956) and the article about the Parisian Traverso virtuoso and composer Michel de La Barre (*c.*1675-1744) here reproduced as a facsimile.

la Chambre du roi », ou de « l'un des musiciens de la Chambre pour la flûte traversière », mais encore par ses œuvres, qui consistent en trois *Livres de Trio* pour la flûte, et treize *Suites* à deux flûtes.

Michel de La Barre, « officier de la musique du roi », fit son testament le 8 mars 1741 ; celui-ci fut insinué le 16 mars 1745, peu après la mort du musicien.

MÉMOIRE DE M. DE LA BARRE

Sur les Musettes et hautbois &c (1)

[vers 1740].

on trouue dans les archives de la Chambre des comptes, quatre charges de haubois et musettes de poitou, de la création du Roy Jean. dans ces tems parbare (*sic*) au moins pour les arts, et sur tout pour la musique, on ne connoisoit dautres istrumens que la musette, le hauboïs, la cornemuse, le cornet, le

(1) Arch. Nat., *Maison du Roi*, O^1. 878 (Musique de la Grande Ecurie). La musique dite de la Grande Ecurie comprenait, aux dix-septième et dix-huitième siècles, les trompettes, les fifres et tambourins ou tambours, les hautbois, saquebutes (trombones) et cornets, les hautbois et musettes du Poitou. Il y avait aussi des violons. Cette sorte de musique militaire, ou de plein air, dépendait du Grand Ecuyer.

cromorne. et le cacbouc (1), ce dernier estoit une Espece de cornemuse mais bien plus grand, tous ces instrumens estoient bons pour réjouir les paysans et pour leurs dances, quoy quils sacordassent tres mal, premierement par lignorance de ceux qui en jouuent, et par le deffaut mesme des instrument ; du uiuent de françois premier, on commença a se decrasser sur la musique, un nommé du coroy (2) valet de chambre de sa maiesté et maitre de musique de sa chapelle fut le premier et le seul qui en fit de belle pour ce tems la ; il voulut se seruir de ces instrumens, mais il ne put jamais, on fut obligé de faire venir des uiolons du milanois, apres sa mort la musique retomba dans le barbare, et elle y est restée a tres peu pres, jusques autams de louis quatorze, sous le célébre raygne ou tous les arts ont esté portez a leur perfection. la musique a brillé infiniment Le Camus, Boisset, Dembris et Lambert (3) ont éstez les premiers a faire

(1) Peut-être faut-il lire « cachout » pour saquebute, l'ancêtre du trombone ; mais alors, l'explication de La Barre, qui rapproche cet instrument de la cornemuse, serait fantaisiste.

(2) Sur Eustache du Caurroy, voir ci-dessus, p. 136, n. 1.

(3) Chef de la grande bande des violons du roi, Sébastien Le Camus a laissé des « airs », dans des recueils manuscrits ; on ignore à peu près tout de sa vie, bien qu'il ait joui d'une grande réputation sous Louis XIII et au début du règne suivant. Il mourut le 24 mars 1677.

Son fils Charles Le Camus, « joüeur de Téorbe » et « joüeur de Violle de la musique de la Chambre » hérita de lui ces deux places. Un recueil posthume d'*Airs* de Sébastien parut en 1678.

Un maître de musique, Honoré Dambruis, obtenait le 23 novembre 1684, un privilège pour l'impression d'ouvrages de musique ; il le faisait enregistrer le 31 mars suivant. Sur

des airs qui exprimassent les parolles, mais surtout le Celebre Luly ; on peut dire que on deuroit Lapeller Lapollon de La france mais son Eleuation fit la chute totalle de tous ces entiens instrumens a lexception du haubois, grace aux filidor et hautteterre (1) lesquels on tant gâté de bois et soutenus de la musique, quils sont enfin paruenus a le rendre propre pour les Conçerts. des ce tems la on laissa la musette aux bergers, les uiolons, les flutes douces, les theorbes et les uioles, prirent leur place, car la flute trauerssiere n'est venue quapres. C'est philbert (2)

les Boësset, voir ci-dessus, p. 121 et suiv. Lambert, beau-père de Lully (1610-1696).

(1) Les Danican Philidor, dynastie de musiciens, qui s'établit en France sous Louis XIII. Les Hotteterre, famille de flûtistes et de hautboïstes, fleurit à la même époque.

(2) Philibert Rebeillé, dit Philbert, flûtiste. Il fut mêlé à l'affaire des poisons. Un gros bourgeois du port Saint-Landry, Brunet, lui destinait sa fille. « Brunet adorait le flûtiste pour l'agrément de son talent, et, Mme Brunet pour l'agrément de sa personne, dit M. Funck-Brentano. Tout eût été pour le mieux, si Brunet ne se fût avisé d'offrir à Philbert sa fille, avec une belle dot. » Mme Brunet, jalouse, confia son sort à la Voisin ; moyennant 2.000 livres, Brunet fut empoisonné, et Philbert épousa la mère au lieu de la fille, et le roi signa au contrat. Brunet était mort en 1672; sept ans plus tard, tout fut découvert et la femme du flûtiste fut condamnée à faire amende honorable, puis à être pendue en place de Grève, son corps jeté au feu et ses cendres au vent. Philbert, qui s'était constitué prisonnier à la Bastille, fut absous par arrêt du 8 août 1680. Il succéda vers le même temps à Jean Brunet, à la Grande Ecurie « joueur de fluste du Cabinet », il démissionna de cette charge, le 31 décembre 1689 en faveur de Pierre Piesche. Il mourut au plus tôt en 1715. Voir Funck-Brentano, *le Drame des Poisons*, pp. 141-143. La Bruyère, faisant allusion à cette fameuse affaire mit Philbert sous le nom de Dracon, dans ses *Caractères*.

qui en a jouez le premier en France, et puis presque en meme tems Descoteaux (1), le roy aussibien que toute la cour, a qui cet istrument plut infiniment, *adiouta deux charges aux quatres musettes de poitou*, et les donna à Philbert et à Descoteaux, et ils mont dit plusieurs fois que le roy leur auoit dit en les leur donnant quil souhaitoit fort que les six musettes fussent metamorphoseés en flutes traversieres, qua moins elles seroient utilles, au lieu que les musettes nestoient propre qua faire danser les paisanes, voila tout ce que jay lu et tout ce que jay ouy dire touchant la musette. Je souhaite quil soit assez bien écrit pour que vous puissierz l'entendre, Je nay peu faire mieux ce nest point mon metier d'ecrire, Je joue de la flute a votre tres humble seruice.

Je suis très parfaitement, Monsieur,

votre tres humble et tres
obeissant serviteur

Delabarre.

(*Adresse:* A Monsieur, Monsieur Deuilliers (2)
a l'hotel de la monnaye, A Paris.)

(1) Pignon Descostaux (François) serait né vers 1655. Il mourut en 1728, ayant fait nommer son fils René, en survivance, comme hautbois et musette du Poitou, le 11 décembre 1689. Ce fut l'un des plus célèbres flûtistes de son temps. Ami de Molière, de Racine, de La Fontaine, de Boileau, il était logé au Luxembourg dans les dernières années de sa vie. Très amateur de fleurs, il avait longtemps vécu faubourg Saint-Antoine. Ce serait le « curieux de fleurs » des *Caractères*.

(2) M. de Villiers était secrétaire du prince Charles de Lorraine, grand Ecuyer de France « au Carousselle. »

Appendix XVI

Eisel, Johann Philipp. (1738, 81-87; 1762, 63-69). *Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe*, *Musicus Autodidacticus* in *Musicus Autodidacticus*. Erfurt: Johann Michael Funcken. This is a free translation to German of some sections and fragments as found in *Principes*, including an engraving of a Traverso-player which clearly is under influence from the famous engraving by Bernard Picard (1673-1721) as found in *Principes*.

Von der Fleute Traversiere oder sogennanten Quer-Pfeiffe.

1.

Warum wird sie eine Quer-Pfeiffe genennet?

Weil man sie die Quere vor den Mund hält.

2.

Wird sie nicht auch eine teutsche Flöthe geheissen?

Ja.

3.

Woher hat sie diesen Namen bekommen?

Daher, weil sie von den Teutschen erfunden worden: wiewohl Polydorus Vergilius Lib. I. de inventoribus rerum c. 15 vorgiebt: Midas, ein König in Phrygien, sey ihr Erfinder gewesen, wiewohl nach der Zeit die Herren Franzosen diesem Instrumente ein ganz anderes Ansehen gegeben und auf das beste excoliret.

4.

Was ist einem Anfänger dieses Instruments nöthig?

Eine feine Positur und ein guter Ansatz.

5.

Wie muß die Positur beschaffen seyn?

Folgendermaßen: Wenn man stehet, daß man den Leib gerade halte, und den Kopff ein wenig auf die eine Seite biege, um zu den Ansatz desto geschichter zy seyn; auf den Beinen aber muß man feste stehen, und den lincken Fuß ein wenig voraus setzen, und vor allen Dingen keine affectirte Positur machen, weniger den Leib und das Haupt mit bewegen, wie ihrer viele zu thun pflegen, wenn sie entweder Trillo schlagen, oder den Tact führen. Hierauf halte man beyde Hände in der Höhe, ohne die Achseln oder Ellenbogen zu erheben, so wird die Positur, wenn sie mit einem geschickte Tone begleitet wird, allezeit eine gute Air geben.

6.

Wie kann man zu einen guten Ansatze gelangen?

Also: Man bemühe sich hauptsächlich, die Lippen also zu formiren, daß eine auf der andern stehe, und nur mitten eine kleine Oeffnung bleibt, damit der blasende Wind könne hindurch kommen. Hierauf lege man die Quer-Pfeiffe and den Mund, und mit ihrer oberen Oeffnung gegen die kleine Oeffnung des Mundes über, und blase mit gemäßigter Lufft, indem man zugleich die Pfeiffe bald einwärts nach dem Munde zu, bald auswärts drehet, so lange, bis man den rechten Ort getroffen. Damit man aber dieses um so viel besser in Acht nehmen möge, kann man vor einen grossen Spiegel treten, allwo man sich selbst mit allen Bewegungen am deutlichsten erkennen kann, und anfänglich nur lediglich den Ansatz erst recht suchen, ohne mit denen Fingern die Tone zu greiffen, welches schon hernachmals geschehen kann. Wer aber aufgeworffene Lippen hat, kann, nach vorher beschriebener Methode, daß er nemlich die Lippen einwärts zusammen drücke, den Ansatz nicht machen: sondern muß dieselbigen in ihrer natürlicher Positur lassen, und sie nur feste zusammen drücken: Also kommt der Ansatz naturell und ungezwungen heraus, wie aus beygefügter Figur zu sehen:



7.

Was hat ein Anfänger hierbey mehr zu beobachten?

Die Stellung derer Hände, wie aus beygefügter Figur, die eine naturelle Positur vorstellt, welche ein Mensch haben muß, wenn er dieses Instrument recht tractiren will, mit mehrern zu ersehen. Es stehet demnach die lincke Hand A. voran; die Flöte aber wird mit dem Daumen und Zeige-Finger B. gehalten. Hierauf die Hand von den Faust-Gelencke ein wenig erhopen, die beyden ersten Finger gebogen, der dritte aber gerade hingestrecket. Bey der rechten aber wird der Daumen fast unter das vierte Loch gehalten, hierauf folgen die drei Finger C. nach einander, bey dem fünften Loch aber ist eine solche Feder wie bey denen Fagotten und Hautbois zu seyn pfleget, und welche dazu dienet, daß man mit Bequemlichkeit das Loch erreichen könne, dieses wird von dem noch übrigen kleinen Finger der rechten Hand gegriffen, und hiermit zugleich die Flöte in etwas unterwärts gegen D. zugebogen. Hierbey ist noch zu erinnern, daß diese Fleute Traversiere, nach beygesetzter Figur, von denen Soldaten ihren Quer-Pfeiffen sehr unterschieden, denn diese haben nur 6. Löcher, jene aber 7. und das ist eben die meßingene Klappe, welche durch eine Feder regieret wird.

8.

Wenn nun ein Anfänger dieses alles wohl begriffen,
was hat er ferner zu thun?

Er muß anfangen sich besser zu appliciren, und die Scalam zur Hand nehmen, sich den Violinen Schlüssel G. oder das Französische Zeichen wohl bekannt machen.

9.

Wie viel hat solche Octaven?

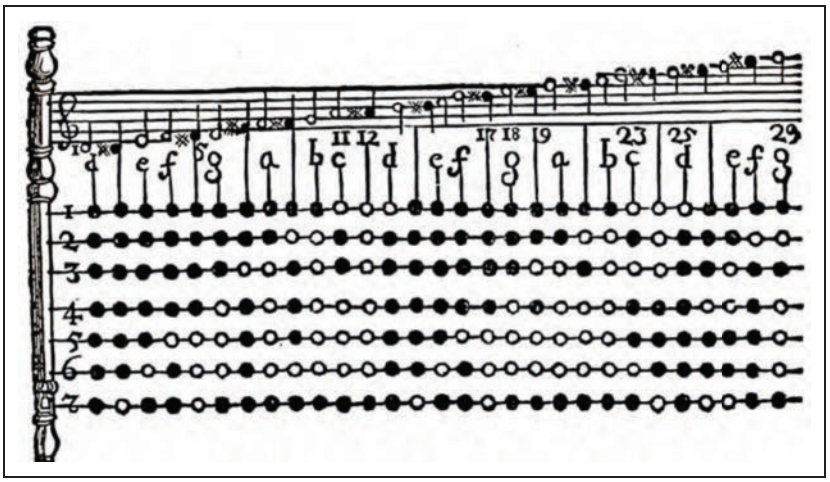
Sie hat 2. Octaven, von dem grossen D. biß auf das eingestrichene, und noch drey Buchstaben drüber vor, und dieses gehet aus dem Niedrigen in die Höhe, wie die Figur ausweset, was die andere anlangt, da man aus der Höhe nach dem Niedrigen gehet, ist bloß um die Figuren zu menagiren nicht á part bezeichnet worden, welches auch überflüßig wäre, und kann einer nur von G. wieder zurück gehen, so hat er eben die andere Scalam.

10.

Was bedeuten aber die beygesetzten Buchstaben?

Der Noten Benennung.

Figur der Flute Traverse, ihre Etendüe anzeigend.



11.

Was sollen aber die Zahlen 1. 2. 3. 4. 5. 6. 7. samt denen beysthehenden runden Nullen anzeigen?

Die Zahlen zeigen an die Finger, die runden Nullen aber die Löcher. Wo demnach alle Löcher schwarz sind, bedeutet es, daß dieselben alle mit denen Fingern müssen bedecket werden, daraus entstehet denn das unterste d. wo aber alla Löcher zugehalten werden bis auf das letzte, welches offen bleibet, so ensthehet daraus dis, und also biß hinauf und wieder herunter, wie aus obanangezeigter Figur deutlich zu ersehen.

12.

Wenn man nun gemeldte Tone zu blasen anfänget, wie muß der Wind tractiert werden?

Man muß den Wind moderat mit der Zunge anstossen, damit es in etwas den Ton schärfft, denn dieses Instrument wird durchgängig gestossen. Ferner bläset man die Tonos Naturales, (das sind die weissen Noten) zuerst durch: Und wenn man diese kann, alsdenn auch die Artificiales oder die Semitonia mit, (das sind die schwarzen Noten).

13.

Wenn aber ein Liebhaber dieses Instruments in allen recensirten Stücken sich so weit perfectioniret hat, was muß er noch lernen?

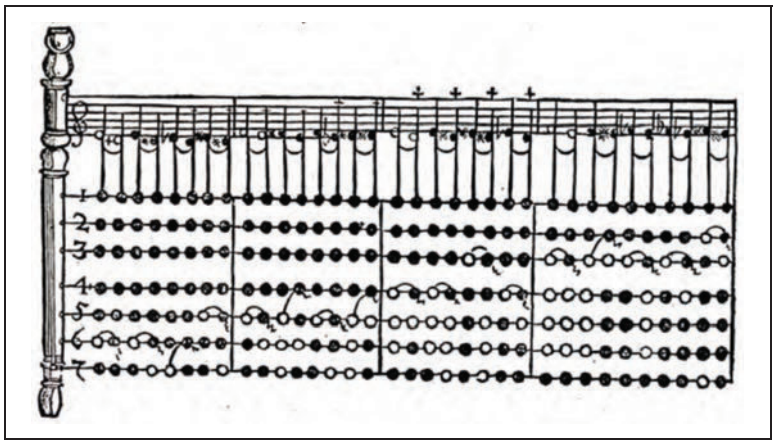
Er muß alsdenn anfangen die Cadences zu erlernen, wobey sonderlich die Schwebung des Windes muß observiret werden.

14.

Was ist aber eine Cadence?

Eine Cadence ist nichts anders als eine Schleiffung eines ganzen Tones in einem andern gantzen, oder auch einen halben, oder Semitonium, welche anfänget von dem höhern Tone, und sich in dem niedrigen endigt. Ein deutliches Exempel davon ist in beygesetzter Figur an denen beyden Noten E. und D. enthalten.

Beschreibung aller Abfälle, Tone und Manieren, welche bey der Flute Traverse vorkommen.



Wobey zu mercken, daß bey D. ein Kreutzgen stehet, dieses zeiget einen Vorschlag an, da die Flöthe in etwas tremuliret. So gehen die andern Kreutzgen alle fort, bey denen andern Noten.

15.

Wie kann man aber das tremuliren erlernen?

Folgendergestalt: Wenn man nemlich bläset, so stösset man etwas mit der Zungen, und schläget zugleich etlichemal mit dem Finger nur halb und halb auf das Loch, ohne mit der Zunge wieder von neuen anzustossen, oder den Athem zurück zu nehmen, endlich lässet man die Finger gar drauf liegen, daß der natürliche Ton heraus komme. Wieviel man aber mit denen Fingerns schlagen muß, ist eigentlich nicht zu determiniren, sondern man richtet sich darnach, wieviel die Note gilt, um die Cadence kurz oder lang zu machen. Hat man also auf diese Art die natürlichen Tone wohl durchgegangen, und sich darinnen feste gesetzet, so greiffe man auch die Semitonia mit an, welche gleiche Manier brauchen, doch wird auch hierbey die Flöthe an dem Mund bisweilen mit beweget, welches aber die Praxis selbst einem jeden besser lehren wird, als ich solches beschreiben kann. Dieses belobte Instrument hat wegen seines insinuanten Tones sowohl in Frankreich als Teutschland viele hohe und vornehme Liebhabers gefunden, welche solches vortrefflich excoliret, inmassen vielen nicht unbekannt seyn wird, daß Ihro Königliche Hoheit, der Cron-Prinz in Preussen, es auf diesen Instrument so hoch gebracht, das Sie viele Virtuosen darinnen übertreffen.

Appendix XVII

Descriptions regarding the lips and embouchure in relation to the one-keyed Traverso as described in *Principes*, *Rudiments*, Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), *L'Encyclopédie Méthodique* (1785 & 1788), Devienne (*c.*1794), Peraut (*c.*1802), and Balleron 1895.

Principes **1707** ***Rudiments*** **1729**	Il faut qu'elles [the lips] soient jointes l'une contre l'autre, excepté dans le milieu où l'on doit former une petite ouverture pour le passage du vent: On ne les avancera point, au contraire on les retira du coin de la Bouche, afin qu'elles soient unies & applaties. Il faut placer l'embouchure vis-à-vis de cette petite ouverture. (II: 3)	[…] what manner the lips are to be disposed they ought to be join'd close together except just in their middle, where a little opening is form'd for the passage of the wind, the lips must not pout out, but rather be contracted toward the corners of the mouth; So that they may be smooth and even; let the hole of the Flute be plac'd just opposite to this opening of the lips, and resting the Flute upon the under lip […] (1729, II: 3)
Corrette 1735 & 1773	Il faut poser les levres sur le trou de l'Embouchure […] les joindre l'une contre l'autre, et faire une petite ouverture dans le milieu pour le passage du vent. Et pour l'Emboucher aisément, il faut retirer les lèvres des côtés de la bouche, et placer le trou de l'Embouchure vis-avis la petite ouverture des lèvres; ensuite pousser le vent fort doucement. (1735 & 1773, III: 9)	One must put the lips on the blowing-hole, join them one against the other, and make a small opening in the middle for the passage of the airstream. And you have to tighten the lips from the sides of the mouth, and place the blowing-hole of the head head-joint *vis-à-vi*s the small opening between the lips
Mahaut 1759	Il faut joindre les levres l'une contre l'autre en les retirant du coin de la Bouche pour les unir et les applatir laissant une petite ouverture au millieu pour le passage du vent. On place le trou de l'Embouchure de la Flute vis a vis l'ouverture des levres, en apuyant la Flute contre la levre d'en bas, de façon que l'Embouchure de la Flute reste presque a decouvert. (1759, II: 6)	The lips must be joined together by pulling them from the corners of the mouth to unite and making them smooth and even, leaving a small opening in the middle for the passage of the airstream. Place the blowing-hole of the head-joint of the Flute opposite the opening of the lips, resting the Flute against the under lip, so that the head-joint of the Flute remains almost uncovered.
De Lusse *c.*1761	L'embouchure de la Flute doit être placée droite au milieu de la levre inférieure […] il faut observer que les levres soient tendues & resserrées sur les dents, & que la levre supérieure puisse couvrir à une ligne de distance ou à peu près, l'extérieur de l'embouchure de la Flute, afin de contraindre le vent à ne prendre d'autres route que celle que le trou de l'embouchure lui offre. (1761, 3-4)	The head-joint [and its blowing-hole] of the Flute must be placed straight in the middle of the lower lip […] it must be observed that the lips are stretched & tightened on the teeth, & that the upper lip can cover at a distance of a *ligne* or so (2,26 mm), outside the blowing-hole of the Flute, in order to force the airstream to take no other route than the one offered by the blowing-hole.
Bailleux-Hotteterre 1765	[…] il faut qu'elles [the lips] soient jointes l'une contre l'autre, excepté dans le milieu où l'on doit former une petite ouverture pour le passage du vent: on ne les avancera point, au contraire on les retira du coin de la bouche, afin qu'elles soient unies et applaties. Il faut placer l'embouchure vis-à-vis de cette petite ouverture, souffler d'un vent moderé […] (1765, II: 6)	[…] they [the lips] must be joined one against the other, except in the middle where one must form a small opening for the passage of the airstream: one should not advance them, on the contrary withdraws them from the corner of the mouth, so that they become even and flattened. You must place the blowing-hole opposite this small opening
L'Encyclopédie Méthodique **1785 & 1788**	Il faut joindre les lèvres l'une contre l'autre, ensorte qu'il ne reste qu'une petite ouverture dans le milieu, large environ d'une demi-ligne, & longue de trois ou quatre : on n'avancera point les lèvres en devant, comme lorsque l'on veut souffler une chandelle pour l'éteindre: au contraire, on les retirera vers les coins de la bouche, afin qu'elles soient unies & applaties. (1785 & 1788, 106)	You must join the lips against each other, so that there is only a small opening left in the middle, about half a *demi-ligne* wide (1,13 mm), and a three or four *lignes* long (6,78 – 9,04 mm): you should not move the lips forwards, as when one wants to blow out a candle to extinguish it: on the contrary, withdraw the lips towards the corners of the mouth, so that they are even and flattened.
Devienne *c.*1794	[…] il faut joindre les lèvres, les tendre et les resserer aux deux extrèmités, en sorte qu'il ne reste qu'une petite ouverture dans le milieu, large environ d'une ligne et longue de deux ou trois. (*c.*1794, 6)	[…] you must join the lips, stretch, and tighten them at both ends [corners], so that there is only a small opening in the middle, about one *ligne* wide (2,26 mm), and two or three long (4,52 mm – 6,78 mm).
Peraut *c.*1802	[…] retirer un peu les lèvres en arriere pour leur faire former un petit trou par où doit passer le souffle […] (*c.*1802, 3)	[…] withdraw the lips back a little, to make them form a small opening through which the airstream must pass […]
Balleron 1895	Pour émettre un son, l'embouchure étant posée comme il a été dit, on pince les lèvres en les retirant vers les coins de la bouche. […] Pour obtenir les sons aigus, il faut pincer plus ou moins les lèvres, et chasser l'air plus vivement. Pour les sons graves, on relâche un peu les lèvres. (1895, 9)	To emit a sound, the head-joint being posed as described, one pursues the lips while withdrawing them towards the corners of the mouth. […] To obtain the high register, you must pinch your lips more or less, and expel the airstream more lively [faster]. For the low notes, relax the lips a little.

Appendix XVIII

Figure combining aspects regarding the opening between the lips, embouchure, *Tonus* and activity in the lips, and the airstream based on the three-piece Traverso: *Principes* (1707) and *Rudiments* (1729), four-piece Traverso: Quantz (1752), Boehm-flute: Altès (1880/1906) and Hériché (1975).

Notes and fingerings	**D1** **123/456** [/7]	**G1** **123/0** [/7]	**D2** **23/456** [/7]	**G2** **123/0** [/7]	**D3** **23/456** [/7]	**G3** **13/0** [/7]
Just intonation* compared with *Equal 12 division **G1 as reference note**	**+2**	**±0**	**+2**	**±0**	**+2**	**±0**
1/4-Comma Meantone* compared with *Equal 12 division **G1 as reference note**	**–3**	**±0**	**–3**	**±0**	**–3**	**±0**
1/5-Comma Meantone* compared with *Equal 12 division **G1 as reference note**	**–2**	**±0**	**–2**	**±0**	**–2**	**±0**
Head-joint positions influencing intonation Hotteterre, 1707/1729	**Normal**	**Normal**	**Normal or Outward**	**Normal**	**Normal or Outward**	**Normal**
Level of *Tonus* in the lips and embouchure Hotteterre 1707/1729	Less *Tonus* in the lips compared with **G2**	Less *Tonus* in the lips compared with **G2**	Less *Tonus* in the lips compared with **G2**	[…] *pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres,* (III: 8) […] *take care to close the lips more, and more, to contract them towards the corners of the mouth* (III: 6)	[…] *pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres,* (III: 8) […] *take care to close the lips more, and more, to contract them towards the corners of the mouth* (III: 6)	[…] *pour adoucir les Tons hauts & les former plus facilement, ils auront soin de serrer les Levres de plus en plus, de les retirer du coin de la bouche, d'avancer la langue vers les Levres,* (III: 8) […] *take care to close the lips more, and more, to contract them towards the corners of the mouth* (III: 6)
Speed of the airstream Hotteterre 1707/1729	*Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas* (III: 6) *You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend* (III: 5)	*Il faut remarquer que l'on ne doit donner que peu de vent, pour faire les Tons bas* (III: 6) *You must observe to blow but gently, for the lower Notes; blowing stronger as you ascend* (III: 5)	*On doit pour alors augmenter le vent; ensorte que le son soit aigu, cependant il ne faut point trop le pousser, de peur qu'en soufflant trop fort, on ne monte une Octave plus haut qu'il ne faut.* (III: 8) […] *blow pretty strong, but not too strong, least you sound an Octave higher than you ought.* (III: 5)	[…] *d'augmenter le vent peu à peu.* (III: 8) […] *increase the strength in blowing, by little, and little.* (III: 6)	[…] *d'augmenter le vent peu à peu.* (III: 8) […] *force the wind a little more* (III: 6)	[…] *d'augmenter le vent peu à peu.* (III: 8) […] *force the wind a little more* (III: 6)
Covering the blowing- hole with the under lip turning the head-joint inward towards the high register directs the airstream gradually downwards Quantz, 1752, Tab: II, Fig. 2 	 Cover the blowing-hole to the first line from below	 Cover the blowing-hole to the first line from below	 Cover the blowing-hole to the second line from below	 Cove the blowing-hole to the second line from below	 Cover the blowing-hole to the third line from below	 Cover the blowing-hole to the fourth line from below
Directions of the airstream Quantz, 1752, Tab: II, Fig. 2	Slightly downwards	Slightly downwards	More downwards	More downwards	Even more downwards	Even more downwards
Level of *Tonus* in the lips and speed of the airstream Altès, 1880/1906	[…] *the lips must be less pressed together (looser) for the lower notes* (5th *Lesson*, 39)	[…] *the lips must be less pressed together (looser) for the lower notes* (5th *Lesson*, 39)	[…] *the lips must be less pressed together (looser) for the lower notes than for the middle notes* (5th *Lesson*, 39)	*The stream of the air for the second octave must have a greater degree of velocity than that necessary for producing the lower notes* […] *the lips must be more pressed together for the medium register than for the lower* (6th *Lesson*, 44)	[the lips] *more pressed together for the upper* [notes] (5th Lesson, 39)	[the lips] *more pressed together for the upper* [notes] (5th Lesson, 39)
Size of the opening between the lips Hériché, 1975, 3						

Appendix XIX

The anonymous text for the Brunette *L'autre jour ma Cloris* and a free English translation of the same.

