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The Flutes of Quantz: Their Construction and Performing Practice¹

Johann Joachim Quantz's monumental treatise, the *Versuch einer Anweisung die Flöte traversiere zu spielen* (1752), has earned its author a universally recognized position today as one of the most important musical theorists of the 18th century. But despite a recent spate of publications in honour of the composer's tercentenary (1997), scholars have provided us with little context for its proper valuation. The vast majority of Quantz's musical compositions are still unpublished; we know few details of his early musical education and performing repertory, and his important contributions as a flute maker have been even less understood.² Like most of Quantz's surviving compositions, his extant flutes formed part of the estate of King Frederick II of Prussia 'the Great' (1712–86), who was Quantz's employer from 1741 to 1773; what is not generally known is that the defining features of these instruments are products of a much earlier period, that is, the time Quantz spent as a young musician at the Dresden court under Friedrich August I (Augustus II) and Friedrich August II (Augustus III). This fact not only explains many misconceptions about Quantz as flute maker; it has important implications for how we should read the *Versuch* and understand its application to 18th-century performance practice.

By the end of the century, Quantz's ideals were being misunderstood and had to be defended. Already in 1792 (nineteen years after Quantz's death), Christoph Friedrich Nicolai summarized Quantz's contributions

¹A shorter version of this paper was presented as a lecture–demonstration at the meeting of the Galpin Society in Edinburgh, 11 July 1999. The paper summarizes a number of conclusions from the second chapter of the author's Ph.D. dissertation: 'Quantz and the Flute at Dresden: His Instruments, His Repertory, and Their Significance for the *Versuch* and the Bach Circle', Duke University, 1998.

²Studies about Quantz as flute builder have primarily relied on secondary and anecdotal literature—not fieldwork on the extant instruments; cf. Edward R. Reilly, 'Quantz and the Transverse Flute: Some Aspects of his Practice and Thought Regarding the Instrument', *Early Music* 25 (1997): pp.429–38. The most comprehensive survey of extant instruments, including several newly identified instruments, is Mary Oleskiewicz, 'A Museum, a World War, and a Rediscovery: Flutes by Quantz and Others in the Hohenzollern Museum', *Journal of the American Musical Instrument Society* 24 (1998): pp.107–45. See also the author's dissertation, 'Quantz and the Flute at Dresden'.

with great admiration but was compelled to conclude: 'The low tuning of Quantz is no longer used; departed with it are Quantz's flutes, Quantz's concertos, and the true art of playing them, without which they suffer indescribably. Now there are perhaps no more than three people in Berlin who still know the way to play them.'³ This observation may have been prompted by the flautist and maker Johann Georg Tromlitz's criticisms which had appeared just one year earlier, disparaging Quantz's flutes and especially their 'difficult' high register.⁴ Tromlitz's agenda no doubt had to do with establishing himself as an authority on flutes and flute playing; any flute treatise in this period would, on some level, have had to come to terms with Quantz's.⁵ But Tromlitz's up-to-date views failed, as Nicolai observed, to take into account the essential and delicate relationships between pitch, the specific qualities of an instrument, the repertory for which it was originally designed, and its performance technique. Players, curators, and makers of today also have lent unfair criticisms, and most writings on Quantz are still plagued by fanciful anecdotes and time-honoured asser-

³ *Anekdoten von König Friedrich II von Preussen, und von einigen Personen, die um ihn waren*, ed. C. F. Nicolai (Berlin und Stettin, 1788-92), vi, p.70. Among the 'three people in Berlin' were undoubtedly former flute students of Quantz and their pupils, most likely including Augustin Neuff, a royal Prussian chamber musician at the Berlin court from 1754 to 1792. Neuff, who came from Graz to study with Quantz, is thought to have been the scribe of the only surviving copy of Quantz's *Solfeggi* (Copenhagen, Det Kongelige Bibliotek [DK Kk], mu 6210.2528 [Gieddes samling I, 16], c.1780), which contains telltale pedagogical remarks indicating its use by a beginning student playing a two-keyed Quantz-style flute. In 1781 (the approximate copying date of the latter manuscript) Neuff taught the 13 year-old Friedrich Ludvig Dulon (1769-1826) in Berlin, whose playing impressed C. P. E. Bach in 1782 or 1783. Quantz's other pupils in Berlin were: Johann Joseph Friedrich Lindner (1730-1790), from 1750 to c.1789 a royal Prussian chamber musician and notably one of Quantz's best pupils, according to Nicolai; Georg Gotthelf Liebeskind (1732-1800), a flautist in the Capelle of the Margrave of Bayreuth who studied in Berlin from 1756 to 1759; and Georg Wilhelm Kottowsky (1735-1785), who studied with Quantz but died in the service of the Capelle in Dessau. Friedrich Wilhelm Riedt (1710-1783), from 1741 a flautist in the royal Capelle at Berlin, is not known to have studied with Quantz and died well before Nicolai's comment. Nicolai may have had in mind Frédéric de Castillon (1747-1814), a flautist in Berlin from 1763, who is known to have owned and played flutes by Quantz and who contributed a knowledgeable description of them (s.v. 'Flûte') to the *Supplément à l'Encyclopédie ou Dictionnaire Raisonné des Sciences des Arts et des Métiers. Par une Société de Gens de Lettres*, ed. J. B. Robinet (Paris, 1777), vol. 3. Not to be excluded here is Christian Gottlob Krause (1747-1829), a student of Lindner whom Friedrich II called upon in the years after Quantz's death.

⁴ J.G. Tromlitz, *Ausführlicher und gründlicher Unterricht die Flöte zu spielen* (Leipzig: A.F. Böhme, 1791; facs., F. Knuf: Buren, 1985), p.23.

⁵ It is worth noting, however, that Tromlitz approved of Quantz's innovations in flute construction, adopting some of them for his own instruments. These included the enharmonic key for a D-sharp pitched lower than E-flat and the use of a moveable cork screw in the head joint. See also below.

tions.⁶ Because Quantz ended his years in Berlin in the employment of Frederick, from whose collection we have numerous flutes by Quantz and others, it is assumed that Quantz's instruments were conceived and built to the taste of mid- to late-18th-century Berlin. If, however, one recognizes that Quantz modeled his flutes on a much earlier sound concept, and that the style of repertory performed on them in Berlin likewise reflected an older taste (that of the 1720s and 1730s), many criticisms of the instruments take care of themselves. Those that remain can be eliminated by applying Quantz's very specific directions for how to play them. A list of flutes by Quantz (Table 1) will be useful for the following discussion.⁷

Berlin, Kunstgewerbemuseum, Hz 1289.
Berlin, Musikinstrumentenmuseum des Staatliche Instituts für Musikforschung Preußischer Kulturbesitz, MIM 5076.
Halle, Händel-Haus Instrumentenmuseum, MS 577 (Quantz?).
Hamamatsu, Japan, City Music Instrument Museum, A-0088R.
Hechingen, Burg Hohenzollern.
Karlsruhe, private collection.
Leipzig, Instrumentenmuseum der Universität Leipzig, 1236n.
Potsdam, Schloß Sanssouci, Staatliche Schlösser und Gärten, V 18.
Washington D.C., Library of Congress, Dayton C. Miller collection, 916.

