A Study of Two Seventeenth-Century Teaching Manuals in Hamburg: Critical Editions and Translations of Thomas Selle's Kurtze Doch Gründtliche Anleitung zur Singekunst (c. 1642) and Heinrich Grimm's Instrumentum Instrumentorum, Hoc Est, Monochordum vel Potius Decachordum (1634)

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A STUDY OF TWO SEVENTEENTH-CENTURY TEACHING MANUALS IN HAMBURG: CRITICAL EDITIONS AND TRANSLATIONS OF THOMAS SELLE’S KURTZE DOCH GRÜNDTLICHE ANLEITUNG ZUR SINGEKUNST (c. 1642) AND HEINRICH GRIMM’S INSTRUMENTUM INSTRUMENTORUM, HOC EST, MONOCHORDUM VEL POTIUS DECACHORDUM (1634)

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ABSTRACT

Two manuscript music primers used by the Hamburg cantor Thomas Selle (1599-1663) serve as the basis for this dissertation. Bound together in the seventeenth century, these two manuscripts are the *Kurtze doch gründtliche anleitung zur Singekunst* (c. 1642), Selle's own manual outlining rudimentary theory and solmization practices, and *Instrumentum Instrumentorum, hoc est, Monochordum vel potius Decachordum* (1634), a treatise by another North German cantor, Heinrich Grimm, on the division of the monochord and its practical application for teaching music theory.

In addition to providing translations and transcriptions of the two manuscripts and accompanying critical notes, the dissertation examines topics such as the careers of both cantors, the role of music instruction in Hamburg's St. Johannis-Schule in the early seventeenth century, and a possible network of cantors and theorists surrounding Selle’s teacher, Seth Calvisius. Commentaries on the manuscripts describe the transmission, structure, and content of the texts, as well as place them within the history of German music instruction manuals.

The examination reveals that each of the manuscripts includes useful didactic methods and noteworthy features, which distinguish it from other music primers of the period. As a result, both Selle and Grimm may be viewed as more progressive educators than many of their contemporaries.
INTRODUCTION

Background

In the seventeenth and eighteenth centuries, a German cantor was expected to perform a wide range of tasks, as his position often placed him in charge of music for civic functions, as well as for multiple churches. In his *Grundlage einer Ehren-Pforte* (1740), a collection of biographies and autobiographies of German musicians, the theorist and composer Johann Mattheson characterized the duties of a German cantor in the following manner:

A cantor is a music scholar employed by the churches and the school, who teaches the youth in an orderly fashion, especially about the proper foundation for the art of singing. He must be very experienced in composing, and must provide liturgical music to the best of his ability and direct it himself in praise of the Almighty, for the edification of the common man, and for the laudable education of his pupils.¹

The multi-faceted nature of the position in the Baroque period, which Mattheson’s description clearly demonstrates, placed the cantor between the interests of Church and State, thereby creating potential conflicts. Although problems occasionally developed among the leaders of the various ministries and the cantor, the close connection between the Lutheran Church and North German civic institutions in particular gave rise to a rich musical culture.

In addition to the new musical genres and performance opportunities that emerged in Post-Reformation Germany, an increasing number of texts on music were produced, often by cantors writing instruction manuals on basic theory and performance practice for their pupils. Many texts on music may have originated as compilations of classroom notes, which perhaps partly accounts for the widespread use of material from other writers.²

One of the most prominent cantors and a dedicated tutor, Thomas Selle (1599-1663), was active in North Germany in the first half of the seventeenth century. In 1641 he became cantor of Hamburg's Lateinschule, the St. Johannis-Schule, a position which also involved the coordination of music in the city's four principal churches. During his tenure he did much to improve the quality of performances by increasing the number of musicians, reforming the regulations for choristers, and conscientiously preparing the pupils of the Latin school to sing in the city's church choirs.

In his role as music tutor Selle made use of two unpublished music manuals: *Kurtze doch gründtliche anleitung zur Singekunst* (A brief but thorough introduction to the art of singing) and *Instrumentum Instrumentorum, hoc est, Monochordum, vel potius Decachordum, ad utramque Scalam diatonam scilicet veterem, et Syntonam novam accuratè delineatum, additáque brevi declaratione* (The instrument of instruments, that is, the monochord, or rather the decachord, accurately delineated according to both the ancient diatonic scale and the new syntonal diatonic scale, and including a brief explanation). Although the two manuscripts were bound together during the seventeenth

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² John Butt, *German Education and the Art of Performance Practice in the German Baroque* (Cambridge: Cambridge University Press, 1994), 53. Butt notes that some treatises have survived in earlier manuscript and printed forms. Authors, such as Hitzler (*Extract aus der Neuen Musica*, Nürnberg: Abraham Wagenmann, 1623), also allude to the practice of using class notes.
century and both contain marginalia by Selle, the Latin manual is by another North German cantor. A second exemplar of the Latin text ascribes the work to the cantor of Magdeburg and organist of Braunschweig, Heinrich Grimm (1592/93-1637). Grimm’s manuscript presents the monochord as a useful pedagogical device and illustrates its acoustic divisions, while the former manuscript is Selle’s own manual outlining rudimentary theory and solmization practices. Progressive elements in both texts distinguish them from many other basic teaching manuals of the period.

Outline of Study

The first three chapters of the dissertation present biographical information on both Selle and Grimm, examine the historical context for the teaching manuals, and explore the nature of relationships among a group of theorists and cantors, to which both cantors may be linked. Chapter 1 provides information on each cantor’s training and career. Chapter 2 on the history of the St. Johannis-Schule discusses the role of music in the school curriculum and the interdependence of school and civic musical activities in Hamburg. Documents and letters are used to portray the experiences and concerns of a seventeenth-century cantor, especially Selle's letters to the Hamburg City Council. Chapter 3 investigates the circle of theorists and cantors connected to Seth Calvisius, Selle’s own teacher.

In Chapter 4 the two manuals are discussed with respect to transmission, structure, content, and the German tradition. Sources named in the manuals by Selle and Grimm provide a greater understanding of their content, and how the two cantors diverge
from or ally themselves with other writers in the Calvisius circle. An important aspect of this examination concerns the nature of Selle’s and Grimm's respective contributions to music education.

Two appendices follow the discussion of the manuals. Appendix A is a brief note on issues concerning the translations. Appendix B contains the translations and transcriptions of the Anleitung zur Singekunst and Instrumentum Instrumentorum, hoc est, Monochordum. To facilitate an examination of the manuals, the transcriptions have been placed on the verso side of the pages, and the translations on the recto side.

**Review of Research**

Four dissertations on Thomas Selle and his works have been written by German authors, but none contains a thorough investigation of the manuals. The most comprehensive of the three, which includes a biography and an examination of Selle's sacred compositions, was written by Siegfried Günther in 1935. A 1957 dissertation by Joachim Birke also covers liturgical music, namely, Selle's settings of the Passion, while Thomas Detlef discusses the cantor’s secular music in his 1992 dissertation. In another more recent dissertation on Selle, Joachim Schmedes examines the cantor’s role in the development of the oratorio passion.

There are fewer studies on Heinrich Grimm and his works. Until recently, Hermann Lorenzen’s 1940 dissertation, Der Cantor Heinrich Grimm (1593-1637). Sein Leben und seine Werke mit Beiträgen zur Musikgeschichte Magdeburgs und Braunschweigs, was the only longer examination on Grimm. Thomas Synofzik’s Heinrich Grimm (1592/93-1637): “Cantilena est loquela canens.” Studien zu Überlieferung und Kompositionstechnik, published in 2000, offers a more complete
picture of the cantor’s biography, as well as important documentation about the transmission of his music.

Other information on Selle's work in Hamburg, both in the churches and the Johannis-Schule, may be found in a 1933 archival study by Liselotte Krüger, *Die hamburgische Musikorganisation im XVII. Jahrhundert*. Although Krüger presents many primary sources in her work, she does not examine the two handbooks. Jürgen Neubacher’s *Die Musikbibliothek des Hamburger Kantors und Musikdirektors Thomas Selle (1599-1663)*, published in 1997, offers new information on source material since the reunification of Germany.

The most thorough survey of seventeenth-century elementary manuals appears in a dissertation written in 1924 by Eberhard Preußner, *Die Methodik im Schulgesang der evangelischen Lateinschulen des 17. Jahrhunderts*. Despite the breadth of Preußner's study, the two theoretical works attributed to Selle are not discussed. Most recently, John Butt has provided a general survey of music education at seventeenth-century Lateinschulen in his book *Music Education and the Art of Performance in the German Baroque* (1994), the first extensive publication on the subject in English. In *Deutsche Musiktheorie des 15. bis 17. Jahrhunderts* (1994) Werner Braun has noted the connection between the Hamburg exemplar of the Latin manual and the copy bearing the ascription to Grimm. Braun has also included a section on seventeenth-century treatments of the monochord and placed the Latin manual within this tradition. Braun's discussion of the primer, however, like Amalie Arnheim's 1910 article on Selle's manual, *Thomas Selle als Schulkantor in Itzehoe und Hamburg*, merely provides an introduction to the issues. Neither author truly delves into the content of the manuals, nor do they illustrate the
progressive aspects of the cantors' respective pedagogical approaches. Thus, in effect, virtually nothing has been written on these two manuscripts.

Since few English studies on German *Lateinschulen* or even translations of elementary teaching manuals have been published, editions of the two manuscripts will be useful to scholars in the fields of German music history, as well as in music education or theory. In American music scholarship, the tendency has been to stress the performance and composition of music by German cantors rather than their work as music educators. Given the close relationship that existed between education and practice, it is essential that this important aspect of a cantor's work be sufficiently investigated. Thus, an examination of the contributions of progressive music tutors such as Selle and Grimm will greatly enhance our understanding of how music was taught, perceived, and performed in seventeenth-century Germany.
CHAPTER 1

BACKGROUND AND BIOGRAPHIES

Thomas Selle (1599-1663)

Although Thomas Selle was regarded by his contemporaries as one of the foremost German composers of his time, little is known about the cantor’s early life and education. Some information may be gleaned about Selle’s youth, however, from a few documents written prior to his tenure in Hamburg (1641-1663) and information found in later works, such as the preface to his Opera omnia.¹

A portrait of Selle engraved by Dirk Dircksen in 1653, perhaps to commemorate the completion of the cantor’s Opera omnia in the same year, reveals that Selle was born on 23 March 1599. He grew up in Zörbig, a small village located about twelve miles northeast of Halle. Sometime prior to 1615 Selle probably became a pupil at the Thomasschule in Leipzig, where he would have worked with the renowned cantors Seth

Calvisius (1556-1615) and Johann Hermann Schein (1586-1630).² It seems likely that Selle attended the Thomasschule until he began studying at the University of Leipzig in the summer term of 1622. No records indicate the subject of his studies, but it was not uncommon for an aspiring seventeenth-century cantor to study rhetoric, philosophy, and music theory.³ Selle may well have had advanced training in Latin since his later cantorial duties involved teaching the language.⁴

In 1624 Selle became a tutor at a school in Heide in the region of Holstein. While little is known about the musical life of the area in the early seventeenth century, there is no doubt that it could hardly compare to the opportunities available in Leipzig. By the time Selle assumed the position in Heide, he had already published at least one polyphonic work.⁵ Two collections of three-part secular vocal works, as well as a few single pieces composed for weddings, were printed in 1624.⁶ In the prefaces of the two collections, Selle described his musical and poetic talents as “God-given” and noted that

² In the Objectio of his Anleitung zur Singekunst Selle mentions that he has been motivated by Calvisius for the past 28 years. While it is possible Selle could have been inspired by the theoretical works of Calvisius rather than a professional encounter with him, other evidence suggests that Selle was a pupil at the Thomasschule under both Calvisius and Schein, his successor. For example, many of Selle’s compositions contain stylistic traits common to Schein, and Selle seems to have used the Leipzig choir as a model for the Hamburg Cantorei.


⁴ Selle also composed Latin verses for some of his musical works. For example, we know from the preface that the poems of an early anthology, Concertatio Castalidum, hoc est Musicalischer Streit (Hamburg: Hering, 1624), were written by Selle.

⁵ Thomas Selle, Drey schöne Ding (Rostock, 1623). Although this print is no longer extant, it is apparent that the work was published in Rostock. In 1910 Amelie Arnheim reported that an extant manuscript copy of the print included the following comment in the composer’s own hand: “Ist gedruckt gewesen zu Rostock 1623, weil aber alle Exemplaria damals distrahiret, ist dieses geschriebene an dessen statt hingelegt.”

he had devoted himself to music since his youth. He also called the pieces in the collections, however, “the works of a beginner.” Nevertheless, his reputation among his colleagues in Heide appears to have been quite good, as several of them composed Latin verses in his honor for the two anthologies.\footnote{For example, one poem was written by Jacob Praetorius, organist in Heide during Selle’s tenure there.}

Selle remained in Heide for only one year, perhaps due to the more attractive professional opportunities afforded by his next appointment. In 1625 he moved to neighboring Wesselburen to become a school rector, a prominent position to hold at age twenty-six. Four years later he married Anna Weihe.\footnote{Two wedding songs in honor of Selle’s marriage, one by Matthaeus Swant and the other by Mathias Ebio, document the event. For more information on the compositions, see Arnheim, 38-9.} Selle worked in Wesselburen for nine years, during which the region suffered greatly from the effects of the Thirty Years’ War and the plague.\footnote{Since the conflict between Denmark and lower Saxony erupted in 1625, the effects of the Thirty Years’ War were felt earlier in the northwestern region of Germany. Although Dithmarschen, the district for Wesselburen, was not affected by any military actions directly, the residents nevertheless experienced severe famine and plundering even well after the peace treaty of 1629 was signed.} Doubtless, one may attribute the large number of works for small ensemble Selle wrote in the 1630s to the limited musical resources available to him then.\footnote{For a comprehensive discussion of Thomas Selle’s compositions during the Thirty Years’ War, see Barbara Wiermann’s “Musik zu Zeiten des Dreißigjährigen Krieges: Thomas Selles Schaffen in Wesselburen” in Thomas Selle (1599-1663): Beiträge zu Leben und Werk des Hamburger Kantors und Komponisten anläßlich seines 400. Geburtstages (Herzberg: Traugott Bautz, 1999), 243-57.} Indeed, Selle and many other German composers of the era, such as Schütz, complained in the prefaces to their works that the war was disturbing the musical life of their respective regions.\footnote{In the preface to his first collection of sacred works, Selle described the situation in the area in the following terms: “Also gehet es auch heutiges Tages allen Geistlichen Israeliten vnd frommen Christen denn weil dieselben zu diesen gefährlichen vnd beschwerlichen zeiten nach Gottes Gerechten willen der Sünden halben von den Röhmischen vnd WiderChristlichen Babylonien sehr werden gedrungen beleidigt verfolget gestückt vnd gepflöckt hin vnd wieder an allen Orten vnd enden […] also höret man auch an statt der Orgeln Harpffen Lauten vnd dergleichen Instrumenten fast nichts anders als Heertrummeln Mußquetten etc. an statt der heiligen Lobgesänge vnd KirchenPsalmen fast nichts anders als Heulen Winseln vnd Wehklagen.” Thomas Selle, \textit{Hagio-Deca-Melydrion}, voice part II (Hamburg, 1627), preface. See also Heinrich Schütz, \textit{Kleine geistliche Konzerte}, II (1639), preface.} Generally speaking, Selle began composing more sacred
music in this period. While working in Wesselburen, Selle also became acquainted with the Lutheran pastor and poet Johann Rist (1607-67), with whom he maintained a lifelong friendship and collaborated on several works.\textsuperscript{12}

The city officials of Itzehoe, located forty-two miles northwest of Hamburg, asked Selle to audition for the position of cantor in February 1634. This invitation may have come as a result of a familiarity with Selle and his work, since the cantor had apparently spent some time in Itzehoe. Indeed Selle indicated in the preface to his \textit{Monomachia harmonico-latina II} that the work was completed in Itzehoe in 1630, four years before he assumed the position of cantor there.\textsuperscript{13} On 2 March 1634 Selle was offered the position in Itzehoe officially, and he relocated two months later.\textsuperscript{14}

Within one and a half years Selle had published no fewer than five anthologies, two containing secular works and three containing sacred pieces. The greater financial rewards associated with the new position probably allowed Selle to publish works he had composed earlier in Wesselburen. Although Selle was certainly occupied by the numerous duties associated with the position of cantor, he was able to compose and publish more works during his tenure in Itzehoe.

\textsuperscript{12} Selle apparently met Rist in about 1630. According to the preface of Rist's \textit{Neue Musikalische Fest-Andachten} of 1655, he and Selle had been good friends for twenty-four years. For this anthology and the \textit{Sabbathische Seelenlust} of 1651, Selle composed 110 melodies with basso continuo. Johann Rist, \textit{Neue Musikalische Fest-Andachten} (Lüneburg: Johann and Heinrich Stern, 1655).

\textsuperscript{13} The preface reads “Izehoae Holsatorum ipsa Dominica Trinitatis Anno 1630.” Thomas Selle, \textit{Monomachia harmonico-latina [...] congressus posterior}, manuscript, Staats- und Universitätsbibliothek Hamburg, ND VI 491, 2.

\textsuperscript{14} Karl Seitz, \textit{Aktenstücke zur Geschichte der frühen lateinischen Schule zu Itzehoe II} (Itzehoe, G. I. Pfingsten, 1889), 51-53. In the official invitation, the mayor said the following about the audition and assumption of cantorial duties: “...wan wir dan an deßen Artis Musicae heute erwießener proba ein begnüegen getragen, vnndt dannenhero denßelben in Cantorem hujus Scholae unanimiter elegiret, Alß wollen wir denßelben zu besagtem Cantorat, Selbiges officium vff baldt einstehende Ostern würglich anzutreten . . . .”
According to the 1620 school schedule for Itzehoe, which would have been applicable during Selle’s tenure, the cantor was responsible for directing the music in St. Lawrence’s Parish Church on Sundays, feast days, Wednesdays, Fridays, and Saturdays.\textsuperscript{15} His duties in the Latin school included teaching religion, Latin and Greek grammar, and literature, as well as lessons in music.\textsuperscript{16} In keeping with the normal procedure in many seventeenth-century Latin schools, the cantor was the only instructor who taught music theory to students in the upper grades and prepared performances of polyphonic choral music.\textsuperscript{17} In the case of the lower grades, however, the cantor did not have the sole responsibility for music instruction. For example, the subrector in Itzehoe was scheduled to teach sight-singing to the younger pupils, while the cantor rehearsed polyphonic vocal works with the upperclassmen. The cantor was also required to instruct the younger pupils in the other aforementioned areas when he was not occupied with music lessons for the older ones.

As a lengthy letter written to the city leaders of Itzehoe in 1639 reveals, the cantor occasionally had to deal with other issues besides academics among the pupils, such as discipline problems and interpersonal matters. In his letter, Selle complained about a group of wicked boys whose antics had so offended the cantor and his assistants that they could no longer be tolerated. Selle listed each boy and his father, if he knew the name, and then described a series of unpleasant incidents. Apparently, one of the boys, after

\begin{thebibliography}{99}
\bibitem{15} The \textit{Schulordnung} of 1620 is found in Karl Seitz, \textit{Aktenstücke zur Geschichte der früheren lateinischen Schule zu Itzehoe} I (Itzehoe: G. I. Pfingsten, 1888), 43-56.
\bibitem{16} In the case of literary works the cantor discussed texts, such as Erasmus’s \textit{De civilitate morum puerilium} (\textit{On Civility in Boys}) of 1526.
\bibitem{17} Livingstone, \textit{The Theory and Practice of Protestant School Music in Germany as seen through the Collection of Abraham Ursinus} (ca. 1600), 411.
\end{thebibliography}
being punished for disturbing Mass on the previous Sunday, had planned to get back at Selle by throwing a rock at the cantor as he left the church. Another pupil fortunately disclosed the scheme, and Selle was spared a blow to the head. He then requested that the boy remain with his father during the church service. The next Sunday, however, the father responded by criticizing Selle for the manner in which his son had been punished and then threatened to report the incident to the mayor. The other boys who had disrupted Mass were even worse at Vespers later that day. They refused to obey the cantor and chastised the organist by calling him “the little black thief.” As soon as the sermon ended, they rushed to the choir exit and started pushing one another. This sort of behavior continued later in the week as well, so Selle reprimanded the boys again. In turn, the boys wrote in chalk on the sexton’s door that Selle was “the cantor of the black thief.” Unfortunately, the insult had to be covered with a small board. After reporting the incidents and other information to the city officials, Selle requested that a formal letter be written and circulated for his own protection.\textsuperscript{18} Although no letter of this sort has remained extant to document an official reply, Selle did continue his duties as cantor of Itzehoe for nearly two more years.