L'autre jour ma Cloris Pour qui mon cœur soupire Avec un doux souris S'en vint tout bas me dire: Mon berger, mes Amours, M'aimerez-vous toujours?	The other day my Cloris For whom my heart sighs With a sweet smile She whispered to me: My Shepherd, my Loves, Will you still love me?
Quoi qu'absent, chaque jour, Mon cœur sent qu'il t'adore. Quand ma bouche, à son tour, Te dira-t-elle encore? Ma Cloris, mes Amours, Je t'aimerai toujours.	Although absent, every day, My heart feels that it adores you. When my mouth, in turn, Will she tell you again? My Cloris, my Loves, I will always love you.

Appendix XX

Descriptions regarding the placement of the tip of the tongue and the articulation syllable **T** for single tonguing. Names marked with bold indicate flute teachers at the *Conservatoire* covering the period 1795-2021.

Traverso	Multi-keyed conical flutes	*Ringklappenflöte*	Boehm-flute
[Tu] Il se fait en frappant de la langue au palais. **Devienne** (*c.*1794, 9)	—	—	—
[…] pour détaché, c'est à dire, donnez un coup de langue entre les lèvres […] (Cambini, *c.*1795, 4)	—	—	—
[Tu] […] il est nécessaire de porter toujours la langue à l'extrémité du palais et non pas sur les dents, ce qui rendroit les sons pointus et secs en leur ôtant les moyens de vitesse et de légèreté. **Hugot & Wunderlich** (1804, 7)	**Tu** […] il est nécessaire de porter toujours la langue à l'extrémité du palais et non pas sur les dents, ce qui rendroit les sons pointus et secs en leur ôtant les moyens de vitesse et de légèreté. (**Hugot & Wunderlich**, 1804, 7)	—	—
Tu se fait en portant la langue légèrement au palais au dessus des dents supérieures […] (**Wunderlich**, 1812, 6) […] la langue doit être posée derrière les dents, touchant lègerement au palait, en ayant soin de tenir les lèvres assez resserrées, de manière à ce que vous prononciez la syllabe **Tu**, forçant l'articulation; et la syllabe **Du**, en l'adoucissant. (**Wunderlich**, 1818, 27)	[**Tu**] se fait en portant la langue légèrement au palais au dessus des dents supérieures […] (**Wunderlich**, 1812, 6) […] la langue doit être posée derrière les dents, touchant lègerement au palait, en ayant soin de tenir les lèvres assez resserrées, de manière à ce que vous prononciez la syllabe **Tu**, forçant l'articulation; et la syllabe **Du**, en l'adoucissant. (**Wunderlich**, 1818, 27)	—	—
[…] il faut à peu près prononcer la syllabe ***te*** ou ***tu*** ce qui s'obtient en desserant les dents et en avançant le bout de la langue, mais seulement jusqu'à la face interne des lèvres. (Kastner, 1844, 6/214) Le coup de langue *Simple* se fait en frappant le bout de la langue sur le bord des lèvres sans la faire sortir et en prononçant la syllabe **Tu**. Le coup de langue *Louré* en frappant la langue au palais, un peu au-dessus des dents, et en prononçant **Du**. (**Tulou**, 1851/1973, 8)	[…] il faut à peu près prononcer la syllabe ***te*** ou ***tu*** ce qui s'obtient en desserant les dents et en avançant le bout de la langue, mais seulement jusqu'à la face interne des lèvres. (Kastner, 1844, 6/214) Le coup de langue *Simple* se fait en frappant le bout de la langue sur le bord des lèvres sans la faire sortir et en prononçant la syllabe **Tu**. Le coup de langue *Louré* en frappant la langue au palais, un peu au-dessus des dents, et en prononçant **Du**. (**Tulou**, 1851/1973, 8)	[…] la langue s'avance pour fermer l'ouverture qui reste encore au milieu de la bouche et pour retenir l'air aspiré; la langue se retirant ensuite avec précipitation, l'air aspiré s'échappe, frappe celui que l'instrument renferme, et cette collision produit le son. (**Coche**, 1839, 28) […] la langue qui doit frapper le palais un peu au-dessus des dents. (**Dorus**, 1845, 17)	[…] il faut faire à la langue, en portant son extrémité contre la lèvre supérieure, le même mouvement que pour prononcer la syllabe (***Te***) (Gattermann, 1861, 159)
—	—	—	[…] advancing the tongue to the inner edge of the lips, never going beyond this, impart to it in withdrawing a movement short and quick similar to the pronunciation of the syllable **Tu**. (**Altès**, 1880/1906, 20)
Le bout de la langue doit être appuyé intérieurement contre les dents tout en laissant la bouche hermétiquement fermée […] on retire vivement langue dans l'intérieur de la bouche comme si on voulait chasser un pépin au dehors, en prononçant la syllabe **tu** (*c'est ce qu'on appelle coup de langue*). (Balleron, 1895, 9)	Le bout de la langue doit être appuyé intérieurement contre les dents tout en laissant la bouche hermétiquement fermée […] on retire vivement langue dans l'intérieur de la bouche comme si on voulait chasser un pépin au dehors, en prononçant la syllabe **tu** (*c'est ce qu'on appelle coup de langue*). (Balleron, 1895, 9)	Le bout de la langue doit être appuyé intérieurement contre les dents tout en laissant la bouche hermétiquement fermée […] on retire vivement langue dans l'intérieur de la bouche comme si on voulait chasser un pépin au dehors, en prononçant la syllabe **tu** (*c'est ce qu'on appelle coup de langue*). (Balleron, 1895, 9)	Le bout de la langue doit être appuyé intérieurement contre les dents tout en laissant la bouche hermétiquement fermée […] on retire vivement langue dans l'intérieur de la bouche comme si on voulait chasser un pépin au dehors, en prononçant la syllabe **tu** (*c'est ce qu'on appelle coup de langue*). (Balleron, 1895, 9)
—	—	—	[**Te**] l'extrémité de la langue prennent appui contre la face interne des dents du haut ainsi obturateur. Puis, brusquement, on libera la quantité de souffle ainsi comprimée en ramenant la langue à sa position normale. (**Taffanel & Gaubert**, 1923/1958, 14)
—	—	—	With the tongue out, try to get a consistent note, rather like a vibrating pizzicato; each note therefore short but not harsh; I a word, let it be as lively as possible in the shortest time. (**Moyse**, 1934, 15)
—	—	—	La langue se trouve placée entre les dents et va ainsi déterminer le départ de la colonne d'air. C'est aussi l'attaque du simple coup de langue. (**Rampal**, 1978, 32) […] only brush the teeth with the tongue […] (**Rampal**, 1989, 81)
—	—	—	We use *Tu-Tu* for the attack for the single tonguing. **Marion** (Ljungar-Chapelon, 2008, 141)
—	—	—	Contrairement au détaché ou la langue est placée derrière les dents supérieures, «le détaché français» consiste à placer la langue entre les dents. (**Bernold**, 2021, 21)

Appendix XXI

Comparison of twelve French fingering-charts regarding the three- and four-piece Traverso and the use of the D#-key for the chromatic scale D1–C4, as found in *Principes*, Rippert (1725), Corrette (1735 & 1773), Bordet (1755), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), Mussard (1778), Devienne (*c.*1794), Cambini (*c.*1795), Van der Hagen (1798), and Balleron (1895), all published in Paris.

It is noteworthy that the D#-key as indicated in *Principes* is generally less used than in the other shown sources. For the notes G♭1–D2, and G2–B2 does *Principes* not suggest using the D#-key, whereas all other sources generally use the D#-key for these notes. A possible reason could be that the three-piece Traverso—as described in *Principes*—initially and to some degree was influenced by the Renaissance Traverso regarding playing-techniques. Considered that playing-techniques on the three-piece Traverso was developed in the three, four last decades of the 17th Century, and for the first time codified in *Principes* (1707) it seems plausible that remains of how to play on the Renaissance Traverso could have been incorporated in this process.

X indicates *to use* the D#-key
0 indicates *not to use* the D#-key
0/X indicates the alternatives *to use or not use* the D#-key
— no indicated fingering for this note

Note	*Principes* 1707 Three-pieces Traverso	Rippert 1725 Three-pieces Traverso	Corrette 1735 & 1773 Four-pieces Traverso	Bordet 1755 Four-pieces Traverso	Mahaut 1759 Four-pieces Traverso	De Lusse *c.*1761 Four-pieces Traverso	Bailleux-Hotteterre 1765 Four-pieces Traverso	Mussard 1778 Four-pieces Traverso	Devienne *c.*1794 Four-pieces Traverso	Cambini *c.*1795 Four-pieces Traverso	Van der Hagen 1798 Four-pieces Traverso	Balleron 1895 Four-pieces Traverso
D1	0	0	0	0	0	0	0	0	0	0	0	0
D#1	X	X	X	X	X	X	X	X	X	X	X	X
E♭1	X	X	X	X	X	X	X	X	X	X	X	X
E1	0	0	0	0	0	0	0	0	0	0	0	X
E#	0	—	—	—	0	0	0	0	—	—	0	—
F♭1	—	—	—	—	0	0	0	—	0	—	0	—
F1	0	0	0	0	0	0	0	0	0	0	0	0
F#1	X	X	X	X	X	X	X	X	X	X	X	X
Fx1	—	—	—	—	—	—	—	—	—	—	X	—
G♭1	0	X	X	X	X	0	0	0/X	X	[X]	X	X
G1	0	X	X	0/X	0/X	X	0/X	0/X	0	X	X	0/X
G#1	0	0	0	0	0	X	0	X	X	X	X	0
A♭1	0	0	0	0	0	0	0	0	X	[X]	X	0
A1	0	X	X	0/X	0/X	X	0/X	0/X	0	X	X	0/X
A#1	0	0	0	0	0	X	0	0	0	0	0	X
B♭1	0	0	0	0	0	0	0	0	0	0	0	0/X
B1	0	X	X	0/X	0/X	X	0/X	0/X	0	X	X	X
B#1	0	—	—	0/X	0/X	X	0/X	0/X	0	—	X	0/X
C♭2	—	—	—	—	X	0	X	—	—	—	X	—
C2	0	0	X	0/X	0/X	0	0/X	X	0	X	X	X
C#2	0	0	X	0/X	0	0	X	X	0	X	0	X
Cx2	—	—	—	—	—	—	—	—	—	—	0	—
D♭2	0	0	X	0/X	0	X	X	X	0	X	X	X
D2	0	0	0	0	0	0	0	0	0	0	0	0
D#2	X	X	X	X	X	X	X	X	X	X	X	X
E♭2	X	X	X	X	X	X	X	X	X	X	X	X
E2	0	0	0	0	0	0	0	0	0	0	0	0
F♭2	—	—	—	—	X	0	0	—	—	—	0	—
E#2	0	—	—	0	0	0	0	0	0	0	0	0
F2	0	0	0	0	0	0	0	0	0	0	0	0
F#2	X	X	X	X	X	X	X	X	X	X	X	0/X
Fx2	—	—	—	—	—	—	—	—	—	—	X	—
G♭2	X	X	X	X	X	0	X	X	X	[X]	X	0/X
G2	0	X	X	0/X	0/X	X	0/X	X	X	X	X	0/X
G#2	0	X	X	X	X	X	X	X	X	[X]	X	X
A♭2	0	X	X	X	X	X	X	X	X	X	X	X
A2	0	X	X	0/X	0/X	X	0/X	X	X	X	X	0/X
A#2	0	0	X	X	0/X	X	0/X	X	X	X	X	X
B♭2	0	0	X	X	X	0/X	0/X	X	X	X	X	X
B2	0	X	X	0/X	0/X	X	0/X	X	X	X	X	0/X
B#2	X	—	—	X	X	X	X	X	X	[X]	X	X

C♭3	—	—	—	—	X	0	X	—	—	—	X	—
C3	0	X	X	X	X	X	X	X	X	X	X	X
C#3	X	X	X	X	X	X	X	X	X	X	X	0
Cx3	—	—	—	—	—	—	—	—	—	—	X	—
D♭3	X	X	X	X	X	X	X	X	X	[X]	X	0
D3	0	X	X	X	X	X	X	X	X	X	X	X
D#3	X	X	X	X	X	X	X	X	X	X	X	X
E♭3	X	X	X	X	X	X	X	X	X	[X]	X	X
E3	X	X	X	X	X	X	X	X	X	X	X	X
E#3	—	—	—	X	X	0	X	X	X	[X]	X	X
F♭3	—	—	—	—	X	X	X	—	—	—	X	—
F3	X	—	0	X	X	X	X	X	X	X	X	X
F#3	0	—	0	0	0	0	0	0	0	0	0	X
Fx3	—	—	—	—	—	—	—	—	—	—	0	—
G♭3	—	—	0	0	0	0	0	0	0	[0]	0	X
G3	0	—	0	0	0	0	0	0	0	0	0	X
G#3	—	—	X	0	0	X	0	0	X	X	0	X
A♭3	—	—	X	0	0	X	0	0	X	[X]	0	X
A3	—	—	0	0	0	0	0	0	0	0	0	0
A#3	—	—	—	X	X	X	X	X	—	—	X	0
B♭3	—	—	—	X	X	X	X	X	—	—	0	0
B3	—	—	—	X	X	—	X	X	—	—	—	X
B#3	—	—	—	0	0	—	0	0	—	—	—	X
C♭4	—	—	—	—	X	—	X	—	—	—	—	—
C4	—	—	—	0	0	—	0	0	—	—	—	X
C#4	—	—	—	—	—	—	—	—	—	—	—	—
D♭4	—	—	—	—	—	—	—	—	—	—	—	—
D4	—	—	—	—	—	—	—	—	—	—	—	—

Appendix XXII

Comparison of standard fingerings for trills regarding the three- and four-piece Traverso for the chromatic scale C#1-A3, covering the period 1707 to *c.*1794 as found in *Principes*, Eisel (1738 & 1762), Corrette (1735 & 1773), Mahaut (1759), De Lusse (*c.*1761), Bailleux-Hotteterre (1765), and Devienne (*c.*1794). When comparing fingerings are they generally rather similar from the low D1 up to about B2, and fingerings from B2 up to the final B♭3 show far more alternative fingerings. This altogether points on that the higher register from about the middle of the 18th Century gradually became more in use than in the late 17th and early 18th Centuries. It should be noted that some fingerings in the high register as described by Mahaut (1759), and especially De Lusse (*c.*1761) are rather difficult, and could possibly include some rare misprints. Alternatively needing a special model of the Traverso like a *Flûte d'Amour* or *Basse de Traversière* because these bigger flutes are surprisingly easy to play in the high register (Ljungar-Chapelon, 2002).

Trill	*Principes* 1707 Three-piece Traverso	Eisel 1738 & 1762 Three-piece Traverso	Corrette 1735 & 1773 Four-piece Traverso	Mahaut 1759 Four-piece Traverso	De Lusse *c.*1761 Four-piece Traverso	Bailleux-Hotteterre 1765 Four-piece Traverso	Devienne *c.*1794 Four-piece Traverso
D1-C#1	123/456 **123/45(6)** *Turn the head-joint very much inwards for C#1*	—	—	123/456 **123/45(6)** *Turn the head-joint very much inwards for C#1,and enlarge the opening between the lips*	—	123/456 **123/45(6)** *Turn the head-joint very much inwards for C#1*	—
D#1-C#1	123/4567 **123/45(6)7** *Turn the head-joint very much inwards for C#1*	—	—	—	—	—	—
E1-D1	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	—
E1-D#1	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	—
E♭1-D1	123/4567 **123/45(6)**	123/4567 **123/45(6)**	123/4567 **123/45(6)**	123/4567 **123/45(6)** 123/4567 **123/456(7)**	123/4567 **123/456(7)**	123/4567 **123/45(6)**	—
E#1-D#1	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	—
F♭1-E♭1	—	—	—	123/45 **123/45(6)7**	—	123/45 **123/45(6)7**	—
F1-E1	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**
F#1-E1	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)57**	123/47 **123/(4)5**
F1-E♭1	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**
F#1-E#1	123/47 **123/(4)6**	123/47 **123/(4)6**	123/47 **123/(4)6**	123/47 **123/(4)6** 123/56 **123/(4)6**	123/47 **123/(4)6**	123/47 **123/(4)6** 123/56 **123/(4)6**	123/47 **123/(4)6**
FX1-E#1	—	—	—	—	123/7 **123/(46)**	123/0 **123/(4)6**	—
G1-F1	123/0 **123/(4)6**	123/0 **123/(4)6**	123/7 **123/(4)6**	123/0 **123/(4)6**	123/0 **123/(4)6**	123/7 **123/(4)6**	123/0 **123/(46)**
G1-F#1	123/0 **123/(4)7**	123/0 **123/(4)7**	123/7 **123/(4)7**	123/0 **123/(4)7**	123/7 **123/(4)7**	123/7 **123/(4)7**	123/0 **123/(4)7**

G#1-F#1	12/456 **12(3)/47**	12/456 **12(3)/47**	12/456 **12(3)/47**	12/456 **12(3)/47**	12/4567 **12(3)/47**	12/456 **12(3)/47**	12/4567 **12(3)/47**
G♭1-F1	123/56 **123/(4)6**	123/56 **123/(4)6**	123/47 **123/(4)6**	123/56 **123/(4)6**	—	123/56 **123/(4)6**	123/47 **123/(4)6**
G♭1-F♭1	—	—	—	123/56 **123/(4)5**	—	123/56 **123/(4)57**	—
G#1-FX1	—	—	—	12/567 **12(3)/7**	—	12/456 **12(3)/7**	—
A1-G1	12/0 **12(3)/0**	12/0 **12(3)/0**	12/7 **12(3)/7**	12/0 **12(3)/0**	12/7 **12(3)/7**	12/0 **12(3)/0**	12/0 **12(3)/0**
A1-G#1	12/0 **1(2)/456**	12/0 **1(2)/456**	12/7 **1(2)/456**	12/0 **1(2)/456**	12/7 **1(2)/4567**	12/0 **1(2)/456**	12/0 **12/(456)7**
A♭1-G1	12/456 **12(3)/0**	12/456 **12(3)/0**	12/456 **12(3)/7**	12/456 **12(3)/0** 12/45 **12(3)/0**	12/456 **12(3)/7**	12/456 **12(3)/0** 12/45 **12(3)/0**	12/4567 **12(3)/0**
A♭1-G♭1	12/456 **12(3)/56**	12/456 **12(3)/56**	12/456 **12(3)/47**	12/456 **12(3)/56** 12/45 **12(3)/56**	12/456 **12(3)/4**	12/456 **12(3)/56** 12/45 **12(3)/56**	12/4567 **12(3)/567**
A#1-G#1	13/4567 **1(2)/456**	13/4567 **1(2)/456**	13/45 **1(2)/456**	13/4567 **1(2)/456** 13/45 **1(2)/456**	13/457 **1(2)/4567**	13/4567 **1(2)/456** 13/45 **1(2)/456**	13/45 **1(2)/456**
B1-A1	1/0 **1(2)/0**	—	1/7 **1(2)/7**	1/0 **1(2)/0**	1/7 **1(2)/7**	1/0 **1(2)/0**	1/0 **1(2)/0**
B♭1-A1	13/45 **1(2)/0**	—	13/45 **1(2)/7**	13/45 **1(2)/0**	13/45 **1(2)/7**	13/45 **1(2)/0**	13/45 **1(2)/0**
B♭1-A♭1	13/45 **1(2)/456**	—	13/45 **1(2)/456**	13/45 **1(2)/456** 13/45 **1(2)/45**	13/45 **1(2)/456** 13/45 **1(2)/456**	13/45 **1(2)/456** 13/45 **1(2)/45**	13/45 **1(2)/456**
B1-A#1	1/0 **(1)3/456**	—	1/7 **(1)3/457**	1/0 **(1)3/4567** 1/0 **(1)3/457**	1/7 **(1)3/47**	1/0 **(1)3/4567** 1/4 **(1)3/457**	1/0 **1(3)/(4)5**
B#1-A#1	23/4 **(1)3/456**	—	23/7 **(1)3/45**	23/4 **(1)3/4567** 23/0 **(1)3/45**	23/7 **(1)3/47**	23/0 **(1)3/4567** 23/0 **(1)3/4**	23/0 **(1)3/45**
C2-B1	23/0 **(1)/0**	—	23/7 **(1)/7**	23/0 **(1)/0**	23/7 **(1)/7**	23/0 **(1)/0**	23/0 **(1)/0**
C2-B♭1	23/0 **(1)3/45**	—	23/7 **(1)3/457**	23/0 **(1)3/45**	23/0 **(1)3/45**	23/0 **(1)3/45**	23/0 **(1)3/45**
C♭2-B♭1	—	—	—	1/0 **(1)3/45**	—	1/0 **(1)3/45**	—
C#2-B1	0/0 **(1)/0**	—	0/7 **(1)/7**	0/0 **(1)/0**	0/0 **(1)/7**	0/0 **(1)/0**	0/0 **(1)/0**
C#2-B#1	0/0 **(23)/4**	—	0/7 **(23)/7**	0/0 **(23)/4** 0/0 **23/4(5)6**	0/0 **23/(45)**	0/0 **(23)/4** 0/0 **23/4(5)6**	0/0 **(23)/0**
CX2 B#1	—	—	—	23/456 **23/4(5)6**	23/456 **23/(45)6**	23/456 **23/(45)6**	—
D2-C2	23/456 **23/(4)56**	—	23/456 **23/(4)56**	23/456 **23/(4)56**	23/456 **23/(4)56**	23/456 **23/(4)56**	23/456 **23/(4)56**

D2-C#2	23/456 **(23)/456**	—	23/456 **(23)/456**	23/456 **(23)/456**	23/456 **(23)/456**	23/456 **(23)/456**	23/456 **(23)/456**
D#2-C#2	123/4567 **(23)/4567**	—	123/4567 **(23)/4567**	123/4567 **(23)/4567**	123/4567 **(23)/4567**	123/4567 **(23)/4567**	123/4567 **(23)/4567**
Db2-C2	0/0 **(23)/0**	—	0/7 **(23)/7**	0/0 **(23)/0** 0/0 **23/(4)56**	0/7 **23/(45)6**	0/0 **(23)/4** 0/0 **23/(4)56**	0/0 **(23)/0**
Db2-Cb2	0/0 **(1)/0**	—	—	0/7 **(1)/7**	—	0/7 **(1)/7**	0/0 **(1)/0**
D#2-CX2	—	—	—	123/4567 **123/45(6)** 123/4567 **123/456(7)**	—	123/4567 **123/45(6)**	—
E2-D2	123/45 **123/45(6)**	—	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**	123/45 **123/45(6)**
Eb2-D2	123/4567 **123/45(6)**	—	123/4567 **123/45(6)**	123/4567 **123/45(6)** 123/4567 **123/456(7)**	123/4567 **123/456(7)**	123/4567 **123/45(6)**	23/4567 **23/456(7)**
E2-D#2	123/45 **123/45(6)7**	—	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**	123/45 **123/45(6)7**
Eb2-Db2	123/4567 **(23)/4567**	—	123/4567 **(23)/4567**	123/4567 **(23)/4567**	123/4567 **(23)/4567**	123/4567 **(23)/4567**	23/4567 **(23)/4567**
E#2-D#2	123/46 **123/4(5)67**	—	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**
F2-E2	123/46 **123/4(5)**	—	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**	123/46 **123/4(5)**
F#2-E2	123/47 **123/(4)5**	—	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**	123/47 **123/(4)5**
F2-Eb2	123/46 **123/4(5)67**	—	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**	123/46 **123/4(5)67**
F#2-E#2	123/47 **123/(4)6**	—	123/47 **123/(4)6**	123/47 **123/(4)6** 123/567 **123/(4)6**	123/47 **123/(4)6**	123/47 **123/(4)6** 123/567 **123/(4)6**	123/47 **123/(4)6**
FX2-E#2	—	—	—	123/0 **123/(4)6**	123/0 **123/(4)6**	123/0 **123/(4)6**	—
G2-F2	123/0 **123/(4)6**	—	123/7 **123/(4)6**	123/0 **123/(4)6**	123/7 **123/(4)6**	123/0 **123/(4)6**	123/7 **123/(4)6**
G2-F#2	123/0 **123/(4)7**	—	123/7 **123/(4)7**	123/0 **123/(4)7**	123/7 **123/(4)7**	123/0 **123/(4)7**	123/7 **123/(4)7**
G#2-F#2	12/4 **12(3)/47**	—	12/467 **12(3)/47**	12/467 **12(3)/47**	12/47 **12(3)/47**	12/467 **12(3)/47**	12/47 **12(3)/47**
Gb2-F2	123/567 **123/(4)6**	—	123/47 **123/(4)6**	123/567 **123/(4)6**	—	123/567 **123/(4)6**	—
Gb2-Fb2	123/567 **123/(4)5**	—	—	123/567 **123/(4)57**	—	123/567 **123/(4)57**	123/47 **123/(4)5**
G#2-FX2	—	—	—	12/467 **12(3)/7**	—	12/467 **12(3)/7**	—
A2-G2	12/0 **12(3)/0**	—	12/7 **12(3)/7**	12/0 **12(3)/0**	12/7 **12(3)/7**	12/0 **12(3)/0**	12/7 **12(3)/7**
A2-G#2	12/0 **1(2)/4**	—	12/7 **1(2)/467**	12/0 **1(2)/467**	12/7 **1(2)/47**	12/0 **1(2)/467**	12/7 **12/(4)7**
Ab2-G2	12/4 **12(3)/0**	—	12/467 **12(3)/7**	12/467 **12(3)/7** 12/47 **12(3)/7**	12/467 **12(3)/7**	12/467 **12(3)/7** 12/47 **12(3)/7**	12/47 **12(3)/7**