Table 1: *Summary checklist of Quantz's surviving flutes*

The 25-year period that Quantz spent as a musician in Dresden was undoubtedly the most formative in his life. The music he performed and the contacts he made there, above all with the violinist Georg Pisendel, inspired and guided him: by Quantz's admission, Pisendel helped to shape the aesthetic on which he grounded not only his compositions but also the

⁶A prime example is the notion that Quantz 'collaborated' with makers F. G. A. Kirst and C. F. Freyer. That younger Berlin makers (as well as makers outside of Berlin, such as Tromlitz) later imitated isolated features of Quantz's famous instruments does not constitute evidence for any such collaboration. To date, no one has shown material or documentary evidence that proves that either maker produced any of Quantz's instruments. Nevertheless, this is routinely and casually asserted in modern writings, including websites of historical flute dealers and makers, as well as standard reference books; cf. William Waterhouse, s.v. 'Freyer, (1) C.F.' and 'Kirst', *The New Langwill Index: A Dictionary of Musical Wind-Instrument Makers and Inventors* (London: Tony Bingham, 1993). T. Lerch, 'Einige Querflötenmodelle des 18. Jahrhunderts', in *Flöten, Oboen und Fagotte des 17. und 18. Jahrhunderts: Bericht über den 1. Teil des 12. Symposiums zu Fragen des Musikinstrumentenbaus Michaelstein, 08./09. November 1991* (Michaelstein, 1994), pp.8-20, finds little in common between flutes of Quantz and those of F. G. A. Kirst, further noting that only four of the latter's instruments bear tuning slides; Lerch associates two of these with Frederick II (p.10).

⁷A detailed list of instruments by and ascribed to Quantz, from which this table is drawn, is found in Oleskiewicz, 'A Museum, a World War, and a Rediscovery', pp.109-12.

Versuch.⁸ In the *Versuch*, Quantz reveals fundamental information about his flutes that will be indispensable to our examination of them.

In 1718, when Quantz became an oboist in the Polish Chapel of King Augustus II,⁹ he was still a young musician seeking to establish himself, and he had much to gain from the advocacy of the rising virtuoso who would eventually assume the post of leader of the orchestra in Dresden. Pisendel fulfilled the role of mentor, and the two men formed a close relationship which lasted until Pisendel's death in 1755. Quantz soon found that he could advance more quickly at the Dresden court as a flautist, and he began serious study with the principal flautist of the *Hofkapelle*, the Frenchman Gabriel Pierre Buffardin.¹⁰ The paucity of good available flutes at this time stimulated Quantz's lifelong devotion to perfecting the instrument. In 1726, while in France, he added a second key (for D-sharp) to the flute to improve its intonation.¹¹ The portrait of c.1735–6 shows Quantz proudly pointing to the additional key (Photo 1). The music shown is an autograph of his concerto in A major (QV 5:218), a work containing D-sharps, and its presence in the portrait suggests the ease in performing on Quantz's new flute in a formerly problematic tonality.¹²

Flautists had long used alternate fingerings to make enharmonic distinctions in which flats were lower than sharps, but until Quantz's invention the

⁸Cf. 'Herrn Johann Joachim Quantzens Lebenslauf, von ihm selbst entworfen', in Friedrich Wilhelm Marpurg, *Historisch-kritische Beyträge zur Aufnahme der Musik*, 1/3: p.211 (Berlin, 1755; facs., Hildesheim: Olms, 1970; facs. of Quantz's article also in *Selbstbiographien deutscher Musiker des XVIII Jahrhunderts*, ed. Willi Kahl, Amsterdam: Knuf, 1972, pp.104–57). Also trans. Paul Nettl in *Forgotten Musicians* (New York: Philosophical Library, 1951), pp.290–1. See also Quantz, *Versuch einer Anweisung die Flöte traversiere zu spielen* (Berlin: Johann Friedrich Voss, 1752); anonymous French translation (prepared at Quantz's direction) as *Essai d'une méthode pour apprendre à jouer de la flûte traversière* (Berlin: Christian Friedrich Voss, 1752); trans. Edward Reilly as *On Playing the Flute*, 2nd ed. (New York: Schirmer Books, 1985).

⁹The Polish Chapel was established to travel with the King between Warsaw, Cracow, and Dresden in place of the regular *Hofkapelle*. It performed sacred and secular music in all three cities. For details on its personnel and responsibilities, see Oleskiewicz, 'Quantz and the Flute at Dresden', pp.26–36.

¹⁰Cf. 'Herrn Johann Joachim Quantzens Lebenslauf', p.209. Buffardin entered the service of the *Hofkapelle* in 1715 as its most highly paid woodwind player.

¹¹Quantz, *Versuch*, i.8.

¹²C. Walthal, 'Portraits of Johann Joachim Quantz', *Early Music* 14 (1986): p.506. The dating of the portrait to approximately 1735–6 accords with the handwriting in the concerto shown (the depicted autograph score is now lost), as well as with the dating of surviving manuscript parts copied by a professional Dresden court scribe. The earliest surviving set of parts, copied by Dresden scribe A (possibly Johann Gottfried Grundig) between c.1730 and c.1735, became part of Frederick II's library (Berlin, Staatsbibliothek, Preußischer Kulturbesitz, Haus 1, KH M. 3721). The inkwell and wet pen depicted in the portrait suggest a contemporaneous composition date with the concerto, as does the general appearance of the flute, which differs in certain external details from flutes of his own workshop (from 1739).