When Selle became cantor of Hamburg’s Latin school, the St. Johannis-Schule, on 12 August 1641, it was one of the most prestigious positions for a protestant church musician to hold.\textsuperscript{19} Not only was Hamburg one of the most populous cities in seventeenth-century Germany with resources available to support a thriving musical life, it was largely spared the horrors of the Thirty Years’ War. Aside from the obvious

\textsuperscript{18} Karl Seitz, \textit{Aktenstücke zur Geschichte der früheren lateinischen Schule zu Itzehoe} II, 53-7.
\textsuperscript{19} The school was also referred to as the Johanneum, as it is today in much secondary literature.
financial advantages afforded Hamburg as a port city and member of the Hanseatic League, the main reason for the city’s economic stability during this turbulent period was a policy of neutrality with respect to various European powers. Secondly, the leaders of Hamburg had begun constructing a formidable wall prior to the onset of the war in 1618. As a result of the security afforded by the political measures and the strong fortification around the city, many wealthy refugees settled in Hamburg in the early seventeenth century and generated further prosperity.\textsuperscript{20} While there were many opportunities for musicians to perform secular music during this period of growth, the most significant developments occurred in church music in the first half of the seventeenth century. The fact that most of the city’s churches had to expand or build new choir stalls and galleries for instrumentalists between 1600 and 1630 attests to the rise of sacred music performance in Hamburg at the turn of the century.\textsuperscript{21}

As cantor at the St. Johannis-Schule, Selle was responsible for the liturgical music in Hamburg’s four main churches—St. Petri, St. Nikolai, St. Catharinen, and St. Jakobi—and the cathedral, as well as for music instruction at the school itself. During his tenure in Hamburg, Selle composed over two hundred pieces, many of them sacred vocal works written for the Hamburg churches. Indeed, all but five of Selle’s sacred compositions can be considered works for the Lutheran liturgy.\textsuperscript{22} Selle’s best-known work is probably his


\textsuperscript{22} Günther, 39.
Johannespassion (1641/43), which was the first oratorio Passion performed with instrumental interludes.  

Generally speaking, Selle’s musical style may be described as eclectic. Many scholars have noted the influence of Johann Hermann Schein and Michael Praetorius (1571-1621). Like Schein, Selle composed both traditional cantus firmus concerto settings and more progressive free concertos with typically Italianate features. Also, Selle’s use of varying performing forces, polychoral techniques, and instrumental music to articulate clear vocal forms is reminiscent of Praetorius.

The cantor organized music instruction for grades one to eight at the St. Johannis-Schule. Along with his assistants, or preceptors, the cantor taught rudimentary music theory and choral music. In particular, the pupils of the St. Johannis-Schule were trained in the art of contrapuntal vocal music, since they were expected to perform musica figuralis in the city’s churches several times a year. When the Akademisches Gymnasium was founded for older pupils in August 1613, the cantor had more mature voices at his disposal for lower voice parts. The increased number of singers also allowed him to perform even more contrapuntal choral works.

Shortly after his arrival in Hamburg, Selle began petitioning the city officials for more resources to improve the quality of musical performances. In a letter written to the town council in January 1642 Selle reported that he needed ten well-trained singers for

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23 Ratte, 226-228. The St. John Passion is scored for three soloists, five-part chorus, solo violin, a five-part orchestra, and basso continuo. The Evangelist is accompanied by two bassoons during his recitative passages.


25 In 1608 the number of performances of contrapuntal music was increased from six times a year to once a month in each of the main churches. Krüger, Die hamburgische Musikorganisation im XVII. Jahrhundert, 50-51.
concerted music, sixteen singers for motets, and, in addition to the pupils of the St. Johannis-Schule and the Gymnasium, singers from the orphanage for works requiring large musical forces.26 He also persuaded the town council to employ a standing group of eight singers and provide them with room and board. This group, known as the Kantorei, assisted Selle with the copying of scores and parts, as well as with rehearsing and performing music. Selle developed elaborate rules to govern both the Kantorei and instrumentalists for liturgical music, as a series of extant letters written between 1642 and 1650 reveals.27 Furthermore, Selle’s enthusiasm for improving musical performances in Hamburg no doubt motivated him to compile his own teaching manual, Kurtze doch gründtliche anleitung zur Singekunst, for the pupils of the St. Johannis-Schule in about 1642. Due to all of Selle’s efforts, performances of liturgical music became an outstanding aspect of Hamburg’s cultural and religious life, an achievement which inspired other north German cities even after Selle’s death—presumably from the plague—in 1663.

26 StAH, 361-1 Scholarchat V 1 c, fol. 4r. “Weil die kirchen in Hamburg weitleufftig vnd groß sein, vnd die gantzte Crafft der Music auf dem Texte beruhet, Allß hat zur Concertat=music der Cantor höchst von nöhten 2 Bassisten, 2 Tenoristen, 2 Altisten, vnd 4 Discantisten, vnd diese müßen aufs wenigste, fertig, Manierlich vnd fein reine singen vnd die worte fein deutlich au[s]sprechen können. Zu Muteten müßen derer noch einmahl so viel sein, wo anders die music sol krafft haben. Allß 4 Bassisten, 4 Tenoristen, 4 Altisten 4 Discantisten vnd dieselben müßen auch alle fertig vnd reine singen können. Zur vollen Capella zubesetzen werden genommen; groß= vnd kleineSchüler aus der Schule; Item die Gymnasiasten, die in etwas singen können, wie auch die knaben aus dem weisenhause.”

Heinrich Grimm (1592/93-1637)

Heinrich Grimm was a well-known composer, theorist, and cantor during his lifetime. Unfortunately, many original documents pertaining to Grimm’s biography and oeuvre were lost when the city of Magdeburg, where he was active as cantor from 1617 to 1630, was destroyed during the Thirty Years’ War. Nevertheless, it is possible to reconstruct a basic outline of Grimm’s life and career through his connections to other theorists and from recently discovered musical concordances.28

Grimm was one of at least twelve children of Michael Grimm, a tailor from Holzminden.29 Grimm’s date of birth can be established through a connection to his music teacher, Michael Praetorius. In the Preface to Volume V of his Musae Sioniae (1607) Praetorius names Grimm as the composer of one of the motets and calls him “my fourteen-year-old pupil.”30 It is not altogether clear where Grimm studied with Praetorius, since the latter traveled extensively, often remaining in one location for longer periods, while working for the Duke of Braunschweig-Wolfenbüttel. If Grimm did study under Praetorius in Wolfenbüttel, he may have been a chorister in the court chapel there.


29 Lorenzen, 9.

Enrollment records at the University of Helmstedt indicate that Grimm began his university studies in philosophy (and probably theology as well) in 1609.\footnote{Lorenzen, 10.}

In 1617 Grimm’s name appears in a family album, in which he refers to himself as cantor of Magdeburg \textit{pro tempore}.\footnote{Synofzik, 2.} As the church records for the period from 1616 to 1618 are missing, it is possible that Grimm assumed the position of cantor in 1616. Thomas Synofzik and others have suggested that Grimm may have received some assistance from Praetorius in managing his duties during the early years of his Cantorat. Praetorius was working for the Bishop’s administrator in Halle at the time, so he would have been in close proximity to Magdeburg.\footnote{Ibid., 3.} Moreover, it is likely that Praetorius, Heinrich Schütz, and Samuel Scheidt were involved in the reorganization of the music at Magdeburg cathedral, which would also support the notion that Praetorius continued to assist his pupil.\footnote{Ralph-Jürgen Reipsch. \textit{Heinrich Grimm (1593-1637): Kantor – Komponist – Theoretiker}. (Magdeburg: Stadt Holzminden, 1993), 6.}

Grimm’s first music publication in Magdeburg, \textit{Threnodia, das ist, Der klägliche und doch trostreiche Bet-Psalm des Königlichen Propheten Davids}, appeared in 1618. In another publication of a motet from 1618, \textit{Ach Herr, straff mich nicht}, Grimm is designated as \textit{musicus} instead of cantor, which was probably used to indicate that Grimm was an accomplished musician and composer.\footnote{Synofzik, 1-3.} One year later Grimm married Martha Brand. His predecessor as cantor, Friedrich Weißensee, composed a motet in their honor for the wedding.\footnote{Reipsch, 5.}
Between 1617 and 1631, the year that Magdeburg was besieged and destroyed by imperial troops, Grimm served as cantor at the Altstadt Gymnasium in Magdeburg. He was responsible for instructing the fourth- and fifth-grade pupils of the school in music, and for organizing the music at two main churches, St. Johannes and St. Jacobi. Once a month, he was expected to lead his pupils in performing contrapuntal choral music in the cathedral, for which he received a salary increase of 20 Talers in 1620. During this period, Grimm published a number of anthologies for both school and church use, as well as most of his extant theoretical works. His pieces include a variety of genres of seventeenth-century Protestant church music, such as motets, concerted sacred works for two and three voices, and chorale arrangements, but no secular music.

When Grimm was forced to flee Magdeburg, he and his family were escorted to safety by a Jesuit priest. Grimm must have spent some time in Hamburg thereafter, since his name appears in the financial records of St. Catherinen Church, and his anthology of two-part sacred concertos, *Probi patentia Jobi*, was dedicated to the Hamburg City Council and published in 1631.

Since he was not able to find satisfactory employment in Hamburg, Grimm turned to an old school friend in Braunschweig for assistance. Although Grimm was not successful in obtaining the position of cantor at St. Katharinen Church in Braunschweig,

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37 Synofzik, 4; Reipsch, 6.
38 Reipsch, 8.
40 Synofzik notes that Grimm’s friend and cantor of the Martinum in Braunschweig, Conradt Huhstedt published Grimm’s *Vestibulum hortuli harmonici sacri* of 1643 posthumously. Synofzik, 5.
he appears to have been welcomed at court by Duke Friedrich Ulrich. He also did freelance work in the city as a composer and musician, particularly for two of the main churches, St. Michaelis and St. Martini.\textsuperscript{41} By the end of the year 1632 Grimm had finally secured a position as organist at St. Andreas Church.\textsuperscript{42} Despite the fact that Grimm was not active as cantor in Braunschweig, as has been suggested by Lorenzen and others, Grimm must have continued to teach.\textsuperscript{43}

Two renowned theorists, Otto Gibel and Konrad Matthaei, studied under Grimm while he was in Braunschweig. Both pupils offer information about Grimm’s theoretical works: Gibel indicates in his \textit{Bericht von den Vocibus Musicalibus} where Grimm’s treatise on solmization, which was thought to be lost until recently, actually appears, namely as a part of the latter’s anthology \textit{Tyrocinia seu Exercitia Tyronum musica},\textsuperscript{44} and Matthaei mentions a manuscript German version of the monochord treatise in his \textit{Bericht Von den Modis Musicis}.\textsuperscript{45}

When Duke Friedrich Ulrich died in 1634, Grimm dedicated his treatise \textit{Instrumentum Instrumentorum, hoc est, Monochordum} to the Duke’s successor, perhaps in hopes of obtaining a position as cantor. Since the manual was designed in conjunction with a decachord Grimm had designed prior to leaving Magdeburg, it is likely that an

\begin{footnotesize}
\begin{enumerate}
\item Ibid., 5-6.
\item Lorenzen, 30.
\item Heinrich Grimm, \textit{Tyrocinia seu Exercitia Tyronum musica} (Halle, 1624, 2\textsuperscript{nd} ed. Leipzig: Johann Francks Erben, Samuel Scheib, 1632). The solmization treatise is entitled \textit{Kurzer Unterricht, Wie ein junger Knabe zum Solmisieren leicht angeführt werden könne}.
\item Konrad Matthaei, \textit{Kurzer, doch ausführlicher Bericht Von den Modis Musicis} (Kalingrad: the author, 1652; Johann Reusner, 1658), 10-12. No German version of the treatise has been found, however.
\end{enumerate}
\end{footnotesize}
earlier version of the monochord treatise existed a few years before the dedication was
made to the new duke.

Due to illness, Grimm resigned from his position as organist of St. Andreas
Church in 1637. He died on 10 July 1637. Unfortunately, many documents related to his
tenure as cantor of Magdeburg, as well as many compositions, have been lost. Through
extensive archival work, Thomas Synofzik has been able to reconstruct and locate some
of Grimm’s compositions, and to provide a more accurate picture of Grimm’s biography.
CHAPTER 2
THE ROLE OF MUSIC INSTRUCTION AT THE ST. JOHANNIS-SCHULE

As a port city and member of the Hanseatic League, an organization established in the Middle Ages to foster trade in Europe, Hamburg had a culture that was largely shaped by a dominant merchant class comprised of people of various ethnic backgrounds. Contrary, perhaps, to what one would expect from a society largely oriented towards pecuniary matters, the upper-class citizens of Hamburg highly valued education, culture, and intellectualism. In fact, the changing fortunes of the merchant class probably engendered the attitude that a good education was essential for becoming a successful businessman. At the end of the eighteenth century, for example, one writer noted the following about the upper-class bourgeoisie in Hamburg:

The first…class is made up of those who—as the most highly respected and most affluent citizens—not only carry the greatest weight in the [affairs of] state, but also whose entire education has been refined through travel, polished by erudition and by frequent association with foreigners of all positions in society. In their domestic lives as well as in their social gatherings they are acquainted with the grand style, and which one would otherwise attribute exclusively to the smaller and larger residences, the court, the nobility and that which is connected with it. In this case, however, one must naturally subtract the inanity and vacuity which normally accompanies this bon ton at the court and in aristocratic circles.

1 Die erste…Classe machen diejenigen aus, die nicht allein als die angesehensten und wohlbabensten Bürger im Staate das mehreste Gewicht haben, sondern auch deren ganze Bildung schon verfeinert durch Reisen, häufigen Umgang mit Fremden aus allen Ständen und auch durch Lektüre abgeschliffen ist, die sowohl im häuslichen Leben, als auch in gesellschaftlichen Cirkeln mit allem dem bekannt und vertraut sind, was man gewöhnlich zum grossen Ton rechnet, den man in kleinen und grössem Residenzen dem Hof, dem Adel und was sich diesem anschliesst, ausschliesslich zuschreibt, wovon man hier aber natürlicher Weise das Leere und Fade abziehen muss, was gewöhnlich an Hofe und in adligen Cirklen diesen bon ton zu begleiten pflegt. Johann Arnold Minder, Briefe über Hamburg (Leipzig: Johann Samuel Heinsius, 1794), quoted in and translated by Brian Douglas Stewart, 58.
Due to the lack of a ruling aristocracy in Hamburg or a dependence on any principality, its citizens were able to participate in governmental affairs to a great extent. The city council, the *Senat* or *Rat*, was the governing body that wielded the most political power. Members of the *Senat* were usually successful merchants named by their peers to join the council. While the *Senatoren* and *Ratsherren* were not democratically elected officials, they were legally prohibited from holding titles of nobility. Moreover, the *Bürgerschaft*, one of Hamburg’s many citizens’ assemblies, exercised complete control over the city treasury from 1562 through the eighteenth century. Although the assembly could not initiate legislation, the *Senat* could not mandate a new law or levy taxes without its consent.²

Hamburg’s educational institutions were regulated by a Board of Education known as the *Scholarchat* or *Collegium Scholarchale*.³ Founded in 1610, the board was comprised of four *Senatoren*, the rectors of the four main churches, and the *Oberalten*, a group of the three most senior deacons from each parish.⁴ These officials addressed all matters pertaining to the Cantor within their purview, as well as determined the nature and manner of instruction at both the St. Johannis-Schule, a Latin school for boys, and the *Akademisches Gymnasium*. The latter institution was established in 1613 and functioned as a preparatory school for university studies.⁵ It was housed in the same

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² Ibid., 32-35. It is also noteworthy that membership in Hamburg’s city council depended on economic rather than social status. There was a significant amount of social mobility in Hamburg, which distinguished it from much of the rest of Germany.

³ Although the *Scholarchat* was formally established in 1610, the Lutheran reformer Johannes Bugenhagen provided for a governing body that included basically the same officials in article three of his *Kirchenordnung* of 1529.

⁴ When the cathedral church, St. Michaelis, became a parish in 1685, the number of rectors and *Oberalten* increased accordingly.

⁵ Hamburg did not have a university itself until 1919.
building as the St. Johannis-Schule, and shared some of the same instructors. Subject to the approval of the city council, all teachers for the Latin school were selected by the [Scholarchat](#). Normally, however, the school’s rector could suggest candidates for consideration and vote on their selection. Questions not directly within the scope of the [Scholarchat](#), such as those concerning salary increases and certain administrative issues, were handled either by the [Senat](#) or the appropriate ministries.

The founding of the St. Johannis-Schule occurred in conjunction with the Reformation, formally initiated in Hamburg by the Lutheran theologian Johannes Bugenhagen (1485-1558) with the [Senat](#)’s approval in 1529. As he had for other North German cities, Bugenhagen wrote a constitution for Hamburg, as well as new sets of regulations for both its churches and its schools. His [Schulordnung](#) of 1529 provided the basis for the establishment and organization of the St. Johannis-Schule. Due to its central location in the city between the four main churches, the former St. Johanniskloster was chosen to house the new Latin school in the same year. The Latin school, which had initially offered education through grade five, was expanded to include grades six

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7 Ibid., 139-40.
8 Although the constitution of 1529 relied on previously established organizations and ordinances, Bugenhagen’s document created a framework for governing the city that lasted for at least 330 years. For more on the history of early modern Hamburg, see Joachim Whaley’s *Religious Toleration and Social Change in Hamburg 1529-1819* (Cambridge: Cambridge University Press, 1985).
9 Edmund Kelter, *Hamburg und sein Johanneum im Wandel der Jahrhunderte: 1529-1929* (Hamburg: Lütchke & Wulff, 1928), 11. The cloister, which was originally built in 1227 and rebuilt in 1314, had previously been home to Dominican monks. When the school was founded, the monks were asked to relocate either to the Marien Magdalenenkloster or the Hospital zum heiligen Geist.
through eight. The school also underwent a reorganization in 1629, when the renowned scientist Joachim Jungius became its rector. Instruction was offered in Latin, Greek, German, logic, religion, and music after the reorganization, and other subjects were added in the eighteenth century. Although instructors at the school were employed by the city, they received an additional honorarium from each pupil. Children from poor families were not required to pay the instructors’ fees, however, and their books were supplied by the city.

As the various sets of regulations for the St. Johannis-Schule indicate, music instruction and participation in musical ensembles comprised an important part of the school curriculum. In keeping with Bugenhagen’s Schulordnung, boys of all ages and abilities were trained in musica choralis—unmeasured unison singing—and musica figuralis—contrapuntal choral music. Also, the medieval tradition of singing Latin hymns at the beginning and end of each school day was maintained. Advanced pupils studied the rudiments of music theory and may have learned how to play certain instruments on a private basis.