A♭2-G♭2	12/467 **12(3)/567**	—	12/467 **12(3)/47**	12/467 **12(3)/567** 12/[4]7 **12(3)/567**	12/467 **12(3)/4**	12/467 **12(3)/567** 12/47 **12(3)/567**	—
A#2-G#2	13/0 **1(2)/4**	—	13/7 **1(2)/467**	13/0 **1(2)/467**	13/7 **1(2)/47**	13/0 **1(2)/467**	13/7 **1(2)/47**
B2-A2	1/0 **1(2)/0**	—	1/7 **1(2)/7**	1/0 **1(2)/7**	1/7 **1(2)/7**	1/0 **1(2)/0**	1/7 **1(2)/7**
B♭2-A2	13/0 **1(2)/0**	—	13/7 **1(2)/7**	13/0 **1(2)/0**	13/0 **1(2)/7**	13/0 **1(2)/0**	12/4567 **1(2)/7**
B2-A#2	1/0 **1(3)/0**	—	1/7 **1(3)/7** 1/7 **(1)3/7**	1/0 **1(3)/0** 1/7 **1(3)/7**	1/7 **(1)3/7**	1/0 **1(3)/0** 1/7 **1(3)/7**	1/7 **(1)3/7**
B♭2-A♭2	13/0 **1(2)/4**	—	[13/7] **1(2)/467**	13/0 **1(2)/467** 13/0 **1(2)/47** 12/4567 **1(2)/47** 12/4567 **1(2)/467** 12/4567 **1(2)/47**	13/0 **1(2)/467** 12/4567 **x1(2)/467**	13/0 **1(2)/467** 13/0 **1(2)/47** 12/4567 **1(2)/467** 12/4567 **1(2)/47**	12/4567 **1(2)/47**
B#2-A#2	2/4567 **(1)2/4567**	—	2/4567 **(1)2/4567**	2/4567 **(1)2/4567**	23/567 **(1)2(3)/4567**	2/4567 **(1)2/4567**	23/4567 **(1)2/4567**
C3-B2	2/45 **(1)/0**	—	2/4567 **(1)/7**	2/4567 **(1)/0**	2/4567 **(1)/7**	2/4567 **(1)/0**	2/4567 **(1)/7**
C3-B♭2	2/45 **(1)2/4567**	—	2/4567 **(1)2/4567**	2/4567 **(1)2/4567**	2/4567 **(1)2/4567**	2/4567 **(1)2/4567**	2/4567 **(1)2/4567**
C♭3-B♭2	—	—	—	1/0 **(1)3/0** 1/7 **(1)3/7** 13/4567 **1(2)/4567** 13/4567 **(1)2/4567**	—	1/0 **(1)3/0** 1/7 **(1)3/7** 13/4567 **1(2)/4567** 13/4567 **(1)2/4567**	—
C#3-B2	0/4567 **(1)/7**	—	0/7 **(1)/7** 23/47 **123/(4)57**	0/7 **(1)/7** 23/47 **123/(4)57** 0/4567 **(13)/4567** 23/47 **13/4(56)7** 0/467 **(13)/4567** 3/467 **(1)3/4567**	0/7 **(1)/7** 23/47 **(1)/7**	0/7 **(1)/7** 23/47 **123/(4)57** 0/4567 **(13)/4567** 23/47 **13/4(56)7** 0/467 **(13)/4567** 3/467 **(1)3/4567**	23/467 **(1)/7**

C#3-B#2	0/4567 **(23)/4567**	—	23/47 **23/4(5)7**	23/47 **23/4(5)7** 23/47 **23/(4)57** 23/47 **23/4(5)67** 23/47 **23/(45)67**	23/47 **23/4(5)7**	23/47 **23/4(5)7** 23/47 **23/(4)57** 23/47 **2/(45)67**	23/467 **23/45(6)7**
CX3-B#2	—	—	—	23/7 **123/(45)7**	23/7 **23/(45)7**	23/7 **123/(45)7**	—
D3-C3	23/7 **23/(45)67**	—	23/7 **23/(45)67**	23/7 **23/(45)67** 23/7 **23/(45)7** 23/7 **123/(45)7**	23/7 **23/(45)67**	23/7 **23/(45)67** 23/7 **23/(45)7** 23/7 **123/(45)7**	23/7 **23/(45)67** 23/7 **13/(4)7**
D3-C#3	23/46 **(23)/46**	—	23/7 **23/(4)7**	23/7 **23/(4)7**	23/7 **23/(4)7**	23/7 **23/(4)7**	23/7 **23/(4)7**
Db3-C3	23/467 **23/4(56)7**	—	23/47 **23/4(5)7**	23/467 **23/4(56)7** **23/47** **23/4(5)7** 23/47 **2/4(56)7** 23/47 **123/4(5)7** 23/47 **123/(45)7**	**2/467** **23/4(5)67**	23/467 **23/4(56)7** 23/47 **23/4(5)7** 23/47 **2/4(56)7** 23/47 **123/4(5)7** 23/47 **123/(45)7**	**23/467** **23/4(56)7**
Db3-Cb3	—	—	—	23/47 **13/4(56)7** 0/467 **(13)/4567** 3/467 **(1)3/4567**	—	23/47 **13/4(56)7** 0/467 **(13)/4567** 3/467 **(1)3/4567**	
D#3-C#3	—	—	123/567 **(123)/567**	123/567 **(123)/567**	123/567 **(23)/567**	123/567 **(123)/567**	—
D#3-CX3	—	—	—	123/4567 **23/456(7)** 123/567 **123/(56)7**	—	123/567 **23/456(7)** 123/567 **123/(56)7**	—
E3-D3	—	—	12/567 **12(3)/7**	12/567 **12(3)/7** 12/567 **2(3)/7**	12/567 **2(3)/7**	12/567 **12(3)/7** 12/567 **2(3)/7**	12/567 **2(3)/7**
E3-D#3	12/567 **12(3)/567**	—	12/567 **12(3)/567**	12/567 **12(3)/567**	12/567 **12(3)/567**	12/567 **12(3)/567**	12/567 **12(3)/567**
Eb3-D3	123/4567 **23/456(7)**	—	123/567 **23/456(7)**	123/567 **123/(56)7**	123/567 **23/456(7)**	123/567 **123/(56)7**	123/567 **2(3)/7**

E♭3-D♭3	—	—	123/567 **(123)/567**	123/567 **(123)/567**	123/567 **(123)/567** 123/567 **23/(4)67**	123/567 **(123)/567**	—
E#3-D#3	—	—	13/45 **1(2)3/45**	12/47 **12(3)/4(56)7**	123/45 **123/4(56)7**	12/47 **12(3)/4(56)7**	—
F3-E3	12/4**5**7 **1(2)/567**	—	123/45 **1(2)/567**	12/457 **1(2)/567** 12/47 **1(2)/567** **1**2/457 **1(2)/567** 12/47 **12/4(56)7**	12/47 **12/4(56)7**	12/457 **1(2)/567** 12/47 **1(2)/567** **1**2/457 **1(2)/567** 12/47 **12/4(56)7**	12/47 **1(2)/567**
F#3-E3	—	—	13/45 **1(2)/567**	13/45 **1(2)/567**	123/4 **1(2)/567**	13/45 **1(2)/567**	12/4 **1(2)/567**
F3-E♭3	12/4**5**7 **1(23)/567**	—	12/4**5**7 **1(23)/567**	12/47 **12(3)/4(56)7**	12/47 **1(23)/567**	12/47 **12(3)/(56)7**	12/47 **1(23)/567**
F♭3-E♭3	—	—	—	12/567 **12(3)/567**	—	12/567 **12(3)/567**	—
F#3-E#3	—	—	—	13/45 **1(2)/47** 13/45 **1(2)/457**	123/4 **123/(4)5**	13/45 **1(2)/47** 13/45 **1(2)/457**	—
FX3-E#3	—	—	—	—	13/0 **123/(45)**	—	—
G3-F3	—	—	13/0 **123/(45)**	13/0 **123/(45)**	13/0 **123/(45)**	13/0 **123/(45)**	—
G♭3-F3	—	—	—	13/45 **1(2)/47**	—	13/45 **1(2)/47**	—
G♭3-F♭3	—	—	—	13/45 **1(2)/567**	—	13/45 **1(2)/567**	—
G3-F#3	13/0 **13/(45)**	—	13/0 **13/(45)**	13/0 **13/(45)**	13/0 **13/(4)7**	13/0 **13/(45)**	13/7 **123/(4)**
G#3-F#3	—	—	—	3/0 **(1)3/(45)**	3/7 **(1)3/4**	3/0 **(1)3/(45)**	—
G#3-FX3	—	—	—	3/0 **(1)3/0**	—	3/0 **(1)3/0**	—
A♭3-G3	—	—	—	3/0 **(1)3/0**	—	3/0 **(1)3/0**	—
A♭3-G♭3	—	—	—	3/0 **(1)3/(45)**	—	3/0 **(1)3/(45)**	—
A3-G3	—	—	—	—	23/45 **(1)3/0**	—	—
B♭3-A3	—	—	—	2/45 **2(3)/45** 2/5 **2(3)/(4)5**	12/47 **23/4(5)?**	2/45 **2(3)/45** 2/5 **2(3)/(4)5**	—

Appendix XXIII

Flattement—Softening

Comparison of fingerings for *Flattement—Softening* and *Battement—Beat* for the three- and four-piece Traverso and the chromatic scale D1-A3, covering the period 1707 to 1773 as found in *Principes* (1707), *Rudiments* (1729), Corrette (1735 & 1773), and Mahaut (1759).

Definitions and explanations regarding *Flattement* and *Softening* as found in *Principes* and *Rudiments* have been shown in section *5.4*. Further sources regarding *Flattement* is found in *Méthode pour apprendre aisément à jour de la Flûte Traversière* by Corrette (1735 & 1773) and *Nouvelle Methode Pour Aprendre en peu tems a Joüer de la Flûte Traversière* (1759/1972) by Antoine Mahaut. Both Corrette and Mahaut describes *Flattement* similarly to *Principes* and *Rudiments*. Corrette points on that *Flattement* should be used on long notes *together* with *Son filés* (crescendo and diminuendo) and that it is an exceptionally touching embellishment in pieces with a tender character. Corrette adds that *Flattement* is sometimes notated with a wave which is similar to Hotteterre's notation (see section *6.7*):

> Le flattement se fait pour enfler et diminuer le son. Cet agrément est extremement touchant dans les pieces tendres sur des notes longues, il se marque par ce signe 〰, mais rarement. (Corrette, 1735 & 1773, 30)[1]

Mahaut described *Flattement* similarly when compared with *Principes*, *Rudiments*, and Corrette:

> Le Flattement est un battement plus lent que le Tremblement qui se fait avec un son inferieur qui ne forme pas un intervalle d'un demi ton; cet agrément se fait le plus souvent sur une note longue quand on enfle ou diminue le son. (Mahaut, 1759, 21)[2]

Considered that Mahaut suggested alternative fingerings for the notes G1, A1, B1, C2, G2, A2, B♭2, and B2 whereby the difference is to use or not use the D#-key has for mentioned notes both fingerings been applied to the fingerings for *Flattement*. The difference between these fingerings is that fingerings including the D#-key sometimes makes a slightly narrower micro-interval.

Whether *Principes* nor *Rudiments* have any comments on how to position the head-joint in the three positions *Outward—Normal—Inward* when explaining *Flattement* and *Softening*, thus it seems coherent to use the same positions as described in the chapters on all notes and trills, and these positions are in the following marked within square brackets. Corrette (1735 & 1773) and Mahaut (1759) has no indications regarding intonation and head-joint positions which probably is the result of changes of embouchure-techniques which are described in section *6.6.7*.

In the following is each note in question notated with its standard fingering and underneath the fingering for its *Flattement* and *Softening* in bold. Possible misprints are marked within square brackets. When marked *No suggestion in Principes* and *No suggestion in Rudiments* suggested possible fingerings are marked with italics.

Notes	***Principes*** **1707** **Three-piece Traverso**	***Rudiments*** **1729** **Three-piece Traverso**	**Corrette** **1735 & 1773** **Four-piece Traverso**	**Mahaut** **1759** **Four-piece Traverso**
D1	123/456 **123/456** […] le flattement du *Ré* naturel en bas […] on ébranle la Flûte avec la main d'enbas, ensorte que l'on puisse imiter par ce moyen le flattement ordinaire. (IX: 30) **[Situation ordinaire]**	123/456 **123/456** Softening of **D** […] 'tis therefore done by shaking the Flute, which imitates a usual softening (IX: 22) **[Normal position]**	123/456 **123/456** […] on ébranle la flute avec de la main droite. (1735 & 1773, 30)	123/456 **123/456** […] on ebranle la Flute avec la main d'en bas […] (1759, 21)
D#1 **E♭1**	123/4567 **123/4567** Le flattement du *Ré Diézis*, ou *Mi Bemol*, se fait comme celuy du *Ré* naturel. (IX: 30) **[Situation ordinaire ou Tourne la Flute en dehors]**	123/4567 **123/4567** The softening of **D Sharp**, or **E- la-mi Flat** is done as **D Natural** (IX: 22) **[Normal or Outward position]**	123/4567 **123/4567** […] on ébranle la flute avec de la main droite. (1735 & 1773, 30)	123/4567 **123/4567** […] on ebranle la Flute avec la main d'en bas […] (1759, 21)

1. *Flattement* is done to swell and diminish the sound. This embellishment is extremely touching in soft pieces on long notes, it is marked by this sign 〰, but rarely.
2. *Flattement* is made slower than the *Tremblement*, and is done downwards with an interval smaller than a semitone; this embellishment is is most often done on a long note when one swells or decreases the sound.

E1	123/45 **123/45(6)** Le flattement du *Mi* naturel, se fait sur le bord du sixiéme trou. (IX: 31) **[Situation ordinaire]**	123/45 **123/45(6)** The softening of **E-la-mi Natural**, is made on the edge of the 6th. hole (IX: 22) **[Normal position]**	123/45 **123/45(6)** […] se fait au bord du 6e trou. (1735 & 1773, 30)	123/45 **123/45(6)** (1759, 21)
E#1	—	—	—	123/46 **123/4(5)6** (1759, 21)
F1	123/46 **123/4(5)6** Les flattements […] du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou; Sçavoir les flattements sur le bord du trou (IX: 31) **[Tourne la Flûte en dedans]**	123/46 **123/4(5)6** The softening […] on **F Sharp**, and **Natural**, are made on the 5th. hole […] on the edge (IX: 22) **[Inward position]**	123/46 **123/4[5]6** […] sur le 5e trou. (1735 & 1773, 30)	123/46 **123/4(5)6** (1759, 21)
F#1	123/47 **123/4(5)7** Les flattements […] du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou; Sçavoir les flattements sur le bord du trou (IX: 31) **[Tourne la Flûte en dehors]**	123/47 **123/4(5)7** The softening […] on **F Sharp**, and **Natural**, are made on the 5th. hole […] on the edge (IX: 22) **[Outward position]**	123/47 **123/4[5]67** […] sur le 5e trou. (1735 & 1773, 30)	123/47 **123/4(5)7** (1759, 21)
G♭1	—	—	123/47 **123/4[5]67** (1735 & 1773, 30)	123/567 **123/(5)67** (1759, 21)
G1	123/0 123/0 **123/(4) 123/(5)** Le flattement du *Sol* se peut faire de deux manieres: Sçavoir sur le bord du quatriéme trou, ou sur la cinquiéme trou plein. (IX: 31) **[Situation ordinaire]**	123/0 123/0 **123/(4) 123/(5)** The softening of **G Natural** may be perfom'd two ways, Viz. on the edge of the 4th. hole, or full upon the 5th. (IX: 22) **[Normal position]**	123/7 123/7 **123/(4)7 123/(5)7** […] il se fait de deux façons, savoir, sur le bord du 4e trou, ou sur le 5e trou plein, cette derniere manière est la plus aisée. (1735 & 1773, 30)	123/7 123/0 **123/(4)7 123/(4)** 123/7 123/0 **123/(5)7 123/(5)** 123/7 123/0 **123/(56)7 123/(56)** (1759, 21)
G#1 **A♭1**	12/456 **12(3)/456** Le flattement du *Sol Diézis* ou *La Bemol*, se forme sur le bord du troisiéme trou. (IX: 31) **[Tourne la Flûte en dedans]**	12/456 **12(3)/456** **G Sharp**, or **A Flat** is soften'd on the edge of the 3d. hole (IX: 22). **[Inward position]**	12/456 **12(3)/456** […] sur le bord du 3e trou ou en en ébranlant la flute. (1735 & 1773, 30)	12/456 **12(3)/456** (1759, 21)
A1	12/0 12/0 **12/(4) 12(3)/0** Le flattement du *La* naturel, se fait sur le quatriéme trou plein, ou sur le bord du troisiéme. (IX: 31) **[Situation ordinaire]**	12/0 12/0 **12/(4) 12(3)/0** The softening of **A Natural** is on the 4th. hole full, or on the edge of the 3d. hole. (IX: 22) **[Normal position]**	12/7 12/7 **12/(4)7 12[3]/7** […] sur le bord du 4e trou plein: on peut le faire sur le 3e trou, mais il n'est pas si aisé. (1735 & 1773, 31)	12/7 12/0 **12(3)/7 12(3)/0** 12/7 12/0 **12/(4)7 12/(4)** 12/7 12/0 **12/(45)7 12/(45)** (1759, 21)
A#1	13/45 **13/45(6)** Le flattement du *La Diézis*, ou *Si Bemol*, se forme sur le sixiéme trou plein. (IX: 31) **[Tourne la Flûte en dedans]**	13/45 **13/45(6)** The softening of **A Sharp**, or **B Flat** is upon the 6th. hole full. (IX: 22) **[Inward position]**	13/45 **13/45(6)** Pour le la# ou sib, sur le 6e trou plein. (1735 & 1773, 31)	13/45 **1(2)3/45** (1759, 21)
B♭1	13/45 **13/45(6)** Le flattement du *La Diézis*, ou *Si Bemol*, se forme sur le sixiéme trou plein. (IX: 31) **[Tourne la Flûte en dedans]**	13/45 **13/45(6)** The softening of **A Sharp**, or **B Flat** is upon the 6th. hole full. (IX: 22) **[Inward position]**	13/45 **13/45(6)** Pour le la# ou sib, sur le 6e trou plein. (1735 & 1773, 31)	13/45 **13/45(6)** (1759, 21)

B1	1/0 **1(3)/0** Le flattement du *Si* naturel, se fait sur le troisiéme trou plein. (IX: 31) **[Situation ordinaire]**	1/0 **1(3)/0** The softening of **B Natural**, is made on the 3d. hole full (IX: 23) **[Normal position]**	1/7 **1/(4)7** […] sur le 4e trou plein. (1735 & 1773, 31)	1/7 1/0 **1(3)/7 1(3)/0** (1759, 21)
B#1	—	—	—	23/7 23/0 **23/(4)7 23/(4)** 23/7 23/0 **23/(45)7 23/(45)** (1759, 21)
C2	23/0 **23/(4)** Le flattement du l'*Ut* naturel, se forme sur le quatriéme trou plein. (IX: 31) **[Situation ordinaire]**	23/0 **23/(4)** The softening of **C Natural**, is made on the 4th. hole full. (IX: 23) **[Normal position]**	23/7 **23/(4)7** […] sur le 4e trou plein. (1735 & 1773, 31)	23/7 23/0 **23/(4)7 23/(4)** 23/7 23/0 **23/(45)7 23/(45)** (1759, 21)
C#2 **D♭2**	0/0 **(2)/0** Le flattement de l'*Ut Diézis*, ou *Ré Bemol*, se fait sur le deuxiéme trou plein. (IX: 31) **[Tourne la Flûte en dehors]**	0/0 **(2)/0** The softening of **C Sharp**, or **D Flat** is made on the 2d. hole full. (IX: 23) **[Outward position]**	0/7 **(3)/7** […] sur le 3e trou plein: les anciens le faisoient sur le 2e trou mais il ne vaut rien, et baisse le ton d'un Comma (1735 & 1773, 31)	0/0 **(2)/0** (1759, 21)
D2	23/456 **(2)3/456** Le flattement du *Ré* naturel, se forme sur le deuxiéme trou. Il est different des autres, en ce qu'il faut tenir le trou bouché en le commençant, & en le finissant. On doit observer de ne pas beaucoup lever le Doigt. (IX: 31-32) **[Situation ordinaire]**	23/456 **(2)3/456** The softening of **D Natural**, is made on the 2d. hole full it differs from the rest in its beginning and ending with the finger on, you must observe not to raise the finger high. (IX: 23) **[Normal position]**	23/456 **(2)3/456** […] sur le 2e trou plein, il faut commencer et finir en bouchant le trou. (1735 & 1773, 31)	23/456 **(1)23/456** 23/456 **(2)3/456** (1759, 21)
E♭2 **D#2**	123/4567 **(1)23/4567** Le flattement du *Ré Diézis* ou *Mi Bemol*, se forme sur le premier trou, lequel doit rester bouché avant & après. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	123/4567 **(1)23/4567** The Softening **D Sharp** or **E Flat** is made on the first hole, which ought to remain stopt, before, and after. (IX: 23) **[Normal or Outward position]**	123/4567 **(1)23/4567** […] sur le premier trou qu'il faut boucher avant et après le flattement: on le peut faire aussi en ébranlant la flute de la main droite, comme nous avons dit, au ré# ou mi♭ d'embas […] (1735 & 1773, 31)	123/4567 **(1)23/4567** (1759, 21)
E2	123/45 **123/45(6)** Le flattement […] depuis ce ton jusqu'au *La Diézis ou Si Bemol*, se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	123/45 **123/45(6)** The softenings, and Beats between this Note and **A Sharp**, or **B Flat**, are made as their Octaves below. (IX: 23) **[Normal position]**	123/45 **123/45(6)** Depuis le mi naturel […] jusqu'au la naturel […] le flattement se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	123/45 **123/45(6)** (1759, 21)
E#2	—	—	—	123/46 **123/4(5)6** (1759, 21)
F2	123/46 **123/4(5)6** Le flattement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dedans]**	123/46 **123/4(5)6** The softenings […] are made as their Octaves below (IX: 23) **[Inward position]**	123/46 **123/4(5)6** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	123/46 **123/4(5)6** (1759, 21)
F#2	123/47 **123/4(5)7** Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Tourne la Flûte en dehors]**	123/47 **123/4(5)7** The softenings […] are made as their Octaves below (IX: 23) **[Outward position]**	123/47 **123/4(5)7** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	123/47 **123/4(5)7** (1759, 21)

G♭2	—	—	123/47 **123/4(5)7** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	123/567 **123/4(5)7** (1759, 21)
G2	123/0 123/0 **123/(4) 123/(5)** Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Situation ordinaire]**	123/0 123/0 **123/(4) 123/(5)** The softenings […] are made as their Octaves below (IX: 23) **[Normal position]**	123/7 123/7 **123/(4)7 123/(5)7** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	123/7 123/0 **123/(4)7 123/(4)** 123/7 123/0 **123/(5)7 123/(5)** (1759, 21)
G#2 **A♭2**	12/4 **12(3)/4** Le flattement […] se font comme à leurs Octaves en bas [third hole half covered] (IX: 32) **[Tourne la Flûte en dedans]**	12/4 **12(3)/4** The softenings […] are made as their Octaves below [third hole half covered] (IX: 23) **[Inward position]**	12/467 **12(3)/467** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	12/467 **12(3)/456** (1759, 21)
A2	12/0 12/0 **12(3)/0 12/(4)** Le flattement […] se font comme à leurs Octaves en bas (IX: 32) **[Situation ordinaire]**	12/0 12/0 **12(3)/0 12/(4)** The softenings […] are made as their Octaves below (IX: 23) **[Normal position]**	12/7 12/7 **12/(4)7 12(3)/7** […] se font comme ceux des Octaves d'embas. (1735 & 1773, 31)	12/7 12/0 **12/(4)7 12/(4)** 12/7 12/0 **12(3)/7 12(3)/0** (1759, 21)
A#2 **B♭2**	13/0 **13/(4)** Le flattement de ce dernier [*La Dièzis* & *Si Bemol*] ce forme sur le bord du quatriéme trou. (IX: 32) **[Tourne la Flûte en dedans ou Tourne la Flute en dehors]**	13/0 **13/(4)** The softening this last [**A Sharp**, **B Flat**] is made on the edge of the 4th. hole (IX: 23) **[Inward or Outward position]**	13/7 **13/(4)7** […] sue le bord du 4e trou. (1735 & 1773, 31)	13/7 13/0 **13/(4)7 13/(4)** (1759, 21)
B2	*1/0* ***1(4)/0*** *No suggestion in Principes* [… se fait aussi comme à son Octave] **[Situation ordinaire]**	*1/0* ***1(4)/0*** *No suggestion in Rudiments* […as their Octaves below] **[Normal position]**	1/7 **1/(4)7** […] du 4e trou plein comme à l'Octave d'embas. (1735 & 1773, 31)	1/7 1/0 **1/(4)7 1/(4)** 1/7 1/0 **1(3)/7 1(3)/0** (1759, 21)
B#2	—	—	—	23/457 **23/45(6)7** (1759, 21)
C3	2/45 **2/45(6)** 2/45 **2(3)/45** Le flattement de l'*Ut* naturel, se fait en deux manieres; Sçavoir, sur le sixiéme trou, ou sur le troisiéme. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dedans]**	2/45 **2/45(6)** 2/45 **2(3)/45** The softening of **C Natural** is made two ways, Viz. on the 6th. hole, or on the 3d. (IX: 23) **[Normal or Inward position]**	2/4567 **2/45(6)7** 2/4567 **2(3)/4567** […] sur le 3e ou 6e trou. (1735 & 1773, 31)	2/4567 **2(3)/4567** (1759, 21)
C#3	*0/4567* ***(2)/4567*** No suggestion in *Principes* [… se fait aussi comme à son Octave] **[Tourne la Flûte en dehors]**	*0/4567* ***(2)/4567*** No suggestion in *Rudiments* […as their Octaves below] **[Outward position]**	23/47 **23/4(6)7** […] sur le 6e trou plein. (1735 & 1773, 31)	23/47 23/47 **23/4(6)7 23/4(5)7** (1759, 21)
D♭3	—	—	23/47 **23/4(6)7** […] sur le 6e trou plein. (1735 & 1773, 31)	23/47 23/47 **23/4(6)7 23/4(5)7** (1759, 21)