Photo 1: *Johann Joachim Quantz c.1735-6, by Johann Friedrich Gerhard. Commissioned by Quantz's flute student, the Margrave of Bayreuth, and preserved in Bayreuth, Eremitage, Altes Schloß, Bayerische Verwaltung der Staatlichen Schlösser, Gärten und Seen.*

presence of just one key meant that D-sharp or E-flat, or both, had to be tempered, as on the keyboard. Andreas Sorge, describing the tuning of Quantz's flutes, explained that Quantz's second key 'was motivated by the old false keyboard temperament, in which E-flat to G is good but in which D-sharp is much too high to B; on this account he names one the D[#] key and the other the E^b key, which two tones are supposed to differ from one another by a comma.'¹³ The comma of Sorge and his contemporaries was a basic unit of measure in the design of Quantz's flutes. As traditionally under-

¹³ 'die alte falsche Claviertemperatur bewogen haben, als welche wohl ein bE zu g, aber ein allzuscharfes #D zu H aufweist. Deswegen nennet er die eine #D- und die andere die bE-Klappe, welche beyde Töne um ein Comma von einander unterschieden seyn sollen.' F.W. Marburg, 'Herrn Georg Andreas Sorgens . . . Anmerkungen über Herr Quanzens . . . #D und bE-Klappe auf der Querflöte', in *Historisch-kritische Beyträge zur Aufnahme der Musik*, Bd. IV (Berlin, 1758; facs., Georg Olms: New York, 1970), p.2: Sorge accurately describes Quantz's comma as that of the 55-part octave used in Johann Adolph Scheibe, *Abhandlung von den musikalischen Intervallen* (Hamburg: Author, 1739) and also that of Georg Philipp Telemann, 'Georg Phil. Telemanns neues musikalisches System', in Lorenz Christoph Mizler, *Musikalische Bibliothek*, 3 (Leipzig, 1752; facs. of vols. 1-4, Hilversum: Fritz Knuf, 1966): pp.713-9. Although Sorge originally defended Telemann's system in 1748 (*Gespräch zwischen einem musico theoretico und einem studioso musices*, Lobenstein), he ends this essay in favour of equal temperament. This lends more support to the idea that already by 1758 Quantz's flutes were seen by some as products of an earlier aesthetic.

stood, the syntonic comma was the difference between a just major third (defined as the interval between two notes whose frequencies or string lengths are in the ratio 5:4) and two major whole steps (each defined by the ratio 9:8), yielding the ratio 81:80. In the system used by Sorge and his contemporaries, the whole tone was divided into nine commas. This is to overlook a minute, inaudible discrepancy between the sum of nine commas and a just whole tone as traditionally defined. But it yields perfectly practical results, the whole tone being divided into two unequal semitones that differ by a comma—in modern terms, about 22 cents.¹⁴ The chromatic or minor semitone—for example, D to D-sharp—was made up of four commas (roughly 88 cents), whereas the diatonic or major semitone—for example, D to E-flat—was made up of five commas (about 110 cents). It is the D-sharp key that Quantz added, permitting a significantly lower pitch for this note and simultaneously a slightly higher E-flat key. Thus, without special effort on the part of the player, Quantz's flutes not only bring certain thirds closer to just intonation—major thirds such as E-flat to G and B to D-sharp, as well as minor thirds such as C to E-flat; they also afford a greater number of usable fifths, most advantageously E-flat to B-flat. Accordingly, the new, curved upper key was designated for D-sharp and the lower one for E-flat.¹⁵

It has been convincingly demonstrated that, at least up to the mid-18th century, violinists commonly employed such a tuning system, and Quantz describes its use by all unrestricted instruments and also singers.¹⁶ If it was

¹⁴Sorge described Quantz's comma as the syntonic comma, with a ratio of 80:81. The modern linear concept of tuning, whereby a leading tone is raised to achieve greater proximity to the tonic, is not part of Quantz's system.

¹⁵Quantz's tuning system thus has major thirds that are smaller and nearer to pure than those of equal temperament, minor thirds that are larger and hence closer to pure than in equal temperament, and whole tones which are smaller than that of equal temperament but which approximate those of $\frac{1}{4}$ -comma mean-tone temperament. Since, however, the flute is not a fixed-pitch instrument, the exact size and relative purity of intervals vary depending on the harmonic context. Any attempt to ascribe a particular keyboard temperament to Quantz's flutes, as is frequently done, is, by definition, in error (one may compare Telemann's own arguments to this effect; see 'Georg Phil. Telemann's Neues musikalisches System'). The natural tendency of the Quantz flute is to produce diatonic semitones about 9–10 cents larger than in equal temperament, and chromatic semitones about 12–13 cents smaller. Fifths are generally tuned slightly smaller than pure but vary in size. When a higher F-sharp is needed to form a fifth or to follow E-sharp, for example, Quantz recommends a special (higher) auxiliary fingering.

¹⁶See, for example, P. Barbieri, 'Violin Intonation: An Historical Survey', *Early Music* 19 (1991): 69–88, and J. H. Chestnut, 'Mozart's Teaching of Intonation', *Journal of the American Musicological Society* 30 (1977): 254–71. Johann Daniel Gottlob Türk (*Klavierschule oder Anweisung zum Klavierspielen für Lehrer und Lernende*, Leipzig: Author, 1789; facs., Kassel: Bärenreiter, 1997) and Johann George Tromlitz (*Über die Flöten mit mehreren Klappen*, Leipzig: A. F. Böhme, 1800; facs., Buren: Frits Knuf, 1973; trans. Ardal Powell as *The Keyed Flute by Johann George Tromlitz*, Oxford: Clarendon Press, 1996) are among the late-18th-century musicians who continue to prescribe Quantz's system of tuning for woodwind instruments.

used by Pisendel, as is likely, the Dresden orchestra would have also complied, and this may explain in part Quantz's concern with perfecting it on the flute. Figure 1 shows the actual tuning of the instruments in relation to equal temperament (achieved using the embouchure and techniques as described in the *Versuch*). It is important to note, however, that Quantz did not think in terms of cents or equal temperament, and in practice, he most likely played the thirds as purely as possible with the bass. In 1759, the Dutch flautist Anton Mahaut acknowledged Quantz's invention of the second key for D-sharp, at the same time confirming the continued use of his system of intonation.¹⁷ Tromlitz, F. G. A. Kirst, and C. F. Freyer also approved of Quantz's two keys, incorporating them into some of their own instruments at the end of the century.

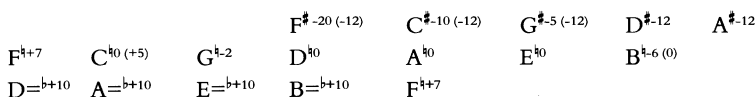


Figure 1: Tuning diagram of Quantz's flutes, based on the author's empirical study. Arabic numerals indicate the approximate deviation from equal temperament. Arabic numerals in parentheses indicate adjusted pitches of these notes (i.e. the pitch of the note obtained with special physical compensation by the player, as described by Quantz). Fifths run from left to right with a reference pitch of D; and major thirds are shown vertically.