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10 At the turn of the seventeenth century, about 900 pupils attended the school. Krüger, Die hamburgische Musikorganisation im XVII Jahrhundert, 7.
11 The amounts teachers received from their pupils are listed in the Schulordnungen. For transcriptions of the various school regulations, please see Richard Hoche, Die Ordnungen der St. Johannis-Schule im 16., 17. und 18. Jahrhundert, Beiträge zur Geschichte der St. Johannis-Schule in Hamburg, III (Hamburg: s.n., 1879).
13 According to a fragment written near the end of the seventeenth century entitled Von der methodischen und füglichen aufeinander folgenden Arbeit der Schulen zu St. Johannis the cantor held “Privatstunden,” which one could perhaps interpret as private lessons on instrumental music. See Staatsarchiv of Hamburg, File 361-1 (Scholarchat), III 1 (Acta Scholastica I), 49. It certainly was common in other North German cities for students to take private lessons with teachers outside of the Latin or advanced schools, as well as with the cantor.
During most of the seventeenth century, the *Schulordnung* of 1634 determined the organization of the curriculum at the St. Johannis-Schule. \(^{14}\) With respect to music instruction, it outlined in great detail how applied music was taught in each grade and who assumed responsibility for each lesson. The cantor generally organized music instruction for all eight grades in the school, but primarily taught basic music theory and the singing of contrapuntal works to the advanced pupils. Prefects instructed the younger pupils in the art of psalm singing. According to the 1634 ordinance the prefects taught the middle three grades in the following manner:

In the first hour the pupils of the third, fourth, and fifth grades meet jointly, and then the choral music is taught and practiced by putting the musical notation for an antiphon or a response on the board. Occasionally a German psalm or sacred song that has been written up on the board in notes is sung. The three prefects of the upper-level grades perform this task in alternation every week. \(^{15}\)

Choral music was also rehearsed on Saturdays from 2:00 to 3:00, and the pupils were to attend the session led by the prefect in charge of the church choir to which they were assigned. \(^{16}\)

With the exception of Wednesday, music was taught between 1:00 and 2:00, Monday through Friday. During this hour the two lowest grades practiced singing psalms with a prefect, while the middle three grades rehearsed choral works. At the same time

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\(^{14}\) The 1634 *Schulordnung* is found transcribed in Hoche III, 66-113. In 1643, a supplementary set of rules was added to the 1634 ordinance. A section containing seven points concerning the *Cantorei* was included in the supplement.

\(^{15}\) Hoche III, 92. “Die erste Stunde rücken die Schüler des vierten, fünfften vnd sechsten Schulhauffens zusammen vnd wird alsdann die Choral-Musik gelehret vnd geübet, also dass eine Antiphona oder Responsorium mit Choralnoten an die Taffel gescrieben wird. Unterweilen wird auch ein Teutscher Psalm oder geistlich Lied, das mit musikalischen Noten an die Taffel gezeichnet ist, gesungen. Diese Arbeit aber verrichten nacheinander die drei Praeceptores obgedachter Schulhauffen vnd solche ein jeglicher eine Woche vber.” Grades in the St. Johannis-Schule and other German schools were numbered in reverse order in comparison to modern practice (e.g. the “eighth class” corresponded to the first grade and the “first class” to the eighth grade). The translation reflects modern usage and word order.

\(^{16}\) Ibid., 81.
the sixth, seventh and eighth-grade pupils studied music theory on Monday and Tuesday, and rehearsed with the cantor on Thursday and Friday. The eighth-graders did not, however, have to attend the theory sessions on Monday and Tuesday. Instead they were to study the works of the Roman historian Cornelius Nepos or rehearse again with the cantor when he was not otherwise engaged with theory. The planned curriculum was executed as follows:

From 1:00 to 2:00, the cantor is occupied with music [instruction]. Namely, in the first three months after exams have been administered, he explains the rules of music on Mondays and Tuesdays to the sixth and seventh grade pupils. For this, he uses the summary on music of Erasmus Sartorius to teach the beginners gradually, so that they learn to produce the musical intervals (the distance between the syllables) properly and confidently. He demonstrates this first according to the hard scale, as it is called, and then the soft scale. On Thursday and Friday, however, he rehearses in the eighth-graders’ classroom and uses the pupils of the class. On Mondays and Tuesdays of the other months, he practices with the pupils of all three classes together, [using] all the vocal parts. By this means, he prepares them to lead the vocal music in the church properly. All the while, though, if he teaches or sings, he uses diligence so that the boys in the other or sixth grade class do not make mischief, create turmoil, or otherwise detract from the singing.17

In addition to the assistance the cantor received from the prefects, he required help occasionally from his colleagues when the demands of coordinating the music for the main churches became excessive.18 This distribution of duties between the cantor, the

17 Hoche III, 95-6. “Von eins biss zwey hat der Cantor mit der Musik zu thun, vnd zwar die drey ersten Monaten nach gehaltenem Examine am Montag vnd Dingstag erklert er den Secundanern vnd Tertianern die Lehr-Regulen der Musik, worzu er dann den Ausszug der Musik Erasmi Sartorij für sich nimbt vnd die anhebenden allgemehlich gewehnet, dass sie die intervalla sonorum (Abstehung der Gelaute) recht vnd Gewiss treffen lernen, vnd solchs zeiget er erstlich nach der Scale des harten Gesangs (wie man es nennet), hernach auch nach des weichen Gesanges. Am Donnerstage aber vnd Freytage übet er die Musik in der Schulstelle des ersten Schulhauffens, nimbt auch darzu die Discipel dieser Class. Die vbrigen Monaten des Montags vnd Dingstages übet er die Schüler dreyer Classen ingesambt im Musiciren mit allen Stimmen vnd bereitet sie dadurch, den Gesang in der Kirchen recht zu führen. Vnterdessen aber, er lehre gleich oder singe, Wendet er Fleiss an, dass die Knaben in dem andren oder dritten Schulhauffen keinen Muthwillen treiben, noch Getümmel machen oder sonst von Gesange sich abstehlen.”
prefects, and the other instructors remained in effect through the seventeenth century. During the eighteenth century, the responsibility for performances of liturgical and extra-liturgical sacred music shifted somewhat more towards the churches themselves.\footnote{Kremer, 151.}

Besides the formal instruction in music theory and the singing of choral music, pupils at the St. Johannis-Schule were expected to participate in other musical activities. They were, as has been mentioned, assigned to the choirs of the main churches, and they were enlisted to provide music for funeral processions and official events. In Hamburg pupils participated in ensembles, such as the \textit{Currende} and the \textit{Chorus Symphoniaicus}, according to their abilities and economic status.\footnote{Records concerning the two groups in the seventeenth century are sparse. It appears that both groups sang in the streets of Hamburg for money. Documents suggest that members of the \textit{Currende} were children from the poor house that were supported by the churches. The pupils in the \textit{Symphoniaci}, who performed contrapuntal choral music, wandered through the city on Sundays and holidays humbly requesting alms. It is not clear whether the \textit{Symphoniaci} were all the same members of the contrapuntal choir at the school. See Krüger, \textit{Die hamburgische Musikorganisation im XVII. Jahrhundert}, 48.}

The former ensemble was comprised of poorer pupils who usually sang in unison at funerals, for which they received some compensation.\footnote{Although pupils were compensated for this work, the performance of funeral music disrupted their studies. Funerals of wealthier citizens also demanded, for example, the services of five prefects, as well as the cantor and the pupils. The prefects for the third and fourth grades were required to provide substitutes for their lessons when they were involved in funeral services. See Krüger, \textit{Die hamburgische Musikorganisation im XVII. Jahrhundert}, 46-7.}

Likewise, the \textit{Symphoniaci} were pupils who earned a small amount of money for singing contrapuntal music at festive events, such as weddings and civic celebrations.

In addition to these ensembles, a group of the best singers from the school and the \textit{Gymmnasium} or, later, several professional musicians formed the \textit{Cantorei}.\footnote{As early as 1642 Selle petitioned the \textit{Senat} to establish the \textit{Cantorei}, which would consist of eight well-trained singers who would receive room and board from the city and be allowed to earn extra money by singing in the streets of Hamburg. For the various letters concerning the \textit{Cantorei} see Neubacher, “Thomas Selle als Organisator der Kirchenmusik,” 292-319.} Under the
direction of the cantor the *Cantorei* performed the contrapuntal choral music in the liturgies of the main churches. Pupils who sang in the *Cantorei* could also be members of the *Symphonici*, or simply those pupils who possessed skill in music. During Selle’s tenure, the *Cantorei* included sixteen talented pupils from the St. Johannis-Schule and eight paid singers, two for each voice part. The professional singers were required to perform other duties, such as copying scores and parts, and to attend four singing lessons in the school per week. Besides their salary, the singers received room and board. In fact, Selle outlined in painstaking detail what food and other amenities they were to receive, and how they were to comport themselves. Moreover, the singers had to obligate themselves for at least one year. In his letters to the *Scholarchat* and *Ministerium*, the governing body for the city’s churches, Selle complained repeatedly about the behavior of the professional choristers and the city instrumentalists, especially during church services when they became disruptive after frequenting the tavern during the sermon.

As was common in other Protestant cities in Germany, the cantor stood between two realms: on the one hand, he bore the responsibility for organizing, composing, and presenting the music in Hamburg’s main churches each week, and on the other, he was in charge of music education at the Latin school. In addition, he supervised all official civic musical performances, from concerts at festivals to music at political events. Although

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Selle even required that the singers sign a contract stating that they would abide by these rules. Ibid., 71.

In one instance, the members of the *Cantorei* even broke into his house during the night and threw him out of the window. Staatsarchiv of Hamburg, Ministerium File, III A 1 d, “…welches oft wilde Gäste, dem Cantor seinen gebührlichen Respect und Autoritas nicht zollen, wie wol vor diesem sie sich unterstanden haben, indem sie ihm bei nachtschlafender Zeit die Fenster ausgeworfen und das Haus gestürmet haben.” Quoted in Krüger, *Die hamburgische Musikorganisation im XVII. Jahrhundert*, 76.
the position encompassed many non-religious duties, the cantor, as well as the other instructors at the Latin school, were required to proclaim their loyalty to the Lutheran faith and the church of Hamburg. 27 Thus, the history of music education, liturgical music, and musical culture in Hamburg are inextricably linked to one another, the cantor himself embodying the connection between them.

27 Kremer, 140-41. Along with other employees of the city’s religious institutions, the rector and teachers of the school were required to indicate their loyalty to the faith by signing a Konkordienbuch, which included a statement of the Lutheran creed.
In writing their own teaching manuals, seventeenth-century cantors freely borrowed material from other theorists, often without crediting original sources, and referred their readers to other useful works on music. Selle and Grimm, for example, drew information from a few well-known texts, mostly from those written by their teachers and their followers. Seminal music theoretical works of the early seventeenth century, such as Seth Calvisius’s *Exercitationes musicae duae* and Johannes Lippius’s *Synopsis musicae novae*, were listed a few times as sources for information in the *Anleitung zur Singekunst* and *Instrumentum Instrumentorum, hoc est, Monochordum*. In addition to merely citing familiar texts as sources in their own manuals, however, Selle and Grimm belonged to a small group of theorists who shared many of the same views, took examples from each other’s works (musical as well as theoretical), and were active in northern Germany in the late sixteenth and early seventeenth centuries. Although several other cantors may be linked to various members of the group, we shall consider only those who have an immediate bearing on this study.

At the center of the group, which included Johannes Lippius (1585-1612), Michael Praetorius (1571-1621), Heinrich Baryphonus (1581-1655), as well as Selle and

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1 Seth Calvisius, *Exercitationes musicae duae* (Leipzig: Jacob Apel, 1600) and Johannes Lippius, *Synopsis musicae novae* (Strasbourg: Paul Ledertz, 1612).
Grimm, was the renowned cantor of the Thomasschule from 1594 to 1615 Seth Calvisius (1556-1615). Along with being credited as a primary influence on Johann Hermann Schein, Calvisius was one of the first theorists to compile a history of music theory and interpret the theoretical works of Gioseffo Zarlino for didactic purposes. Indeed, it was through Calvisius’s pedagogical treatises that many German musicians and writers became familiar with the theoretical concepts of Zarlino.

Born in Gorsleben, Thuringia in 1556, Calvisius probably acquired his early musical training in Magdeburg and Frankenhausen. His name appears in the matriculation records for the University of Leipzig in 1576. He also studied, however, at the University of Helmstedt from 1579 to 1580, after which he returned to Leipzig and continued his studies again there. During the next two years he worked as a Repetent with the choir of the Paulinerkirche in Leipzig, and then taught music and science at Schulpforta from 1582 to 1594, when he returned to Leipzig and became Cantor of the Thomasschule. Calvisius’s first theoretical work, Melopoeia sive melodiae condendae ratio, quam vulgo musicam poeticam vocant, was published in 1592. Owing to the fact that Calvisius incorporated many concepts from Zarlino's Le istitutioni harmoniche in the

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2 The second part of Exercitationes musicae duae (1600) contains a history of music theory, and his Melopoeia sive melodiae condendae ratio, quam vulgo musicam poeticam vocant (Erfurt: Georg Baumann, 1592; rev. ed., Magdeburg: Haeredes Johann. Franc., 1630) includes the transmission of Zarlino’s ideas from Le istitutioni harmoniche (1558).

3 For further information on the connection between Calvisius and Zarlino, see Joel Lester’s Between Modes and Keys: German Theory 1592 to 1802, Harmonologica Series No. 3 (Pendragon, 1989), 21-4 and Kurt Benndorf’s “Sethus Calvisius als Musiktheoretiker,” in Vierteljahrsschrift für Musikwissenschaft 10 (1894), 411-70.


5 A Repetent was an assistant conductor who helped prepare the choir for performances. During his tenure as cantor in Leipzig, Calvisius also conducted the choir of the university church for a short time.
Melopoeia, it is perhaps his best-known work. His other theoretical works cover topics, such as modes, rudimentary theory, and sight-singing methods.\footnote{6}

Although the extent of Calvisius’s influence on the members of the network varied, they all professed a great respect for him and clearly deferred to his judgement in specific instances. The members of the group usually cited his works directly in their own treatises, or, at the very least, paid homage to him. Moreover, two of the group studied with Calvisius, and one other produced the second edition of the Melopoeia. While it is not possible to document a direct, personal connection between Calvisius and every member of the group, it seems likely under the circumstances that Calvisius at least corresponded with all of them at some point.

The two members of the network with whom Calvisius worked most closely were the theologian and mathematician Johannes Lippius and his own pupil, presumably at the Thomasschule, Thomas Selle. After having completed a Master of Arts degree in philosophy and theology in 1606, Lippius traveled to Leipzig to confer with Calvisius about music and philosophy and, possibly, to pursue a doctoral degree. Although he remained in Leipzig for less than a year, he apparently met with Calvisius on a regular basis and profited greatly from their interactions, as he states in the preface to Synopsis musiceae novae, that he was:

\begin{quote}
greatly encouraged by the renowned mathematician, musician, and historian, Seth Calvisius. Up to this point I used to meet with him only, and with him I was able to confer profitably on the fundamental concepts of music.\footnote{7}
\end{quote}

\footnote{6} Besides the Melopoeia and the Exercitationes musiceae duae, Calvisius wrote Compendium musiceae [practicae] pro incipientibus (Leipzig: Voigt, 1594; Leipzig: Frank Schnellboltz Erben, 1602) and Exercitatio musiceae tertia (Leipzig: Thomas Schürer, 1611).


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The admiration between the two men was certainly mutual, though, since Calvisius wrote a poem honoring Lippius that appears in the latter’s second disputation on music.\(^8\)

Generally speaking, Calvisius and Lippius share similar views on the classification of music. In their treatises both theorists basically follow the two-fold division of music into *theorica* and *practica* found in Zarlino’s *Le istitutioni harmoniche* (1558), rather than the tripartite division established by Nicolaus Listenius in 1537, which relies on the three types of musicians—the theorist, the practical musician, and the composer—as outlined by Boethius. Although Calvisius and Lippius subscribe to the Italian system of classification, neither of them views the areas as being entirely separate from one another. Instead, the categories, which are interdependent, provide the musician with the resources to truly understand music as a science or an art.\(^9\) It is perhaps this holistic approach to the study of music that most distinguishes Calvisius, Lippius, and their followers from other contemporaneous schools of thought.

Like Lippius, Thomas Selle clearly agrees with his mentor Calvisius on many subjects and acknowledges the debt he owes to him. In fact, Selle refers his students to Calvisius’s treatises for further explanations more often than to works by any other writer. There is one major difference, however, in their respective approaches to music pedagogy: the necessity of using solmization systems. While Lippius and Calvisius prefer the method known as bobization or bocedisation, which utilizes the syllables *bo, ce, di, ga, lo, ma, ni* instead of the Guidonian ones, Selle advocates the use of note names

\(^8\)Johannes Lippius, *Disputatio musica secunda* (Wittenberg, 1609), C 2r.
\(^9\)For a detailed discussion of Lippius’s theories and how they compare to those of his contemporaries, see Rivera, *German Music Theory in the Early 17th Century*, 1-36.
from the outset. He maintains that learning note names and tablature symbols aids in the instruction of musical intervals and that students are less confused by them than by solmization syllables. In this respect, Selle’s attitude toward solmization also deviates from that of the group as a whole.

The other three members of the network, Michael Praetorius, Heinrich Barpyhonous, and Heinrich Grimm, may be linked to Calvisius primarily through their treatises. Praetorius, who served as Kapellmeister for the Duke of Braunschweig-Wolfenbüttel from 1602-1619, is the author of the important treatise *Syntagma musicum* that appeared in three volumes between 1614 and 1620. In Volume III, *Termini musici*, Praetorius cites the works of Calvisius a few times and mentions that the two have corresponded on certain issues. In fact, an excerpt from a letter by Calvisius to Praetorius that appears in Volume II of *Syntagma musicum* is quoted by Grimm in *Instrumentum Instrumentorum*.

Cantor of Quedlinburg from 1606 to 1655, Heinrich Baryphonus may be clearly connected to Praetorius, Calvisius, and Grimm. In his significant work on theory and composition, *Pleiades musicae* (1615; rev. ed. 1630), Baryphonus expressed his regard for Zarlino, Calvisius, and Praetorius. He described Praetorius in the first edition of the

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12 Although Praetorius was technically in the service of the court at Braunschweig-Wolfenbüttel, he spent much of his time working elsewhere after the death of Duke Heinrich Julius in 1613.
14 The letter begins on page 156 of *De Organographia*, Volume II of *Syntagma musicum*. It appears in the Wolfenbüttel copy (of Grimm’s *Instrumentum Instrumentorum, hoc est, Monochordum* on fols. 22v-24v.
Pleiades as the “master of his art” and considered him an admirable teacher. Although Baryphonus did not acknowledge his debt to Lippius in the revised and expanded edition of the Pleiades, it is likely that he was influenced by Lippius’s triadic theories.\(^\text{15}\) In the 1630 edition, Baryphonus included some of Lippius’s rules for composition, as well as an extended section on the triad.

According to Praetorius, who was only about ten years his senior, Baryphonus also completed several manuscript treatises on music theory.\(^\text{16}\) Unfortunately, the manuscripts, as well as three other published texts, are no longer extant. Praetorius so highly regarded Baryphonus, in fact, that he planned to publish the latter’s work on composition entitled De melopoeia as the fourth volume of Syntagma musicum.\(^\text{17}\) Due to Praetorius’s death in 1621, however, the fourth volume never materialized.