D3	23/456 **(2)3/456** Le flattement du Ré naturel, se fait sur le deuxiéme trou, ainsi qu'à son Octave. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	23/456 **(2)3/456** The softening of **D Natural** is made on the 2d. hole, as its Octave. (IX: 23) **Normal or Outward position]**	23/7 **23/(4)7** […] le doigt sur le bord du 4e trou. (1735 & 1773, 31)	23/7 **23/(4)7** (1759, 21)
D#3 **E♭3**	123/567 **(1)23/567** Le flattement du Ré Diéziz ou *Mi* Bemol, se fait aussi comme à son Octave. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	123/567 **(1)23/567** The softening of **D Sharp**, or **E-la-mi Flat**, is done as its Octave. (IX: 23) **[Normal or Outward position]**	123/567 **12[3]/567** […] le doigt sur le 3e trou. (1735 & 1773, 31)	123/567 **123/(4)567** (1759, 21)
E3	12/567 **12(3)/567** Le flattement du *Mi* naturel, se forme sur le bord du troisiéme trou. (IX: 33) **[Tourne la Flûte en dehors]**	12/567 **12(3)/567** The softening of **E-la-mi Natural** is made on the edge of the 3d. hole. (IX: 23) **[Outward position]**	[…] pour les autres tons hauts les flattements ne se peuvent faire qu'en ébranlant la flute de la main droite. (1735 & 1773, 31)	12/567 **12(3)/567** (1759, 21)
E#3	—	—	[…] pour les autres tons hauts les flattements ne se peuvent faire qu'en ébranlant la flute de la main droite. (1735 & 1773, 31)	12/47 **12/4(5)7** (1759, 21)
F3	—	—	—	12/47 **12/4(5)7** (1759, 21)
F#3 **G♭3**	—	—	—	12/46 13/45 **12/4(5) 12/4(5)** (1759, 21)
G3	—	—	—	13/0 **13/(4)** (1759, 21)
A3	—	—	—	23/45 **(1)23/45** (1759, 21)

*

Battement—Beat

Comparison of fingerings for *Battement—Beat* for three- and four pieces Traversi and the chromatic scale D1-A3, covering the period 1707 to 1773 as found in *Principes*, *Rudiments* (1729), Corrette (1735 & 1773), and Mahaut (1759). Definitions and explanations regarding *Battement* and *Beat* as found in *Principes* and *Rudiments* have been shown in section *5.5*. Further sources regarding *Battement* are found in *Methode pour apprendre aisément à jour de la Flûte Traversière* by Corrette (1735 & 1773) and *Nouvelle Methode Pour Aprendre en peu tems a Joüer de la Flute Traversiere* (1759) by Antoine Mahaut. Interestingly enough is there no section on *Battement* in the revision *Méthode pour apprendre a jouer en très peut de tems de la Flûte traversiere, de la Flute à bec et du Haut- bois. Divisée en differents traités par Mr. Hotteterre, le Romain Flute de la Chambre du Roi. Nouvelle édition* (1765) by Antoine Bailleaux, but in its section regarding the Recorder is a section on *Battement* similar to what is described in *Principes*. If the reason why Bailleux did not include a section on *Battement* for the Traverso is because this ornament had become out of fashion or not is difficult to say. But maybe this could be a reason because in both *L'Art de la Flûte Traversière* (*c.*1761) by De Lusse and *Nouvelle Méthode Théorique et Pratique pour la Flûte* (*c.*1794) by Devienne are no section on *Battement*. In the above-mentioned method by Corrette is a description of *Battement* in *Chapitre IX* (32-33) together with a fingering-chart covering E1-A3. The description is similar to what is found in *Principes* and *Rudiments*:

> Le Battement se fait en battant une ou plusieurs fois un doigt sur le trou le plus près du ton ou du demi-ton ou on veut le faire. On en fait de simple et de double, Le Battement simple se fait en battant une fois le doigt sur un trou plein, on entend par trou plein le doigt qui pose a plomb sur le trou. Le Battement double se fait en battant plusieurs fois le doigt sur un trou plein, et générallement le Battements se fait toujours sur le trou plein. (Corrette, 1735 & 1773, 32)[1]

In *Nouvelle Methode Pour Aprendre en peu tems a Joüer de la Flute Traversiere* (1759) by Mahaut is a description of *Battement* in *Chapitre VII* (22) but Mahaut does not give a fingering-chart for *Battement*. At the contrary is the explanation of how to perform *Battement* made in a short text in a clear manner. To summarize Mahaut, a *Battement* is made with a note below the main note in question, with the example that if making a *Battement* on G the next note below is a F or F# depending on the tonality of the played piece in question. Further that a *Battement* could consist of one, two, and more very fast movements to the note below the main note in question, and finally that this explanation could serve as a general instruction how to make *Battement* on all notes:

> Le Battement se forme sur une note en la frapant une, deux ou plusieurs fois tres vitte avec la note qui se trouve naturellement un degré au dessous. Ainsi pour faire le battement sur le *Sol*, on Emprunte le *Fa* ou le *Fa diesis* selon le ton ou l'on joue, avec lequel on fait le battement sur le *Sol* et ainsi des autres, le doigt qui frape le battement reste toujours en l'air apres le battement excepté sur le second *Re*. Par exemple le Battement sur le *Sol* soit tire du *Fa* naturel ou du *Fa diesis* se bat sur le quatrieme trou, lequel reste débouché apres le battement pour former le *Sol* celui du *Re* tire de l'*Ut naturel* se bat sur le quatrieme trou lequel doit rester bouché apres le battement pour former le *Re* etant tire de l'*Ut* diesis on le bat sur le second et troisiéme trou qui restent de même bouchés pour former le *Re* on formera facilement avec cette connoissance les batemens sur les tons. (Mahaut, 1759, 22)[2]

In the following is each note in question notated with its standard fingering and underneath the fingering for its *Battement* and *Beat* in bold. Possible misprints are marked within square brackets. When marked *No suggestion in Principes* and *No suggestion in Rudiments* suggested possible fingerings are marked with italics. Whether *Principes* nor *Rudiments* have any comments on how to position the head-joint in the three positions *Outward—Normal—Inward*, thus it seems coherent to use the same positions as described in the chapters on all notes and trills, and these positions are in the following marked within square brackets. Regarding Corrette there are no indications regarding intonation or positions of the head-joint.

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1. *Le Battement* is done by closing and opening the tone-hole below and closest to the tone or semitone where you want to do it. One can do a single and *double Battement*, the *simple Battement* is done by closing the tone-hole once. *Le Battement double* is done by closing the tone-hole several times, generally a *Battement* is made by completely cover the tone-hole in question. (Corrette, 1735 & 1773, 32)

2. *Le Battement* is formed on a note by striking it one, two or more times very quickly with the note which is naturally one degree below. So, to make the beat on the G, we borrow the F or the F# depending on the tonality or key where we play, with which we make the *Battement* on the G, the finger which strikes the *Battement* always leaves the tone-hole in question open after the *Battement* except on D2. For example, the *Battement* on the G is taken from F or the F# while closing and opening the fourth tone-hole, which remains open after the *Battement* to form the G, that of D[2] takes from the C[2] on the fourth tone-hole which must remain closed after the *Battement* to form the D[2] being drawn from the C#[2] we beat it on the second and third tone-hole which remain similarly closed to form the D[2], with this explanation of the Battement it will be easy to make *Battements* on all notes. (Mahaut, 1759, 22)

Notes	*Principes* **1707** **Three-piece Traverso**	*Rudiments* **1729** **Three-piece Traverso**	**Corrette** **1735 & 1773** **Four-piece Traverso**
D#1/E♭1	123/4567 **123/456(7)** Le Battement se forme sur la Clef avec le petit Doigt, & il y doit rester appuyé. (IX: 30) **[Situation ordinaire ou Tourne la Flute en dehors]**	123/4567 **123/456(7)** The Beat is made upon the key with the little finger, ending with it on. (IX: 22) **[Normal or Outward position]**	Pour le *ré* naturel d'embas, le *ré*# ou le *mi*♭, on ne fait point de Battement: Comme le Battement se tire de la note au dessous du ton, il servit ridicule de le chercher sur le ré d'embas par ce que c'est le ton le plus bas de la Flute. (1735 & 1773, 32)
E1	123/45 **123/45(6)** *Mi* naturel […] Le battement se forme sur le même trou [sixiéme trou] trou plein. (IX: 31) **[Situation ordinaire]**	123/45 **123/45(6)** Beat on **E-la-mi Natural**, is made on the same hole full [6th. […] (IX: 22) **[Normal position]**	123/45 **123/45(6)** Pour le *mi* naturel, il se fait sur les 6e trou. (1735 & 1773, 32)
F1	123/46 **123/4(5)6** […] les battements du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou […] sur le trou plein. (IX: 31) **[Tourne la Flûte en dedans]**	123/46 **123/4(5)6** [the Beat] **F Sharp**, and **Natural**, are made on the 5th. hole, Viz. the Beat full on the hole (IX: 22) **[Inward position]**	123/46 **123/4(5)6** Pour le *fa* naturel, et *fa*#, sur le 5e trou. (1735 & 1773, 32)
F#1	123/47 **123/4(5)7** […] les battements du *Fa* naturel & du *Fa Diézis* se font sur le cinquiéme trou […] les battements sur le trou plein. (IX: 31) **[Tourne la Flûte en dehors]**	123/47 **123/4(5)7** The […] Beat on **F Sharp**, and **Natural**, are made on the 5th. hole, Viz. the Beat full on the hole (IX: 22) **[Outward position]**	123/46 **123/4(5)6** Pour le *fa* naturel, et *fa*#, sur le 5e trou. (1735 & 1773, 32)
G1	123/0 **123/(4)** Le battement se fait sur le quatriéme trou [plein]. (IX: 31) **[Situation ordinaire]**	123/0 **123/(4)** **G Natural** […] the Beat is made on the 4th. hole. (IX: 22) **[Normal position]**	123/7 **123/(4)7** Pour le *sol* naturel, sur le 4e trou. (1735 & 1773, 32)
G#1/A♭1	12/456 **12(3)/456** Le battement sur le mème trou [troisiéme trou; plein?] (IX: 31) **[Tourne la Flûte en dedans]**	12/456 **12(3)/456** **G Sharp**, or **A Flat** […] the Beat on the 3d. hole full. (IX: 22) **[Inward position]**	12/456 **12(3)/456** Pour le *sol*# ou *la*♭ naturel, et naturel, sur le 3e trou. (1735 & 1773, 32)
A1	12/0 **12(3)/0** Le battement sur le troisiéme [trou, plein]. (IX: 31) **[Situation ordinaire]**	12/0 **12(3)/0** […] the Beat upon the 3d. hole. (IX: 22) **[Normal position]**	12/7 **12(3)/7** Pour le *sol*# ou *la*♭, et *la* naturel, sur le 3e trou. (1735 & 1773, 32)
A#1/B♭1	13/45 13/45 **13/45(6) 1(2)3/45** Le battement sur le même trou [le sixiéme plein], ou sur le deuxiéme, quand il est précedé d'un port-de-voix. (IX: 31) **[Tourne la Flûte en dedans]**	13/45 13/45 **13/45(6) 1(2)3/45** The Beat upon the same hole [6th.] or on the 2d. when 'tis is preceded by a Port-de-voix. (IX: 22) **[Inward position]**	13/45 **1(2)3/45** Pour le *la*# ou *si*♭, et *si* naturel, sur le 2e trou. (1735 & 1773, 32)
B1	1/0 **1(2)/0** Le battement sur le le deuxiéme. (IX: 31) **[Situation ordinaire]**	1/0 **1(2)/0** […] the Beat upon the 2d. (IX: 23) **[Normal position]**	1/7 **1(2)/7** Pour le *la*# ou *si*♭, et *si* naturel, sur le 2e trou. (1735 & 1773, 32)
C2	23/0 23/0 **23/(45) (1)23/0** Le battement sur le quatriéme & le cinquiéme trou en même temps, ou sur le premier quand il est précedé d'un Port-de voix. (IX: 31) **[Situation ordinaire]**	23/0 23/0 **23/(45) (1)23/0** […] the Beat on the 4th. & 5th. At the same time, or on the first, when 'tis preceded by a Port-de voix (IX: 23) **[Normal position]**	23/7 **(1)/7** Pour l'Ut naturel, sur le 4e et 5e trous, les deux doigts frappent en même tems. (1735 & 1773, 32)

C#2/D♭2	0/0 **(1)/0** Le battement sur le premier. (IX: 31) **[Tourne la Flûte en dehors]**	0/0 **(1)/0** […] the Beat upon the first. (IX: 23) **[Outward position]**	0/7 **(1)/7** Pour l'*ut*# ou *ré*♭, sur le 1r trou. (1735 & 1773, 32)
D2	**D2-C2** **D2-C#2** 23/456 23/456 **23/(4)56** **(23)/456** Le battement se fait sur le quatriéme trou, quand on jouë dans un ton naturel, & sur le deuxiéme & troisiéme en même temps, quand on jouë dans un ton où l'*Ut* est *Diezis*. Il faut que les trous soient aussi bouchez en commençant, & en finissant (IX: 32) **[Situation ordinaire]**	**D2-C2** **D2-C#2** 3/456 23/456 **23/(4)56** **(23)/456** […] the Beat is made on the 4th. hole, when you play in a Natural key, and upon the 2d. & 3d. at the same time, when you play in a key where **C** is **Sharp**, the holes ought also to be stopt as well in beginning as ending it. (IX: 23) **[Normal position]**	**D2-C2** **D2-C#2** 23/456 23/456 **23/45(6)** **(23)/456** Pour le *ré* naturel, sur le 4e trou qand le ton de la piece ne demande pas l'*ut*# mais si l'on joüe en *ré* il faut faire le Battement avec l'ut# qui est la note sensible du *ré*; alors on le fera sur le 2e et 3e trous, en battant les deux doigts ensemble; il faut prendre garde aussi de bien boucher les trous en commençant et en finissant le battement. (1735 & 1773, 33)
E♭2/D#2	123/4567 123/4567 **123/456(7)** **(23)/4567** Le battement se fait sur la Clef, pour le *Mi Bemol*, de la manière que je l'ay expliqué, en parlant de celuy d'en bas. Quant au *Ré Dieziz*, il se fait sur le deuxiéme & le troisiéme trou en même temps. Le premier trou doit être débouché, & il faut réboucher le deuxiéme & le troisiéme trou, en finissant le battement. (IX: 32) **[Situation ordinaire ou Tourne la Flûte en dehors]**	123/4567 123/4567 **123/456(7)** **(23)/4567** […] the Beat is made upon ye key for **E-la-mi**, after the manner I shew'd you in speaking of it below, as to **D Sharp**, 'tis Beat upon the 2d. & 3d. holes at the same time, the first hole ought to be open, and you must stop the 2d. & 3d. in ending the Beat. (IX: 23) **[Normal or Outward position]**	123/4567 Pour le *ré*# ou *mi*♭, on ne peut tirer d'aucun ton qui ne soit faux. (1735 & 1773, 33)
E2	123/45 **123/45(6)** Le battement […] depuis ce ton jusqu'au *La Diézis ou Si Bemol*, se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	123/45 **123/45(6)** The [Beat] of **E-la-mi Natural**, is made on […] the 6th. […] hole full. (IX: 23) **[Normal position]**	123/45 **123/45(6)** […] depuis le *mi* naturel, jusqu'au *si* naturel, les Battements se font comme ceux des Octaves d'embas. (1735 & 1773, 33)
F2	123/46 **123/4(5)6** Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dedans]**	123/46 **123/4(5)6** […] the Beat as their Octaves below (IX: 23) **[Inward position]**	123/46 **123/4(5)6** Pour le *fa* naturel, et *fa*#, sur le 5e trou. (1735 & 1773, 33)
F#2	123/47 **123/4(5)7** Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Tourne la Flûte en dehors]**	123/47 **123/4(5)7** […] the Beat as their Octaves below (IX: 23) **[Outward position]**	123/46 **123/4(5)6** Pour le *fa* naturel, et *fa*#, sur le 5e trou. (1735 & 1773, 33)
G2	123/0 **123/(4)0** Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	123/0 **123/(4)0** […] the Beat as their Octaves below (IX: 23) **[Normal position]**	123/7 **123/(4)7** Pour le *sol* naturel, sur le 4e trou. (1735 & 1773, 33)
G#2/A♭2	12/4 **12(3)/4** Le battement […] se font comme à leurs Octaves en bas. (I : 32) **[Tourne la Flûte en dedans]**	12/4 **12(3)/4** […] the Beat as their Octaves below (IX: 23) **[Inward position]**	12/467 **12(3)/467** Pour le *sol*# ou *la*♭ naturel, et naturel, sur le 3e trou. (1735 & 1773, 33)
A2	12/0 **12(3)/0** Le battement […] se font comme à leurs Octaves en bas. (IX: 32) **[Situation ordinaire]**	12/0 **12(3)/0** […] the Beat as their Octaves below (IX: 23) **[Normal position]**	12/7 **12(3)/7** Pour le *sol*# ou *la*♭, et *la* naturel, sur le 3e trou. (1735 & 1773, 33)

A#2/B♭2	13/0 13/0 **13/(4) 1(2)3/0** Le battement se peut faire sur le même trou [quatriéme trou], ou bien sur le deuxiéme, principalement quand il est précedé d'un port-de-voix. (IX: 31) **[Tourne la Flûte en dedan ou Tourne la Flute en dehors]**	13/0 13/0 **13/(4) 1(2)3/0** The Beat on the same hole [4th.] or else on the 2d. especially when 'tis is preceded by a Port-de-voix. (IX: 22) **[Inward or Outward position]**	13/7 **1(2)3/7** Pour le *la*# ou *si*♭, et *si* naturel, sur le 2e trou. (1735 & 1773, 33)
B2	*1/0* ***1(2)/0*** No suggestion in *Principes* **[Situation ordinaire]**	*1/0* ***1(2)/0*** No suggestion in *Rudiments* **[Normal position]**	1/7 **1(2)/7** Pour le *la*# ou *si*♭, et *si* naturel, sur le 2e trou. (1735 & 1773, 33)
C2	2/45 2/45 **2/45(6) (1)2/45** Le battement se forme de même [sixiéme trou], & aussi sur le premier trou quand il est précedé d'un port-de-voix. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dedans]**	2/45 2/45 **2/45(6) (1)2/45** […] the Beat is made on ye same [6th. hole], and also on the first, when tis preceded by a Port-de-voix. (IX: 23) **[Normal or Inward position]**	2/4567 2/4567 **2/45(6)7 (1)2/4567** Pour l'*ut* naturel, sur le premier ou sur le 6e trou. (1735 & 1773, 33)
C#3	*0/4567* ***(1)/4567*** No suggestion in *Principes* **[Tourne la Flûte en dehors ou Tourne la Flute en dedans]**	*0/4567* ***(1)/4567*** No suggestion in *Rudiments* **[Outward or Inward position]**	23/47 **23/4(5)7** Pour l'*ut*#, ou *ré*♭ sur le 5e trou. (1735 & 1773, 33)
D3	23/456 **(23)/456** Le battement se forme sur le deuxiéme & sur le troisiéme trou en même temps. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dehors]**	23/456 **(23)/456** […] the Beat is made on the 2d. & 3d. holes at the same time. (IX: 23) **[Normal or Outward position]**	23/7 **23/(4)7** Pour le *ré* naturel, sur le 4e trou (1735 & 1773, 33)
D#3/E♭3	123/567 **123/(56)7** Le battement se forme de même [comme à son Octave] ou bien sur le cinquiéme & le sixiéme trou en même temps. On doit tenir le quatriéme, & le septiéme débouchez, & on doit remettre les Doigts en finissant. (IX: 32) **[Situation ordinaire ou Tourne la Flute en dehors]**	123/567 **123/(56)7** […] the Beat is made the same way [as its Octave], or else on the 5th. & 6th. holes at once, you must hold the 4th. & 7th. holes open, and replace your fingers in ending. (IX: 23) **[Normal or Outward position]**	123/567 **123/(4)567** Pour le *ré*# ou *mi*♭, on le peut faire en le faisant bien bref sur le 4e trou. (1735 & 1773, 33)
E3	12/567 **12(3)/567** Le battement sur le même trou plein [troiséme trou]. (IX: 33) **[Tourne la Flûte en dehors]**	12/567 **12(3)/567** […] the Beat on the same hole full [3d. hole] (IX: 24) **[Outward position]**	12/567 **12(3)/567** Pour le *mi* naturel, sur le 3e trou. (1735 & 1773, 33)
F3	—	—	Sur le *fa* naturel et le *fa*#, de la troisiéme Octave, on ne fait point de Battemens. (1735 & 1773, 33)
F#3	—	—	Sur le *fa* naturel et le *fa*#, de la troisiéme Octave, on ne fait point de Battemens. (1735 & 1773, 33)
G3	—	—	13/0 **13/(4)** Pour le *sol* naturel, sur le 4e trou, la Clef bouché. (1735 & 1773, 33)

Appendix XXIV

Documents regarding Paul Taffanel performing music by Rameau at the *Exposition Universelle 1889* in Paris in *Musiques pittoresques, promenades musicales à L'Exposition de 1889* by Julien Tiersot (1889), and a recital December 13, 1891, in Paris, mentioned in *Le Ménestrel* in 1891.

> Qui connaissait, parmi nous, le musique de Milandre [*c.*1756-*c.*1776, composer, violinist and viola d'amore player], de Berteau [1691-1771, composer and cellist], de Marais, même? Mais l'effet le plus charmant a été produit par les morceaux dans lesquels ces divers trio de Marais, pour quinton Pardessus de viole), viole d'amour et viole da gambe, et surtout les délicieuses *Pièces en Concert* de Rameau [1741], pour clavecin, flûte et basse, où M. Taffanel, sur la même flûte dont sait faire à l'occasion un véritable instrument de bravoure, s'appliquait à adoucir les sons pour donner l'impression des flûtes douces d'autrefois, et où le clavecin, sous les doigts de M. Diémer [1843-1919], donnant tant de netteté et de piquant au dessin mélodique du vieux maitre bourguignon.
> (Tiersot, 1889, 10)

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> Mercredi prochain, 9 décembre, aura lieu au Cercle Saint-Simon une audition de musique française du XVIII[e] siècle pour le chant, le clavecin, la flûte, la viole d'amour et la viole da gambe, donnée avec le concours de Mme Paulin-Archaimbaud, de MM. Diémer, Taffanel, Van Waefelghem et Delsart. On y entendra pour la première fois, entre autres choses, une cantate française de Campra, *Daphné*, pour soprano, clavecin et basse de viole, dont l'exécution sera précédée d'une conférence sur les cantates françaises du XVIII[e] siècle, par M. Julien Tiersot. (*Le Ménestrel*, 1891, December 6, 391)

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> L'audition de musique du XVIII[e] siècle, donnée mercredi au Cercle Saint-Simon, a permis d'apprécier clairement les mérites transcendants des grands maitres français du commencement du XVIII[e] siècle: Rameau, Couperin et Campra. Devant le public très éclairé qui se pressait dans la grande salle des Sociétés savantes, leur supériorité sur les musiciens de second ordre qui figuraient au programme: Marais, de Boismortier, Lœillet, est apparue manifestement, peut-être encore accusée par l'éloignement; de même, les romances de Jean-Jacques Rousseau, de date pourtant plus récente, ont semblé assez pâles; et peut-être en eût-il été de même pour les morceaux des premiers temps de l'opéra-comique, si le programme, limité strictement à des compositions non théâtrales, en avait admis quelques-uns. De même, le clavecin s'est montré une fois de plus l'instrument convenant essentiellement à l'exécution de Couperin et de Rameau, bien supérieur au piano à cet égard, tandis que le violon, l'alto et le violoncelle, de même nature que les violes marquant sur ces instruments un progrès certain. Et cette démonstration était d'autant plus péremptoire que les exécutants étaient d'une égale supériorité et tiraient chacun le meilleur parti possible de leurs instruments respectifs: MM. Diémer, Van Waefelghem et Delsart, auxquels, auxquels s'était adjoint M. Taffanel avec sa flûte moderne. Les *Pièces en concert* de Rameau, pour clavecin, flûte et basse, sont vraiment de petites merveilles, ainsi que les pièces de clavecin de Rameau et de Couperin, dont le succès, additionné du succès personnel de M. Diémer, a été considérable. De même, la cantate Daphné, de Campra, chantée par M[me] Paulin Archainbaud avec accompagnement de clavecin et basse – une véritable résurrection après un siècle et demi – a produit l'impression la plus favorable. L'exécution de cet important morceau était précédée de la lecture de fragments d'une étude sur les cantates françaises du XVIIIe siècle, de M. Julien Tiersot, qui, à en juger par la chaleur et la durée des applaudissements qui l'ont accueillie, a paru vivement intéresser l'auditoire. (*Le Ménestrel*, 1891, December 13, 397)

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Appendix XXV

Section on the Traverso in the article *La Flûte* by Louis Fleury in *Encyclopédie de la Musique et Dictionnaire du Conservatoire* (1925a, 1492-1493)

ainsi la longueur du tube sans que fussent modifiés en même temps les intervalles des trous!

Description de la flûte de Delusse. — Elle se compose de 4 morceaux. Elle est faite de bois. Sa longueur totale (en partant de l'embouchure) est de 0,624. L'embouchure est de forme plutôt ovale, de 9 mm. de longueur sur 6,5 de largeur. Les trous ont respectivement 6, 6, 5 1/2, 6, 6, 5 mm. de diamètre et l'intervalle entre eux est de 30, 29, 46, 28, 25 à 28 mm.

La clef est en cuivre. Elle bouche un trou de 20 mm. de diamètre.