Thus, the D forms a fifth to a G that is 2 cents lower than it would be in equal temperament; the G forms a major third to an E^b that is 10 cents higher.

¹⁷Antoine Mahaut, *Nieuwe manier om binnen korten tyd op de dwarsfluit te leeren speelen/Nouvelle Méthode pour apprendre en peu de tems à jouer de la flûte traversière* (Amsterdam: J.J. Hummel, c.1759), p.3: 'M. Quantz, Élève de M. Buffardin a ajouté une seconde Clef a la patte dont le trou qu'elle couvre est de beaucoup plus grand que celui de la Clef ordinaire pour avoir le Mi Bemol juste, qui est toujours un peu bas par raport au Re-Diese qui se doit de même que le Mi-Bemol, et qui seroit trop haut si le Mi-Bemol étoit juste. Les Facteurs d'aujourd'hui font le trou de la Clef ordinaire un peu plus grand qu'encienement pour mitiger ces deux tons, moyenant quoy l'on y peut suppléer avec l'Embouchure.' ('Mr. Quantz, Mr. Buffardin's student, added a second key on the foot joint. The hole that it covers is much larger than the hole of the first key; this is in order to correct the E-flat, which is always a little low in relation to the D-sharp (which is fingered the same way as the E-flat) and would be too sharp if the E-flat were in tune. Makers today fashion the hole of the regular key a little larger than it used to be, in order to compromise between these two notes. The differences in pitch are then corrected with the embouchure.') [Translation follows Eileen Hadidian, ed., *A New Method for Learning to Play the Transverse Flute by Antoine Mahaut* (Bloomington: Indiana University Press, 1989).] In other words, Mahaut claims that rather than building flutes with two keys to alleviate the problem of these two enharmonic notes, some makers began to build flutes with a single, slightly larger hole than before, one that no longer favoured E-flat over D-sharp, but which instead split the difference, making it more possible to reach either note by embouchure adjustments on the part of the player.

Quantz also tuned his flutes with a lower F than usual (the note is commonly too high on many 18th-century flutes), providing a solid tonic for F major and F minor as well as a good subdominant in C major and C minor and a better scale overall in flat keys. Tuning the F in this way directly affects the tuning of F[#], a note which consequently also becomes lower and forms a smaller major third to D. Quantz recommends a special F[#] fingering for occasions when this note does not serve as the third of a chord, especially in slow or cantabile passages in which F[#] moves by step in keys with four or more sharps, as when it follows E[#] or precedes G[#].¹⁸ Keys with multiple flats and sharps appear frequently in Quantz's Dresden compositions; it is unlikely that pieces in such keys were routinely transposed by flautists, as is sometimes supposed. D major and G major are the keys often regarded today to be the most suited to the traverso, but manuscript evidence shows that composers in Dresden generally had little concern for favouring simple keys.¹⁹

Telemann presented a complex tuning system to Lorenz Mizler's *Sozi-
etät der Musikalischen Wissenschaften* in the 1740s that was defended by Sorge. Perhaps the inevitable culmination of a widespread tuning practice unfamiliar in intellectual circles dominated by keyboard players, Telemann's system represented 'the sounds found on unrestricted instruments like the cello and violin . . . that can be played purely in tune'.²⁰ Moreover, Telemann's *Fantaisies* for unaccompanied flute, published in 1732–33 and championed by Quantz as late as 1759, are written in a wide assortment of flat and sharp keys.²¹ It cannot be purely by chance that Quantz's flutes from 1726 onward made use of a tuning system so close to the one codified by Sorge, Telemann, and Scheibe from the 1730s.

In addition, Telemann's *Fantaisies* call for a flute that possesses two further important qualities characteristic of Quantz's flutes: a strong fundamental register and agility in passing rapidly between extreme registers. This capability makes possible the so-called polyphonic type of melody in which the notes lying in different registers represent distinct voices in a contrapuntal texture. Such textures are particularly common in the arpeg-

¹⁸Quantz, *Versuch*, iii.7.

¹⁹The author has explored early uses of all 24 tonalities for winds and keyboards in 'Tonality, Temperament, and Woodwind Intonation: What Every Keyboard Player Should Know', a paper read at the annual meeting of the Midwestern Historical Keyboard Society, Dayton, Ohio, 14 May 1999. On the wide-ranging tonalities in the Dresden repertory, see Oleskiewicz, 'Quantz and the Flute at Dresden', pp.198–205, 323–27, 332–3, 355.

²⁰G. P. Telemann's 'Neues musikalisches System', in L. C. Mizler, *Musikalische Bibliothek*, iii/4 (Leipzig, 1752; facs., 1966). See also H. R. Jung, 'Telemann und die Mizlersche Societät der musikalischen Wissenschaften', in *Konferenzbericht der 3. Magdeburger Telemann-Festtage* (Magdeburg, 1969), vol. 2, p.87.

²¹Quantz, 'Hrn. Johann Joachim Quanzens Antwort auf des Herrn von Moldenit gedrucktes so genanntes Schreiben an Hrn. Quantz nebst einigen Anmerkungen über dessen Versuch einer Anweisung die Flöte traversiere zu spielen', in F. W. Marburg, *Historische-kritische Beyträge zur Aufnahme der Musik*, iv: pp.153–9.

giated passagework that plays an important role in the solo sonatas and concertos of the early eighteenth century, including the Dresden court's instrumental repertoires, among these works for flute by Quantz.



Example 1: Johann David Heinichen, *Italianate Concertino* (Allegro) in B minor placed just before the Credo in Missa V, *D DI Mus.* 2398-D-6 (score), 1726, mm. 80-7. At the beginning the staves are labeled Flauto Travers. Conc: [stave 1]; Violini e Hautb: [staves 2 and 3]; Violetta [stave 4]; and basso continuo (unlabeled) [stave 5].

In Example 1, flute passagework in a Dresden Mass by Johann David Heinichen requires exceptional strength in the low register. A virtuoso 'Concertino' for the traverso inserted just before the Credo features wide leaps in which the bottom notes provide a bass pedal tone; similar figuration occurs in contemporary Dresden writing for the theorbo.²²

Perhaps even more striking is one early Dresden sonata by Quantz that contains a movement which is virtually an étude in this type of playing (Example 2). Quantz must have remembered it later in Berlin when he came to write the *Versuch*, for the latter includes an extract from it to illustrate a type of passagework idiomatic to the flute but not the violin.