A pupil of Praetorius himself, Heinrich Grimm produced the second editions of both Calvisius’s Melopoeia sive melodiae condendae ratio and Baryphonus’s Pleiades musicae in 1630. It is unclear how Grimm came to edit these two works in particular, since no correspondence exists to link Grimm to either Calvisius or Baryphonus.\(^\text{18}\) The relationship between Praetorius and Grimm, which appears to have continued after Grimm’s schooling ended, may have some bearing on his choice to edit the two texts, since Praetorius respected the work of both theorists.\(^\text{19}\) Grimm may simply have considered them important pedagogical texts and edited them for use at the Altstadt

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\(^{15}\) For more information on the connection between Pleiades musicae and Lippius’s theories, see Rivera, 149-53.
\(^{16}\) Praetorius, Syntagma musicum III, 227 ff.
\(^{17}\) Ibid., 223.
\(^{18}\) This is especially perplexing since Baryphonus lived until 1655.
\(^{19}\) Praetorius was certainly active in the area near Magdeburg when Grimm was cantor there. In fact, when a celebration was held in the cathedral in Magdeburg in 1618, Praetorius, Scheidt, and Schütz were present.
School in Magdeburg. In Grimm’s *Instrumentum Instrumentorum*, another didactic text perhaps aimed at the pupils of the Altstadt School, treatises by all of the members of the Calvisius circle except Selle are cited. In addition, the fact that the Wolfenbüttel copy of Grimm’s manual was bound together with the *Synopsis* and the *Pleiades* in the 1630s suggests a further point of intersection between Grimm, Lippius, and Baryphonus.

As one would expect, Selle’s unpublished manual does not appear as a reference in the works of other members of the group. Aside from his direct connection to Calvisius, Selle’s familiarity with the rest of the Calvisius circle may be further supported through archival evidence. Records of Selle’s personal music collection, which eventually became a part of the Hamburg State and University Library, reveal much about the cantor’s theoretical sources. Among the music theoretical texts he possessed are Calvisius’s *Exercitationes musicae duae* and *Melopoeia sive melodiae condendae ratio*, Baryphonus’s *Pleiades musicae* (rev. ed., edited by Grimm), Lippius’s *Philosophiae verae Synopsis*, which includes *Synopsis musicae novae*, and Praetorius’s *Syntagma musicum*.²⁰ It is also noteworthy that Selle based his own *St. Matthew Passion* (1642) on Grimm’s 1629 version of Johann Walter’s *St Matthew Passion*. Selle mentions his source next to the title in his manuscript copy of the passion:

> The usual accent has been retained from the chorale, and the four-part chorus of the late Heinrich Grimm’s edition has been added here.²¹

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The fact that Selle’s own teaching manual was bound together with a manuscript copy of Grimm’s monochord treatise during Selle’s lifetime further attests to his regard for the latter’s work.
CHAPTER 4
AN INTRODUCTION TO THE MANUALS

Thomas Selle’s Kurtze doch gründtliche anleitung zur Singekunst¹

Origin and Transmission

Six months after assuming his duties as cantor of the St. Johannis-Schule, Thomas Selle wrote a lengthy letter to the city officials of Hamburg suggesting many improvements in the organization of the city's musical life, especially with respect to liturgical music in the main churches.² Since the quality of musical performances in Hamburg's churches was closely linked with the effectiveness of music instruction at the St. Johannis-Schule, Selle wrote a further letter a few months later, in which he expressed his concerns about the school’s music program. This letter was directed toward the

²The letter is found in the Staatsarchiv of Hamburg, File 361-1 (Scholarchat), V 1 c; fols. 1-6. It is entitled "Verzeichnis deren Adjuvanten, welche zur Music der Cantor zu Hamburg alle gemeine Sontage höchst von Nöthen hat." A transcription of the text is found in Jürgen Neubacher’s “Thomas Selle als Organisator der Kirchenmusik in Hamburg,” 292-97.
**Scholarchen** and *Inspectorn* of the St. Johannis-Schule, officials who were in a position to mandate changes in the educational policies of the school and thereby influence student participation in church choirs.³

From the letter to the school officials, in particular, one may surmise that Selle's pupils were less interested and skilled in the art of singing than the new cantor had hoped.⁴ After urging school officials to require all pupils proficient in the art of music to attend the usual singing lessons, to acquire a proper knowledge of music, and to allow themselves to be used in church choirs to the glory of God, Selle notes how discipline problems have prevented these standards from being maintained in the past:

The instructors did not want to punish [the pupils], and the cantor was not allowed to punish them without special permission. Unfortunately, therefore, it has gotten to the point where especially the ones in the advanced class (from which one has to recruit the most [pupils] and the best prepared ones, because it is not possible to carry it [the rehearsal] out with the young beginners) have taken and imagined they have particular license to treat the practice sessions and even the cantor himself disgracefully and with hostility, whenever he, on account of his position and conscience, occasionally had talked somewhat sternly to them. The examples are horrible.⁵

Given the lack of discipline and organization Selle encountered upon his arrival, it is not surprising that he elected to write his own basic teaching manual shortly thereafter. According to the title page of the manual, *Kurtze doch gründtliche anleitung zur Singekunst*, the work was conceived for the pupils of the St. Johannis-Schule and was

³ “Beÿ den Herrn Scholarchen vnd Jnspectorn,” StAH, File 361-1 (Scholarchat), V 1 c; fols. 7-9, or Neubacher, 297-300.
⁴ Concerning this point, see “Beÿ den Herrn Scholarchen vnd Jnspectorn,” fols. 7r and 7v.
commissioned and approved by the school's supervisory board. The full title and dedication of the treatise read as follows.

A Brief, but Thorough Introduction to the Art of Singing. Namely, how a boy (and indeed an adult) can learn to sing without great effort and confusing mutations, first of all, simply according to the basic letters, which the German organists also use with good reason and great application. Written for the beginning pupils of St. John’s Latin school, with the approval and by order of the gentlemen of the Scholarchat and the honorable Inspector, by Thomas Selle, himself of Saxony-Anhalt, Cantor of St. John’s School and Civic Music Director of Hamburg.\(^6\)

While the dedicatory title page does not include a specific date for the work's completion, the conclusion of the *Anleitung zur Singekunst* offers a clue as to when it was written. Selle remarks that he has "in the last twenty-eight years” been “motivated by the late Seth Calvisius.”\(^7\) This is probably a reference to having studied twenty-eight years earlier under Seth Calvisius, cantor of the Thomasschule in Leipzig from 1594 to 1615. Since Selle began studying with Calvisius between 1613 and 1615, the manual must have been written by at least 1643.\(^8\) Moreover, watermark evidence is not inconsistent with either

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\(^7\) D-Hs, ND VI 5126a, 80.

\(^8\) In his book *Deutsche Musiktheorie des 15. bis 17. Jahrhunderts*, Werner Braun claims that the manuscript was written in approximately 1652. Braun calculates the twenty-eight-year period from the beginning of Selle’s professional career, when he became a Schulkollege in Heide in 1624. He is therefore interpreting Selle’s comment to mean that the cantor had been active as a pedagogue for twenty-eight years. While the manuscript’s watermarks cannot verify either date with certainty, there are no other extant autograph sources dated in the 1650s with the same watermark. Since further evidence, such as Selle’s letters from the 1640s in which he complains about his pupils’ skills, seems to suggest an earlier date, as well, Braun’s argument is less convincing. See Werner Braun, *Deutsche Musiktheorie des 15. bis 17. Jahrhunderts, Zweiter Teil: Von Calvisius bis Mattheson*, Geschichte der Musiktheorie, vol. 8/II (Darmstadt: Wissenschaftliche Buchgesellschaft, 1994), 51.
1642 or 1643 as a date for the manual’s completion.⁹

When Selle died in 1663, his entire library, which included the only extant copy of the *Anleitung zur Singekunst* bound together with an unattributed treatise on the monochord, was donated to the city’s public library. In 1919, the year the University of Hamburg was founded, Selle’s library became a part of the collection of the Staats- und Universitätsbibliothek Hamburg. During World War II many works housed in the State/University Library, including much of Selle’s collection, were stored outside of the city. Consequently, many of Selle’s books were either permanently or temporarily lost. The volume containing Selle’s teaching manual was transferred to Saxony in 1943, and fifteen years later it was integrated into the collection of the German State Library in East Berlin. The Hamburg State/University Library acquired a photocopy of the text in 1980, thereby providing western scholars with limited access to Selle’s manual and the monochord treatise until 1989, when the actual manuscript was returned to Hamburg after the reunification of Germany.¹⁰

According to Jürgen Neubacher, Music Librarian of the Hamburg State/University Library, the volume was initially compiled in the mid-seventeenth century. The two teaching manuals were bound together with a parchment cover that bears the title

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⁹ A similar watermark, an urn bearing the initials “BO,” out of which flowers, a cross, and a crescent appear, is found in a London manuscript dated 1644-46. The watermark also resembles several marks that appear in papers produced during the reign of the French king Charles I in about 1642/43. According to Churchill, the symbol of an urn with flowers was almost exclusively used by French papermakers. See William Algernon Churchill, *Watermarks in Paper in Holland, England, France, etc., in the XVII and XVIII Centuries and their Interconnection* (Amsterdam: Menno Hertzberger and Co., 1935), 86 and CCCXLV-CCCXLVII. It is, nevertheless, possible that Selle first used the paper for the manuscript in 1650. In the seventeenth and eighteenth centuries it was common for paper to be used for approximately five years from the date of its production. On the other hand, several autograph documents written by Selle in 1649 and 1650 bear watermarks with flowerpots different from the one found in the manual.

“Declaratio Monochordi” in Selle’s hand. Clearly, the cantor wanted the two texts bound together. A blue-gray cardboard cover was added to the quarto volume in the mid-nineteenth century, as well as a table of contents inscribed by the librarian, Johann Christoph Wolf, who listed the two works in the following manner: “1. Sellii (Tho) Declaratio monochordi p. 1-30 [:] 2 - - Kurtze Anleitung zur Singe Kunst p. 31-84.”

This attribution and conflation of titles that led to the later confusion surrounding the provenance of the monochord treatise. Thus, Selle was presumed to be the author of both texts until the connection between the Hamburg exemplar of the monochord treatise and Heinrich Grimm’s *Instrumentum instrumentorum, hoc est, Monochordum* was established.

**Function**

As the title page of the *Anleitung zur Singekunst* states, Selle’s teaching manual was geared toward the instruction of beginning pupils, either children or adults. Since the primary purpose of the volume seems to have been to improve music education in the St. Johannis-Schule, though, its contents reflect an orientation toward classroom instruction and, more specifically, a concern for the most efficient means of teaching sight-singing. Thus, Selle’s manual was probably used to teach either the pupil who had experienced some difficulty in acquiring sight-singing skills by traditional means or the absolute beginner.

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11 Ibid.
12 The Hamburg exemplar of the monochord treatise has only recently been identified as a copy of Heinrich Grimm’s manuscript treatise *Instrumentum instrumentorum, hoc est, Monochordum*. Werner Braun first published this discovery in 1994 in his *Deutsche Musiktheorie des 15. bis 17. Jahrhunderts*; I had independently come to the same conclusion regarding the two manuscripts a few years earlier.
13 D-Hs, ND VI 5126a, 31.
14 Ibid. This is apparent from the title page, as well. As Selle writes, the pupil “can learn to sing without great effort and confusing mutations, first of all, simply according to the basic letters.”
While there is no record that Selle’s manual was ever published, the condition of the manuscript suggests that the *Anleitung zur Singekunst* did not simply remain in the cantor’s desk drawer. The text itself is generally legible, but there are several interpolations (added with a different quill) and emendations, as well as marginalia. For the most part, the interpolations serve to clarify explanations. One wonders whether the cantor added the information after having presented the material and having found the explanation lacking in some respect. An example of this type of interpolation appears on page 47 of the volume (the interpolated text is indicated here in italics):

> An interval is a certain difference between two pitches or tones. *Or it is the distance between two tones.*

Most of the interpolations and emendations occur in the explanations of practical information, rather than in the discursive sections of the text, such as the conclusion and the *Objectio*. This would support the idea that the changes were made to facilitate the learning process.

The practical portions of the *Anleitung zur Singekunst* may, in fact, have been primarily fashioned after Selle’s lectures, since the book’s format differs from that of many comparable seventeenth-century manuals. If, within the first year of his tenure in Hamburg, Selle determined that the pupils of the St. Johannis-Schule were lacking knowledge in certain areas, he may have quickly compiled a primer based on his lecture notes to address their specific needs. Moreover, because few pupils had textbooks of their own, it was common for the cantor or his assistants to copy explanations and

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15 D-Hs, ND VI 5126a, 47. “Intervallum ist eine gewiße Unterscheidung zwischen zweyen clavibus oder Noten. *Oder, ist ein raum zwischen zweyen klängen.*”

16 Although Selle covers some of the same topics as his contemporaries, he emphasizes different concepts and omits some issues entirely. For a more detailed explanation of traditional formats and topics in seventeenth-century manuals, see Butt, 55-67.
exercises on a board. In the case of the *Anleitung zur Singekunst* the layout of the material and the nature of the interpolations lend themselves well to classroom presentation. Another letter by Selle concerning the organization of music education at the St. Johannis-Schule indicates that prefects and other assistants were expected to instruct pupils, especially the beginners, when the cantor himself could not be present.

When he himself did not have time for the beginners (as it is quite a boring task to instruct them), the cantor also sent a student—either a tenor or bass—to the second grade class on Mondays and Tuesdays to teach the beginners. The rector indeed allowed him to do so, too, [but] the cantor himself often did it unexpectedly.

Therefore, the various emendations and interpolations found in the manual, all of which are in Selle’s hand, may have been more than mere corrections to his text; they may have been included to aid his assistants in explaining theoretical and practical concepts.

In order to examine the rhetorical style of the *Anleitung zur Singekunst*, it is useful to consider the receptiveness of the cantor’s pupils and the insidious attitude among students toward music education at the St. Johannis-Schule. Selle apparently believed that the pupils of the Latin school were not receiving sufficient instruction in music. Thus, he attempted to include additional music lessons in the curriculum. In a

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17 Ernest Livingstone, “The Place of Music in German Education around 1600,” *Journal of Research in Music Education* 19/2 (1971), 154. Since the language of instruction for all courses at the St. Johannis-Schule was Latin, it is interesting that Selle chose to write his manual in German. If Selle or his assistants did use the manual in class as I have proposed, it is unclear whether the explanations would have been copied in Latin or German.


19 It is interesting to note that Selle’s marginal comments appear in Latin, although the text itself is primarily in German. One wonders whether the additional remarks, many of which appear to be definitions of basic terms, were borrowed from Latin sources. A review of theoretical Latin texts found in Selle’s library, however, has not yielded any concordances for the marginal comments.
letter written to the Hamburg Senate in 1648 Selle describes his reform efforts and their reception by his pupils:

... in many places, the music class is taught from 12:00 to 1:00. The rectors of honorable schools have always followed this very strictly. The current cantor in Hamburg has also followed this common practice, as much as it was possible for him to do so, but he did not always have suitable pupils because only a few of the burgher children attend the St. Johannis-Schule, and the ones who do attend have little interest in music and cannot even be persuaded by force to come, not to mention those who have no natural musical ability. Nevertheless, the lessons continued with the very few burgher children who are interested in music and the ones supported by the city, who have to be there.20

Despite the low attendance of the cantor’s extra classes and the lack of “suitable” and interested pupils, Selle stubbornly refused to discontinue the lessons. In his opinion, the quality of the musical life in Hamburg depended on the efficacy of his teaching, which was why he remained so steadfast. Selle’s general tenacity and commitment to educational reform, evident in this account, is likewise found in the Anleitung zur Singekunst. In his manual Selle attempted to simplify the learning process by means of his pragmatic approach, even though some musicians apparently found the method unconventional or inappropriate for beginning students.

Given the negative attitude toward music education that Selle apparently encountered in some of his pupils, it is not surprising that the Anleitung zur Singekunst contains only concise explanations of theoretical and practical concepts. In the manual

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20 StAH. File 511-1, Ministerium, III A 1e, p. 1625, or Neubacher, 310-11. “...daß an etlichen Orten vom 12. biß zu 1. Uhr die Singstunden angeordnet sein. Über diese Ordnung haben die Rectores in Wolbestelten Schulen allzeit steiff und fest gehalten. Dieser gebräuchlichen Ordnung hat auch gefolget der jetzige Cantor in Hamburg, so viel als sichs hat thun laßen wollen, aber er nicht allzeit habilia subjecta gehabt, weil die wenigsten Bürgerkinder Scholan Johannitana frequentiren, und die noch frequentiren, wenig Lust zur Music haben, auch mit Gewalt nicht wollen dazu gezwungen sein, zugeschweigen derer, die dazu nicht naturalia haben. Es ist aber nichts destoweniger das Exercitium vor sich gegangen mit etlichen wenigen dazu Lust haben den Bürgerkindern und denen die von der Stadt erhalten werden und da sein müßen.”
Selle dispenses with all abstract discussions of music, electing instead to quote the Latin proverb *nam quod fieri potest per pauca, frustra fit per plura* (for what can be done with little means, is done in vain with much effort) three times to explain his approach. In fact, he begins not with a definition of music, as many authors of the standard teaching manuals do, but turns first to practical matters, such as the staff and note names. Throughout the text, Selle underlines the ease of learning to read music according to his method, which reflects his objective to train his pupils in the most expedient manner possible. In short, the rhetorical style used by Selle in the primer may be characterized as simple and direct, the aim being to communicate his ideas as clearly and concisely as possible to a group of students who may have had little natural musical ability or interest in music at all.

**Structure**

Selle presents concepts in his *Anleitung zur Singekunst* in a very systematic and pragmatic fashion. As has already been discussed, little of the text is devoted to abstract concepts or theoretical discourse. Selle establishes the practical orientation of the work from the outset. In an introductory section following the title page, he outlines what skills and basic knowledge the pupil must acquire in order to learn how to sing:

One who wishes to learn how to sing must know what the art of singing is truly about: finding the pitch or tone in the clef specifically associated with it, or [finding] on the commonly used staff the alphabetical designations considered the basis of pitches and intervals, upon which the scale, a certain arrangement of the pitches or notes, is organized.

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21 This phrase was very popular among seventeenth-century cantors. It appears in many treatises by the members of the network, for example, as the explanation for the various solmization systems they use.

22 D-Hs, ND VI 5126a, 33. “Einer der da singen lernen will, muß den sonum oder klang, damit die Singekunst eigentlich umbgeheth in seinen gewißen ihm zugeordneten Clavibus ‘oder literis characteristicis’ wißen zu suchen auffen gebraüchlichen Systemate ‘als sonorum und Intervallorum sede,’ die Scala, welche ist eine gewiße ordnung der Sonorum oder clavicium, geordnet ist.”

46
The next topic Selle introduces is the staff, which he describes as having two forms: the
general or universal, and the special or particular. The former is then depicted
graphically in a table containing a staff of fifteen lines and letter note names, including
registration, for four octaves. It is noteworthy that Selle depicts all the chromatic tones in
the table, since many cantors in the early seventeenth century do not include tablature or
notes with accidentals (aside from B) in their manuals, or their musical systems illustrate
hexachordal relationships between pitches. Two types of claves are also presented,
intellectae and signatae. Selle defines claves signatae as “music clefs by which the other
type of claves [notes], called intellectae [understood notes], are governed.” He
concludes this section of the text by discussing the advantages of using letter names,
instead of solfege syllables, for sight-reading. It is interesting that Selle includes such a
passage at this point in the manual. Although it seems to interrupt the systematic
presentation of practical material, the discussion serves to underline the cantor’s position
once again and to prepare the reader for the information to follow.