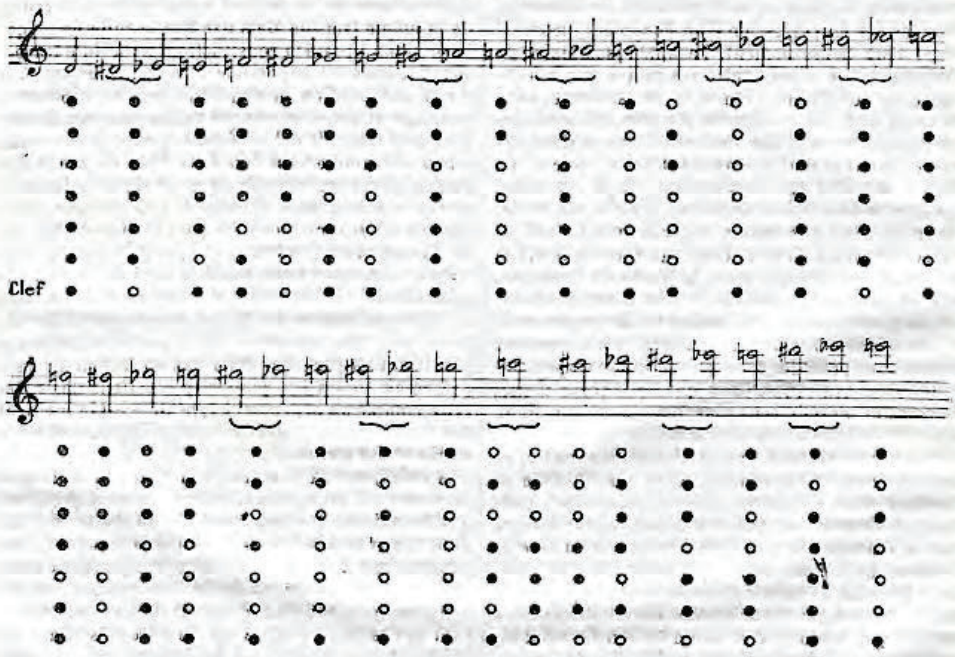
Le diamètre du tube est de 0,019 à la tête, 0,012 à l'intersection entre le 3e et 4e trou, 0,019 à l'extrémité inférieure. La tête est munie d'un bouchon.

Nous avons essayé cette flûte, et l'essai nous a confirmé dans notre première impression : elle nous a paru le meilleur de tous les instruments de ce type appartenant au Musée du Conservatoire.



Fig. 617. — Flûte Delusse.

Nous donnons ici la tablature de la flûte à une clef telle que nous l'avons trouvée dans le Traité d'Hotteterre (nous avons dit plus haut pourquoi nous avions dû décrire une flûte autre que celle de ce maître). Il faut dire que cet ouvrage excellent a fait autorité durant tout le XVIIIe siècle et, qu'à part le *Traité* de Quantz, toutes les méthodes parues au cours de ce siècle sont de simples copies, traductions, ou d'assez imprudents plagiats de l'œuvre d'Hotteterre.



On remarquera, dans cette tablature, l'absence de *fa* naturel dans la 3e octave. Cette note était vraisemblablement impossible à produire.

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A partir de ce moment, la suprématie de la flûte traversière n'est plus contestée. La flûte à bec ne fut cependant pas brusquement délaissée. Nous devons supposer qu'il se produisit pour elle ce qu'il se produisit pour la viole de gambe. On joua d'abord la viole et la flûte douce concurremment avec le violoncelle et la flûte traversière. Puis, les nécessités de l'orchestration nouvelle firent éliminer peu à peu de l'orchestre et de la musique de chambre ces instruments imparfaits, dont le plus grave défaut était la faiblesse de sonorité. Ils ne furent plus alors pratiqués que par certains amateurs pour tomber, vers la fin du XVIIIe siècle, complètement dans l'oubli. Il est possible qu'on ait fabriqué encore des flûtes à bec vers 1777. *L'Almanach Dauphin* de cette date nous dit que les luthiers sont ceux qui ont l'art de faire et le droit de vendre... clavecins, flûtes traversières, *flûtes à bec*, etc.

Nous avons de fortes raisons de croire qu'ils n'usaient pas fréquemment de ce privilège.

***

Revenons donc à la flûte traversière. Il suffit de voir la tablature d'Hotteterre pour comprendre à quel point la flûte était imparfaite. L'emploi conti-

nuel des « fourches » rendait les gammes les plus simples excessivement compliquées. Quant à la justesse, elle était plus qu'approximative. On pouvait, il est vrai, corriger la justesse des notes par le moyen des lèvres, mais telle devait être la difficulté à vaincre, que de rares artistes devaient en être capables.

C'est cependant sur cet instrument défectueux qu'une série de grands virtuoses va jouer durant tout un siècle et en fera « l'instrument à la mode » de l'époque. Et son usage dure jusqu'au commencement du XIXe siècle! Il ne faut pas croire, toutefois, que les chercheurs et les inventeurs restaient inactifs. Nous sommes amené à penser que les flûtistes d'un talent moyen ou médiocre, souffrant de l'imperfection de leur instrument, plus portés à rejeter la responsabilité de leur insuccès sur les défauts de leur flûte que sur leur propre insuffisance, cherchèrent à améliorer leur instrument. Mais les grands artistes, de BLAVET (1700-1768) à DEVIENNE (1759-1803) se servent uniquement de la flûte à une clef. Ecoutez DEVIENNE parlant des inventions nouvelles dans la préface de sa méthode : « Ce n'est pas cependant que je veuille blâmer les petites clefs, que des recherches justes ont fait ajouter à la flûte ordinaire, pour remédier aux sons bouchés, qui se trouvent dans le bas : tels que le *sol*♯ ou *la*♭ et le *si*♭ ou *la*♯; elles sont d'une grande nécessité dans les morceaux lents, et surtout quand les notes ci-dessus désignées sont soutenues; quoique je ne m'en serve pas, je les approuve, mais dans ces cas-là seulement, car pour les traits elles deviennent inutiles et ne servent qu'à ajouter à la difficulté. La manière la plus simple étant souvent la meilleure, je ne puis trop recommander aux élèves de la mettre le plus souvent en pratique. »

Il est fort heureux que tous les flûtistes de cette époque n'aient pas possédé cette grande virtuosité ou cet esprit accommodant. On verra, au contraire, que les chercheurs d'améliorations furent innombrables.

Une des premières inventions dignes de remarque est celle de deux clefs ouvertes fermant deux trous supplémentaires percés dans une extension du tube à l'extrémité inférieure. Ces clefs ont pour objet de donner à la flûte l'*ut naturel* et l'*ut*♯ graves. Cette transformation, dit QUANTZ, a été essayée vers 1722, mais a été désapprouvée par tous les flûtistes, car l'extension du tube nuisait, prétendaient-ils, à la qualité du son. Il faudra attendre un siècle pour qu'on y revienne, et l'on entendra à nouveau les mêmes protestations.

Le même QUANTZ eut, vers 1726, lors d'un voyage à Paris, la curieuse idée de donner plus de justesse à son instrument par l'adjonction d'une seconde clef fermée à la patte. Dans son esprit, l'une des deux clefs devait produire le *ré*♯, l'autre le *mi*♭ (on voit par là quel soin scrupuleux mettait QUANTZ à l'obtention d'une justesse parfaite). De plus, l'emploi de l'une ou l'autre clef devait apporter une amélioration à la production de certaines autres notes. Ce perfectionnement ne paraît guère avoir été goûté en Allemagne, et nous n'en trouvons nulle trace ailleurs.



FIG. 618.

Une autre invention que QUANTZ s'est attribuée (on la lui a contestée) est celle du bouchon à vis permettant de modifier légèrement le diapason. Cette disposition a été conservée sur toutes les flûtes depuis QUANTZ et existe encore sur nos instruments actuels.

Il nous faut attendre jusqu'en 1774 pour nous trouver en face d'un perfectionnement vraiment sérieux. Il s'agit de la perce de trois trous nouveaux, munis de clefs fermées pour la production du *fa naturel*, du *sol*♯ et du *si*♭. Là encore, l'incertitude règne sur le nom de l'inventeur. Les uns attribuent l'invention à l'Anglais Josef TACET, mais W.-S. ROCKSTRO ne paraît pas vouloir souscrire à cette opinion en faveur de son compatriote. FÉTIS penche pour le flûtiste PETERSEN de Brême et pour le facteur WOLFF, mais il y a lieu de douter encore du bien fondé de cette assertion. Quoi qu'il en soit, cette amélioration, qui aurait dû révolutionner le monde des flûtistes par son importance, paraît, au contraire, les avoir laissés assez froids. Les grands virtuoses du temps, s'ils la connaissaient, la dédaignaient. Cependant, ces trois clefs pouvaient être d'un usage facultatif (ainsi que le fait remarquer DEVIENNE dans le passage de sa Préface cité plus haut), et ne devaient heurter en rien les habitudes prises.

La clef de *fa*♯ était peut-être la plus nécessaire des trois, car elle donnait à la flûte une note de plus : le *fa naturel* de la 3e octave, tout en améliorant les deux autres *fa*. On se rappelle que ce *fa*♯ n'était même pas mentionné dans la tablature d'HOTTETERRE.

Ce trou pour le *fa*, placé entre les 4e et 5e trous, mais latéralement, du côté de l'exécutant, était actionné par une clef placée en travers du corps de l'instrument. Elle devait être actionnée par le 3e doigt (annulaire) de la main droite. Pour produire le *fa* 1re et 2e octave), on ouvrait cette clef en gardant le doigté du *mi naturel*, et la note ainsi produite était excellente.

Le trou pour le *sol*♯ était percé à peu près sur la même ligne que celui du *fa naturel*, mais entre le 3e et le 4e trou. Il était actionné par le petit doigt de la main gauche.

Le trou pour le *si*♭ était placé entre les 2e et 3e trous, longitudinalement aussi, et s'actionnait par le pouce de la main gauche.

Nous avons dit que ces perfectionnements avaient été généralement dédaignés par les virtuoses; certains artistes, cependant, en faisaient usage à une époque que nous pouvons déterminer. Un flûtiste allemand nommé RINGK déclare les avoir adoptés vers 1782, et le fabricant Richard POTTER en faisait dès 1774.

Un peu plus tard, un Italien du nom de FLORIO, flûtiste au Royal Italian Opera de Londres, fit ajouter à sa flûte les deux clefs ouvertes supplémentaires d'*ut naturel* et *ut*♯ grave, inventées depuis longtemps, puis abandonnées. La flûte ainsi modifiée fut longtemps désignée sous le nom de flûte à 6 clefs.

Cependant, un perfectionnement réel surgit : le percement d'un trou supplémentaire pour l'*ut naturel* (médium et aigu) placé entre le premier et second trou. Primitivement, ce trou était muni d'une clef ouverte, et on le tenait fermé constamment par le pouce de la main gauche. Mais bientôt, on lui applique une clef fermée placée à côté de la clef fermée de *si*♭ (RINGK s'attribue cette invention), et maniée également par le pouce de la main gauche.

Ce perfectionnement marque une étape importante dans l'histoire de la flûte. L'instrument, tel que nous l'avons décrit (mais non muni des clefs d'*ut* et d'*ut*♯ graves), est encore connu et fabriqué de nos jours sous le nom de flûte à cinq clefs. Nombre d'artistes et d'amateurs ont fait leurs premiers essais sur cet instrument, encore en usage, d'ailleurs, en certains pays.

Appendix XXVI

Impressions and ideas regarding Hotteterre, La Couture-Boussey, historical contexts, and Traverso-making by Alain Weemaels.

THE HISTORICAL CONTEXT

Jacques Hotteterre *Le Romain* (1674-1763) comes from a family from La Couture-Boussey, a village located about 80 kilometres from Paris, to the North-West. *Couture* means culture (of the fields) and *Boussey* means boxwood, which abounded in this region. In the 17th and 18th Century spinning mills did not yet exist and pottery tableware was expensive, which created demand for wood turners, who were very numerous in all regions, for spinning wheels, wooden tableware and also taps. for barrels (Appendix XXXI). Oral tradition reports that in 1590 the inhabitants of Boussey recovered Fifes after *The Battle of Ivry* (March 14, 1590). This took place partly in Boussey and there were many mercenaries, Swiss with (*Fifes*) and German with (*Flute d'Allemagne*).

Château d'Anet is close to La Couture-Boussey, and an important castle still existing. Diane de Poitiers (1500-1566) —favourite of King Henri II (1519-1559)—gave great Renaissance parties there, it is assumed that she did chose the best musicians, maybe including flautists? Local turners have undoubtedly expanded their production by creating wind instruments. In addition, there was a strong demand for music in the 17th Century for the Castle of Versailles a little further from La Couture-Boussey. Many turners have chosen Paris to escape poverty, responding to this new outlet.

FROM THE CYLINDRICAL FLUTE OF THE MERCENARIES TO THE HOTTETERRE FLUTE

After about 60 years of research (since 1590?) it is coming! In 1660 the Traverso (probably Hotteterre) appeared in concerts at Versailles. The surviving instruments of this family of makers and musicians are:

- Hotteterre of *Landesmuseum Joanneum* in Graz (Austria) at the lowest pitch would be the oldest (early 18th Century?). *Model I* from the time of Louis XIV (reign 1643-1715).
- Copies from the 19th Century are found in the museums of *Le Musée des Instruments à Vent* in La Couture-Boussey, *Musée des Instrument de Musique* in Brussels, *Staatliches Institut für Musikforschung* in Berlin, *Museum of Musical Instruments* in St. Petersburg. By copying them it is beneficial to replace the 19th Century characteristics with baroque ones which gives this flute model a lot of agility and balance, Rameau and *Model II* would suit each other very well! This is the Louis XV period (reign 1715-1774).
- The flute from the *Music Museum* in Paris, also Louis XV, for which I don't have the plans could thus be called *Model III*.

A LITTLE ON ACOUSTICS AND WORKSHOP CONSIDERATION

The wooden flutes and the wood lathe form an inseparable couple (perhaps already since Rome, the beginning of the cylindrical flutes). The drilling is thus very precise, the exterior is then turned. Cylindrical flutes octave on one and a half octave, and higher they quintoient and the fingerings change. For a tenor in D, for example, the E♭ is done on the 6th hole half closed, it is not comfortable. The semi-tones are made with fork fingerings and are adjusted by the embouchure which is very flexible. Baroque flutes inaugurate the conical bore (which already existed for a long time for other wind instruments) and the key of D#/E♭, it is comfortable and the range for the octaves passes to two, with the fifths to the third as for the cylindrical ditto for the operation of the fork-fingerings!

This is a summary of the evolution of the transverse flute by an important family of makers and players.

In my turn, I explored this field by recreating models from before the Hotteterre and from the Hotteterre, I have a lot of joy playing them too. I also like the Boehm-flute very much, which I play with delight, but I don't build one.

Alain Weemaels, August 2023

HOW CAN A TRAVERSO-MAKER OF TODAY USE INFORMATION FROM THE PAST?

The 18th Century

There are still old Traversi practically in new condition: that have hardly been used! Obviously the current Traverso-maker can copy them as faithfully as possible.

Other original Traversi has alterations that must be corrected, at the level of the bore, the finger holes, the head-joint and blowing hole. These structures correspond in principle to what was done at their time.

There are also joints and parts of the Traverso that have been shortened, we can evaluate this according to the pitch of their time and thus restore the correct length in a copy.

Before 1660

Going further into the past, in the 17th and 16th Century the Traversi are often even more altered, deformations, enlargements of the finger holes, missing parts, here there is more and more to reconstruct, helped by comparisons with other factors from the past and the length proportions given by Pythagoras.

To my knowledge, there is no longer an older transverse flute, everything has unfortunately disappeared!

There remains religious iconography and sculpture, also Roman, which testifies to their very ancient existence.

*

The Traverso-maker and the Traverso-player explore the past together. The first reconstructs what seems to have existed and the second brings it back to life, discovering together a past world that they only partially know! (what we call experimental archaeology)

Alain Weemaels, September 2023

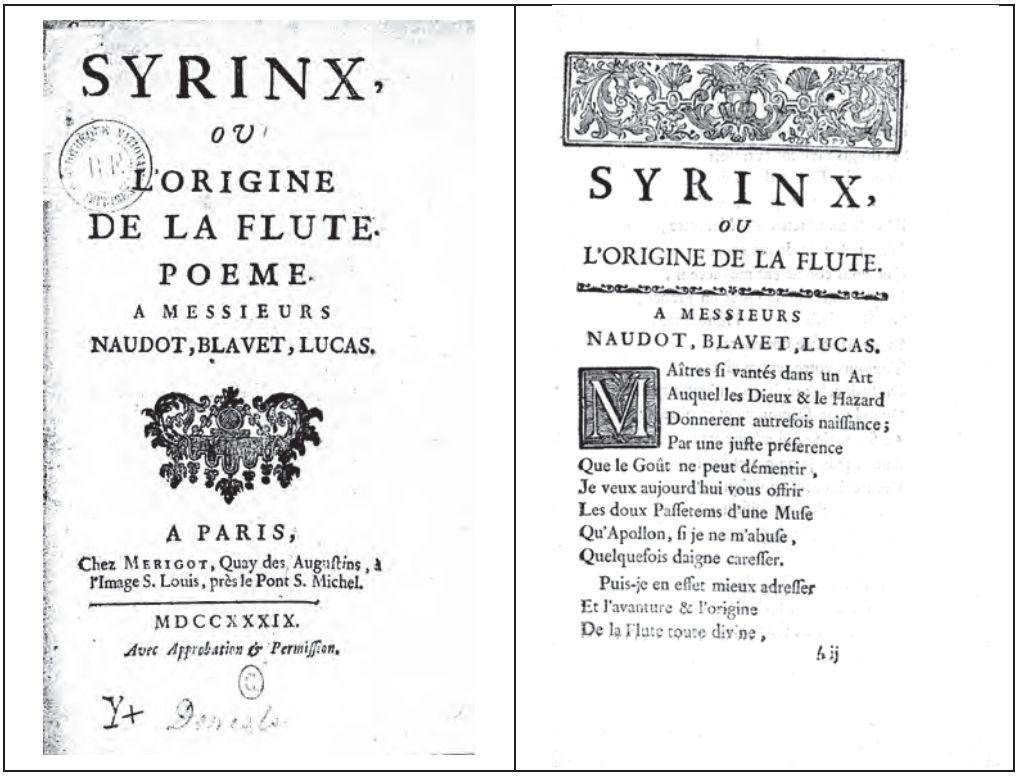
Appendix XXVII

Print after drawing of *Pan's wedding with Flora* (*c.*1670) by Claude Lorrain (*c.*1604-1682) in *Liber veritas*, depicting a pastoral scene with four musicians in the left corner below, one playing a transverse flute. Coloured *Mezzotinto* print (1775), Nr. 108 by Richard Earlom (1743-1822). (Private Collection)



Appendix XXVIII

The complete text of *Syrinx ou l'Origine de la Flute Poeme. A Messieurs Naudot, Blavet, Lucas* (1739) by Denesle. At the end of the poem is a reference to a *Le Fluteur Automate de M. de Vaucanson* created by Jacques Vaucanson (1709-1782) a famous French inventor, and in the present context Denesle refers to his music automate from 1737, which was made as a shepherd—in full life size—playing a transverse flute and a drum.



SYRINX,

OU

L'ORIGINE

DE LA FLUTE.

POEME.

A MESSIEURS

NAUDOT, BLAVET, LUCAS.

A PARIS,

Chez MERIGOT, Quay des Auguſtins, à l'Image S. Louis, près le Pont S. Michel.

MDCCXXXIX.

Avec Approbation & Permiſſion.

Y+ Denesle

SYRINX,

OU

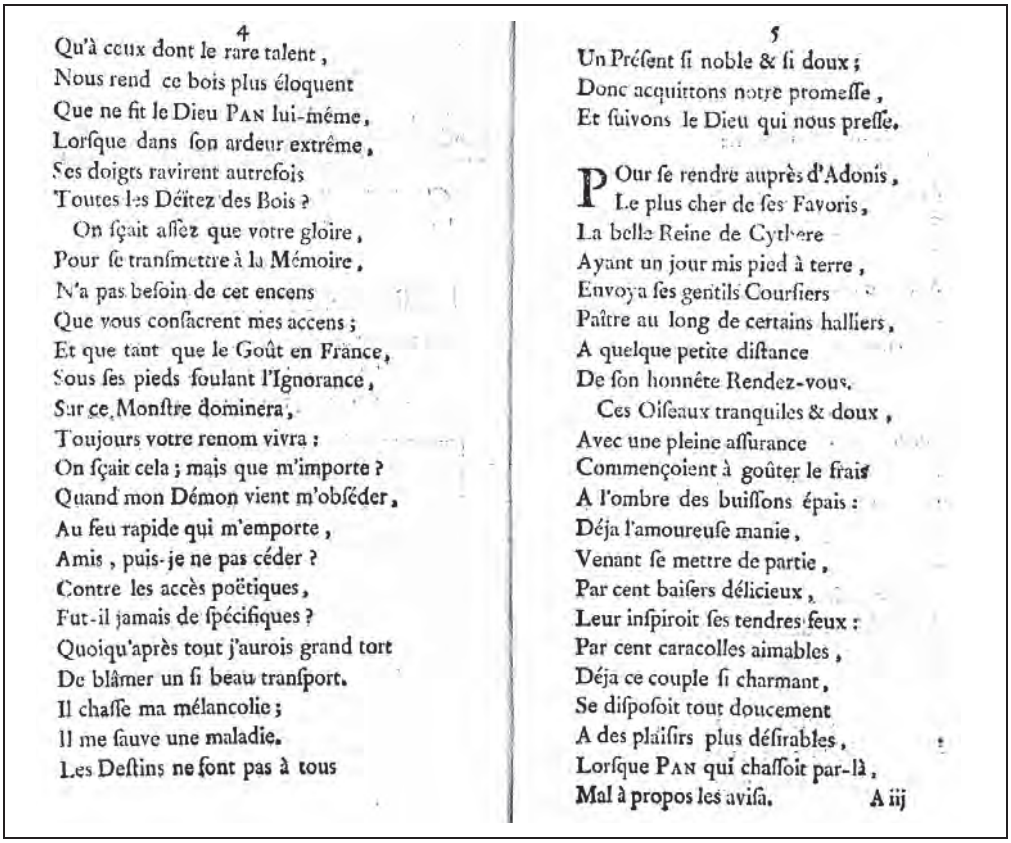
L'ORIGINE DE LA FLUTE.

A MESSIEURS

NAUDOT, BLAVET, LUCAS.

Maîtres ſi vantés dans un Art
Auquel les Dieux & le Hazard
Donnerent autrefois naiſſance;
Par une juſte préference
Que le Goût ne peut démentir,
Je veux aujourd'hui vous offrir
Les doux Paſſetems d'une Muſe
Qu'Apollon, ſi je ne m'abuſe,
Quelquefois daigne careſſer.
Puis-je en effet mieux adreſſer
Et l'avanture & l'origine
De la Flute toute divine,

A ij



4

Qu'à ceux dont le rare talent,
Nous rend ce bois plus éloquent
Que ne fit le Dieu PAN lui-méme,
Lorſque dans ſon ardeur extrême,
Ses doigts ravirent autrefois
Toutes les Déïtez des Bois?
On ſçait aſſez que votre gloire,
Pour ſe tranſmettre à la Mémoire,
N'a pas beſoin de cet encens
Que vous conſacrent mes accens;
Et que tant que le Goût en France,
Sous ſes pieds foulant l'Ignorance,
Sur ce Monſtre dominera,
Toujours votre renom vivra:
On ſçait cela; mais que m'importe?
Quand mon Démon vient m'obſéder,
Au feu rapide qui m'emporte,
Amis, puis-je ne pas céder?
Contre les accès poëtiques,
Fut-il jamais de ſpécifiques?
Quoiqu'après tout j'aurois grand tort
De blâmer un ſi beau tranſport.
Il chaſſe ma mélancolie;
Il me ſauve une maladie.
Les Deſtins ne ſont pas à tous

5

Un Préſent ſi noble & ſi doux;
Donc acquittons notre promeſſe,
Et ſuivons le Dieu qui nous preſſe.

POur ſe rendre auprès d'Adonis,
Le plus cher de ſes Favoris,
La belle Reine de Cythere
Ayant un jour mis pied à terre,
Envoya ſes gentils Courſiers
Paître au long de certains halliers,
A quelque petite diſtance
De ſon honnête Rendez-vous.
Ces Oiſeaux tranquiles & doux,
Avec une pleine aſſurance
Commençoient à goûter le frais
A l'ombre des buiſſons épais:
Déja l'amoureuſe manie,
Venant ſe mettre de partie,
Par cent baiſers délicieux,
Leur inſpiroit ſes tendres feux:
Par cent caracolles aimables,
Déja ce couple ſi charmant,
Se diſpoſoit tout doucement
A des plaiſirs plus déſirables,
Lorſque PAN qui chaſſoit par-là,
Mal à propos les aviſa.

A iij

A plus d'un céleſte avantage,
De Cypris le cher Attelage
Se fit reconnoître aiſément ;
Mais ce fut inutilement :
Du Chaſſeur la fléche mortelle
Atteignit la tendre fémelle.
Son triſte & déſolé mari,
Avec un lamentable cri,
Apprit bien-tôt à la Déeſſe
L'affreux ſujet de ſa triſteſſe.
Vénus, contre toute raiſon,
Par le Dieu ſauvage outragée,
Jura que cette trahiſon
Sur lui-même ſeroit vengée.
Elle avoit la puiſſance en main ;
Et pardeſſus elle étoit femme :
PAN reſſentit l'effet ſoudain
De ſa vindicative flâme.
Viens, dit la dolente Cypris
A ſon cher & dangereux Fils,
Viens ſervir ma juſte colere,
Et venger l'affront de ta Mere.
Mes Oiſeaux que fuit le Vautour,
Et que l'Aigle même révere,
Ont été percés en ce jour

Des traits d'une main ſacrilége.
Un Dieu du plus petit état,
Un vil Satyre, le dirai-je ?
Par un témeraire attentat,
Oſe inſulter à ma puiſſance !
Que PAN reconnoiſſe aujourd'hui
L'extrême, mais juſte diſtance
Qu'à jamais entre nous & lui
Mettent les Deſtins immuables ....
Cours, prens tes fléches redoutables ;
Que d'un traître feu conſumé,
Il aime, & ne ſoit point aimé.
Suivant les ordres de ſa Mere,
Amour rarement pareſſeux,
Si-tôt qu'il s'agit de mal faire,
Saiſit ſon carquois & ſes feux.
Entre mille traits homicides,
Il en a ſur-tout deux perfides.
L'un fait haïr à la fureur ;
L'autre fait aimer à la rage.
Du premier il perce le cœur
De SYRINX Nymphe belle & ſage ;
De l'autre, le coupable Dieu.
A l'inſtant ce dangereux feu,
Auteur des amoureuſes peines,

Se répand dans toutes ſes veines.
Amour, quel eſt votre pouvoir !
Ah ! qu'il eût été beau de voir
Le Dieu groſſier de l'Arcadie,
Frappé de cette maladie !
C'eſt en vain qu'il conte ſes maux
Aux Bois, aux Rochers, aux Echos ;
La jeune Beauté qu'il adore
Peut-ſeule au feu qui le dévore,
Apporter du ſoulagement.
Mais il brûle pour une Ingrate.
La Nymphe fiére & délicate,
Dédaigne d'un pareil Amant
L'injurieux empreſſement.
Sçais-tu quelle eſt mon origine,
Lui diſoit-il ? Elle eſt des Cieux.
Mercure ambaſſadeur des Dieux,
Dépouilla ſa forme divine
Jadis pour me donner le jour ;
Je ſuis le fruit de ſon amour ....
Pénélope, jeune Bergere,
Belle comme toi, mais moins fiére,
Ne prit point ſur le pied d'affront,
Que ce Dieu pour lui rendre hommage,
Eût laiſſé croître ſur ſon front,

D'Hymen, l'ordinaire appanage ;
Ces mêmes cornes dont tes yeux
Te font un objet odieux.
Quoique bienfaite, quoique belle,
Ni les cornes, ni la toiſon,
Ne purent la rendre cruelle.
Fille ſenſée entend raiſon,
Et dans ce cas penſe comme elle ;
Car on ne trouve pas toujours,
S'il faut te parler ſans détours,
Et laiſſer-là le ton modeſte,
Un Amant de race céleſte.
Dieux ! à des diſcours ſi preſſans,
Si flatteurs & ſi ſéduiſans,
Quel cœur pourroit ne ſe pas rendre ?
SYRINX en fut-elle plus tendre ?
Non. Car agiſſant ſans façon :
J'aime mieux, lui répondit-elle,
Un Amant de race mortelle,
Mais qui ſoit au moins beau Garçon,
Sans bien, ſans crédit, ſans naiſſance,
Fût-il même du plus bas lieu,
Qu'avec toute ſon excellence,
Un malfait & difforme Dieu.
Il eſt juſte qu'on vous honore ;

Mais fuſſiez-vous plus noble encore,
Divin PAN, chacun a ſon goût,
Je ne vous ſerai rien du tout.
Mille Nymphes ambitieuſes
Seront pour vous moins dédaigneuſes.
Que ce ſoit caprice ou raiſon,
Je leur céde ſans nulle peine,
Voyez combien peu je ſuis vaine!
Vos cornes & votre toiſon.
Une ſi fiére impoliteſſe
Ne ralentit point ſa tendreſſe;
Au contraire ce fut un vent,
Qui rendit ſon feu plus ardent.
Car telle eſt la bizarrerie
Du Dieu de la Galanterie,
Il nous fait chérir qui nous fuit,
Et nous fait fuir qui nous chérit.
C'eſt une aſſez rare merveille,
Et j'en ſuis grandement ſurpris,
Lorſque d'une flâme pareille,
Deux cœurs ſe trouvent bien épris....
Mais SYRINX n'étoit point blâmable;
Fût-on ſorti du Sang des Dieux,
Une mine déſagréable
Paroît telle à de certains yeux.