Two things in particular are notable about this passage. First, in order to succeed in playing each note with proper tone and intonation, one must use a highly flexible embouchure to adjust the direction of the air stream for each register. Second, one must blow quite strongly in the low register.²³ Quantz carefully describes both of these techniques in the *Versuch*. But Quantz's techniques are effective only if one possesses a properly built instrument and if one follows Quantz's instructions with regard to other mat-

²²The flute writing here is, for example, akin to figuration in a 'tiorba' aria in a Heinichen serenata dated 1719, in Mus. ms. 2398-L-1.

²³Quantz, *Versuch*, xii.17: 'Je tiefer die Sprünge in Passagien sind; je stärker müssen die tiefen Noten vorgetragen werden; theils weil sie zum Accorde gehörige Hauptnoten sind; theils weil die tiefen Töne auf der Flöte nicht so schneidend und durchdringend sind, als die hohen.' (The deeper the leaps in passagework are, the stronger the deep notes must be played; partly because they belong to the main notes of the harmony; partly because the deep tones on the flute are not as cutting and penetrating as the high ones.)

ters as well, such as the proper alignment of the parts of the flute (described below). Of course they also require practice and a well-developed, muscular embouchure. Few flautists today, even those who specialize in early instruments, follow Quantz's instructions. Unfortunately, this is not the only



Example 2a: Johann Joachim Quantz, extract from the Sonata in G minor for Flute and Continuo, QV 1:128, second movement, bars 26-7. The passage between the dotted barlines appears in the Versuch (1752), chapter xviii, para. 14 (fig. 13). Slurs have been added in the remainder of the example by analogy.



Example 2b: Johann Joachim Quantz, Sonata in G minor, QV 1:128, mvt. 2, Allegro, bars 19-30.

instance in which many flautists disregard Quantz's very clear and helpful directions.

Perhaps even more regrettable is the failure of most modern traverso players to employ the articulation patterns that Quantz and others took such care to describe. These patterns, produced by pronouncing certain syllables at the tip of the tongue while attacking each note or brief slurred figure, produce distinctive groupings of more and less strongly articulated tones. The result is to place agogic accents on some notes while also creating subtle distinctions between more and less legato notes in each figure. Quantz never entirely explains the rationale for his articulation patterns, merely prescribing that passagework should be played 'roundly'—notably the same advice he gives to singers.²⁴ It is clear, however, that certain tonguing patterns are chosen to introduce inequality of articulation and/or of rhythm,²⁵ and all of them tend to emphasize notes that are important for one reason or another, such as those that are registrally isolated or that mark changes of harmony or the beginnings of motivic figures.

Many flautists today, even those playing baroque instruments, articulate with a uniform staccato or non-legato, or even with a pattern of double tonguing actually more in keeping with so-called 'modern' performing practice, thereby impoverishing their performances of this repertory.²⁶ So widespread is this very clean, chiseled sort of articulation in modern traverso playing that many listeners and even early-music specialists wrongly associate it with historical practice. Yet the more expressive, flowing, and in general more legato, approach described by Quantz is well documented. On Quantz's instruments the uniform, overly articulate playing just described sounds clipped and fails to let the instrument achieve its full resonance, much like harpsichord playing that is too staccato. Even in quick passagework, Quantz explicitly demanded a vocal, as opposed to a mechanical, manner of performance. His flutes produce this effect when his articulation system is faithfully employed.

A trio in D major for two flutes and continuo, QV 2:15, exemplifies Quantz's articulation style. For passages in the two fast movements we have Quantz's recommended articulation syllables, as preserved in his *Solfeggi*, the pedagogical collection of extracts transmitted by a pupil of Quantz.²⁷ Example 3 transcribes these articulation patterns as Quantz gave them, first for bars 5 and 6, then for bars 13ff., where the first flute has a solo. The open-

²⁴Quantz, *Versuch*, xii.4, xviii.11.

²⁵*Versuch*, vi.9.

²⁶The present widespread de-emphasis of historical articulations and differing viewpoints by some professional modern traverso players are discussed in *Traverso: Historical Flute Newsletter* 7 (July 1995): 3, and 9 (July 1997): 1-2.

²⁷See note 3 above. The *Solfeggi* have been published as *Solfeggi Pour La Flute Traversiere avec l'enseignement, Par Mons^r. Quantz*, ed. Winfried Michel and Hermien Teske (Winterthur, Switzerland: Amadeus, 1978), in which the manuscript is erroneously described as an autograph.

Allegro

5
di di ri di di [ri di di ri di di ri]

9

13
ti ri [di ri] di ri di [ri ti ri di ri di ri di ri]

Example 3: Johann Joachim Quantz, *Trio in D major for two flutes and continuo*, QV 2:15, mvmt. 2, Allegro, bars 1-16, with articulations prescribed in Quantz's Solfeggi.

ing bars, characterized by leaps in quavers, are straightforward and would have been articulated with the crisp syllable 'ti' to make them distinct.²⁸ In

²⁸Quantz, *Versuch*, vi.1.7: 'Wenn die Achttheile im Allegro Sprünge ausmachen, so haben sie *ti*.' (If in an Allegro the quavers form leaps, they receive *ti*.)

bars 5ff. and 13ff., however, the conjunct semiquavers are performed with varied, alternating syllables that produce a much smoother, round and rolling effect nearer to that produced by a vocalist.²⁹ The varied syllable pattern prescribed in the *Solfeggi* highlights the independent polyphonic voices implied by the registral changes within the soloist's part.³⁰

The 'full, thick, and masculine' (*voll, dick, männlich*) tone of his flutes, as Quantz himself described it,³¹ and a concomitant stability of pitch result from a wider-than-standard bore (c.20.4mm at the head rather than the more usual diameter of about 19.1mm) and from the especially thick wall of ebony. The main body of the flute tapers more dramatically than in other instruments, to about 13.1mm, forming a sharper internal cone before widening again to the end of the foot. Unlike that of the frequently copied Godefroid-Adrien-Joseph Rottenburgh flute, for example, whose narrow bore tapers more rapidly before the first tonehole and features a light, responsive high range, Quantz's gradually tapering bore, with its greater reduction, gives great power in the low range but does not match the Rottenburgh's ease above e^{'''}. These qualities are not faults but advantages for playing the Dresden repertoires, which in fact exceed e^{'''} in only the rarest circumstances. In Quantz's own compositions, notes above e^{'''}, extending upward to a^{'''}, do occur. They can be found regularly, however, only in the *Caprices* (QV 3: 1-22), which are didactic in nature.³² The notes f-sharp^{'''} and g^{'''} are in fact quite usable on Quantz's flutes, but, as on many 18th-century traversi, f^{'''} is more problematical.