After explaining his views on solmization, Selle first indicates the ranges for each
voice part on individual staves and then shows how musical signs, such as sharps, flats
and natural signs, function. For instance, Selle shows the reader through several
examples how to raise and lower pitches by a half tone. Within this discussion, the
reader learns that certain accidentals will produce a slightly higher or lower version of a
pitch. Although Selle does not comment further on this phenomenon, perhaps in order to
avoid confusing the beginning pupil, he is probably alluding to differences resulting from
unequal temperament in seventeenth-century tuning systems. At the end of this section,
Selle writes out the pronunciation of all the pitches’ names and their corresponding

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23 Ibid., 34.
characters in tablature. By drawing connections between denotive systems, the cantor hopes to simplify the process of learning intervals, his next topic of discussion.

The next twenty pages are devoted to the so-called *Doctrina Intervallorum*, or rules for intervals. This section serves to familiarize the reader with different kinds of intervals, whereby greater, lesser, major, minor, diminished, and augmented intervals are distinguished from one another. Intervals are first treated individually in ascending or descending patterns, and then shown beginning on different pitches. After introducing all intervals smaller than a third, Selle demonstrates how the octave can be divided using only those intervals. Once the other intervals have been presented, however, the octave is then shown divided into both small and large intervals in relation to c. In general, though, the aim of this section seems to be to convey the material as clearly as possible, rather than merely to be comprehensive.

Before turning to other more practical subjects, Selle interjects another two-page discourse, this time on the advantages of learning intervals as they relate to middle C and of using octave transposition. This also serves to clarify the previous graphic representation of the octave’s divisions. After the digression he returns to rudimentary theoretical concepts. The next section of text presents note lengths, rests, and meter, as well as a comparison of rhythms in modern notation, mensural notation, and organ tablature. Here the explanations are brief, the musical examples being used primarily to demonstrate the various possibilities for each topic.

A further passage on musical signs and symbols precedes a short glossary of Latin and Italian terms, for which Selle provides concise definitions. Since the list is not comprehensive and Selle includes no musical excerpts in the manual, he refers the pupil at this point in the text to specific works by other cantors, namely those of Johann
Andreas Herbst and Michael Praetorius for further terms, and, for musical examples, those of Seth Calvisius, Heinrich Grimm, and Christoph Thomas Walliser. As Selle puts it, if the reader chooses to go beyond the scope of his “little work,” he may consult these other sources.

The manual ends with a short conclusion that mainly stresses the benefits of using letter names and organ tablature to teach beginning pupils. Furthermore, Selle notes that pupils who have learned to sing in this manner have also acquired a “foretaste of instrumental music.” The reader will have accomplished all this, according to Selle, without “concerning himself at all with the Guidonian syllables and their mutations.”

The final section of the Anleitung zur Singkunst, entitled Objectio, offers interesting insights into Selle’s views on teaching. The cantor states at the beginning of the passage that he has adopted his approach to sight-singing for purely practical reasons:

However, in the last twenty-eight years, having been motivated by the honorable Mr. Seth Calvisius and after having meditated on things a little more as well as seen others make strides, I have indeed tried both methods publicly and privately. I have discovered, though, that correct singing requires extensive instruction on intervals, namely that one has to teach them to the boys from the outset and educate them well.

We learn from this excerpt that Selle was initially inspired by his former teacher, Seth Calvisius, twenty-eight years earlier. Although he has tried Calvisius’s solmization

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25 Ibid., 78.

26 Ibid., 78.

27 Ibid., 80. “...aber in die 28 Jahr hero aus antrieb des Sel. H. Sethi Calvisy, und das man den Sachen in wenig weiter nachgesonnen, auch andere zur Nachfolge zu schreiten gesehen, hab publice et privatim ich beyderley wol versucht, hab aber wol erfahren, das das reine singen erforderne eine richtige fleißige Unterweisung der intervallen, das man nemlich die etistantiam derselben den knaben wol und fundamentaliter inculcirem und einbilden müsse. . .”
method, namely *bocedization*, with his pupils over the years, Selle claims he has found a better way to teach young boys how to read music. Selle believes that the reason so many youth, even those who have sung contrapuntal choral music for twelve years or more, “sing so imprecisely and after the beat” is their poor grounding in the study of intervals. In Selle’s opinion, either the pupils have never studied the “rules for intervals” properly, or they have never really grasped them. Aside from attempting to meet the immediate needs of the pupils of the St. Johannis-Schule, Selle indicates in the *Objectio* that this concern is the fundamental motivation for writing his *Anleitung zur Singekunst*.

Other passages of the *Objectio* suggest that the cantor anticipated some resistance to his rather progressive ideas. In defense of his approach, Selle maintains throughout the text that the main purpose of his manual is to teach intervals rather than theoretical concepts. The cantor does not mind referring the pupil to other, more comprehensive texts, nor does he discourage the use of other pedagogical methods. The primary issue seems to be that the pupil should learn to sing “correctly and purely”; it is not to engage in polemics about methods of music education.

The practical sections of the *Anleitung zur Singekunst* include both musical examples and diagrams. The examples are not taken from musical works; they simply

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28 This method is also called bobization. It includes an octave series of solfege syllables, which are somewhat modeled on their older hexachordal counterparts (i.e., ce, di, ga, lo, ma resemble re, mi, fa, sol, la). For a more thorough discussion of the method, see Dale Allen Scott’s *Nikolaus Gengenbach’s “Musica Nova: Newe Singekunst”: A Translation, Critical Edition, and Commentary*, 35-46 and “Bobization and Bebization: Two Alternative Solmization Systems of the Early Seventeenth Century,” 25-47.


30 Ibid., 79 and 83.

31 Ibid., 79.
consist of either scales or intervals. While it is possible that an instructor would have applied Selle’s sight-reading method to actual pieces of music in the context of a theory class, the organization of music lessons and rehearsals at the St. Johannis-Schule indicate that theory and practice were taught separately, as was common in Germany at the time. In other words, it need not be surprising that Selle’s manual lacks examples from musical works. With respect to the various diagrams used to demonstrate scales and intervallic relationships, Selle appears to have created them himself instead of simply borrowing material from other music primers, which cantors often did when preparing their own manuals.\textsuperscript{32}

\textbf{Content}

As has already been discussed, Selle’s \textit{Doctrina Intervallorum} comprises an essential part of the \textit{Anleitung zur Singekunst} and the cantor’s pedagogical method. Each interval is illustrated with an example showing ascending and descending movement, as well as the number of syntonic commas, in the case of the small intervals, or the number of greater and lesser semitones and whole tones it contains. Selle continues to emphasize the importance of acoustic divisions when he demonstrates the “rules for intervals” by using a monochord:

Next, follow the rules for intervals as they are measured on the monochord according to the syntonal diatonic scale commonly used today. This will be done in both steps and leaps according to notes and letters within one octave, as seen in the octave from c’ to c.”\textsuperscript{33}

The use of middle C as a reference pitch for other intervals suggests that Selle is advocating a type of fixed-do system, which is not as common as transposable

\textsuperscript{32} In many teaching manuals, diagrams are borrowed from texts by other theorists without giving any attribution.
solmization systems in early seventeenth-century manuals. He does this for two reasons: because, as he says, “all instruments are nowadays characteristically said to begin in this clef,” and because “whoever learns this single octave well, to him it is all the same” regardless of the mode. The fact that he recognizes octave equivalences indicates an awareness of the emerging diatonic tonal system and the significant relationship between intervals and scales. Even chromatic movement from one pitch to the next is represented in relation to the octave from c’ to c”. This allows Selle to demonstrate the difference between the greater and lesser semitones and whole tones, and therefore indirectly to reflect on aspects of seventeenth-century tuning and temperament.

Perhaps the most significant aspect of the Anleitung zur Singekunst, however, is Selle’s confidence in the use of letter names to teach sight-singing, or Clavisieren, as it was called. Although the case for using letter names was made by Pancratius Crüger as early as 1588—for which he lost his position as cantor in Lübeck—Selle was one of the first to promote it in a teaching manual. The first printed source advocating the use of

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33 Ibid., 47. “Hier auf folget nun Doctrina Intervallorum nach der heütiges tages gebräuchlichen scala syntona secundum dimensionem Monochordi so wol in gradibus als saltibus, nach Noten und Buchstaben in einer einzigen Octava, als vom c’ zum c” angedieüet.”

34 Many writers were either continuing to use the Guidonian syllables and hexachordal mutation or other transposable solmization systems, such as bocedization, which Calvisius and his followers generally preferred. The system of bebization developed by Daniel Hitzler in his Extract aus der Neuen Musica oder Singekunst (Nürnberg: Abraham Wagenmann, 1623) also relies on a connection between the syllables and letter names. In his system, however, not all pitches appear with accidentals. For example, the note a is not chromatically altered. For more information on bebization, as well as bocedization (or bobization), see Dale Allen Scott’s Nikolaus Gengenbach’s “Musica Nova: Newe Singekunst”: A Translation, Critical Edition, and Commentary, 35-53 and “Bobization and Bebization: Two Alternative Solmization Systems of the Early Seventeenth Century,” 25-47.

35 D-Hs, ND VI 5126a, 6. “Darumb, weil von diesem clave (der billig Rex oder ein König aller clavium genennet werden mag) heütiges tages alle Organa proprie dicta ihren anfang machen. Wer diese einzige Octavam wol studiert hat, dem gilt gleich viel. . . “

36 Ibid., 51. “Octavae cujusque clavis eadem est ratio” (The pattern is the same for each octave of a pitch.).

37 There is no extant compendium by Crüger, a former cantor of Braunschweig. Johann Mattheson mentions it, however, in his Grundlage einer Ehren-Pforte, 47 and in Critica Musica II (Hamburg:Thomas von Wierings Erben, 1725), 20. For other accounts see Ernst Ludwig Gerber’s Historisch-bibliographisches Lexicon der Tonkünstler (Leipzig, 1812-14; Graz 1966-77).
letter names was that of Ambrosius Profe, organist of Breslau, in 1641. The text is actually an eighteen-page compendium that appeared as a foreword to a volume of Profe’s sacred concertos. Selle and Profe concur on many points, especially with respect to the advantages of *Clavisieren*, but Selle stresses the importance of mastering intervallic relationships and presents the full range of pitches and intervals. Profe, on the other hand, simply offers a brief overview of rudimentary theory and proposes the adoption of *Clavisieren* for teaching sight-singing over the other solmization systems in use.

At the start of the seventeenth century the greatest controversy among cantors and other authors of teaching manuals seems to have been the issue of solmization. Although the extant manuals provide evidence that several solmization systems besides the Guidonian method were commonly used, the real controversy appears to have been between those who advocated solmization in general and those who favored *Clavisieren*. We see glimpses of this dispute in the concluding chapter of Selle’s *Anleitung zur Singekunst*, when he remarks,

>If one should, however, interject and say that the manner of learning to sing according to the letters is something new and uncommon, [that] the instruction on intervals is too difficult and too subtle for young boys because of the chromaticisms, [that] the theory is easier than the practice, and that one should perhaps teach the mutations and the double scale before or indeed these intervals in particular as soon as possible, then I cheerfully give him herewith the proper answer: if he believes in himself, he will do it.\(^{39}\)

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\(^{38}\) Ambrosius Profe, *Compendium Musicum, das ist: Kurtze Anleitung, wie ein junger Mensch in weniger Zeit leichtlich und mit geringer Mühe ohne einige Mutation, möge singen lernen* (Leipzig: Henning Kölern, 1641). A cantor working in the mid seventeenth century, Otto Gibelius, also names Profius in his teaching manual *Kurtzer, jedoch gründlicher Bericht von den vocibus musicalibus* (Bremen, 1659) as the first theorist to advocate *Clavisiseren* in print.

\(^{39}\) D-Hs, ND VI 5126a, 79. “Es möchte aber einer einwerffen vnd sagen, der *Modús*, nach den Buchstaben singen zu lernen, were etwas newes vnd Vngebräuchliches; die *Doctrina intervallorum pp Chromatismùm* were vor kleine Knaben zu schwer vnd zu süß, vnd den *Theoricis* beqwehmer als den *Practicis*, vnd sollte man ihnen an dero stat die *Mutationes* vnd gedüppelte *Scalam* vlieicht ehe, oder doch ja so bald als insonderheit diese Intervalla beýbringen. Dem gebe ich hirmit zur freündlichen richtigen antwort: Vertraut er sichs, so thue ers. . . ”
The defensive attitude apparent in this excerpt reflects the position in which many cantors teaching the new method found themselves. Calling the pro-Clavisieren tutors “inept people,” the Weimar poet Johann Christoph Lorber accuses them of “spoiling the youth” and “concealing the basic accuracy of music,” even as late as 1696. The proponents of the new method generally present their arguments in a more factual manner, choosing instead to demonstrate the superiority of Clavisieren by listing its advantages and by comparing it with other solmization methods. Despite the opposition to Clavisieren and the small number of cantors advocating it in their manuals, however, the method became predominant by the end of the century, due to the advantages it afforded pupils in learning to read music.

In addition to the progressive stance Selle takes in the Anleitung zur Singekunst by recommending Clavisieren, he is one of the few early seventeenth-century cantors to include tablature notation in his primer. Selle’s use of tablature notation has several purposes. Letter names showing the specific octave for a pitch enable the pupil to make the transition to instrumental music more easily. He writes,

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41 Preußner, Die Methodik im Schulgesang der evangelischen Lateinschulen des 17. Jahrhunderts, (Ph.D. dissertation, Universität Berlin, 1924), 92. Preußner’s dissertation of 1924 remains the most comprehensive examination of all the different solmization methods outlined in numerous seventeenth-century German and Latin treatises. More recent works in English, such as John Butt’s Music Education and the Art of Performance in the German Baroque and Joel Lester’s Between Modes and Keys: German Theory 1592-1802 are less broad in scope and only touch on the different solmization methods in a limited number of texts.
And it is better to use letters than solfege syllables, *ut, re*, etc., because each interval can have its own character, which is not possible in the Guidonian scale, because *c', d'* as well as *c#, d'* etc. must be called *ut, re*.

With a knowledge of tablature notation, the pupil can also use keyboard instruments to practice and learn music on his own. Furthermore, the pupil will be able to sing a wider range of music, specifically pieces in which chromatic pitches occur.

Besides the usual arguments given for the advantages of *Clavisieren*, Selle cites a further reason for learning the letter names to practice intervals rather than solmization syllables. They are, according to Selle, easier to sing. He claims, for example, that this is particularly true for the Germans since they tend to pronounce everything less smoothly than the Italians, the French, or the British, but especially the sounds *o, u, t,* and *l*. Also, the use of letter names frees the pupil from having to determine what the *fundament*, or in modern terms, what “do” is.

**Selle and the German Tradition**

The theoretical traditions that Selle and other cantors were transmitting in the early seventeenth century attest to a diversity of thought regarding music instruction, particularly with respect to solmization practices. Most cantors continued to present aspects of the modal system, with its mutation of hexachords, and other new solmization methods, such as those used by the circle of German theorists and cantors in northern Germany.

While in keeping with the practical orientation of early seventeenth-century pedagogy, Selle’s didactic method also incorporates progressive elements not found in

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42 D-Hs, ND VI 5126a, 40. “…vnd richtiger nach den buchstaben als nach den vocibus Musicalibus. Ut, re, etc. angehet, weil jedes Intervallum seinen eigenen charaterem haben kan, daz in der Scala Guidonica nicht angehet da c', d' so wol als c', d', etc., ut, re genennt werden muß.”

43 Ibid., 82.
the works of many of his contemporaries. Even the seemingly conservative aspects of his approach, such as his belief in the ancient practice of demonstrating intervals on a monochord, have pragmatic purposes: to enable his pupils to sing intervals as accurately as possible and to learn to read music in an expedient manner. Thus, he restricts himself in the *Anleitung zur Singekunst* to topics that reflect those goals, and he does not model his manual after those of his own teacher or other contemporaries. Passages of the *Anleitung zur Singekunst* also illustrate the cantor’s concern for his pupils and their education. In general, Selle’s method reflects his progressive attitude toward music instruction, as well as an awareness of his own role in transmitting and shaping musical traditions.
Heinrich Grimm’s *Instrumentum Instrumentorum, hoc est, Monochordum vel potius Decachordum*

**Origin and Transmission**

Between 1618 and 1648 many people living in German territories became victims of the devastating religious and political struggle known as the Thirty Years’ War. In particular, civilians frequently suffered the loss of their property, as armies on both sides of the conflict looted and burned homes without regard for the owners’ allegiances. Such wanton destruction befell the city of Magdeburg, located between Hanover and Berlin, in May of 1631, when it was occupied and burned to the ground by the Imperial troops of Ferdinand II. Fortunately, the main cathedral was spared, but many important documents and artifacts, as well as lives, were lost in the destruction.

The composer Heinrich Grimm, who had served as cantor of Magdeburg’s principal churches and Altstadt Gymnasium since at least 1617, was fortunate to escape from the city following its devastation. Apparently, Grimm initially hoped he could find employment in Hamburg, and fled with his family to the North. After unsuccessfully attempting to secure a position in the city by ingratiating himself with the Hamburg

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1 There were two primary causes of the war: a deep religious division between Protestants and Catholics in the Empire, and a struggle for power between German princes (both Catholic and Protestant) and the Emperor Ferdinand II. Some princes supported the Lutheran elector palatine Frederick V because Ferdinand opposed Protestantism. In addition, some Catholic allies occasionally aligned themselves with the Protestants to maintain a balance of power in the empire.


3 As Thomas Synofzik noted in his dissertation *Heinrich Grimm (1592/3-1637) “Cantilena est loquela canens” Studien zu Überlieferung und Kompositionstechnik*, 2-3, it is possible that Grimm became cantor as early as 1616, since church records for 1616-18 have been lost. Some predecessors in the position were Martin Agricola (1524-1556), Gallus Dressler (1558-1575), Leonhart Schröter (1576-1595), and Friedrich Weißensee (1596-1602). In addition to his teaching duties, the cantor was responsible for the polyphonic liturgical music in the Altstadtkirchen St. Johannis and St. Jacobi. Every month he and his pupils also performed contrapuntal choral music in the cathedral.
Senate, Grimm turned to Duke Friedrich Ulrich of Braunschweig, who may have offered him work at the court until he became organist of the St. Andreas church in 1632. Upon the Duke’s death two years later Grimm dedicated a teaching manual on acoustics and the monochord, which he had probably begun writing during his tenure in Magdeburg, to the Duke’s successor, August II. By dedicating the manual, entitled *Instrumentum Instrumentorum, hoc est, Monochordum vel potius Decachordum,* to Duke August, Grimm may have hoped to obtain the financial support necessary for its printing. While the dedication did not result in the publication of Grimm’s teaching manual, the text apparently did circulate in manuscript form. Nevertheless, only two manuscript copies of the manual have survived, one housed in Wolfenbüttel and the other in Hamburg, the latter exemplar perhaps a copy of the text left during Grimm’s visit to the city in 1631, when the cantor was seeking a new residence there. It is also possible that Grimm’s son Michael, who assumed the position of organist in Celle in 1642, may have brought the text to Hamburg sometime after his father’s death.

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4 Grimm dedicated his *Probi patenti Jobi, Binis in Concerto vocibus cum BC.* (Hamburg, 1631), a collection of concerted works for two voices, to the Senate. It has unfortunately been lost. Lorenzen and other biographers have suggested that Grimm probably hoped to gain employment through the dedication. See Lorenzen, 28.

5 According to an inscription found on a decachord fashioned by Grimm to accompany the manual, a design for the instrument was conceived in 1630. Changes were made to the instrument’s design in 1634, the year the decachord was completed and the manual was dedicated to the duke. It is likely that an earlier version of the manual existed along with the 1630 design of the instrument.

6 Hans Haase, *Sammler, Fürst, Gelehrter: Herzog August zu Braunschweig und Lüneburg 1579-1666, Catalogue to the Lower Saxony State Exhibit in Wolfenbüttel, 26 May – 31 October 1979,* No. 718 (Wolfenbüttel, 1979), 339-40. Haase maintains that a dedication in an early seventeenth-century manuscript was quite uncommon, and therefore it is possible that Grimm fully expected the text to be published.