De ſoi la Nobleſſe fort belle
Sert peu chez une Jouvencelle,
Qui ſimple & ſans ambition,
Aime par inclination.
Quoi qu'il en ſoit, le Dieu champêtre,
A qui ſa Nobleſſe peut-être
Avoit tenu lieu de beauté
Près de maintes belles Nayades,
Près de maintes belles Dryades,
Pour le coup ne fut écouté.
Amour niché dans la prunelle
De la dédaigneuſe Pucelle,
Lui faiſoit voir ce malheureux,
Trois & quatre fois plus affreux.
Ce fut en vain que ſa tendreſſe
Employa la ruſe & l'adreſſe,
Pour ſurprendre dans ſes filets
Le fier objet de ſes ſouhaits:
La Nymphe ſémillante & vive
Etoit toujours ſur le qui-vive.
Sans un ſecret conſentement,
L'on n'attrape pas aiſément
Fille qui hait le badinage:
Et comme toute fille ſage,
Ce que celle-ci ſçavoit bien,

Pour ne rien donner, ne prend rien,
Quoiqu'on ait changé cet uſage,
Les promeſſes & les préſens
Ne ſervirent pas davantage.
La honte, le dépit, la rage,
L'ayant enfin mis ſur les dents,
Des Dieux il invoqua le Pere,
Qui ne put rien en cette affaire.
Peut-être qu'ailleurs occupé,
Et d'un nouvel objet frappé,
Il étoit ce Pere ſuprême,
Bien embarraſſé pour lui-même;
Car Amour pour ſe divertir,
Comme un autre le fait courir;
Et l'on ne peut ſans peine croire
Les ſottiſes qu'il lui fait faire.
Tant il eſt vrai que de ſes Loix
Il n'excepte ni Dieux ni Rois.
Tout ſouffre de la frénéſie
Du triſte Dieu de l'Arcadie.
Sans Chiens, ainſi que ſans Paſteurs,
Dans les Bois ſes Chévres errantes,
Sont les victimes innocentes
Des Loups, affamés raviſſeurs.
Parmi les meurtres, les pillages,

Faunes & Satyres peu ſages,
Ne penſent qu'à ſe divertir.
A travers buiſſons & bruyéres,
On les voit par troupes courir
Après de folâtres Bergeres.
Tout va mal dans une maiſon,
Lorſque le Maître eſt ſans raiſon.
Enfin pour reſſource derniere,
Et c'étoit le plus ſûr moyen,
Notre PAN crut qu'il feroit bien
De bruſquer cette Nymphe altiére.
L'Amant le plus reſpectueux
N'eſt pas toujours le plus heureux;
Et femme eſt ſouvent hypocrite,
Lorſqu'elle veut faire un mérite
Au ſage Amant de ſon reſpect.
L'éloge eſt diablement ſuſpect.
Elle aime qu'on aide à la lettre;
Et quoi qu'il oſe ſe permettre,
Un Galant a rarement tort,
S'il peut l'obtenir par effort.
Suivant cette honnête maxime,
Le Dieu que ſon dépit anime,
Saiſit un jour l'occaſion.
La Nymphe cria tout de bon.

14

Ce ne fut point fauſſe ſageſſe,
Puiſqu'elle eut même la ſoupleſſe
D'éluder ſon avidité.
S'il eût été moins laid, peut-être
Son heureuſe témérité
L'en eût-elle rendu le maître.
Vertu ſouvent doit ſon effet
A l'indignité du Sujet.
Malgré ſes ruſes & ſa fuite,
Notre Belle n'en fut pas quitte;
Le terrible & fougueux Amant
La pourſuivit rapidement.
Mais l'Amour & ſa bonne Mere,
Qui de l'œil conduiſoient l'affaire,
Vouloient qu'après tout ce débat,
Le Dieu ribaud ne prît qu'un Rat.
Grande Déeſſe de Cythere,
Diſoit la Pucelle en fuyant,
Contre un Satyre téméraire,
Prête-moi ton ſecours puiſſant.
Laiſſe-toi toucher de mes larmes,
Et ne permets pas que mes charmes
Servent de jouet malheureux
Aux tranſports d'un Monſtre hideux.
Mon cœur ne croit pas faire injure

15

Aux droits de ton divin Enfant,
Quand il exige qu'un Amant
D'un homme ait au moins la figure.
Elle prioit ainſi tout bas;
Lorſque par malheur un faux pas,
Arrêtant la Nymphe craintive,
Au bord d'une onde fugitive,
La fit tomber ſans mouvement.
Le Sylvain treſſaillit de joye,
Et crut que ſon aimable proye
Etoit à lui dans le moment.
Mais quelle ſurpriſe cruelle!
Dans le tems qu'il veut l'embraſſer,
Et contre ſon ſein la preſſer,
Ce Dieu malheureux au lieu d'elle,
Ne ſaiſit qu'un fréle Roſeau!
Pendant qu'il pâlit, qu'il ſoupire,
Cupidon éclate de rire.
Mais autre prodige nouveau!
A peine d'une main tremblante,
Murmurant contre le Deſtin,
Il eut de ſa tige récente
Détaché ce fragile Brin;
A peine ſa bouche amoureuſe
Eut enfin baiſé librement

16

Cet infortuné Monument
D'une Beauté trop rigoureuſe,
Que pour ſurcroît d'enchantement,
Une voix douce, gracieuſe,
Se fit entendre clairement.
SYRINX à la beauté charmante,
Avoit joint une voix touchante;
Et du Deſtin les juſtes loix,
Car on ne doit croire autre choſe,
De la triſte métamorphoſe,
Voulurent préſerver ſa voix.
Des Immortels ce don céleſte,
Eſt le ſeul hélas! qui lui reſte.
Son corps autrefois ſi charmant,
Ne préſente aucun agrément.
Son Goſier ſeulement enchante;
Et ne pouvant pas faire mieux,
Quoiqu'également amoureux,
Il faut bien que PAN s'en contente.
Néceſſité fait la raiſon.
Mais par un merveilleux ſyſtéme,
Il ſçut en varier le ſon,
Dont la teneur étoit la même;
Et trouva bien-tôt le ſecret,
Etant ſçavant dans la Muſique,

17

Comme dans tout genre harmonique,
De rendre l'organe parfait.
C'étoit choſe bien raiſonnable,
Que cet Inſtrument admirable,
Aux ſoins d'une Divinité
Dût ſes graces & ſa beauté.
SYRINX qui fut pendant ſa vie,
De PAN l'implacable ennemie,
Enfin ſenſible à ſon amour,
Devînt depuis cet heureux jour
Son éternelle Compagnie.
Lorſque pour la premiere fois,
Aux Echos, le Dieu fit entendre
Sa Flute harmonieuſe & tendre,
On dit que la fidelle voix
De ces Déïtez inviſibles,
Par le ſilence d'un moment,
A celle du rare Inſtrument,
Rendit des hommages ſenſibles.
On eût vû ſortir des Forêts,
Et des Antres les plus ſecrets,
Tranſportés d'un nouveau délire,
Le Faune & le joyeux Satyre.
Par les danſes, les ris, les jeux,
Toutes les Déïtez champêtres,

Chaque jour à l'ombre des hêtres,
Du Dieu PAN célébroient les feux.
Lui-même pour charmer ſa peine,
Seul aſſis ſur le gazon frais,
Faiſoit redire à l'Inhumaine,
Et ſon amour & ſes regrets.
Bien-tôt dans toute l'Arcadie,
SYRINX eut un renom fameux;
Amour la privant de la vie,
Lui rendit un ſort plus heureux.
Ici brillent votre ſageſſe,
Votre puiſſance & votre adreſſe,
Grands Dieux! le meurtre d'un Oiſeau,
En vérité qui l'eût pû croire?
Comme tout ſert à votre gloire!
Produit un miracle nouveau;
D'une Fille ſimple, innocente,
Qui fuit un Amant odieux,
Faire une Flute raviſſante!
Cela n'appartient qu'à des Dieux.
C'eſt à cette Fille divine,
Que l'Univers doit l'origine
De ce Tube mélodieux,
Qui cent fois, dans la main ſçavante
Des Maîtres fameux que je chante,

Fut peut-être envié des Cieux:
Soit que de l'amoureuſe flâme
Il peigne les douces langueurs;
Soit qu'il exprime avec plus d'ame
Bacchus, la Table & les Bûveurs.
Mieux que la Lyre ſi vantée,
Il pourroit fléchir ſous leurs doigts
Du Tigre la rage indomptée;
Et du Deſtin forçant les loix,
Donner à la Parque un cœur tendre.
Par des éloges répétés,
Que ſert-il ici de s'étendre
Sur leurs brillantes qualitez?
Paris charmé de les entendre,
Fait valoir leurs talens heureux,
Bien mieux qu'un éloge pompeux.
Un ſi glorieux témoignage
Emporte tout autre ſuffrage.
Ce ſeroit bien ici l'endroit
De célébrer une Merveille,
Qui peut ſe vanter à bon droit
De n'avoir point eu ſa pareille;
J'entends ce poſtiche Fluteur,*

* Le Fluteur Automate de M. de Vaucanſon.

De qui l'admirable harmonie
Décéle le profond génie
De ce rare & ſublime Auteur,
Dont s'enorgueillit notre France.
Car quoique dans l'éloignement,
C'eſt à PAN qu'il doit ſa naiſſance;
Et ſans la Flute, aſſurément,
Ce mécanique Phénoméne,
Emule de l'eſpece humaine,
Au regret du Monde ſçavant,
Seroit encore dans le néant.
Mais pour relever l'excellence
De tant de Miracles divers,
L'étonnement & le ſilence
Sont plus éloquens que les Vers.

FIN.

DENESLE.

BIBLIOTHÈQUE ARSENAL H.F. IMPRIMÉS

APPROBATION.

J'Ai lû par l'ordre de Monſieur le Lieutenant Géneral de Police, un Ouvrage qui a pour titre: *Syrinx*, ou *l'origine de la Flute*. Je crois que l'on peut en permettre l'impreſſion. Ce dixiéme Mars 1739.

CREBILLON.

PERMISSION.

VEu l'Approbation. Permis d'imprimer. A Paris ce 13 Mars 1739.

HERAULT.

BIBLIOTHÈQUE ARSENAL H.F. IMPRIMÉS

Appendix XXIX

Portrait of Philippe Rebillé *dit* Philbert (1639-1717, sometimes spelled as Philibert) as found in *Mercure de France* (June 1725, 1081-1085) describing Philbert's character and formidable skills as a flautist, singer, imitator, and gardener. It is interesting to read about his familiarity with the Court and the King Louis XIV. At the end of this telling is a poem by Alexandre Lainez (*c.*1650-1710) portraying Philbert, which here is shown as a facsimile from *Poësies de Lainez* (1753, 29).

> Je vais vous en donner un autre d'un caractere tout different qui est celui de Philibert, ce qui vous fera connoître que Laînez excelloit dans tous les genres de poêsie qu'il tratoit.
> Quoique je ne doute pas que vous n'ayez entendu parler de Philibert, je ne laisserai pas de vous donner une idée de son caractere, & de ses talens, afin de vous mettre plus au fait de tout ce qui est renfermé dans son portrait, cela servira à vous divertir vous & vos amis.
> Philibert étoit un plaisant spirituel, qui étoit recherché à la Cour & à la Ville par les personnel du meilleur goût, par rapport à mille talens agréables & facetieux; il joüoit parfaitement de la flute Allemande, il étoit camarade de Descôteaux, celebre dans l'art de joüer de cet instrument. Loüis XIV se faisoit un vrai plaisir d'entendre ces deux personnes exprimer des chants melodieux sur leurs flutes, & les faisoit souvent venir pour cela dans ses appartements, & dans les bosquets de Versailles.
> Philibert & Descôteaux ont été les Fleuristes les plus entendus, & les plus renommez de leur temps. On peut voir encore au Palais du Luxembourg dans les saisons convenable le jardin de fleurs que Descôteaux y cultiver avec un soin admirable.
> Philibert chantoit fort bien; pour donner plus d'expression à ses chants, il sçavoit adoucir sa voix, & la grossissoit tout-à-coup, pour passer du gracieux, au bruyant & au martial. Il avoit le talent de contrefaire toutes sortes baragoüins, ou langage corrumpu, le Gascon, l'Allemand, & le Suisse francisé; il imitoit les manieres, & le parler des jeunes filles, & contrefaisoit les vielles; il étoit, pour ainsi, dire le singe du genre humain. On l'admettoit souvent dans les ballets du Roi pour y representer tous les personnages comiques où il réüssissoit parfaitement bien.
> Il imagina d'imiter le bruit des cloches, & les differens carillons, par le moyen d'une grande poële à frire qu'il mettoit en branle d'une main, & sur laquelle il frappoit de l'autre avec un bâton, tantôt sur le milieu du fond, tantôt sur les côtés, & sur la queuë, ce qui formoit differens sons. Les personnes qui ne le voyoient pas, & qui entendoient le bruit qu'il faisoit, ne doutoient point que ce ne fut le bruit de veritable cloches. Un jour LoüisXIV le surprit avec une poële, en imitant tout ce que je viens de raconter. Il fit demander à S. M. la permission de l'aller amuser quelques moment à Marly, & divertir Madame la Duchesse de Bourgogne qui étoit arrivée depuis six mois en France, ce qui lui fut accordé. Il se fit annoncer dans l'appartement où étoient le Roi, Madame la Duchesse de Bourgogne, & plusieurs Dames & Seigneurs de la Cour, sous le nom du Baron Vielle-Veste, Gentilhomme Gascon; son habillement étoit convenable au rôle qu'il joüoit; il fit d'abord un compliment gracieux, & thès-plaisant au Roi, & complimenta ensuite Madame la Duchesse de Bourgogne sur son heureuse arrivée en France, & sur toutes les graces qui brilloient sur sa personne. La Princesse que le Roi n'avoit pas prévenuë sur cette avanture, ne sçavoit comment prendre la chose, & ne poivoit s'empêcher de rire de la figure & du parler du Baron de Vielle-Veste.
> Après que Philibert eut amusé une bonne heure cette auguste Compagnie, il passa dans le grand salon de Marly, où il fit un bruit si surprenant avec sa poële, qu'on se figuroit entendre un grand nombre de cloches en branle, & entre-mêllées de carillon. Madame la Duchesse de Bourgogne courut à ce bruit, & le Roi la suivit aussi-tôt, en disant: *c'est ce plaisant de Philbert*; & quand il l'eut vû se démener avec sa poële, il ne pût s'empêcher d'éclater de rire.
> Il étoit necessaire, comme vous allez voir, Monsieur, de rapporter ce que je viens de dire cy-dessus, pour être plus au fait du portrait que Laînez a de de Philbert. Je n'ai qu'un mot à ajoûter, la connoissance de Lainez & de Philibert se fit à …. À une lieuë de Paris chez M. Bose, Conseiller d'Etat, & Prevôt des Marchands de Paris, qui invita Laînez de venir dîner dans cette agréable Maison, dont Philibert étoit l'ordonnateur des jardins, Pensionnaire de la Ville de Paris pour l'entretien des arbres plantez sur les ramparts. Philibert qui ëtoit à …… à la reception qu'on fit Laînez, sçut que de Poëte étoit d'un genie des plus particuliers de son siecle, ce qui le mit en humeur de lui faire connoître son sçavoir; il ne manque pas de lui conter son avanture de Marly; celui-ci eut aussi grande attention à écouter tout ce que lui disoit Laînez qui parut si content de lui, pour tous ses talens, qu'il lui dit en le quittant, d'un ton haut qui lui étoit assez naturel: *tu m'as réjoüi, Philibert, je t'immortaliserai.* Effectivement quatre jours après, il donna à Moreau, son Musicien, le portrait de Philibert, afin qu'il le mit en air.

PORTRAIT
DE PHILBERT (a),
Excellent Joueur de Flute.

CHerchez-vous des plaiſirs, allez trouver *Philbert*;
(b) Sa voix, des doux chants de *Lambert*,
Paſſe au bruit éclatant d'un tonnerre qui gronde :
Sa Flute ſeule eſt un Concert.
La fleur naît ſous ſes mains dans un affreux déſert,
Et ſa langue féconde
Imite, en badinant, tous les Peuples du Monde.
Si dans un vaſte Pavillon (c)
Il ſonne le tocſin, ou fait un carillon,
En battant une poële à frire;
Le Héros immortel, que nous révérons tous,
Devient un homme comme nous,
Il éclate de rire.
Cherchez-vous des plaiſirs, allez trouver *Philbert*,
Sa Flute ſeule eſt un Concert.

(a) *Lainez* nous repréſente ce Muſicien tel qu'il étoit, on pouvoit l'appeller le Singe de la Nature.

(b) Ces deux Vers convenoient fort à la voix de *Philbert*: il l'adouciſſoit, la groſſiſſoit à ſa volonté.

(c) Salon de Marly, où *Philbert* s'amuſoit quelquefois à carillonner ſur une poële, en la frappant d'un bâton. Madame la Ducheſſe de Bourgogne fut un jour ſi ſurpriſe, qu'elle vint demander au Roi ce que c'étoit que ce bruit. Le Roi lui répondit : *Ah! c'eſt ce fou de* Philbert *qui a voulu vous divertir.*

Appendix XXX

Three prints from *The Musical Entertainment* (1737-1739, London: Charles Corbett by George Bickham Jr. (*c.*1706-1771). Vol. I: nr. 31 (18th Century hand coloured) and 100, Vol. II: nr. 67. (Private collection)

Note that the first engraving has the remark "*within ye Compas of ye flute*", and the second and third engraving have flute parts marked "*For the Flute*".



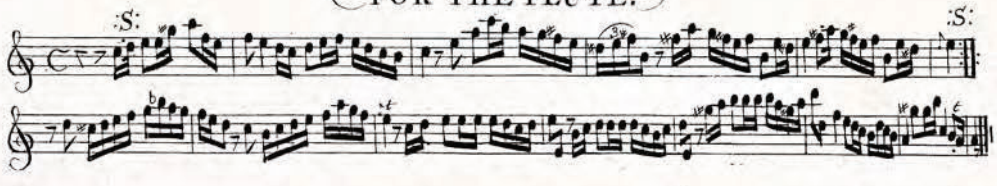


On Gallant Moor of Moor Hall.

Sung by Miss Isabella Young.



FOR THE FLUTE.





The Masque at the Old House

P

sino is no such Rover O no your Senesino has lick'd himself quite clean O has Thousands got fif

teen O ..... and lives in clo-ver;

C

I'm glad my Senesino has Thousands got fifteen O ..... & lives in clo-ver.

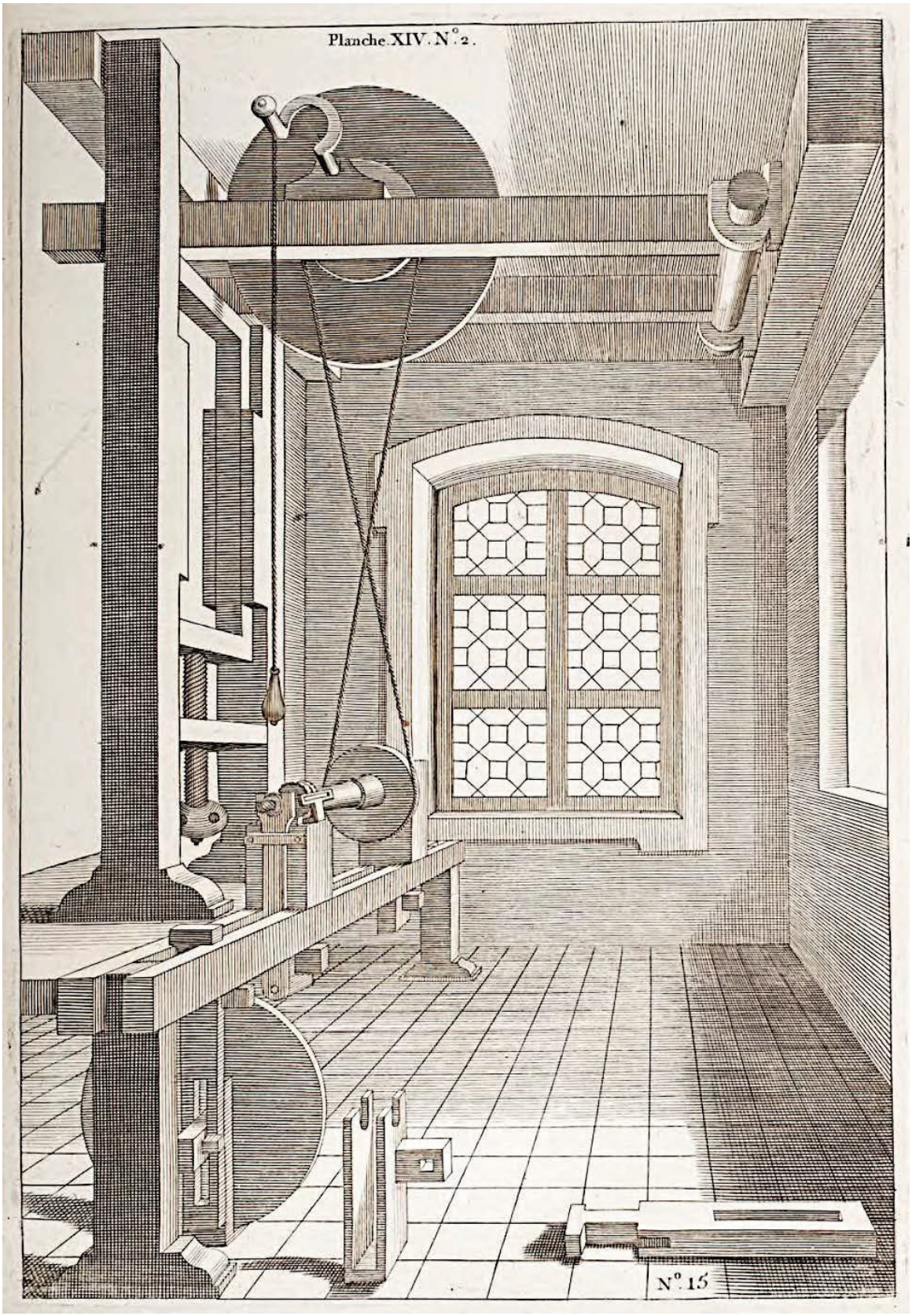
C *After Porpora or Handel*
Where d'ye think y^e Town will dandle
Or which must hold the Candle
P *I dont care a Farthing*
But Harliquin O Lun O
Has Cook'd a deal of Fun O
Of Pantomine and Pun O
And expects a mighty Run O
At Covent Garden.

C *Shall we go and see the Fun O*
At Covent Garden
P *In Play-houses full Six O*
One knows not where to fix O
Till they let us in for Nix O
That's Punches bargin
B *We'll see 'em round all Six O*
If they'll let us in for Nix O
That's allways our bargin

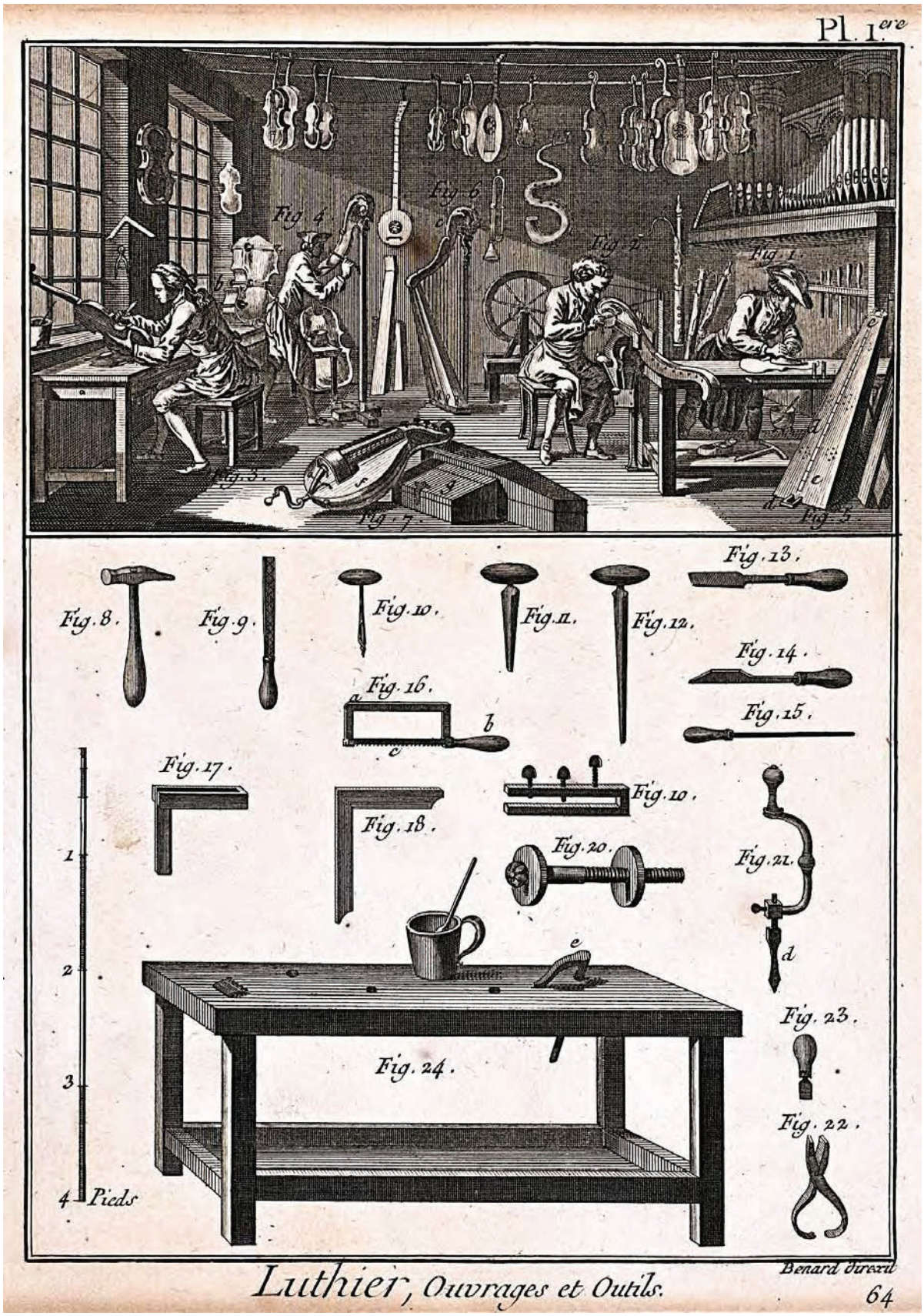
FLUTE.