Although he preferred the clarity and tone of ebony, Quantz occasionally used other woods. The flute pictured in the portrait of c.1735-6 (Ill. 1) is of a lighter wood than ebony, possibly stained boxwood. Quantz appears to have provided flutes of boxwood for patrons other than the King of Prussia,³³ and he described it as the most common and durable material for flutes.³⁴ Widely undercut toneholes and embouchure lend Quantz's thick-walled flutes the effect of a thinner wall, improving their response. In fact,

²⁹Quantz, *Versuch*, xii.4: 'Die geschwinden Passagien müssen vor allen Dingen im Allegro rund, proper, lebhaft, articuliret, und deutlich gespielt werden.'

³⁰In the spoken presentation of this paper at the Galpin Society Meeting, Edinburgh, 1999, my recording of this passage generated this observation from those in attendance.

³¹Quantz, *Versuch*, iv.3.

³²Dk Kk mu 6310.0860 [Gieddes samling I.17]. The *Caprices* have been published as *Capricen, Fantasien, Stücke für Flöte ohne Baß*, ed. Horst Augsbach (Leipzig, Edition Peters, 1981).

³³Edward Reilly, *On Playing the Flute*, 2nd ed., p.359, cites a letter from Quantz to a nobleman that was quoted in a 1909 auction catalog. In the letter, dated 11 February 1756, Quantz offers to provide 'a transverse flute of the kind described in my *Versuch die Flöte zu spielen* [sic] bored and truly tuned by me, and indeed made of box wood with six middle pieces... for 7 Louis d'or. Of ebony I have let none go except to His Royal Majesty.'

³⁴Quantz, *Versuch*, i.18.

Quantz achieved different effects by varying the amount of undercutting on the embouchure holes. The great degree of undercutting on the embouchure of Washington D.C., DCM 916 makes its high range more responsive; the lesser degree of undercutting on the embouchure of Berlin, Kunstgewerbemuseum Hz 1289 reduces the speed of response in the high register but yields a thicker and denser tone overall. Many of Quantz's instruments survive with two headjoints, and their embouchure holes are differently shaped in each case. In addition, slight overcutting of the tone-holes lends great stability to pitch even under high wind pressure, which is ideal for performing sharply attacked notes with written 'strokes' above them. One encounters the latter articulation frequently in early 18th-century Dresden compositions by Quantz, Hasse, Heinichen, Zelenka, and others for both small and large performing forces.

At about the time he wrote the *Versuch*, Quantz made his last major change to the flute by supplying some headpieces with a tuning slide, thus creating the first five-piece flute (seen in Fig. 2).³⁵ The telescoping tuning slide consists of a short, separate section of headjoint (about 40.1 mm in length) fitted with a long tenon. The tenon fits into the socket of the main part of the headjoint, into which socket Quantz introduced a thin brass tube.³⁶ The slide offers instant pitch flexibility, in smaller increments than are afforded by the use of alternate middle joints (*corps de rechange*), of which fewer are now required. The tenons of the slides are etched with helical markings (visible by removing any lapped threads) and are accurately depicted by Castillon (Fig. 2). When the slide is drawn out about 6–7mm with the longest middle joint in place, the resulting internal gap causes a favourable acoustical disturbance to the bore, which increases tonal resonance and volume without harming the scale. As Quantz explained, this gap (a distance proportionate to the comma) is better placed in the headjoint than between the headjoint and the body.³⁷ He further noted that drawing out the tuning slide is particularly necessary when performing in flat keys, since on the flute the tonic notes of these keys are pitched about a comma higher than on the keyboard.

³⁵Prior to this invention the baroque flute was built in three or four main pieces. Apart from one 18th-century copy of a Quantz flute, a single lost instrument was the only flute bearing witness to his pre-1750 headjoint design without tuning slide. See Oleskiewicz, 'A Museum, a World War, and a Rediscovery', pp.133–4, and especially note 56.

³⁶Brass-lined sockets are in evidence on all of the surviving headjoints. The brass tube once part of Washington, D.C., DCM 916 no longer survives, but at the time of my examination traces of glue and threads remained in the headjoint. Although these tubes seem to be simply glued to the sockets in their present-day form, I posit that originally they may have been lapped with thread (with or without glue) to hold them in place.

³⁷To produce gaps *larger* than the comma (6–7mm) when pulling out the middle pieces, Quantz recommended that one insert rings to fill the extra space (see *Versuch*, i.13).

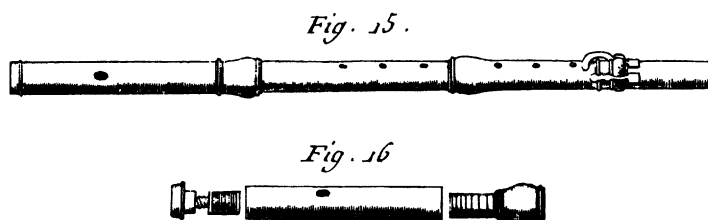


Figure 2: Castillon's depiction of Quantz's two-keyed flute with tuning slide and end-cap screw-cork (1777), from the *Supplément à Diderot's Encyclopédie*, planche 17.

Quantz reports that when, in 1727, he set out to form a personal style of composition, he relied on the advice and judgement of Georg Pisendel.³⁸ Quantz's early compositions frequently took the form of trios for flute, violin, and basso continuo, to which Pisendel made emendations as he saw fit. One might envision the two playing Quantz's compositions together, Quantz at once jotting down suggestions and emulating the polished performing style of his teacher. These early encounters with Pisendel must have challenged Quantz to develop a technical facility comparable with his teacher's, and, above all, a large tone capable of competing with that of a virtuoso violinist. Herein may lie a clue to the origin of his bores. Years later, Quantz would observe that 'the trio is the touchstone by which we can best judge the strength and insight of two persons. If it is to have a good effect, it requires a performance by two persons who have the same kind of execution.'³⁹

In 1728 Quantz was appointed flautist to the Dresden *Hofkapelle*, where he remained and performed under Pisendel's direction for 13 years. During this tenure, in 1739, Quantz began to manufacture and tune instruments for sale. Despite a comment by Tromlitz in 1800 to the contrary, all earlier sources agree that Quantz had a direct role in the making of these flutes.⁴⁰ Quantz did not consider *Handwerk* to be below the status of a *Gelehrter*, a view evidenced by his recommendation that—since to craft a good flute one must both play well and understand the proportions of the notes—'it is most advantageous for the flute player if he knows how to make flutes himself, or at least how to tune them'.⁴¹ Modern criticisms of Quantz's instruments have suggested that the big sound afforded by their design was valued over good intonation. As Quantz was a member of the Dresden *Hofkapelle* at the height of its fame, it is unlikely that he tolerated

³⁸Herrn Johann Joachim Quantzens Lebenslauf,' p.245.