7 The signature of the Wolfenbüttel copy is D-HAB 4281 2.12 mus.

8 Since the paper of the Hamburg exemplar is the same as that used for the *Anleitung zur Singekunst,* which dates from the early to mid 1640s, it must have been copied ten years after we know that Grimm was in Hamburg. If the manuscript was disseminated in Hamburg in 1631, however, an exemplar could have been used as a source for Selle’s copy of the text.
In comparison to the Wolfenbüttel manuscript, the Hamburg copy of *Instrumentum Instrumentorum, hoc est, Monochordum* owned by Selle is less pristine.\(^9\) Scribal errors indicate, for example, that the manual was copied with less than the utmost care. Selle’s copy contains many more abbreviations of the Latin text, and merely cites rather than quotes a lengthy passage in German that Grimm had included from Praetorius’s *Syntagma musicum* II.\(^10\) Some additional marginal comments, usually references to other sources, appear in the Hamburg exemplar but not in the Wolfenbüttel copy.\(^11\) Generally speaking, though, the content of Selle’s version of the text differs only slightly from that of the Wolfenbüttel manuscript. Moreover, since the Hamburg copy is bound with Selle’s *Anleitung zur Singekunst* and seems to have been a working copy of Grimm’s text, one could surmise that the two manuals were used by Selle in the classroom.

Given its beauty and clarity, as well as the dedication to Duke August on the title page, the Wolfenbüttel exemplar probably served as a presentation copy of Grimm’s manual. It is bound together with another printed treatise on music theory, *Synopsis musicae novae* by Johannes Lippius.\(^12\) The two texts, which were compiled as a single volume in the mid-seventeenth century, address many of the same issues and are related to one another in a complex manner.\(^13\) In fact, several musicologists, including Robert

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\(^9\) The signature for the Hamburg copy is Staats- und Universitätsbibliothek Hamburg, ND VI 5126a.

\(^{10}\) D-Hs ND VI 5126a, 29. The passage is a quotation of correspondence between Calvisius and Praetorius found in the latter’s *Syntagma musicum* II, 156.

\(^{11}\) Ibid., p.19, for example.


\(^{13}\) According to Dr. Hans Haase, former head of the Manuscript Collection at the Herzog August Bibliothek in Wolfenbüttel, the two texts were bound together during the Duke’s lifetime (1579-1666). In other words, the volume was put together between 1634 and 1666, but it is not clear whether Grimm himself was responsible for the compilation.
Eitner and Werner Braun, have identified Lippius’s *Synopsis musicae novae* as the primary source for Grimm’s monochord manual. Grimm repeatedly refers his reader to the *Synopsis* for further information on various subjects and even quotes Lippus’s definition of the monochord. Although the *Synopsis* is not the only text that Grimm relies on and cites, it does serve as the primary conceptual springboard for many of Grimm’s ideas on triadic harmony and his presentation of musical proportions. In contrast to the more philosophical Lippius, however, Grimm does not delve into abstract, ontological interpretations of music theory.\(^{14}\) Instead, he appropriates Lippius’s ideas and terminology in the *Synopsis* in a pragmatic manner in keeping with the educational disposition of early seventeenth-century cantors. Moreover, Grimm does this with a specific practical purpose in mind, namely, to present the decachord, an instrument he fashioned between 1630 and 1634 to accompany the teaching manual, as a useful pedagogical tool.\(^{15}\)

\(^{14}\) According to Lippius, the triad, which he views as the foundation of music theory, symbolically reflects the foundation of Christianity, the Trinity. See Lippius, *Synopsis musicae novae*, fol. F 4r-v.

Function

Although few documents concerning Grimm’s work in Magdeburg have survived, his renown as a teacher and composer is evident in the accounts of the theorist Johann Mattheson (1681-1764) and Grimm’s pupil Otto Gibelius (1612-1682). Mattheson names Grimm, for example, as one of the most significant proponents of solmization after Calvisius and a well-known musician and composer of his time. Gibelius refers to him in his *Bericht von den Vocibus Musicalibus* (1659) as “the renowned musician and composer” and “my highly esteemed and much beloved former music teacher.”

Grimm served as the cantor of the Altstadt Gymnasium from approximately 1617 to 1631. In addition to directing the polyphonic choral music in the principal churches and, once a month, in the cathedral in Magdeburg, Grimm was responsible for general music instruction and taught the fourth- and fifth-grade classes. Like many other German cantors, Grimm produced texts for instructing his own pupils in the rudiments of music theory and performance. Grimm’s teaching manuals were not all designated as such, but other evidence suggests that his extant treatises, including *Instrumentum Instrumentorum*, appear to have been conceived as tools for music instruction at the Altstadt Gymnasium in Magdeburg.

It is noteworthy that Grimm produced a volume in 1630 containing the second editions of Calvisius’s *Melopoia sive melodiae condendae ratio* and Baryphonus’s

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16 Johann Mattheson, *Das beschützte Orchestre; oder desselben zweyte Eröffnung* (Hamburg: im Schillerischen Buchladen, 1717), 345-46.
18 In addition to the extant sources, at least two other pedagogical works (including a German translation of the monochord treatise) may have been published. For further information on these works see Synofzik, 43-5.
The title page of the volume reveals that the texts were published for use at the Magdeburg school. In the case of the latter work, in fact, Grimm expanded the text considerably and added thirty pages of tabular summaries. These publications provide further evidence that Grimm was a dedicated pedagogue who devoted much of his time to the preparation of instructional materials for his pupils.

Another work that was probably aimed at the pupils in Magdeburg is a text on sight-singing which served as the introduction to the second edition of Grimm’s *Tyrocinia seu Exercitia Tyronum musica* anthology, *Kurzer Unterricht, Wie ein junger Knabe zum Solmisieren leicht angeführt werden könne.* Since it appeared in 1624, and the volume containing the treatises of Calvisius and Baryphonus was published in 1630, it is quite possible that *Instrumentum Instrumentorum* was Grimm’s next project for the Altstadt Gymnasium. As the other texts had already been completed by 1630, when Grimm began work on the decachord, it seems likely that the diligent cantor simultaneously started his new manual then, as well.

While Grimm does not explicitly instruct the reader of *Instrumentum Instrumentorum* to test the principles outlined in the manual on his decachord, the two pedagogical tools were probably designed to be used in conjunction with one another at the Altstadt Gymnasium. By using Grimm’s decachord, in fact, one can easily

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20 “Henrici Baryphoni/ Pleiades Musicæ/ quæ fundamenta/ musicae theoreticae ex princi/sis mathematicis eruta, et/ Melopoëtica accuratiorem modum compendiosi/ oremque viam hoc altera sed/ limatiori cursu et/ auctore accessu in scenam pro/ducunt:/ Tum/ Sethi Calvisii, m. p./ Melopoia/ Ex veris fundamentis extracta/ et explicata/ In gratiam et usum/ Gymnasii Magdeburgensis/ publici juris facta/ Curante et edente/ Henrico Grimmino Mus./ ibid. ordin. Magdeburgi/ Sumtibus/ Haeredeum Johann Franc. Bibliop./ Anno M.DC.XXX.”

21 Grimm’s *Tyrocinia seu Exercitia Tyronum musica* (Halle, 1624; 2nd ed. Leipzig: Johann Francks Erben, Samuel Scheib, 1632)) is a collection of three-part concertos.
demonstrate intervals that are more difficult to render on a regular monochord. At the very least the manual advocates demonstrating acoustic proportions and musical intervals on some type of monochord, a practice that dates back to the fifth century BC.\textsuperscript{22} Indeed, it is the integration of ancient pedagogical traditions and seventeenth-century pragmatism that distinguishes \textit{Instrumentum Instrumentorum, hoc est, Monochordum} from other contemporaneous manuals on the monochord and its acoustic divisions.

**Structure**

Grimm’s \textit{Instrumentum Instrumentorum} is divided into three sections: the first concerning the monochord’s name or definition; the second, its proportions or divisions, and the third, its seven practical uses. The final section contains the most original material, especially the sixth use of the monochord, which involves generating two-part counterpoint by deriving harmonic pitches from the opposite side of a stopped string. Among other topics, Grimm examines questions of tuning and temperament as one of the uses of the monochord. Within this discussion, Grimm inserts the passage by Calvisius from Book II of Praetorius’s \textit{Syntagma musicum}.\textsuperscript{23} He then concludes the manual with two canons, one drawn in hexagonal form and the other written out as a mathematical table.

The first section of the manual is preceded by an outline in Grimm’s presentation copy of the manuscript, while Selle’s begins immediately with the definition of the

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\begin{itemize}
\item \textsuperscript{23} Michael Praetorius, \textit{Syntagma musicum} II (Wolfenbüttel, Elias Holwein, 1618), 156.
\end{itemize}
monochord. Grimm describes the monochord as an ideal teacher, since “it tells the truth, it does not know how to lie, it carefully instructs, and it accuses no one of stupidity.”

He cites a definition and description of the instrument by Lippius and then refers the reader to other texts for further information about its purpose and history.

Section 2 is devoted to illustrating the connection between acoustic proportions and musical intervals. Aspects of Lippius’s *Synopsis musicae* appear in this section, such as the concept of “radical” intervals (those lying within the scope of an octave) and the manner of presenting simple consonances in single numbers and dissonances in numerical proportions. Grimm systematically introduces each consonant interval by demonstrating its respective string division on the monochord and then does the same for the dissonant intervals. Following the discussion of divisions, Grimm provides a summary in which he shows the reader how to derive every note, including the chromatic pitches, within the octave of C to c. He concludes the section on proportions by telling the reader that “nothing concerning the ancient division follows; [what] follows is about its use.”

Grimm begins the section on the monochord’s uses with a quotation from the theorist Andreas Ornithoparchus (b. ca. 1490) in order to show how the instrument has been employed by musicians in the past. According to Grimm the monochord has been used to demonstrate intervals, to prevent singers from making errors in pitch, and to assist

\*24\ D-HAB 4281 2.12 Mus., fol. 3r.
\*25\ The definition is found in Lippius’s *Synopsis musicae novae*, B3. The other works include Anicius Boethius, *De institutione musica*, ed. Godofredus Friedlein, Boethii de institutione musica libri quinque (Leipzig: B. G. Teubner, 1867) 177-225; Seth Calvisius, *Exercitationes musicae duae* (Leipzig: Josef Apel, 1600); and Michael Praetorius, *Syntagma musicum* II.
\*26\ D-HAB 4281 2.12 Mus., fol. 10r.
singers in their general musical development. These uses are well-known, he says, with respect to the ancient tuning system. Grimm maintains he will present other uses and will address “unusual matters of music in the new syntonal diatonic scale.”

Chapter 1 does not really offer anything substantial beyond what Grimm has already discussed in the section on proportions. He basically outlines how numerical proportions function in relation to string divisions, and he proclaims the octave to be the source of “all subsequent intervals.” He concludes the chapter with an analogy between the sixth, which he considers the most harmonious interval, and the six days of Creation. The analogy is certainly in keeping with many of Lippius’s ideas in Synopsis musicae, which he cites before starting Chapter 2.

In the next chapter Grimm first explains how the decachord’s strings and their corresponding divisions produce certain pitches. Two accompanying diagrams clearly illustrate Grimm’s explanation, which lead the reader to a further concept. At this point Grimm attempts to show how the range of pitches from C to c'' may be reduced to a ratio of 16:1 and, in turn, to the triad c'-e'-g'. This is no doubt a reference to Lippius’s “radical harmonic triad,” a chord that is comprised of three different pitches, which includes only “radical” intervals (i.e., those which Lippius, borrowing a concept from mathematics, views as “root” intervals that cannot be reduced any further).

Chapter Three deals with the triad c'-e'-g' in greater detail. Grimm demonstrates how quadruple, quintuple, and sextuple division of the strings produce euphonious intervals in their remaining parts. Next, he shows how the expanded or “diffused” triad

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27 Ibid., fol. 10v.
C-g-e' may be derived from the remaining parts of the lower triad C-E-G.\textsuperscript{28} Grimm uses this example to show that all consonant tones may be reduced to the radical harmonic triad, and that this triad serves as the “foundation of all of the most perfect and complete harmony that can be rendered in the world.”\textsuperscript{29} He then borrows another biblical analogy from Lippius, namely the similarity between the radical harmonic triad and the Trinity, which he also attributes to him.

The fourth use of the instrument, as delineated in the next chapter, is to present differences between tuning systems, specifically between those based on the syntonal diatonic scale and the Pythagorean system. After first comparing intervals within the two respective scales, Grimm examines tetrachords for both systems and demonstrates how other tetrachords may be derived by playing the opposite sides of plucked strings, or what he calls the “remaining parts.” He notes that one cannot produce such “great harmony” with the tetrachords of the Pythagorean scale, owing to its large, tempered thirds.

In the fifth chapter, Grimm attempts to show how the monochord is used to demonstrate intervallic divisions within the octave, the fifth, and the third. Next, he presents the divisions and their corresponding pitches as components of the octave from C to c. As a result of this discussion, Grimm maintains that the order of the ancient musical modes should begin with the Ionian rather than the Dorian mode.

Chapter 6 is devoted to explaining the most interesting and novel use of the monochord: the natural method of composing two-part pieces. According to Grimm, one

\begin{itemize}
\item \textsuperscript{28} Lippius calls a triad “diffused” when one or more notes are found in different octaves. “Enlarged” triads are those with notes that are doubled in another octave. See Johannes Lippius, \textit{Synopsis of New Music}, trans. Benito V. Rivera, Colorado College Music Press Translation Series, no. 8 (Colorado Springs: College Music Press, 1977), 42.
\item \textsuperscript{29} D-HAB 4281 2.12 Mus, fol. 14r.
\end{itemize}
may accomplish this by plucking the opposite side of a single string with movable stops, or by doing the same thing on several strings. Grimm presents the method first by using mathematical proportions and then offers actual musical examples. He acknowledges that the method cannot produce certain intervals, but this “deficiency” may be overcome through compositional skill. Thus, Grimm offers a natural form for an ascending and a descending line each in contrary motion and then demonstrates how the lines may be skillfully modified to include more complex rhythms and dissonant harmonies.

As the final chapter of the treatise, Grimm uses the monochord to demonstrate how intervals within the octave from C to c are tempered according to the syntonal diatonic scale. He then examines the issue of temperament with respect to keyboard instruments. After discussing the different types of semitones and whole tones, and their positions within the octave, Grimm notes that a comma is still lacking in the fifth between D and A. In order to maintain the purity of the thirds in the syntonal diatonic scale, all the fifths are tempered by a quarter of a comma to compensate for the deficiency. Grimm also remarks that this is the reason why musicians have had trouble playing together in tune and have therefore added an extra pitch one comma below D (i.e., between D and C) to form a perfect fifth with A. After enumerating the other tempered intervals in the syntonal diatonic scale, Grimm cites a passage written by Calvisius in Praetorius’s *Syntagma musicum* to clarify the matter further.30 He concludes the chapter by stating that only the “wisest and most learned” musicians will be able to distinguish tempered intervals by ear.31

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30 Michael Praetorius, *Syntagma musicum* II (Wolfenbüttel, Elias Holwein, 1618), 156.
31 D-HAB 4281 2.12 Mus., fol. 24v.
Finally, Grimm offers the treatise to the glory of God and ends the text with a fugue for thirty voices. Instead of writing out the composition in traditional fashion, however, Grimm draws a hexagonal diagram to represent the basis of the work: a radical harmonic triad. He then includes a four-part version rendered as a numeric chart, a notational method that also appears in Lippius’s *Synopsis musicae novae*.

**Content**

In order to understand how Grimm appropriates Lippius’s theories in *Instrumentum Instrumentorum* and how they are, in turn, used with respect to the decachord, it is necessary first to examine the latter’s ideas as they are presented in the *Synopsis*. In the Preface to the treatise, Lippius explains that he is striving to write a comprehensive work, one that covers all aspects of music, including theory, notation, and practice, because as he says:

> A few give an account of *musica theoretica*, *signatoria*, and *practica*, but without the proper approach from general to particular, without the needed compendium that grasps the depths of the mystery, and without the desired simplification. Hence, from among so many I have found no one who has put together a comprehensive, methodic, perfect, and convenient treatise on music.\(^{32}\)

Lippius also acknowledges a higher purpose for writing the *Synopsis*:

> In Christ’s name I swear, there dwells something divine in music when it is taught properly. As it penetrates the human form, it often succeeds in awakening, establishing, and eliciting man’s internal harmony. Hence the Pythagoreans wisely advised that one neither sleep nor rise without first having the cithara played. They were right in thinking that in the flow of human events man’s inner and intellectual harmony was aroused, established, maintained, and enriched by audible external harmony. Thus also, it was not in vain that the all-wise Creator endowed sounds with harmony. He did so in order that when man contemplates,

admires, and perceives the great result, it will provide him pure and noble comfort, relief, and joy.33

He then proceeds to define music and divide it into two categories: the general, which includes *musica theoretica* (i.e., subjects such as principles of cognition and acoustics) *musica signatoria* (i.e., notation and sight-singing systems), and some aspects of *musica practica*, such as composition; and the specific, which briefly covers genres and pieces with varying numbers of parts. He closes the *Synopsis* with several Bible verses and quotations from Martin Luther on music. Generally speaking, the treatise is didactic in tone, but the inclusion of some rather complex mathematical, philosophical, and theological principles makes it less accessible to the younger, inexperienced musician.

An example of the manner in which Lippius combines these various complex principles is found in his discussion of the *trias harmonica*, or musical triad. In this instance, Lippius likens the triad to the Trinity and explains that it is the basis for all harmony:

The harmonic, simple, and direct triad is the true and unitrisonic root of all the most perfect and most complete harmonies that can exist in the world. It is the root of even thousands and millions of sounds, because each of them should ultimately be reducible to the parts of the triad, either by unison or by octave. The triad is the image of that great mystery, the divine and solely adorable Unitrinity (I cannot think of a semblance more lucid).34

33 Lippius, *Synopsis of New Music*, 3. Rivera’s translation, however, has been altered. Lippius, *Synopsis musicae novae*, fol. ”(4v. “Latet, me Christè δειου τι in Musicâ rectè institutâ, quod insinuans se Humanae constitutioni HARMONIAM ejus Internam commovere, stabilire & elicere potest & solet. Undè Pythagorei sapienter somno seimmergere, & emergere suum nolent prius, quam pulsaretur Cithara, dextrè arbitrantes in his rerum humanarum fluctibus HARMONIAM HOMINIS interiorem Intellectualem exsuscitari, constitui, conservari, & augeri per HARMONIAM Exteriorem auribus sensibilem. Quam etiam Omnisapiens ille Opifex in Sonis non posuit frustrâ, sed ut ab Hominis rimatione, miratione & usurpatione producta ingens affert Mortalis commodum, levamen gaudium qu[am] intemeratum & ingenuum.”

He continues the analogy to the Trinity in describing the triad’s component intervallic relationships and invokes the mathematical concept of “radical” or root numbers with respect to the triad:

The three radical sounds, monads, or notes, which also constitute the three radical dyads, are, first of all, the two extremities, namely, the prima or ima basis, and the ultima or summa, which is “begotten” by the prima. These two lie a fifth apart from each other in a 3:2 proportion. They “co-spirate” in a perfect and masculine sonority, and then one media “proceeds” from them and connects them with its milder sweetness, lying a major third away from one end in a 5:4 proportion, and a minor third away from the other in a 6:5 proportion, according to the syntonal scale.35

By reducing triadic constructions to their component intervals and, at the same time, viewing the trias harmonica as a unit, Lippius is able to introduce the invertibility of triads before the modern tonal system is truly in effect.