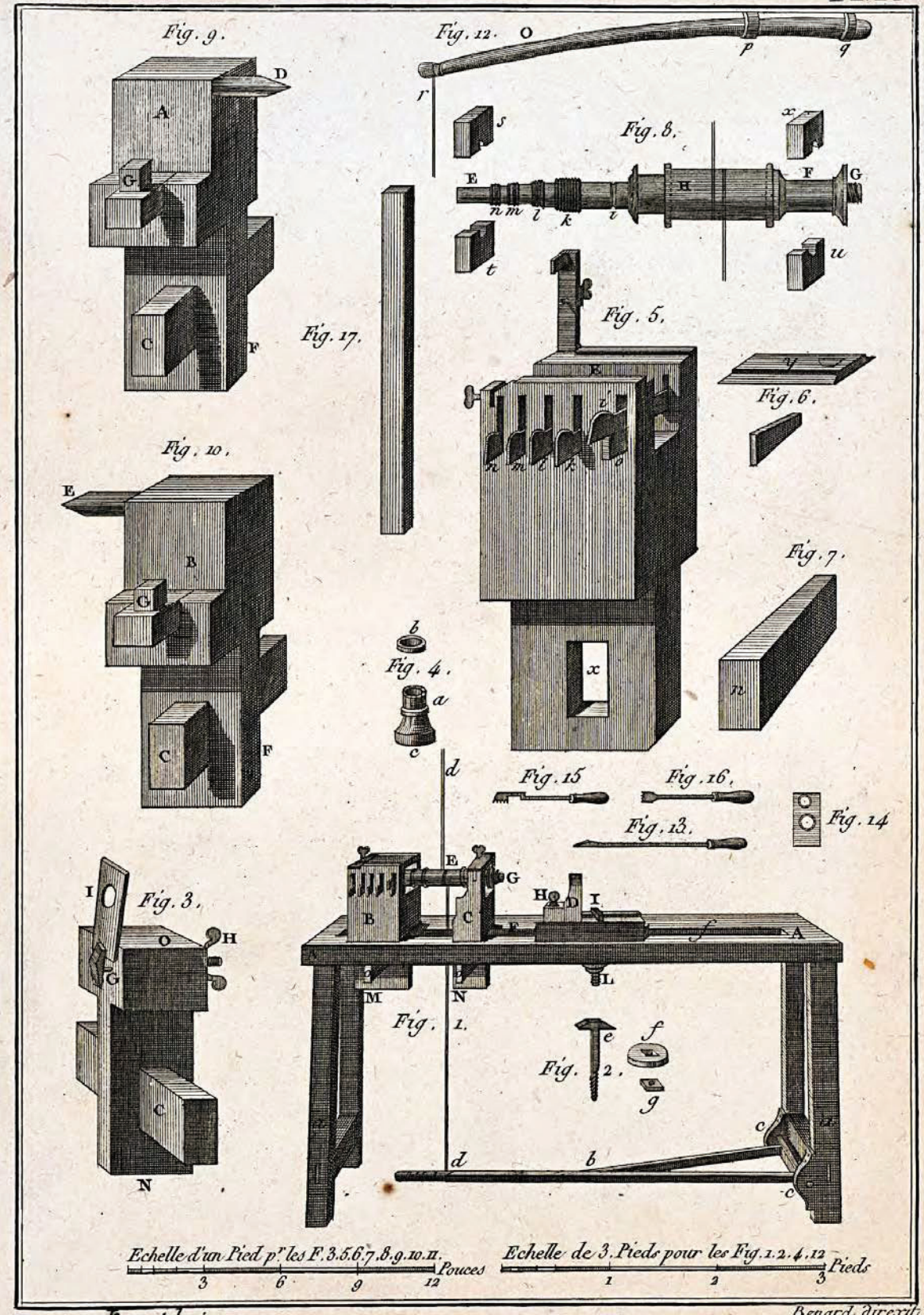
Appendix XXXI

Engraving of a lathe from *L'Art de tourner Ou De faire en perfection toutes sortes d'ouvrages au tour* (1701) by Charles Plumier (1646-1704). Paris: Charles Antoine Jombert.



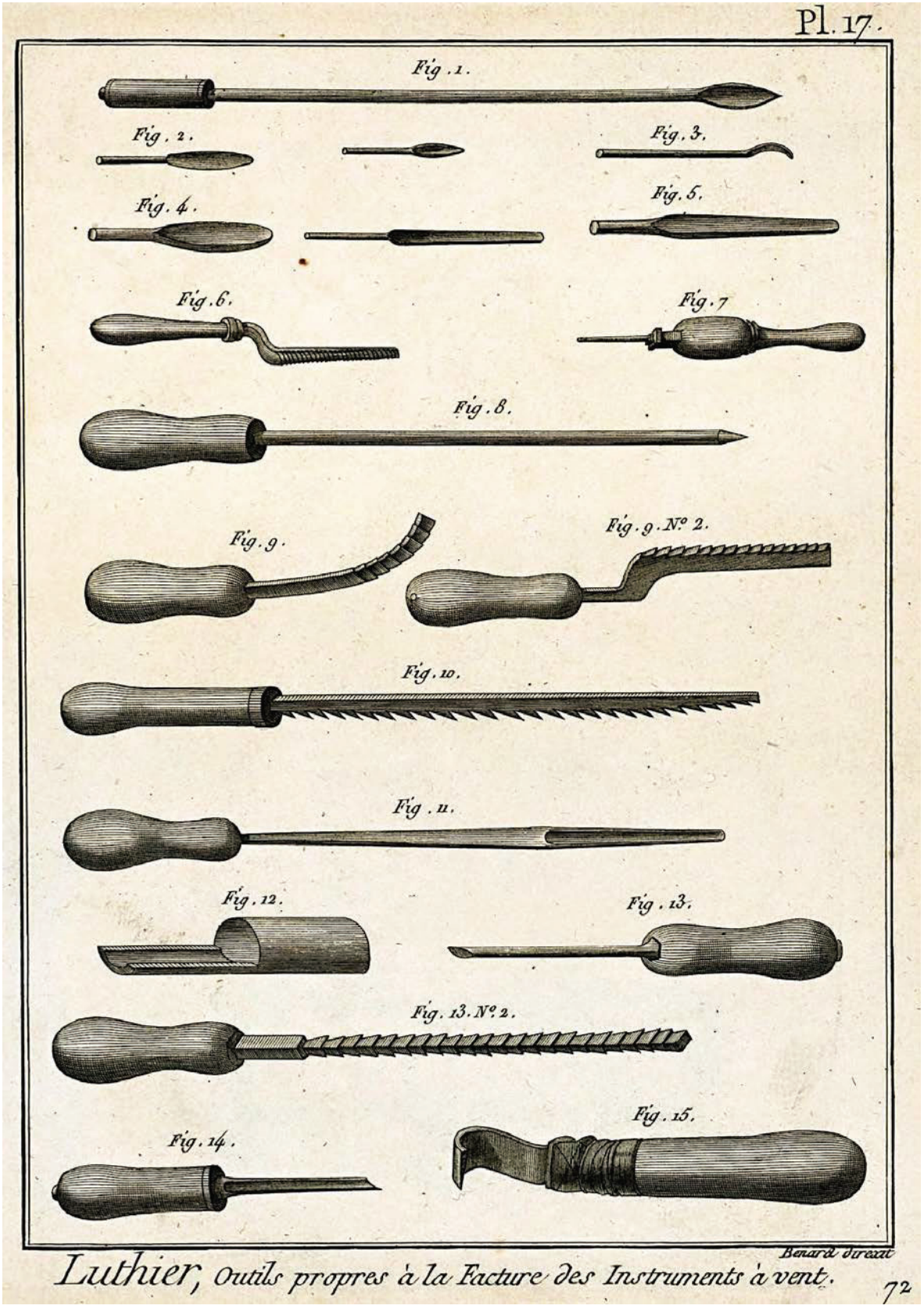
Engravings by Robert Bénard (1731-1794) of an Instrument-maker workshop (*Planche 1*), a Lathe (*Planche 16*), and Tools for making wood-wind instruments (*Planche 17*) from *L'Encyclopédie Méthodique: Art du faiseur d'instruments de Musique et Lutherie.* (1785) by Diderot et d'Alembert. (Private collection)





Benard direxit

Luthier, Tour en l'air et à pointes à l'usage des faiseurs d'Instrumens à vent, Flutes, Haut bois, Musettes &c.

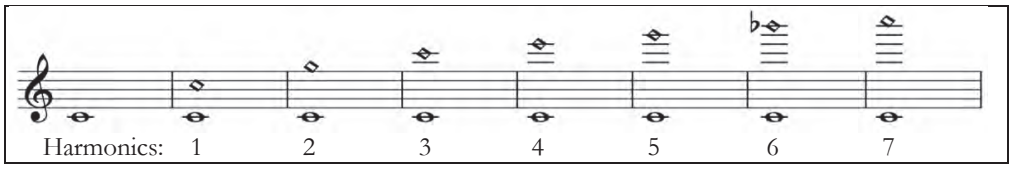

Pl. 17.
Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7
Fig. 8.
Fig. 9.
Fig. 9. N° 2.
Fig. 10.
Fig. 11.
Fig. 12.
Fig. 13.
Fig. 13. N° 2.
Fig. 14.
Fig. 15.
Benard direxit
Luthier, Outils propres à la Facture des Instruments à vent.
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Appendix XXXII

On harmonics for the Traverso (De Lusse (1751, *c.*1761, 1769, Bordet 1755), and the Boehm-flute (Mahillon (1882).

On *Harmoniques*: Traverso and Boehm-flute

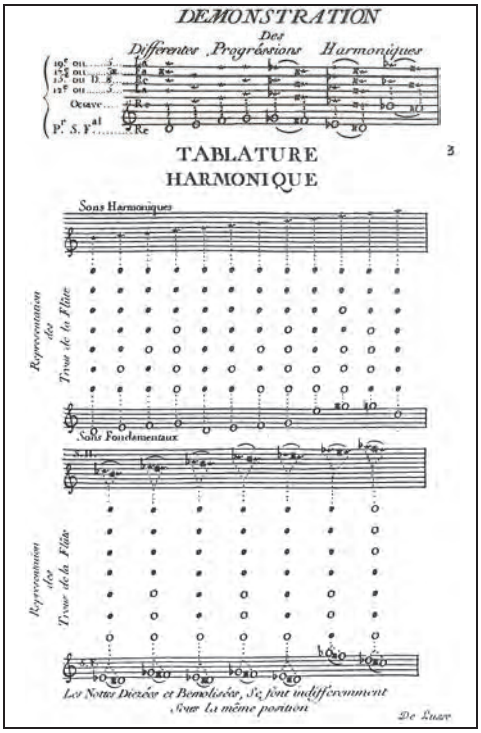
The practice of harmonics on the Traverso and the Boehm-flute are realized by gradually modifying the airstream regarding its speed and direction which develops and strengthens the embouchure, its *Tonus*, control of the airstream, resonance, and support in a favourable way. When playing harmonics on the Boehm-flute are standard fingerings suggested. When practicing harmonics are the first seven harmonics practically used although the sequence of harmonics continues several octaves. A figure of the sequence of harmonics is showed below having C1 as its point of departure. The first seven harmonic are 1: *1 Octave* (8), 2: *1 Octave plus a Fifth* (8+5), 3: *2 Octaves* (8+8), 4: *2 Octaves plus a Major third* (8+8+3), 5: *2 Octaves plus a Fifth* (8+8+5), 6: *2 Octaves plus a Minor seventh* (8+8+7), and finally 7: *3 Octave*s (8+8+8):



Charles De Lusse (1751, *c.*1761, 1769)

In the introduction to the *Six Sonates pour la Flûte Traversiere Œuvre I* (1751) show a *Demonstration* of possible harmonics together with a fingering-chart for each harmonic in question for the Traverso (Ex. 1a, 1b, and 1c). The final *Sonata Armonico* of De Lusse's *Œuvre I* (1751) which is based on harmonics as a basis throughout all its movements whereby shown fingering-charts explains the fingerings for each harmonic. De Lusse explained that the technique to find each harmonic is realised with help of the airstream, which in practice includes the modification of speed and direction of the airstream:

> Les Sons Harmoniques se produisent successivement par le Dégré de vent que l'on fournit dans L'Embouchure de la Flûte (De Lusse, 1751, 2)[1]



Example 1a Fingering-charts for harmonics as shown in *Six Sonates pour la Flûte traversière avec une Tablature des Sons Harmoniques Œuvre I* (1751) by De Lusse.

1. Harmonics are produced successively by the degree [speed and direction] of the airstream blown against the blowing-hole in the head-joint of the Flute. (De Lusse, 1751, 2)

Harmonics	D2	E♭2 D#2	E2	F2	G♭2 F#2	G2	A2	B♭2 A#2	B2	C3	D♭3 C#3
2 Octaves + Sixth	–	–	–	–	–	–	–	–	–	–	–
2 Octaves + Fifth	–	–	–	–	–	–	–	–	–	–	–
2 Octaves	–	–	–	–	–	–	–	–	–	–	–
1 Octave + Fifth	–	–	–	–	–	–	A2	B♭2 A#2	B2	C3	D♭3 C#3
1 Octave	D2	E♭2 D#2	E2	F2	G♭2 F#2	G2	–	–	–	–	–
Minor seventh	–	–	–	–	–	–	–	–	–	–	–
Fundament notes with indicated fingerings	D1 123/456	E♭1 D#1 123/4567	E1 123/45	F1 123/46	G♭1 F#1 123/47	G1 123/7	D1 123/456	E♭1 D#1 123/4567	E1 123/45	F1 123/467	G♭1 F#1 123/47

Harmonics	D3	E♭3 D#3	E3	F3	G♭3 F#3	G3	A3	B♭3 A#3
2 Octaves + Sixth	–	–	–	–	–	–	–	B♭3 A#3
2 Octaves + Fifth	D3	–	–	–	–	–	–	–
2 Octaves	–	E♭3 D#3	–	–	G♭3 F#3	–	–	–
1 Octave + Fifth	–	–	–	–	–	–	A3	–
1 Octave	–	–	E3	–	–	G3	–	–
Minor seventh	–	–	–	F3	–	–	–	–
Fundament notes with indicated fingerings	G1 123/7	E♭1 D#1 123/4567	E2 123/457	G#2 12/47	G♭2 F#2 123/4	G2 123/0	D2 123/456	D♭2 C#2 0/4567

Example 1b Fingerings for harmonics *Six Sonates pour la Flûte Traversiere Œuvre I* (1751) ordered like a scale from D2 up to B♭3/A#3 as shown on the *Tablature Harmonique*.

L'Art de la Flûte Traversiere (*c.*1761)

About ten years after *Six Sonates pour la Flûte Traversiere Œuvre I* (1751) did De Lusse publish *L'Art de la Flûte Traversiere* (*c.*1761) a Traverso method that included a fingering-chart for harmonics (Ex. 2). The explanation given regarding how to play harmonics is to follow indicated fingerings and modify the airstream as already explained in De Lusse's *Six Sonates pour la Flûte Traversiere Œuvre I* (1751) and now quoted literally:

> Les Sons Harmoniques se produisent successivement par le Dégré de vent que l'on fournit dans L'Embouchure de la Flûte (De Lusse, *c.*1761, 10)



Example 2a *Tablature des sons Harmoniques*, in *L'Art de la Flûte Traversiere* (*c.*1761, Chart Z), by De Lusse.

Sounding harmonics and its interval in relation to the generating fundamental notes	**D2** 1 Octave	**E2** 1 Octave	**F2** 1 Octave	**G2** 1 Octave	**A2** 1 Octave + Fifth	**B2** 1 Octave + Fifth	**C3** 1 Octave + Fifth	**D3** 2 Octaves + Fifth	**F#3** 2 Octaves + Major third	**E3** 2 Octaves	**G3** 1 Octave	**A3** 2 Octaves + Fifth
Fundament notes with indicated fingerings	**D1** 123/456	**E1** 123/45	**F1** 123/46	**G1** 123/7	**D1** 123/456	**E1** 123/45	**F1** 123/467	**G1** 123/7	**D1** 123/456	**E1** 123/457	**G1** 123/0	**D1** 123/456

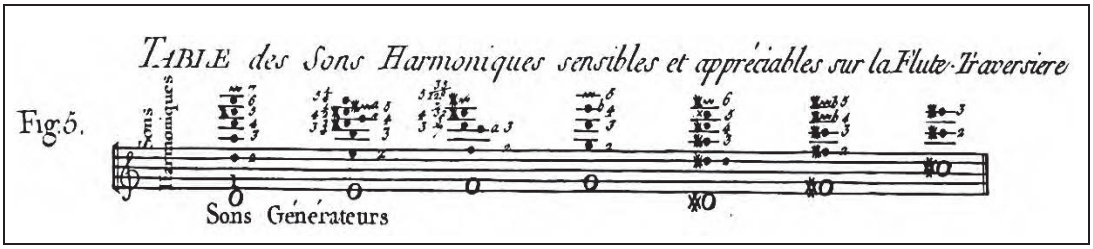
Sounding harmonicn and its interval in relation to the generating fundamental notes	**Eb2 D#2** 1 Octave	**Gb2 F#2** 1 Octave	**Bb2 A#2** 1 Octave + Fifth	**Db3 C#3** 1 Octave + Fifth	**Db3 C#3** 1 Octave	**Eb3 D#3** 2 Octaves	**Ab3 G3** 2 Octaves
Fundament notes with indicated fingerings	**D#1** 123/4567	**F#1** 123/47	**D#1** 123/4567	**F#1** 123/47	**C#2** 0/0	**D#1** 123/4567	**C#2** 0/0

Example 2b Fingerings for harmonics *Tablature des sons Harmoniques*, in *L'Art de la Flûte Traversiere* (*c.*1761, Chart Z) ordered like a scale from D2 up to A3.

Des Sons Harmoniques in *L'Encyclopédie* (Diderot et d'Alembert, 1769)

In another text found in *L'Encyclopédie* by Diderot et d'Alembert (1769/1994, 11-12) De Lusse presents a developed fingering chart for harmonics (*Planche XVI bis,* Ex. 3). He includes details about how an extra tone hole on the foot-joint or playing without the foot-joint can facilitate harmonics and how it is easier to play higher harmonics on a *Basse de flûte*. The latter was confirmed by Ljungar-Chapelon (1995; 2002), who initiated a reconstruction, realised by the master Traverso-maker Alain Weemaels in Brussels, of a *Basse de Traversière* as shown in Diderot's *Encyclopédie Méthodique. Art du Faiseur d'Instrument de Musique et Lutherie* (1775/1972):

> Nous ferons remarquer ici, que tous les sons harmoniques désignés par un guidon, ne peuvent être exprimés bien sensiblement que sur une *basse de flûte*; sur une *flûte traversiere* ordinaire, ils sont pour la plupart inappréciables […] il faudroit supprimer la patte de la flûte ou faire percer un trou sur la noix, vis-à-vis la goupille, qui se boucherait au moyen d'une clé, & le déboucher quand ces succesions auroient lieu […] (De Lusse, 1769/1994, 11)[1]



Example 3 *Planche XVI bis Fig. 5* showing harmonics in the article on the Traverso by De Lusse, in *L'Encyclopédie Méthodique: Recueil de Planches* by Diderot et d'Alembert (1769/1994, 11-12).

Toussaint Bordet

Méthode raisonnée suivi d'un recueil d'airs (1755/1993, 17, *Appendix*, 31) includes a short the Traverso method by Toussaint Bordet includes a fingering-chart for harmonics and a short duet for two Traversi together with explanations about how the highest harmonics on a Traverso (B3-D4) are easier to play on a *Flûte d'Amour*, and even easier on a *Basse de Flûte Traversière*:

> Les tons si, ut, re de la 3e 8ve ne se font pas également sur toutes les Flutes, plus elles sont bassses plus il est facile de les y faire, on les tirera aisement avec un corps d'Amour et encore plus aisement avec une Basse de Flute traversière. (1755, 17)[2]

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1. It should be noted that all notes marked with a guidon [indication of the sounding note] is easier to play on a Bass Traverso than on the ordinary Traverso on which many of the harmonies can't be played […] one could take away the foot-joint or make an extra tone-hole on the foot-joint and an extra key for the right little-finger […] (De Lusse in *L'Encyclopédie Méthodique: Recueil de Planches* by Diderot et d'Alembert, 1769/1994, 11)

2. The notes B, C, D of the highest register are not made equally on all the Flutes, the lower they are the easier it is to make them, they will be easily played with a *Corps de rechange* as for a *Flûte d'Amour* and even more easily with a *Bass de Traversière.* (Bordet, 1755, 17)

In the appendix to the method by Bordet is a short duet for two Traversi based on harmonics, which refers to the *Sonata Armonico* by De Lusse (1751). Bordet also presents a fingering chart (Ex. 4a and 4b), and short comments explaining how harmonics are played:

> Pour éxécuter cette pièce en sons harmoniques, il faut proportionner le degré du vent dans l'embouchure de la Flute, au degré des guidons, et n'avoir égard aux petites nottes d'en bas que pour la position des doigts. (Bordet, 1755, *Appendix* 31)[1]

Bordet further explains that notes marked with a line indicate that the D#-key on the foot-joint should be opened: "Il faut lever la clef pour les notes où cette petite barre (–) est posée.". In the fingering chart to *Six Sonates pour la Flûte traversière avec une Tablature des Sons Harmoniques Œuvre I* (1751) De Lusse had already mentioned that intonation and response on some harmonics improved when the D#-key was used.



Sounding harmonics and its intervals in relation to the generating fundamental notes	**D2** 1 Octave	**F#2** 1 Octave	**A2** 1 Octave + Fifth	**A#2 [B♭2]** 1 Octave + Fifth	**B2** 1 Octave + Fifth	**C3** 1 Octave + Fifth	**C#3** 1 Octave + Fifth	**D3** 2 Octaves	**D3** 1 Octave + Fifth	**E3** 2 Octaves	**F#3** 2 Octaves + Major third	**G3** 2 Octaves	**A3** 2 Octaves + Fifth
Fundament notes with indicated fingerings	**D1** 123/456	**G♭1** 123/567	**D1** 123/456	**E♭1 [D#1]** 123/4567	**E1** 123/457	**F1** 123/467	**F#1** 123/47	**D1** 123/456	**G1** 123/7	**E1** 123/457	**D1** 123/456	**G1** 123/0	**D1** 123/456

Example 4a Bordet's fingering chart for *Harmoniques*: *Il faut lever la clef pour les notes où cette petite barre* (–) *est posée.* (Bordet, 1755, *Appendix*, 31)

Harmonics	**D2**	**F#2**	**A2**	**[B♭2] A#2**	**B2**	**C3**	**C#3**
2 Octaves + Fifth	–	–	–	–	–	–	–
2 Octaves + Major third	–	–	–	–	–	–	–
2 Octaves	–	–	–	–	–	–	–
1 Octave + Fifth	–	–	**A2**	**[B♭2] A#2**	**B2**	**C3**	**C#3**
1 Octave	**D2**	**F#2**	–	–	–	–	–
Minor seventh	–	–	–	–	–	–	–
Fundament notes with indicated fingerings	**D1** 123/456	**G♭1** 123/567	**D1** 123/456	**E♭1 [D#1]** 123/4567	**E1** 123/457	**F1** 123/467	**F#1** 123/47

Harmonics	**D3**	**D3**	**E3**	**F#3**	**G3**	**A3**
2 Octaves + Fifth	–	–	–	–	–	**A3**
2 Octaves + Major third	–	–	–	**F#3**	–	–
2 Octaves	**D3**	–	**E3**	–	**G3**	–
1 Octave + Fifth	–	**D3**	–	–	–	–
1 Octave	–	–	–	–	–	–
Fundament notes with indicated fingerings	**D1** 123/456	**G1** 123/7	**E1** 123/457	**D1** 123/456	**G1** 123/0	**D1** 123/456

Example 4b Harmonics given by (Bordet, 1755, *Appendix*, 31) ordered like a scale from D2 up to A3.

1. To perform this piece with harmonics [the duet for two Traversi], it is necessary to modify the airstream [speed and direction] blown in the blowing-hole in the head-joint, to the degree of the guidons, and only consider the small notes below for the fingerings. (Bordet, 1755, *Appendix* 31)

A complete fingering-chart including all three fingering-charts by De Lusse (1751, *c.*1761, 1769), together with Bordet (1755) is shown in Example 5.