³⁹Quantz, *Versuch*, xvi.26.

⁴⁰Tromlitz, *Über die Flöten mit mehreren Klappen*, pp.132–3.

⁴¹Quantz, *Versuch*, iv.4. It is noteworthy that ornamental wood turning was a pastime of royalty in the 18th century. See Cecil Adkins, 'Oboes Beyond Compare: The Instruments of Hendrik and Fredrik Richters', *Journal of the American Musical Instrument Society* 16 (1990): 57.

badly tuned instruments. Certainly, his preoccupation with intonation in the *Versuch* would seem to preclude this notion.

Clearly, we cannot unlock the secrets of these flutes with our late 20th-century ears and lips except through a thoughtful re-reading and application of Quantz's instructions on how to play his flutes. It is therefore essential to examine two chapters in the *Versuch*: II ('Of Holding the Flute, and Placing the Fingers') and IV ('Of the Embouchure'). The instructions for the alignment of the embouchure hole and the amount of lip to be placed over and into it are critical to intonation and, as Quantz himself cautions, can cause the pitch of the flute to vary by *as much as a whole tone*.⁴² Quantz's alignment is well illustrated by Castillon (see Fig. 2). Here, as Quantz instructs, the embouchure is turned inwards about the breadth of the opening.⁴³ A clue to this application can be found on an authentic Quantz flute in Berlin (Instrumentenmuseum 5076). One of this flute's two surviving headjoints bears three little notches, one above the other, to the upper right of the embouchure hole; these are best understood as an alignment guide for the player. Quantz's general rule of closing the embouchure hole halfway also explains why he says that the octaves of the flute must be tuned slightly widely.⁴⁴ As one withdraws the lips in the lower register, the pitch rises; and, as one advances the lips for higher registers, the pitch of these notes lowers. Blowing more strongly in the low register, as is recommended above, necessitates a flute with widely tuned octaves. Modern copies frequently do not reproduce this aspect of Quantz's flutes and thus prevent the modern player from using Quantz's techniques.⁴⁵

Correct cork placement is another factor critical to the flute's intonation and sonority. The cork of the flute is found inside the headjoint between the cap and the embouchure hole and serves to stop the open end of the tube. Quantz likens the effect of the cork to the function of a violin's soundpost, which, if mispositioned, not only ruins the pitch but also the tone quality.⁴⁶ For this reason Quantz employed a moveable screw-cork in his instruments to regulate the octaves, and it must be placed precisely with regard to the overall length of the flute (Fig. 2). About its use Quantz gives only the general direction that it should be pushed inwards when playing with shorter middle joints and pulled outwards for longer joints. Mahaut

⁴²Quantz, *Versuch*, iv.15 (my emphasis). Modern estimations of the pitch of Quantz's flutes err frequently on the high side, probably in part because players fail to heed Quantz's explicit directions about how much embouchure hole to cover during play.

⁴³Quantz, *Versuch*, iv.8–15. Quantz's illustration of the embouchure hole (which shows the distances that the lips should travel in producing various registers) has been significantly reduced in the English translation.

⁴⁴Quantz, *Versuch*, iv.15.

⁴⁵The very fine maker Philippe Allain-Dupré has freely admitted to making this and other acoustical modifications to his copies (verbal communication with the author).

⁴⁶Quantz, *Versuch*, i.10.

credited this invention, as well as that of the foot register, to Quantz's mentor Buffardin, and it probably formed a part of Quantz's design from the first.⁴⁷

Incorrect cork placement will leave the player of Quantz's instruments disenchanting if not bewildered. Quantz's rule of thumb, that one must place it so as to produce good octaves, naturally is contingent upon the way one forms an embouchure and the method of blowing. With a 'modern' embouchure one may find a cork position which makes certain octaves true but which leaves the rest of the flute out of tune with itself. Following Quantz's method of blowing, one finds that the pitch of the flute lowers substantially and that the cork must be placed surprisingly far (c.26.0mm) from the embouchure hole when playing with the longest joint and even further away with each shorter joint. A false position can cause unmanageably low F-sharps and a sagging low D, two common criticisms of Quantz's original flutes heard today.

The known Quantz flutes have up to six alternate middle joints, 'each differing from one another by no more than a comma, or the ninth part of a whole tone'.⁴⁸ Five seems to have been the usual number of middle joints for Quantz, however; five joints exist for Quantz flutes located in Berlin (Instrumentenmuseum 5076), Karlsruhe (private collection), and Hamamatsu (City Music Instrument Museum). Others survive incomplete, and none of them with a joint higher than number four. The flute in Washington, D.C., DCM 916 is the only Quantz flute known to survive with six middle pieces, but the shortest of these (no. 6) originated with a much earlier instrument and it is not proportional in length to the five original joints.⁴⁹ Each original middle piece is shorter than the previous one by c.7mm, yielding a sounding difference of about 5 Herz or 22 cents, which amounts to the comma as described by Quantz. The longest joints of Quantz flutes sound at about $a' = 385-7$ (a bit under a modern G), the shortest at about $a' = 411-14$ (just under modern a-flat'). Each flute thus ranges in pitch, as Quantz indicates, by an interval slightly larger than a 'major semitone', from low French chamber pitch through the varying levels of German A-pitch. These flutes therefore provide a measureable record of pitch levels that Quantz encountered, although the existing flutes play best at the lowest end of this compass.

That Quantz intended his flutes to sound their best at the lowest pitch is evidenced by his use of a single reamer for the longest middle joint. Other joints he constructed with multiple reamers to accommodate the more rapid taper necessary in shorter joints while maintaining a consistent bore diameter at the extreme ends of each joint. The relatively heavy degree of wear on the toneholes of these longest joints conforms to the amount of wear found on the heartpieces of these instruments; other signs of heavy use not found

⁴⁷Anton Mahaut, *Nieuwe manier*, p.2: 'une vis dans le bouchon'.

⁴⁸Quantz, i.9.

⁴⁹The no. 6 joint originated with an instrument marked by roman numeral II and is too close in size to the next shortest joint.

on shorter joints include tenon shrinkage and re-reaming. His preference for the low pitch probably arose among his French-speaking wind colleagues at court, as well as during the half-year spent in France, when he first began experimenting with flute design.⁵⁰ The great uniformity among the most securely attributed of Quantz's flutes permits a consistent theoretical calculation for pitch and relative cork placement (see Figure 3).