As Benito Rivera has observed, two other early seventeenth-century theorists borrowed extensively from the Synopsis.36 Both Johann Heinrich Alsted in 1620 and Johannes Crüger in 1625 extracted passages from Lippius’s treatise for their own theoretical works on music.37 Neither, however, included all aspects of his theories on the triad. Alsted omitted the Trinitarian analogy, while Crüger, who was writing a

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35 Lippius, Synopsis of New Music, 41. Lippius, Synopsis musicae novae, fol. F 5r-v. “Soni Monades, seu Voces Radicales Tres constituentes etiam Tres Dyades Radicales sunt primo duae Extremae, scilicet Prima, ima Basis & Ultima seu summa ab illa genita, distantes a se invicem per δια πέντε quae Sesquialterius est proportionis: deinde est una Media duas illis Extremas perfecto masculoque tinnitu conspirantes leniori sua dulcedine conjugens ex isdem procedens interveniendo & distando ab illarum uná per Ditonum qui est Proportio[nis] Sesquiquartae, & alterá per Semiditonum, qui Proport[ionis] Sesquiquintae, in Scala Syntonā.”


37 Johannes Crüger, Praecepta musicae practicae figuralis (Berlin: Georg Runge, 1625), Synopsis musica continens rationem constituciendi & componenti melos harmonicum (Berlin: Johann Kall, 1630; Berlin: the author and Christoph Runge, 1654); Johann Alsted, Cursus philosophici encyclopaedia libris XXVII complectens universae philosophiae methodum (Herborn: Christoph Corvin, 1620), Encyclopaedia septem tomis distincta (Herborn, 1630).
practical singing manual, excised the mathematical portions. Although Grimm, like Crüger, undoubtedly intended his manual to be used in instructing young musicians, *Instrumentum Instrumentorum* retained some of the mathematical explanations of the *Synopsis*. Likewise, Heinrich Baryphonus incorporated aspects of Lippius’s theories and expanded on them in the second edition of his treatise, *Pleiades musicae* (1630), which later writers, such as Printz, Ahle, and Walther, used as the basis of their explanations of the triad. Since Heinrich Grimm was the one who edited the second, expanded edition of Baryphonus’s text in 1630, together with *Melopoïia sive melodiae condendae ratio* by Calvisius, one may assume that he was quite familiar with Baryphonus’s interpretations of Lippius’s theories, as well as those of Lippius himself. Indeed, Grimm included references to texts by both Lippius and Baryphonus in *Instrumentum Instrumentorum*.

A comparison of the general structures of *Instrumentum Instrumentorum* and Lippius’s *Synopsis* reveals few similarities. As was described previously, Grimm’s manual is divided into three main sections: “On the Name or Definition of the Monochord,” “On the Proportions or Divisions of the Monochord,” and “On Seven Uses of the Monochord.” Since Grimm focuses on presenting the monochord or decachord as a useful pedagogical tool, he does not attempt to be comprehensive or address broader issues, such as delimiting subcategories of music. Outlines of the two texts are shown below for comparison:

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**Synopsis musicae novae**
(Strasbourg: Paul Ledertz, 1612)\(^{39}\)

**Instrumentum Instrumentorum hoc est,**
*Monochordum, vel potius Decachordum* (1634)

I. The Name or definition of the Monochord
II. The Measurements or Divisions of the Monochord
   A. Proportional divisions
      1. Consonances
         i. By two
         ii. By three
         iii. By four
         iv. By five
         v. By six
         vi. By eight
   2. Dissonances
      i. By nine
      ii. By ten
      iii. By fifteen
      iv. By sixteen
      v. By twenty-five
   B. Intervals produced
      1. Consonances
         i. Octave
         ii. Fifth
         iii. Fourth
         iv. Major third and major sixth
         v. Minor third
         vi. Minor sixth
      2. Dissonances
         i. Greater whole tone and minor seventh
         ii. Lesser whole tone
         iii. Major seventh
         iv. Greater semitone
         v. Lesser semitone
         vi. Diesis
   B. Intervals produced
      1. Consonances
         a) simple: monad
         b) composite: dyad and triad
      2. Dissonances
         a) text
         b) musical composition or counterpoint
   1. material cause
   2. efficient cause
   A. external
   B. internal

II. The Uses of the Monochord, which are sevenfold,
and consisting of the demonstration and exploration of:
A. Consonant and dissonant musical intervals
B. The harmonies of the sixths and the division of the whole system of music by sixteen
C. The harmony of the natural harmonic triad
D. The old diatonic and new syntonic scales
E. The harmonic division of the octave, the fifth, and the major third
F. The natural process of composing two-voice works
G. Tuning musical instruments using natural measurements and proper temperaments

The similarities between the texts appear primarily in the passages on proportions
and the *trias harmonica* (i.e., Grimm’s section 3 and Lippius’s “Principles of
Constitution,” Part B). The first instance of correspondence between the *Synopsis* and
*Instrumentum Instrumentorum*, however, occurs in section 1. In this passage Grimm
describes the monochord, using the definition of Guido d’Arezzo, and then paraphrases Lippius, giving the exact page number. One may compare the two excerpts below:\textsuperscript{40}

The canon, root, and mother of all the above is the simplest and most straightforward instrument, the monochord, so named because it consists of one or more cords in simple unison. In terms of radical numbers it can be divided into any number of length of parts, such as two, three, four, five, six, etc. (\textit{Synopsis musicae novae})

The monochord is the simplest and most straightforward instrument, strung with one string or several in simple unison, divisible into however great and many parts, according to the radical numbers, bisecting in two, trisecting in three, quadrasecting in four, etc. [It is] the canon, root, and mother of all musical instruments. Indeed there is no single instrument which has not been born of it or founded upon it, so it may not unjustly be called the instrument of instruments. (\textit{Instrumentum Instrumentorum})

It is apparent that Grimm has merely changed the word order of Lippius’s definition and added a concluding remark extolling the monochord.

In section 2, “On the Proportions or Divisions of the Monochord,” the connection to the \textit{Synopsis} is less obvious. Lippius discusses the relationship between intervals and harmonic proportions in the section of his treatise entitled “Concerning the Musical Dyad,” which opens the \textit{musica practica} portion of the \textit{Synopsis}. It is shown in the above outline as “B. internal, b) composite: dyad and triad.” Although Grimm follows the same order as Lippius in presenting intervallic proportions as demonstrated on a monochord, he also adds note names to clarify his examples, and he only includes certain

\textsuperscript{39} The outline for the \textit{Synopsis} is found in the introduction of Rivera’s translation. Lippius, \textit{Synopsis of New Music}, ii.
proportions. The two authors diverge after the basic divisions of the octave have been covered. While Lippius then turns to an explanation of composite dyads, or intervals greater than an octave, Grimm embarks on an interesting summary of the divisions he has just presented. In this review Grimm shows how specific pitches and intervals are derived from further divisions of three basic proportional relationships:

The entire matter is established in duple, triple, and quintuple divisions. From a duple division it is not difficult to produce a quadruple one, likewise for one of eight or sixteen, etc. Similarly, from a triple one, divisions of six, nine, twelve, etc. [are produced], from a quintuple one, divisions of ten, fifteen, etc. Yet, one is also able to produce a division of fifteen easily from a triple one.\textsuperscript{41}

An example of what follows in Grimm’s summary may be seen in the example below from folio 9r of \textit{Instrumentum Instrumentorum}:

\begin{center}
\textbf{C} C\# \textbf{E} F\# \textbf{G}\#
\end{center}

By dividing the interval \textit{C/E} in five parts, Grimm is able to derive the lesser semitone (one that requires ficta) \textit{C/C\#}. This example also shows how Grimm extends the division by semitones beyond \textit{E} to produce \textit{F\#} and \textit{G\#}. The numbers below the line indicate proportional relationships, with 25:24 being the numeric value of a lesser semitone. Grimm divides the octave into twenty-five parts in order to demonstrate fourteen chromatic pitches, including the distinct tones \textit{D\#} and \textit{E\@} as well as \textit{G\#} and \textit{A\@}.

\textsuperscript{41} D-HAB 4281 2.12 Mus., fol. 8v. “Totum negotium consistit in divisione binaria, ternaria, \& quinaria: Ex binaria enim non difficile est quaternarium, item Octonarium et Sedenarium, etc., producere; similiter ex ternaria senarium, novenarium, duodenarium, etc.; ex quinariâ denarium, quindenarium, etc. quamquam etiam quindenaria ex ternari produci facile posât.”
calculates the difference between the two pairs of pitches as a diesis of 128:125. As Werner Braun has noted, Grimm may be credited as the first theorist to denote the pitches E and A correctly. Although Grimm creates a syntonic-chromatic-enharmonic scale through this method of division, which is in itself progressive, he is forced to provide alternative methods for deriving particular pitches in order to accommodate the excessive syntonic comma (81:80) and achieve pure thirds. Once all the pitches within the octave from C to c have been derived, Grimm turns to the uses of the monochord. In this part of the manual, the application of Lippius’s theories concerning the trias harmonica is most apparent.

Despite the fact that Grimm’s text is more practically oriented than the Synopsis, Grimm retains Lippius’s abstract analogy between the Trinity and the triad in Chapter 3 of the monochord’s uses. Grimm uses Lippius’s exact wording in this passage, and, as in the case of the monochord definition, he cites the source of the quotation. Moreover, Grimm’s explanation of the triad’s significance is based on the concept of radical numbers as outlined in the Synopsis. With respect to this concept, both writers use the radical harmonic triad c'-e'-g' as the model for demonstrating the triad’s special properties. Their explanations differ, however, in their focus and order of presentation. After first introducing the analogy between the triad and the Trinity, Lippius presents the c'-e'-g' chord and then uses it to illustrate the principle of triadic inversion. Grimm, conversely, begins by establishing the monochord’s utility in demonstrating the model triad and in deriving other triads from it. It is only at the end of the section in Grimm’s manual that the Trinitarian analogy is invoked.

42 Braun, 86. See also Synofzik, 45-6.
In his discussion of the *trias harmonica*, Grimm emphasizes the role of the monochord. Although Lippius does mention the monochord in his discussion of the triad, he only does so very briefly. In particular, Grimm explains how to manipulate the monochord to produce the triad and refers to diagrams that appear on the instrument. For example, he instructs the reader that

> Once, therefore, the little bridges or movable stops have been placed under the somewhat larger numbers indicated at the edge of the monochord, the numbers 4, 5, 6 (as done previously), the pleasing harmony of the plucked strings will be heard in these higher notes: c’, e’, g’, [or] *ut, mi, sol.*

Grimm also outlines a method of deriving other intervals in this section that appears to be his own invention. On folio 13v, Grimm demonstrates that the instrument may be used to produce F, E, and E♭, what he terms the *partes residuae* or remaining parts, by plucking the opposite sides of the strings used for the model triad:

![Diagram of monochord](image)

If one divides the string into four parts, as Grimm explains he has done in the example with the bottom string, the pitch produced on one side is an octave equivalent of the open string. When the opposite side of the string is plucked, a pitch an octave and a fourth below the first tone is produced. Grimm demonstrates this acoustic principle with the

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43 D-HAB 4281 2.12 Mus., fol. 13r. “Positis igitur in Monochordo ponticulis seu Magadibus sub numeris majusculis ad marginem notatis 4, 5, 6. (velut antea factum) audietur jucunda pulsatarum chordarum harmonia, in clavibus acutioribus hisce c, e, g, ut, mi, sol.”
other notes of the model triad, e and g, and their corresponding *partes residuae*, E, and E♭. In this section he simply presents the *partes residuae* in conjunction with the triad.

In Chapter 6, however, Grimm illustrates how they are used in composing two-voice works. Lippius likewise suggests a natural style of composition based on the triad, but he neither restricts himself to two-part writing, nor does he discuss the *partes residuae*.44

Both Lippius and Grimm advocate the use of the syntonal diatonic tuning system, a type of meantone temperament, over the older Pythagorean scale.45 The latter tuning system, which generates wide major thirds in order to maintain pure fourths and fifths, was more appropriate for medieval music than that of the Renaissance or Baroque, since thirds occur less frequently in music prior to the fifteenth century. Although seventeenth-century theorists, such as Lippius and Grimm, still mention Pythagorean tuning in their treatises, it is often discussed in order to demonstrate either the relative advantages of meantone systems or simply to be comprehensive in scope.

In the *Synopsis* and *Instrumentum Instrumentorum* the term “syntonal diatonic scale” refers to quarter-comma meantone temperament, which most scholars today consider to be standard meantone tuning. The seventeenth-century designation “syntonal diatonic scale” clearly stems from the use of the syntonic comma in the tuning system to temper fifths. The syntonic comma, which equals 22 cents, is the discrepancy between two whole tones with a ratio of 9:8 and a pure major third with a ratio of 5:4. In contrast to just intonation, where all but one fifth remain pure and that one, the so-called “wolf” tone, becomes extremely dissonant through the addition of excess cents, standard

44 Lippius discusses this method in the section on the pure style of composition in the *Synopsis*.
45 Calvisius, Baryphonus, and Selle advocate the use of syntonal diatonic tuning as well.
meantone tuning preserves the purity of the thirds and narrows each fifth by one-quarter of a syntonic comma (i.e., 5.5 cents). Grimm describes in detail the process of tempering the fifths according to meantone tuning in the last chapter of Instrumentum Instrumentorum, while Lippius is content to list numerical proportions for each interval of the syntonal diatonic scale.

Grimm and the German Tradition

Although the monochord was mainly used for experimentation and tuning purposes in the Middle Ages, it was also highly regarded by medieval writers as an instructional aid in teaching music. As a result most medieval treatises on the monochord presented the instrument’s acoustical divisions for didactic purposes, such as demonstrating intervals and teaching singing. In the mid-fifteenth century, however, with the development of scales with tempered intervals and keyboard instruments to produce pitches for singers, the pedagogical function of the monochord began to decline.46 Renaissance and Baroque treatises on the subject often contained complex explanations of a variety of tuning systems and types of string division, the focus often being to demonstrate how an interval in a given tuning sounds.47 Indeed, many seventeenth-century German texts on music theory and acoustics were comprehensive in scope and often used mathematical methods to illustrate intervals not easily rendered on the monochord.

In comparison with many contemporaneous works on the monochord, Grimm’s Instrumentum Instrumentorum may appear somewhat anachronistic in view of its

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46 Cecil Adkins, The Theory and Practice of the Monochord (Ph.D. dissertation, University of Iowa, 1963), 337.
47 Ibid., 205.
pedagogical rather than encyclopedic or speculative orientation. On the other hand, its pragmatic approach is very much in keeping with early seventeenth-century educational reforms. Like many teaching manuals written by German cantors of the era, Instrumentum Instrumentorum does not contain detailed explanations of music theoretical concepts. Instead, its focus on the usefulness of the monochord or decachord reflects the shift in educational philosophy at the turn of the seventeenth century away from mastering complex theoretical material and superfluous information toward acquiring general knowledge and practical skills.\(^{48}\) Although Grimm systematically presents acoustic divisions of the monochord and musical intervals, he provides neither lengthy descriptions nor complex explanations. In short, the pedagogical approach Grimm takes with respect to the monochord recalls that of practical medieval treatises, while his manner of presenting information corresponds to that found in progressive teaching manuals of the seventeenth century.

What is perhaps most noteworthy about Instrumentum Instrumentorum is the way in which material from Lippius’s Synopsis musicae novae has been appropriated by Grimm. Although Grimm borrowed some fundamental ideas from Lippius directly, he also interpreted other concepts from the Synopsis and presented them differently so that they could be easily grasped by inexperienced musicians and pupils. Despite the fact that cantors frequently incorporated excerpts and ideas from other sources in their own teaching manuals, it was less common to borrow material from a more abstract text, such

\(^{48}\) John Butt, Music Education and the Art of Performance in the German Baroque, 64-66. Perhaps the most ardent education reformer of the seventeenth century, the Moravian Bishop Jan Amos Comenius (1792-1670) strongly influenced educational institutions throughout Europe. In works, such as Didactica magna (Czech edition, 1632; Latin edition, 1657), Comenius advocated a pedagogical approach based on the facilitation of the learning process. His belief that the educational experience should be pleasant, natural, and effective was an extension of his pansophic philosophy, which was based on the concept of gathering knowledge through an awareness of the underlying harmony of the universe.
as the *Synopsis*. Cantors tended rather to include practical information and exercises, often from well-known music primers. Grimm’s association with Calvisius and his circle, however, as well as his obvious fascination with the monochord may have led him to produce this unusual text, which does not fall squarely into any of the typical categories for early seventeenth-century teaching manuals.
CONCLUSION

Elementary music manuals provide information not usually found in theoretical treatises for advanced musicians. Since such handbooks are geared towards pupils and beginning music students, they typically contain theoretical explanations that more clearly reflect actual contemporary perceptions of musical tenets than those largely conceived for theoretical discourse. Much can also be gleaned from such manuals concerning the content of music lessons and the connection between theoretical knowledge and practical application.

The theoretical traditions that Selle and other Cantors were transmitting in the early seventeenth century attest to a diversity of thought regarding music instruction, particularly with respect to solmization and tuning practices. On the one hand, the two cantors present ideas shared by other members of the Calvisius circle in their music primers. On the other hand, they each offer new approaches and concepts: Selle, the use of letter names as opposed to solfege syllables in teaching sight-singing, and Grimm, the practical utility of the monochord, such as a natural process of composing and a harmonic division of the instrument that demonstrates an expanded range of pitches. Perhaps more than Grimm, Selle indicates an awareness that other contemporary theorists and cantors may not share his views, especially regarding solmization itself. Thus he attempts to persuade the reader of the validity of his method in the Conclusion and Objectio of his Anleitung zur Singekunst. Indeed, Selle’s attitude and the apparent existence of a network of theorists associated with Calvisius beg the question to what extent theoretical manuscripts were circulated in Germany in the early seventeenth century.
Pupils of the Hamburg cantor Thomas Selle would, no doubt, have been familiar with the Latin motto "nam quod fieri potest per pauca, frustra fit per plura"--"for what can be done by little means, is done in vain with much effort." This phrase, which epitomizes Selle's pedagogical approach, appears three times in his primer written for the pupils of the St. Johannis-Schule. He invokes the phrase at key points in the text to illustrate the efficacy of his didactic method, one clearly in keeping with the practical orientation of the early seventeenth century. Although Heinrich Grimm does not incorporate the axiom in his manual directly, another form of it does appear in Lippius’s *Synopsis musicae novae*. In both works by Selle and Lippius, the motto is used in conjunction with their discussions of older solmization methods, which neither author considers to be efficient or useful in teaching sight-singing.¹

Selle, long considered by his contemporaries and modern musicologists to be an important figure in the history of the oratorio passion and Hamburg's musical life, may now be viewed as a progressive music educator as well. His practical approach to teaching sight-singing and his conscientious efforts to improve the standards of musical performance in Hamburg are noteworthy. Likewise Heinrich Grimm has not received the attention his contributions to music history truly warrant. As in the case of Selle, Grimm was obviously interested in training his pupils properly and sought to provide them with a variety of useful texts, compositions, and new, practical methods of studying and writing music. In general, both cantors appear to approach the task of educating their pupils and choristers in a pragmatic manner, which leads them to incorporate more progressive didactic methods in their manuals. Moreover, by transmitting and appropriating the music theoretical traditions of Calvisius and his circle in new ways, the cantors participate in the process of shaping music history and education. As dedicated cantors who were clearly concerned with both teaching and the process of learning music, Selle

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¹ Calvisius is probably their source for using the motto in this context, since he invokes it as well in his discussion of bocedization in *Exercitatio musica tertia*, 166-67.
and Grimm would probably agree with another Latin saying: "qui docet discit"--"He who teaches learns."
APPENDIX A

TRANSLATOR’S NOTE

The translation and transcription of Thomas Selle’s *Kurze doch gründtliche anleitung zur Singekunst* were based on the only extant copy of the manuscript, which is housed in the Staats- und Universitätsbibliothek Hamburg Carl von Ossietzsky. Two copies exist of Heinrich Grimm’s treatise *Instrumentum Instrumentorum, hoc est, Monochordum vel potius Decachordum*, one located in the Herzog August Bibliothek Wolfenbüttel, and the other bound together with Selle’s *Anleitung zur Singekunst*. The transcription and translation of Grimm’s manual were prepared from the copy in Wolfenbüttel, but variants in the Hamburg version are included in footnotes.