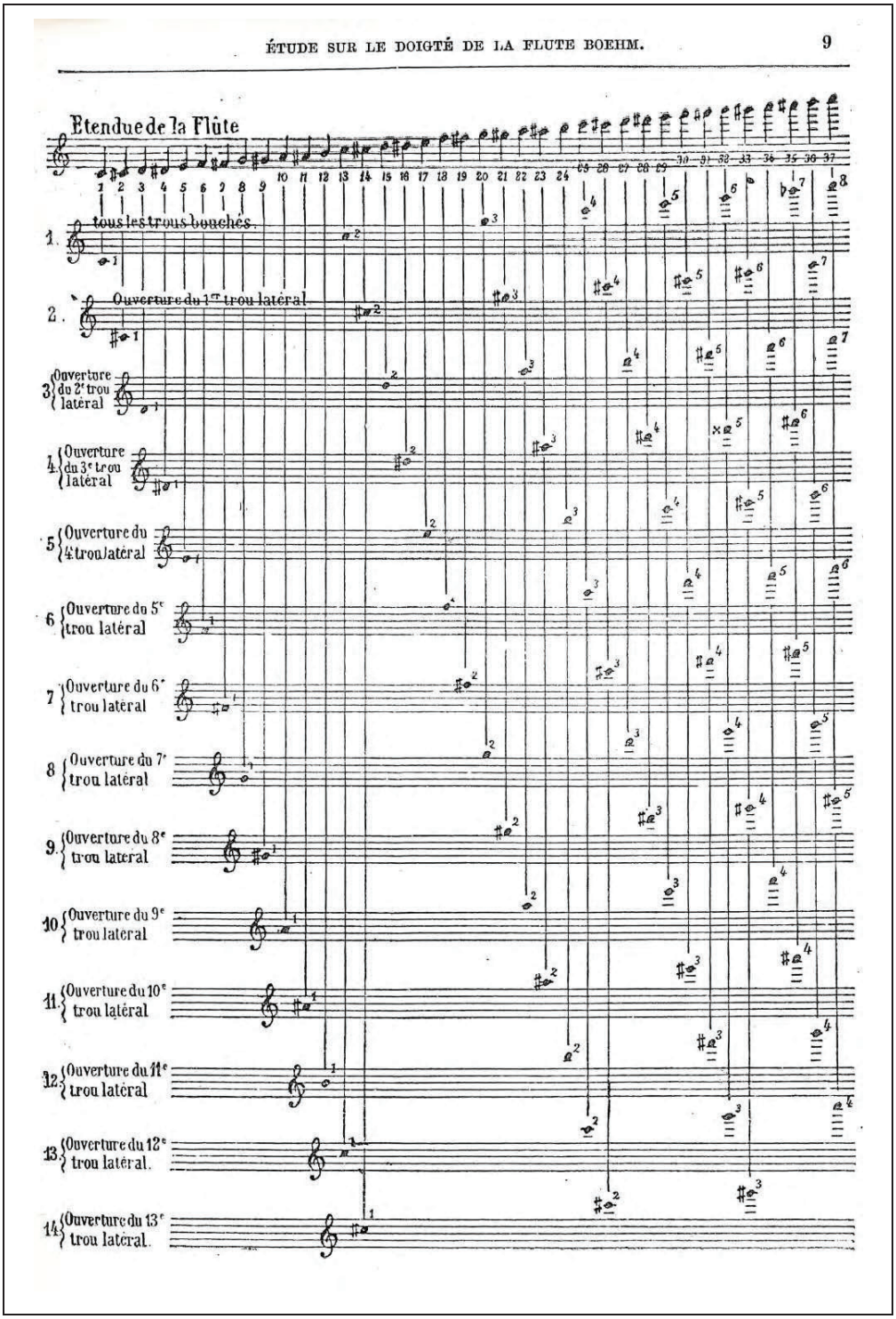
Harmonics	De Lusse 1751	Bordet 1755	De Lusse *c.*1761	De Lusse 1769
D2	123/456	123/456	123/456	123/456
D#2	123/4567	–	123/4567	123/4567
E♭2	123/4567	–	123/4567	–
E2	123/45	–	123/45	123/45
F2	123/46	–	123/46	123/46
F#2	123/47	123/567	123/47	123/47
G♭2	123/47	–	123/47	–
G2	123/7	–	123/7	123/7
A2	123/456	123/456	123/456	123/456
A#2	123/4567	123/4567	123/4567	123/4567
B♭2	123/4567	[123/4567]	123/4567	–
B2	123/45	123/457	123/45	123/45
C3	123/467	123/467	123/467	123/467
C#3	123/47	123/47	123/47	123/47
D♭3	123/47	–	123/47 0/0	–
D3	123/7	123/456 123/7	123/7	123/456 123/7
D#3	123/4567	–	123/4567	123/4567
E♭3	123/4567	–	123/4567	–
E3	123/457	123/457	123/457	123/457
F3	12/47	–	–	–
F#3	123/4	123/456	123/456	123/456
G♭3	123/4	–	123/456	–
G3	123/0	123/0	123/0	123/0
G#3	0/4567	–	0/0	0/0
A♭3	0/4567	–	0/0	–
A3	123/456	123/456	123/456	123/456
A#3	123/4567	–	123/4567	123/4567
B♭3	123/4567	–	123/4567	123/4567

Example 5 *Tablature des sons Harmoniques* from *Opus 1* (1751), *L'Art* (*c.*1761), and *L'Encyclopédie* (1769) by De Lusse, including Bordet (1755) transcribed to a numerical notation, including De Lusse's and Bordet's modified fingerings using the D#-key of the right hand (7) for B natural in the second octave, C and E in the third octave.

*

Victor Mahillon, harmonics and the Boehm-flute

As already mentioned is the practice of harmonics since long a well-established technique regarding the development of the embouchure, airstream, sound colours, nuances, and as well an efficient technique applied to facilitate difficult passages in the high register. An important source regarding the principles of harmonics of the Boehm-flute is *Étude sur le Doigté La Flûte Boehm* (1882) by the Belgian instrument maker and acoustician Victor Mahillon (1841-1924) of important interest. This text explains in detail how the bore of the Boehm-flute Model 1847—with its parabolic head-joint and cylindrical body—and the acoustically well-placed tone-holes than what is possible on a Traverso influences the complete chromatic fingering-chart of the Boehm-flute. The bore of a Traverso with a generally quasi-cylindrical head-joint, a conical middle-body or bodies (*Corps de rechanges*), and a cylindrical, conical or diabolo bore for the foot-joint does not enable the same symmetrical sequences of harmonics as the Boehm-flute. In the present context is Mahillon's chart (1882) with harmonics of interest, whereby all harmonics are played with standard Boehm-flute fingerings. It should be noted that Mahillon's chart is based on a Boehm-flute having a C-foot-joint (Ex. 6):



Example 6 Chart of harmonics on a Boehm-flute having a C-foot by Victor Mahillon (1882, 9)

As can be seen in Mahillon's chart of harmonics is the bore of the Boehm-flute and the placements of its tone-holes resulting in a symmetrical sequence of harmonics being the same for all notes in the chromatic scale as: *1 Octave—1 Octave + Fifth—2 Octaves—2 Octaves + Major third—2 Octaves + Fifth—2 Octaves + Minor seventh—3 Octaves*. Although only the lower notes like b to D1 with some practice makes it possible to reach five harmonics (*2 Octaves + Fifth*) or more. As the fundamental notes ascend gradually the number of playable harmonics decrease as can be seen below is Mahillon's chart of harmonics, here shown with the addition of the low b as on a Boehm-flute having a B-foot joint (Ex. 7):

3 Octaves	**B3**	**C4**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
2 Octaves + Minor seventh	**A3**	**B♭3 A#3**	**B3**	**C4**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
2 Octaves + Fifth	**F#3 G♭3**	**G3**	**G#3 A♭3**	**A3**	**A#3 B♭3**	**B3**	**C4**	**–**	**–**	**–**	**–**	**–**	**–**	**–**	**–**
2 Octaves + Major third	**D#3 E♭3**	**E3**	**F3 E#3**	**F#3 G♭3**	**G3**	**A♭3 G#3**	**A3**	**A#3 B♭3**	**B3**	**C4 B#3**	**–**	**–**	**–**	**–**	**–**
2 Octaves	**B3**	**C3**	**C#3 D♭3**	**D3**	**D#3 E♭3**	**E3**	**F3**	**F#3 G♭3**	**G3**	**G#3 A♭3**	**A3**	**A#3 B♭3**	**B3**	**C4**	**–**
1 Octave + Fifth	**F#2 G♭2**	**G2**	**G#2 A♭2**	**A2**	**A#2 B♭2**	**B2**	**C3**	**C#3 D♭3**	**D3**	**D#3 E♭3**	**E3**	**F3 E#3**	**G♭3 F#3**	**G3**	**G#3 A♭3**
1 Octave	**B2**	**C2**	**C#2 D♭2**	**D2**	**D#2 E♭2**	**E2**	**F2**	**F#2 G♭2**	**G2**	**G#2 A♭2**	**A2**	**A#2 B♭2**	**B2**	**C3**	**C#3 D♭3**
Fundamental notes played with standard fingerings	**b**	**C1**	**C#1 D♭1**	**D1**	**D#1 E♭1**	**E1**	**F1**	**F#1 G♭1**	**G1**	**G#1 A♭1**	**A1**	**A#1 B♭1**	**B1**	**C2**	**C#2 D♭2**

Example 7 Chart based on Mahillon (1882) with the addition of the low b as on a Boehm-flute having a B-foot joint. It should be noted that Mahillon only gives the harmonics for the chromatic scale this is throughout notated with sharps, and that the example above includes enharmonic notes like F#/G♭.

*

The symmetrical natural sequence of harmonics on all fingerings on the Boehm-flute is possible due to its bore and placement of its tone-holes as mentioned above, and sheds light on the essential effect of the D#-key of the Traverso regarding intonation, and the possibility to at all play as many harmonics as shown in the fingering-charts given by De Lusse (1751, 1761, 1769) and Bordet (1755). Several harmonics are not playable without using the D#-key, an example is the harmonic for C3—*1 Octave + Fifth*—based on F1 played with the fingering 123/46 adding the D#-key 7, but when using the original fingering for F1 123/46 without the D#-key then is a somewhat flat D3 generated instead of C3.

A further parameter of importance is the proportional relation between the length of the air-column enclosed by the tube of the instrument and its diameter. This relation was described in indirect terms by 18th Century authors of methods and texts regarding the Traverso like De Lusse (1751, 1769), Bordet (1755), Mahaut (1759), and Bailleux-Hotteterre (1765) when explaining that the very highest notes above A3 generally are difficult to reach when at all playable on a normal Traverso. Mentioned authors pointed on that these notes in the highest register are considerable easier to play on a *Flûte d'Amour* generally transposing a third down compared with a Traverso, and a *Basse de Traversière* transposing a fifth down compared with the Traverso, because a *Flûte d'Amour* and a *Basse de Traversière* has a narrower bore in relation the lengths of their air-columns enclosed by the tube when compared with a Traverso (Ljungar-Chapelon, 1995, 2002). The conclusion is that a narrower bore tends to facilitate the highest register and *vice versa* (Cooper, 1984). This phenomenon does as well shed light on why a lower note on the Boehm-flute as for example C1 generates the six harmonics C2, G2, C3, E3, G3, and B♭3 with ease, whereby the air-column is proportionally narrow when compared with its lengths and thus easily makes it possible to play five or six harmonics (Ex. 7). But when having C#2 as the point of departure the air-column is much shorter and the bore becomes proportionally far larger when compared with C1, and generally only generates two harmonics like C#3/D♭3 and G#3/A♭3 (Ex. 7). In addition, the much larger diameter of the tone-holes on the Boehm-flute having acoustically favourable positions, compared with the relatively narrow diameter of the tone-holes not all having optimal placements on the Traverso play an important role, in so far does mentioned parameters regarding the Boehm-flute facilitate a symmetrical sequence of harmonics on generally all standard fingerings of the Boehm-flute having the notes from low b up to C#2 as their fundamental notes.

*

Regarding *how* to play harmonics as explained by De Lusse (1751, *c.*1761, 1769), Bordet (1755), and Mahillon (1882) it is clear that the techniques when comparing the Traverso and the Boehm-flute are similar in so far that the generation of harmonics is based on the speed of the airstream: higher harmonics needs a faster airstream and *vice-verse*. In addition, the Traverso needs slight modifications of several fingerings, whereby all harmonics for each note can be played with standard fingerings on the Boehm-flute. There are thus two fundamental techniques available when modifying the speed of the airstream: a) with *Tonus* of the embouchure and lips, b) with the breathing muscles (Support). Modifying the speed of the airstream with help of the lips and the embouchure is described in depth by Hotteterre in *Principes* (1707) and *Rudiments* (1729) and is based on that more *Tonus* in the lips—muscular activity—is activated when moving towards the middle and high register compared with when playing in the lowest register. In practical terms is this a technique to regulate the size of the opening between the lips: lower notes a larger opening between the lips, and gradually a smaller opening between the lips when ascending to the highest register. A further technique not mentioned in explicit terms by neither De Lusse, Bordet or Mahillon is the modification of the direction of the airstream with help of the lips and the lower jaw, which is a well-known and often used technique on the Traverso as on the Boehm-flute. An 18th Century example of suggestions including a diagram of the coverage of the blowing-hole regarding the direction of the airstream was made by Quantz (1752) as discussed in *Section 7.3.2 Covering of the blowing-hole with the lower lip*.

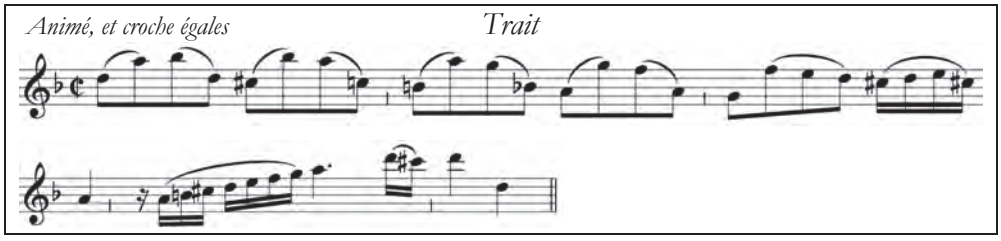
The modifications of the airstream with help of *Tonus* of the embouchure and direction of the airstream stands in a proportional relation to the speed of the airstream being regulated by the size of the opening between the lips. When keeping the same speed of the airstream with help of the breathing muscles (Support) and gradually making the opening between the lips smaller and smaller with help of more *Tonus* in the lips and the embouchure has the effect of speeding up the airstream: the smaller the opening the faster the airstream gets. This phenomenon stands in relation to the activity of the breathing muscles (Support), and is a foundation for playing in different nuances including *Sons filés* with kept intonation. When playing a note—let say A2—in *Mezzo forte* having an appropriate speed of the airstream and *Tonus* of the lips and the embouchure throughout keeping the same speed and direction of the airstream and gradually start to diminish the opening between the lips activating somewhat more *Tonus* in the lips and embouchure the intonation will raise and sharpen and *vice-verse*. So, it could be said that when practicing harmonics which needs a refined skill of balancing the *Tonus* of the lips and the embouchure in combination with the airstream this will develop skilfulness regarding nuances and *Sons filés*.

Two examples from *L'Art de Preluder* (1719) by Hotteterre and suggestions using harmonics and modifications of the airstream for practicing intervals on the Traverso

Firstly, a short *Trait* in d-minor which is modelled around a chromatic descending scale from D2 to A1, whereby D2 could be understood as a reference regarding embouchure—*Tonus* of the lips, opening between the lips, direction of the air—and speed of the airstream. From each note in the chromatic scale is a fifth or seventh played upwards, followed by descending sixths downwards which simultaneously stepwise approaches lower notes being facilitated by gradually make the opening between the lips slightly bigger (see *Section 6.2 The lips, embouchure, and airstream*).

- Start playing **D1** (123/456) in *Mezzo Forte* with a natural sound colour like *Le Son Naturel*.
- Play **D1** again as described above, then within a *Legato* play **D2** as an *Octave harmonic* (8) with the fingering for **D1** (123/456) just slightly changing the direction or increase the speed of the airstream.
- Repeat **D2** with its standard fingering (23/456) keeping the same direction or increased speed of the airstream as above.
- Play **D2** again with its standard fingering (23/456) keeping the same direction or increased speed of the airstream as above. Within a *Legato* change to the standard fingering for **A2** (12/0 or 12/7), keeping exactly the same direction and speed of the airstream as for **D2**. The result should normally be that the note **A1** will sound, because the speed of the airstream would most likely be a little bit too slow for generating **A2**.
- Repeat playing **D2** and **A1** as described above. When **A1** sounds, find **A2** with help of slightly changing the direction and increasing the airstream.
- Play **D2** again as above (23/456), continue playing D2 but change within a *Legato* to the harmonic fingering for **D2** (123/456), then within *Legato* search for **A2** on this fingering *Octave + Fifth harmonic* (8+5), slightly increasing the speed of the airstream and **A2** would be easily found.

- Play **A2** again as described above, then play **B♭2** with the standard fingering (13/7) within a *Legato* keeping the direction and the speed of the airstream as for **A2**. The result should be that **B♭2** will sound.
- Play **B♭2** again as above, change within a *Legato* to the fingering for **D2** (23/456), keeping the direction and speed of the airstream as for **B♭2**. The result should normally be that **D3** will sound because the airstream is somewhat too fast for generating **D2** and instead generates **D3.**
- Play **B♭2** again as above, change to the fingering for **D2** within a *Legato*, and make necessary modifications of the direction or the speed of the airstream, and find **D2**. Then use this method as shown for the notes **D1**, **D2**, **A1**, **A2**, and **B♭2** on the whole *Trait* in d-minor.



Example 20 *Trait* to be played lively with even quavers, from *L'Art de Préluder* (1719, 24) by Hotteterre. On some Traversi—as for example *Hotteterre Model II*—it's possible to play the high B♭3 with fingerings like **12/47** (Mahaut, 1759) or **2/4** (Tromlitz, 1791), and study this *Trait* in the very highest register. Also transpose to f-minor (four flats) and f#-minor (three sharps) as if notated with French Violin-clef, play everything one octave up and F3 and F#3 will be the highest notes. The above-described method can easily be adopted to the Boehm-flute with good results.

The following example is a short *Etude* in g-minor (1719, 20) which is highly interesting, because the impression is that Hotteterre systematically focuses on intonation and the intervals major and minor thirds and sixths, seventh, octaves and tenth (*Decima*), all in combinations with the embouchure—*Tonus* of the lips, adjustments regarding the direction of the airstream, modifications of the opening between the lips—in symbiosis with adjustments regarding the speed of the airstream as described in *Principes* (1707, 1713, 1720, 1722, 1741) by Hotteterre.

The framework for this *Etude* are four "variations" based on descending scales in g-minor, followed by a short coda-like figure. The first three "variations" are based on the g-minor scale played—G2 down to G1—the fourth "variation" starts on D2 and moves in thirds to G1. Considered that G2 is a central note could point in the direction that this note for Hotteterre possibly represents a point of calibration regarding embouchure and airstream when practicing mentioned big intervals (when comparing the Boehm-flute and Traverso the similarities are significant on this point). As a matter of fact, Jean-Pierre Rampal (1989) and Henri Altès (1880) had G2 as a point of reference regarding the embouchure:

> […] the first lessons starts with G above the staff [G2; Altès, *Méthode pour Flûte Systeme Boehm*, 1880], a note that is impossible to play unless the lips are in the correct position. Once you get that right you are on your way. […] It is the G above the staff [G2] that helps the beginner master the correct position of the mouth, the embouchure. (Rampal, 1989, 13-14)

*

The overall structure of the following *Etude* in g-minor could be described as follows:

1) The *Etude* begins with triads—main note–third–perfect fourth, apart from the last triad ending with a *Tritone*—played upwards and based on the g-minor scale—G2-F2-E♭2-D2-C2-B♭1-A1-G1—the last note of each triad is followed by a seventh downwards to the next note in the descending g-minor scale.
2) The second variation is based on the same g-minor scale as above, now is a sixth played upwards from each note and back to the same note in the descending scale.
3) The third variation is based on the same g-minor scale as above, now is from each note in the scale a sixth played upwards and an octave downwards from each sixth.
4) The fourth variation starts with having the notes—D2-C2-B♭1-A1-G1—as starting points and playing an octave upwards and a tenth (*Decima*) downwards from each note in the scale.
5) Finally, is a short coda making a harmonic cadenza to g-minor in the low register.

- Play all notes from A2 up to E♭3 with harmonics, compare notes played with standard fingerings with different harmonics when possible, aim for a maximum of suppleness in combination with a minimum of changes regarding the airstream and embouchure.
- Adopt the method as shown in Example 20 for the notes D1, D2, A1, A2, and B♭2 on all possible notes and intervals.
- Transpose to b-minor through playing as if notated with French Violin-clef, replacing the two flats with two sharps and play everything one octave up and G3 will be the highest note.

Regarding intonation it is beneficial to practice with *Just intonation* and especially on thirds and sixths. In the following are deviations from the *Equal 12-division* (12-ET: 1 semi-tone = 100 Cent) of the scale given: *Minor third* +16 Cent, *Major third* –14 Cent, *Minor Sixth* +14 Cent, *Major sixth* –16 Cent (see *Section 6.6 On Intonation and Temperaments*).



Example 21 *Etude* in g-minor from *L'Art de Préluder* (1719, 20) by Hotteterre. The above-described method of practicing can easily be adopted to the Boehm-flute with good results.



Lorsque le passé n'éclaire plus l'avenir,
l'esprit marche dans les ténèbres.

THE FLAUTISTS VADEMECUM

Vade mecum – *go with me* – has been used as a title for handbooks of different crafts since at least the beginning of the 17th Century

(2023) Anders Ljungar-Chapelon. *Les Traditions en Mouvement. Principes de la Flute Traversiere ou Flute d'Allemagne* (1707) *by Jacques Hotteterre Le Romain and The Rudiments or Principles of the German flute* (1729) *the first English translation of Hotteterre's Principes* . A comparative study of French flute traditions over 300 years: Transitions and changes of aesthetics, musical expressions, playing techniques and flautistic learning regarding the Traverso, Multi-keyed conical flutes, *Ringklappenflöte* and the Boehm-flute (Facsimile)

(2023). Raul Costa d'Avila. *Seresta Barocca Prelúdio para Traverso* (2022). With an introduction by Anders Ljungar-Chapelon.

(2022). Raul Costa d'Avila. *Sound Poems for Solo Flute* (…2020, 2021 and 2022) and the essay *Narration by a flautist-composer* (2022).
With an introduction by Anders Ljungar-Chapelon.

(2021). Rudolf Sulzenbacher. *Soliloque pour Basse de Traversière peut être joué sur le Traverso* (2020). With an introduction by Anders Ljungar-Chapelon.

(2020). Anders Ljungar-Chapelon. *Ah! vous dirai-je, Maman Variations III: On Timbre, Expression, Resonance and Projection.*

(2019). Hina Sakamoto. *Kuhon Raigo–Zu III* for Flauto Traverso or Flute. *Morceau de Concours* for the flute class at Malmö Academy of Music 2018.
With an introduction by Anders Ljungar-Chapelon.

(2019). Anders Ljungar-Chapelon. *Ah! vous dirai-je, Maman Variations II: On Practice, Intervals and Sons filés.*

(2019). Anders Ljungar-Chapelon. *Ah! vous dirai-je, Maman Variations I: On Tone and Articulation.*

(2018). Anders Ljungar-Chapelon. [Charles] De Lusse. *On Harmoniques, Quart-de-Tons et Tremblement flexible, c.1760.* Including works for Traverso by Staffan Björklund, Kent Olofsson, Rudolf Sulzenbacher, and *Suggestions and exercises for harmonics, quartertones, and micro intervals for the Traverso and Boehm-flute.*

(2018). Rudolf Sulzenbacher. *La Mort de Pan pour flûte et acteur* (2016). *Bis de Concert pour flûte en sol ou en ut et clavecin ou harpe, cette pièce peut également être jouée solo* (2016). With an introduction by Anders Ljungar-Chapelon.

(2018). Ida Wennström. *Lekfull svit/Playful suit for flute and piano* (2015-2017), *Morceau de Concours* for the flute class at Malmö Academy of Music 2018.
With an introduction by Anders Ljungar-Chapelon.

(2017). Maurício Dottori. *Para passar esta madrugada de lua cheia* for flute and piano (1995), *For the portraiture of clouds and sky* for amplified alto flute and piano (2004-2007). With an introduction by Anders Ljungar-Chapelon.

(2017). Arnannguaq Gerström. *Sassuma Arnaa – Sanna* for flute and prepared piano, *Morceau de Concours* for the flute class at Malmö Academy of Music 2017. With an introduction by Anders Ljungar-Chapelon.

(2016). Johann Sebastian Bach *Fantasia Chromatica BWV 903 für Flöte eingerichtet von Christian Gottlieb Belcke* (*c.*1830).
With an essay by Anders Ljungar-Chapelon. (Facsimile)

(2016). Simon Söfelde. *GYCKLARMUSIK 11-14 Joker Music for solo flute* (2015), *Morceau de Concours* for the flute class at Malmö Academy of Music 2015. With an introduction by Anders Ljungar-Chapelon.

(2015). Rudolf Sulzenbacher. *Opus-French Suite pour flute basse* (ou normale) et clavecin ou guitarre. With an introduction by Anders Ljungar-Chapelon.

(2015). Jonatan Sersam. *Fluttuante* for flute and piano (2015) *Morceau de Concours* for the flute class at Malmö Academy of Music 2015.
With an introduction by Anders Ljungar-Chapelon.

(2015). Anders Ljungar-Chapelon. *Atys. Six Sonates en Duo, Travaillés pour Six Instruments differens, Flûte, Haut-Bois, Pardessus de Viole à cinq Cordes sans aucun démanchement, Violon, Basson, et Violoncelle; en observant la Clef de Fa, qui est posée sur la 4e ligne Avec des Signes pour diminuer et augmenter les sons par degrees, dans les endroits neccessaires. Œuvre IV.* (1760) (Facsimile)

(2015). Anders Ljungar-Chapelon. *Atys. Clef facile et methodique, pour apprendre en peu de tems à battre la lesure, a distinguer les modulations, à préluder, et à phraser la musique par le moyen de la ponctuation grammaticale et typhographique. Œuvre V* (1763). With an essay by Dr. Stephen Preston: *The Alliance of Music, Poetry and Oratory.* (Facsimile)

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With an essay by Anders Ljungar-Chapelon.

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(2014). Anders Ljungar-Chapelon. *Gustaf Widegren. Texter, Grepptabeller och Övningar* (1873-1885). Vol. II.
With an essay by Dr Stephen Preston: *Culminations, transitions, and continuities: Key virtuoso flutists in the early 19th Century.* (Facsimile)

(2014). Christos Ntovas. *Morfes* for flute and piano, *Morceau de Concours* for the flute class at Malmö Academy of Music 2014.
With an introduction by Anders Ljungar-Chapelon.

(2013) Alessandro Perini. *Assembling Machines* for flute and prepared piano, *Morceau de Concours* for the flute class at Malmö Academy of Music 2013.
With an introduction by Anders Ljungar-Chapelon.

(2013). Anders Ljungar-Chapelon. *Flöjtövningar och texter av Gustaf Widegren. Några notiser, beträffande Nya eller den s.k. Böhm-flöjten* (1866), *Om Staccato på Flöjt* (1868), *Moll-scalor, figurerade för Flöjt* (1873), *Omvänd Dubbel-tunga* (1888), *Dubbeltunga i Trioler, med s.k. vexel-språk* (1888). Vol. I. (Facsimile)

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