<u>Corps</u>	<u>Length†</u>	<u>Pitch (a')††</u>	<u>Cork (distance from centre of embouchure hole)</u>
No.1	188mm	387Hz	26.0mm
No.2	181mm	392Hz	26.5mm
No.3	174mm	397Hz	27.0mm
No.4	167mm	402Hz	27.5mm
No.5	160mm	407Hz	28.0mm
No.6	153mm	412Hz	28.5mm

†Length excludes tenons.

††Pitch calculated with the tuning slide extended ca. 6–7mm.

Figure 3. *Author's calculations for pitch and relative cork placement for corps de rechange*

Quantz did not sign his instruments for Frederick in the conventional way, perhaps because of restrictions placed on him by his royal employer.⁵¹ Seven of the authentic extant flutes bear maker's numbers in the form of roman numerals carved variously into the ivory cap, foot ring, or the tenons.⁵² The highest number extant is XVIII, borne by an ebony flute in Berlin (Instrumentenmuseum 5076). As noted above, the lowest extant number, II, belongs to a single surviving middle joint in the Dayton C. Miller Collection. A flute with roman numeral III turned up at auction in 1995,⁵³ and two authentic flutes uncovered by the present author during field work in Germany in 1995–6 also bear low numbers, IV and VI.⁵⁴

⁵⁰I explore the Dresden context for the development of Quantz's preferences more fully in 'Quantz and the Flute at Dresden' and in a paper read at the July 1999 meeting of the National Early Music Association, York (conference report forthcoming).

⁵¹Music composed by Quantz for Frederick II was not permitted to circulate or appear in print; moreover, Quantz was not permitted to build flutes of ebony for anyone but the King. Other instruments in the King's collection were unsigned, including one of the two Silbermann fortepianos in Potsdam and two harpsichords believed to have been built by Mietke.

⁵²Other flute makers in Prussia, including Friedrich Gabriel August Kirst (*fl.* at Potsdam, 1772–1804), used roman numerals in addition to signing their instruments.

⁵³Karlsruhe, private collection. This flute is not in the Leipzig Instrument Museum (as incorrectly indicated in Reilly, 'Quantz and the Transverse Flute', *Early Music* 25 (1997): 432).

⁵⁴See Oleskiewicz, 'A Museum, a World War, and a Rediscovery,' which describes features of a number of lost flutes as well.

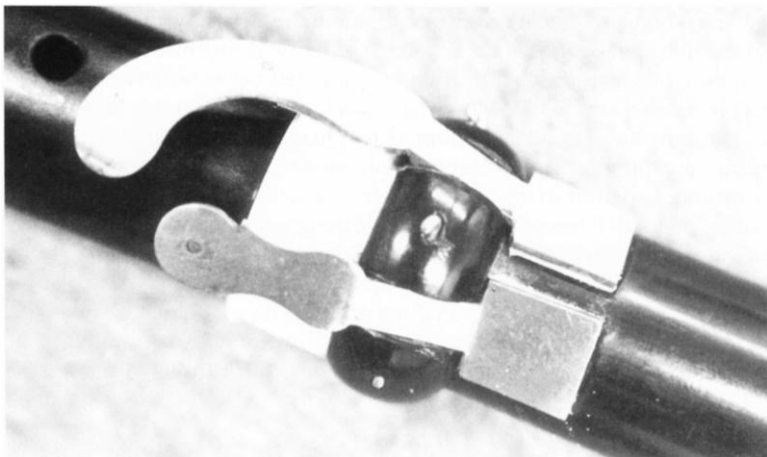


Photo 2: Quantz's two keys for D[♯] (upper) and E[♯] (lower).

One final, important detail helps to separate Quantz's design from those of his contemporaries. Many times in the *Versuch* Quantz stresses that the axis of the flute's balance should lie solely in the left hand, leaving the right hand completely unhindered.⁵⁵ This serves to free up the right hand for fast passagework and, as Quantz repeatedly stresses, permits the player to produce brilliant trills. Quantz built this balance into the flute in three ways, all affecting the amount of weight on the lower end of the instrument: (1) through the use of extraordinarily thick and heavy-duty keys (see Photo. 2); (2) by means of an unusual, wide external flare of the footjoint ending in a broad band of ivory; and (3) the combined use of an ivory mount and a brass ring on the socket of the footjoint, a method with which he may have experimented over a period of time. Originally, Quantz seems to have used only an ivory mount on the socket of the footjoint. However, a number of flutes received silver replacement mounts (repairs?) before 1871, quite possibly still in the 18th century while in Frederick's possession.⁵⁶ On flute XIII (Washington D.C.) a thick inner brass ring, not visible when the flute is assembled, is found under the usual ivory mount. Later this ivory was shaved thin and overlaid in part with silver, lending extra weight. Flute XV (Hamamatsu) also features a brass ring under ivory but no silver overlay. Flute XVII (Berlin, Kunstgewerbemuseum) has a full silver ring mount (no ivory) and an inner brass ring. Flute XVIII, the next flute Quantz made for the King, again has an ivory mount over a brass ring.⁵⁷

⁵⁵Quantz, *Versuch*, ii.3.

⁵⁶The replacement rings are quite similar in style to one another, and the content of the alloy (tested on Berlin 5076, for example) does not preclude an 18th-century origin.

⁵⁷I gratefully acknowledge Jean-François Beaudin for bringing Quantz's use of brass rings in several flutes to my attention.

The design of Quantz's instruments uniquely suits his aesthetic and technical concepts as outlined in the *Versuch*. The surviving instruments incorporate subtle features of construction that could occur only to a flautist of subtle artistic sensibility. The general uniformity of construction among the extant flutes securely attributed to Quantz lends us a guidepost for future attributions. At the same time, subtle differences between these instruments demonstrate Quantz's lifelong desire to improve and offer flexibility to his flutes within a solid basic design, one whose roots lay firmly in the early-18th-century French practices and instruments at the Dresden court. Quantz's instruments are suited not only to his own Dresden compositions but to those of other composers that he would have performed there as an orchestral musician. That these instruments continued to be used into the late 18th century for performances of many of these same works as well as other, newly composed works in Berlin has far-reaching ramifications for performing practice in Germany.⁵⁸

⁵⁸I have explored some of these issues in 'The Trio in Bach's Musical Offering: A Salute to Frederick's Tastes and Quantz's Flutes?' *Bach Perspectives* 4 (1999): pp.79–110.

Audio files containing recordings of works referred to in this paper, performed on modern copies of Quantz flutes, can be heard on the Galpin Society's website <http://www.music.ed.ac.uk/euchmi/galpin/> The author's complete recordings of these and other works of Quantz are forthcoming on the Naxos label.