Since only manuscript copies of both texts have survived, the format and organization of the documents are not always systematic. In the case of the *Anleitung zur Singekunst* in particular, headings have sometimes been rearranged for ease of reading and comprehension. Marginal comments have been noted in each of the translations as *marginalia*. Items that have been written in larger print in the monochord treatise have been emphasized in the translation through the use of a bold font. Page and folio numbers are indicated in brackets on the left side of pages in both the transcriptions and
translations. The transcription of each text appears on the verso side of the page, and the
translation on the recto.

In general, the translations offer versions of the texts that are both close to the
respective original and accessible for the modern reader. Lengthy sentences, for
example, are sometimes shortened, and additional words are inserted in brackets to
clarify confusing and elliptical sentences. Words and concepts that may be interpreted in
different ways are explained in the footnotes.

Selle’s manual includes the frequently used term, *clavis*, which literally means
“key.” In the seventeenth century, *clavis* could indicate a clef, as it did in medieval
theory, or the letter names of pitches. The context of each occurrence has determined the
translation of the word. A few other terms, such as *cantus durus* or *cantus mollis*, have
not been translated, since they refer to seventeenth-century concepts that have no real
parallels in modern terminology. Although the two terms had been used in the Middle
Ages to denote types of hexachords, their meaning in the seventeenth century was
expanded to include key signatures. *Cantus durus*, which originally included hexachords
with b-natural, was indicated by a signature of no flats or sharps, while *cantus mollis*,
which employed hexachords with b-flat, was indicated by a signature of one flat.

In order to represent different versions of pitches used in the seventeenth century
that would be written the same way in modern notation, such as f-sharp, arrows have
been placed above the bracketed, modern examples in the translation. In each instance
where more than one version of a pitch exists, the original form appears first in the
example, followed by a modern rendering in brackets.
Kurtze doch gründtliche anleitung zur Singekunst,

Wie nemlich ein Knabe (auch wol ein erwachsener)

ohne große Weitläuffigkeit und verworrne

Mutationen vor erst schlecht und recht

nach den Fundament-Buchstaben, welcher

auch die Teütschen Organisten sich mit

gutm grunde und großen nutzen

gebrauchen, singen lernen könne.

Auff gutachten und Befehl der Herrn

Scholarchen und des H[errn] Inspectoris

vor die Incipienten der lateinischen S[anct] Johannis

Schuel in Hamburg gestellet

durch

Thomas Sellium Cervicca-Saxonem Ejusdem

Scholae Joh[annae] Cantorem & Chori Musici

Hamburgensis Directorem.
A Brief but Thorough Introduction to the Art of Singing

Namely, how a boy (and indeed an adult)
can learn to sing without great effort and confusing
mutations, above all, simply
according to the basic letters, which
the German organists also use with
good reason and great application.

Presented to the beginning pupils of St. John's
Latin School of Hamburg,

with the approval and by order of the gentlemen
of the Scholarchat\(^1\) and the inspector,

by

Thomas Selle, himself of Saxony-Anhalt,

Cantor of St. John's School and Civic Music
Director of Hamburg.

\(^1\) The Scholarchat or Collegium Scholarchale, a board founded in 1610 to govern educational institutions in Hamburg, was comprised of members of the Senate, the rectors of Hamburg’s main churches, and senior guildsmen or aldermen. The Cantor was supervised by the Scholarchat, who had the authority to hear petitions and institute changes concerning the office itself. For further information concerning the school board see Johann Martin Müller, *Beytrag zur Geschichte des Johannei* (Hamburg: Piscator, 1779).
Einer der da singen lernen wil, muβ den *sonum* oder klang, damit die Singekunst eigentlich umbgehct in seinen gewißen ihm zugeordneten Clavibus oder *literis characteristicis* wißen zu suchen auffen gebrauchlichen Systemate als *sonorum* oder *Intervallorum sede*, darauff die Scala, welche ist eine gewiße ordnung der *Sonorum* oder Clavium, geordnet ist.

[marginalia] + *Sonus est quo quod concinit seu est clavium explio.*

Das *Systema* aber als eine zusammen fügung etlicher *linien* und *spatien*, ist zweyerle: *Generale seu Universale & speciale seu particulare*. *Generale seu Universale Systema*, welches alle *sonos* und *claves* in sich hat, und daher das gantze *Clavier* genennet wird, bestehet nach chormaße zu rechnen, in 4 *Octaven*, begreifft in sich 15 *linien* und 14 *spacia*.

[marginalia] + *Claves sunt certae quidam literae lineis ac spaciis distinctae quibus sursum ac deorsum ordine quoties opus est iteratis sonorum differentiae ac spacia designatur, alias dur intervalla*. *Dividentes in Signatas & in Intellectas.*
One who wishes to learn how to sing must know what the art of singing is truly about: finding the pitch or tone in the clef specifically associated with it, or [finding] on the commonly used staff the alphabetical designations considered the basis of pitches and intervals, upon which the scale, a certain arrangement of the pitches or notes, is organized.

[Marginalia] The pitch is that by means of which something sounds, that is, [by] depressing the key.²

The staff, however, as a combination of several lines and spaces, has two forms: the general or universal and the special or particular. The general or universal staff, which comprises all pitches and notes and is therefore called “the entire keyboard,”³ contains four octaves, [or] fifteen lines and fourteen spaces, in accordance with the range of the choir.

[Marginalia] Notes are indicated by certain letters on the distinct lines and spaces, which are ascending and descending in turn, as many repetitions as is necessary for each of the different pitches and spaces for diatonic intervals. [Claves are] divided into signatas [clef signs] and intellectas [understood notes].

² Many of Selle’s marginal comments in Latin are definitions, which may have been unattributed quotations from other sources. None of the definitions has been located, however, in the music theoretical texts listed in Selle’s library.
³ Selle’s use of the term gantze Clavier for the grand staff suggests a double meaning. As with the word Clave, the expression seems to refer simultaneously to both the keys of the instrument and the pitches sounded when the keys are depressed.
Systema Generale seu Universale juxta Scalam Syntonam & quidem perfecte
mixtam. daß gantze Clavier

Lineae Spacia Claves Signatae,
daß sind Music-Schlüssel darnach sich die anderen
claves intellectae genant richten müssen.

Nota. die Chromata (auffen Clavichordio sinds die schwartzen Claves) haben vor
sich allein in ihrer ordnung hier keinen gebrauch, sondern müßen immisciret
werden, dem Diatonismo darumb, weil die Tertiae et sextae maiores & minores
The General or Universal Staff juxtposed with the Syntonal Diatonic Scale\(^4\) and, indeed, completely combined. The entire keyboard [grand staff]:

<table>
<thead>
<tr>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
<th>6</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>b&quot;</td>
<td>g&quot;</td>
<td>e&quot;</td>
<td>d&quot;</td>
<td>b'</td>
<td>g'</td>
<td>f'</td>
<td>e'</td>
<td>d'</td>
<td>a</td>
<td>g</td>
<td>f</td>
<td>e</td>
<td>d</td>
<td>c</td>
</tr>
<tr>
<td>b&quot;</td>
<td>g&quot;</td>
<td>e&quot;</td>
<td>d&quot;</td>
<td>b'</td>
<td>g'</td>
<td>f'</td>
<td>e'</td>
<td>d'</td>
<td>a</td>
<td>g</td>
<td>f</td>
<td>e</td>
<td>d</td>
<td>c</td>
</tr>
<tr>
<td>Octave 4</td>
<td>Octave 3</td>
<td>Octave 2</td>
<td>Octave 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Claves signatae are music clefs by which the other type of claves [notes], called intellectae [understood notes], are governed.

Note. The chromatic pitches (on the clavichord they are the black keys) have no use on their own in their order here, but rather must be united with the diatonic ones. This is because the major and minor thirds and sixths are thereby produced.

---

\(^4\) The intervals in this scale are tempered using the syntonic comma of 22 cents. In various types of meantone tuning systems, some portion of the 22 cents is subtracted from each fifth throughout the circle of fifths, thereby narrowing them. According to the musicologist Claudio di Veroli in *Unequal Temperaments and their Role in the Performance of Early Music* (Argentina: Artes Graficas Farro, 1978), 49, Pietro Aron published the first description of standard meantone temperament in *Il Toscanello in musica* (1523). Generally, however, Zarlino was credited with the invention of meantone temperament by seventeenth-century theorists. Zarlino discussed various tuning systems in his *Le istitutioni harmoniche* (Venice, 1558) and in *Dimostrazioni harmoniche* (Venice: Francesco de I Franceschi Senese, 1571), the latter work being the main vehicle for advocating meantone tuning. Indeed, Zarlino favored the use of standard meantone (i.e., quarter-comma meantone) temperament and deemed it superior to two-sevenths comma meantone tuning, which he had described in *Le istitutioni harmoniche*.
dadurch verursachet zur volkömlichen *Harmonia* und deren *clausulen* in dieser *Scala Syntona* höchst von nöthen sein.

*Nota.* die größe der Buchstaben, und dann die strichlein über den Buchstaben, scheiden eine *octavam* just von der ander. *Speciale seu particulare Systema*, welches nur etliche *sonos* und *claves* in sich hat, und dahero nur einen einzigen Sänger oder *Instrumentisten*, er seÿ auch *Discant-[,] Alt-[,] Tenor- oder Bassist*, seine partey dastellt, begreiff in sich *per se 5 per accidens* aber wol 6 oder 7 *linien*; und *per se 4 per accidens* aber wol 5 und 6 *Spacia*. die 5 *linien* nennet man auch wol mit einem worte *pentegramma*.

![Musical notation image]

*Lineae*        *Spacia*

auff die *linien* gehören nur, wie *ex Universali Systemate* vorher zu sehen, *Claves Signatae*, das sind Music schlüssel, die da anzeigen, wo die anderen *claves*, *Intellectae* genennet, ihren sitz haben.

    Es seind fürnemblich dreÿ *Claves Signatae* als G[,] T[,] und] ® weil wir

[37] aber *Scalam mixtam* dociren, und das b *rotundum* den *Cantum* unterscheidet,
for the most complete harmony, and their cadences in the syntonal diatonic scale are absolutely essential.

Note. The size of the letters, as well as the small lines above them, simply differentiate one octave from another. The special or particular system, which contains only some of the pitches and notes and therefore only shows the part of one singer or instrumentalist, whether it be for the soprano, alto, tenor, or bass, comprises five lines per part, but also occurs with six or seven lines, and four lines per part, but then with five and six spaces. One calls the five lines together the *pentegramma.*

<table>
<thead>
<tr>
<th>Lines</th>
<th>Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

As was shown previously with respect to the Universal System, the *claves signatae,* which are music clefs that indicate where the other *claves* [notes] known as *intellectae* [understood notes] are located, indeed belong only on the lines.

There are primarily three clefs, written ♭, ♮, and ♯. Since, however, we teach the mixed scale⁵ and the round b [♭] determines the [type of] *cantus* (the

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⁵The idea of a “mixed scale” certainly stems from early seventeenth-century concepts of modes. While the ecclesiastical church modes and hexachordal theory remained in use in the seventeenth century, most German theorists considered music to be notated in terms of either *cantus mollis,* a scale beginning on F with one flat, or *cantus durus,* a scale starting with C that had no flats. More than one traditional mode could appear within each *cantus.* With respect to notation, however, these two main systems were predominant. Selle is attempting to present, on the one hand, a “mixed scale,” or combination of the two systems, and on the other hand, to describe how clefs and “key signatures” function.
nimium Regularem, daß ist $\text{dur}$ vom Transposito seu irregulares, daß ist $\text{b mol}$ als könnten wir brevitatis causa das $\text{b rotundum in loco proprio pro clave signata}
\text{quarta}$ halten.

Die Claves Signatae werden vor die sänger gesetzt eigentlich gefunden auff folgenden Linien:

![Musical notation graphic]

Nota. Quaelibet clavis signata Nomine sibi similis in quacunque etiam linea reperiatur, et eadem est clavis & eundem quoquem resonat sonum. Wenn wir aber die Buchstaben als: $c'$, $d'$, $e'$, $f'$, $g'$, $a'$, $b\ Flat$, neben den Chromatibus:

\[
\begin{align*}
   &c \# , d\ Flat, d\ Sharp, e\ Flat, f \# , g \# , a \# , \\
   &cis, dis, dis\ Flat, fis, gis, as,
\end{align*}
\]

[38] gleich den Teutschen Organisten auffs Systema setzen, wie geschehen, und derselben Nahmen, die auch im aussprechen einjeglicher eine Syllabam geben, alle verworrene Mutationes damit auffzu heben, zugleich pro Vocibus Musicalibus: Ut, re, mi, fa, sol, la, deren Inventor gewesen ist Guido Aretinus; oder bo, ce, di, ga, lo, ma, ni, welche Sethus Calvisius und Johannes Lippius neben ihren nachfolgern gelehrert, gehalten haben; und die heütiges tages gebrauchliche vom Josepho Zarlino erfundene Völlige Scalama Syntonam
regular [natural or untransposed] one, that is the *dur* \( \text{b} \text{b} \), versus the transposed one or rather the irregular one, that is the *mol* \( \text{b} \text{b} \), we could, for the purpose of conciseness, consider the round \( \text{b} \text{b} \) in its usual place as the fourth clef.

The clefs that are properly designated for singers are found on the following lines:

Note. Wherever a particular clef is found on the staff, its name actually corresponds to that line, and that is the note and, therefore, the very same pitch that sounds. If we, however, put the letters \( \text{c}' \text{ b}', \text{d}', \text{e}', \text{f}', \text{g}', \text{a}', \text{b}' \) next to the chromatic ones:

\[
\begin{align*}
\text{c}', \text{d}', \text{e}', \text{f}', \text{g}', \text{a}', \text{b}'
\end{align*}
\]

\[
\text{cis, des, dis or es, fis, gis, as,}
\]

just as the German organists place them on the staff, as done [above], and [use] their same [letter] names, each of which also has one syllable in its pronunciation, all confusing mutations are thus dispensed with—likewise [the need] for the solfege syllables *ut, re, mi, fa, sol, la*, whose inventor was Guido of Arezzo; or *bo, ce, di, ga, lo, ma, ni*, which Seth Calvisius, Johannes Lippius, and their followers taught and maintained, and for the complete syntonal diatonic scale invented by Gioseffo Zarlino that is commonly taught today—“for what can be done by little

---

6 This is probably a reference to the Universal Staff depicted on page 34 of the manual.
7 For clarification on the first instance of meantone temperament, see footnote 3.
Regulariter dociren wollen (Nam quod fieri potest per pauc\(a\), fru\(stra\) fit per plura &: Wenn ich aber erst fragen muß, in welchem clave stehet die Nota? Und ich antworte, im c'. Und hernach weiter, was singstu im c'. Respondeo, ut, wenns hinauff steiget, und im Cantu \$\text{duro fa}, im b molli aber sol, wenns hinunter steiget, so geschieht ja per plura, quod debebat fieri per pauc\(a\), weil das c' dem Sono und Tono nach so wol im b mol als \$\text{dur}. c' heißet und bleibt, welches der sel[ige] Sethus Calvisius sehr wol gesehen, in dem er Exercitatione 3 q[uaestio] 5 das consilium gibt, wenn er sagt: Nomina clavium aut identitate facilitatem deductionis sonorum adjuvarent.)

Als setzen wir zu erst alle Buchstaben nach Teütscher Organisten Tabulatur auff die Systemata, so wol in genere chromatico als Diatonico; so wol vor Discant[,] Alt[,] Tenor[,] als Bassisten, und tractiren alsbald darauff fundamentalem Intervallorum Doctrinam, welches in diesem Wercklein unser fürnembster scopus ist und richtiger nach den buchstaben als nach den Vocibus Musicalibus. Ut, re, &: angehet, weil jedes Intervallum seinen eigenen characterem haben kan, daß in der Scala Guidonica nicht angehet da c' [-] d' so wol als c\# [-] d', etc. ut re genennet werden muß.
means, is done in vain with much effort, etc.”\textsuperscript{8} If I must first ask, however, what pitch the note represents, my response is c'. And a further question, what do you sing for c'? I respond, “ut”; if it ascends and is in cantus durus [scale using the hard hexachord] then it is fa, but if it is in mollis [scale using the soft hexachord], then sol. If it descends, then it is apt to say “what was done with much effort should have been done with little,” because c' is called and remains c' according to the pitch and tone in mol as well as in dur. This is something which the late Seth Calvisius indeed recognized by making the suggestion in Exercitatione [page] 3, question 5 when he says: the names of notes or identifying characters lend ease in finding the pitch.\textsuperscript{9}

Thus, we first place all the letters according to the tablature of German organists on the staff, both in their chromatic and diatonic forms. This we do for soprano, alto, tenor, and bass and begin practicing the basic rules for intervals immediately, which is the primary focus of this little book. And it is better to use letters than solfege syllables, ut, re, etc., because each interval can have its own character, which is not possible in the Guidonian scale, because c' - d' as well as c# - d' must be called ut, re.

\textsuperscript{8}This phrase is a rendition of the principle of parsimony, also known as “Occam’s razor”: “Beings are not to be multiplied without necessity” (Entia non sunt multiplicanda praeter necessitatem). It is attributed to the Franciscan William of Occam (d. 1347). Friedrich Ueberweg, History of Philosophy, vol. 1, trans. George S. Morris (New York: Scriber, Armstrong & Co., 1872), 1:462.

\textsuperscript{9}Seth Calvisius, Exercitationes musicae duae: Quarum prior est, de modis musicis, quos vulgo tonos vocant, rectè cognoscendis, & dijudicandis (Leipzig: Apel, 1600). Selle had a copy of this text in his own library.
Speciale Systema Superius vor die Discantisten.

ce, cis, de, dis, e, dis oder es, ef, fis, ge, gis, a, as, ha, be

Systema Speciale inferior vor die Discantisten.

[41] Speciale Systema Superius vor die Altisten[.]

Systema Speciale inferior vor die Altisten; und Superius vor die Tenoristen.
Special higher staff for sopranos.

\[ \text{ce, cis, de, dis, e, dis or es, ef, fis, ge, gis, a, as, ha, be} \]

Special lower staff for sopranos.

[41] Special higher staff for altos.

Special lower staff for altos and special higher staff for tenors.
Systema Speciale inferius vor die Tenoristen.

[42] Systema Speciale Superius vor die Bassisten.

Systema Speciale inferius vor die Bassisten.

Nota. eben wie die soni oder claves in allen systematibus gradatim ascendiren, also descendiren sie auch gradatim wiederüm per eadem intervalla. NB. Das *b rotundum* stehet in vorhergehenden systematibus alzeit hinter dem quadrato, weils nur per accidens kümpts in cantum regularem, sonst aber röl Intervallorum gehört es vorm $ zu stehen.
Special lower staff for tenors.

Note: Just as the pitches or notes on all staves ascend stepwise, so do they descend for each single interval. NB: the round b [b♭] always appears on the above staff after the natural sign because it can only be sung in the regular *cantus* with an accidental. Otherwise, however, in the list\(^{10}\) of intervals it belongs in front of the natural sign.

---

\(^{10}\) *Röl* is translated here as *Rolle* or *Rulle*, which means *Verzeichniß* in middle high German.
die krummen schwänze an den Buchstaben bedeüten, das vor oder beý dem Clave oder Nota entweder ein #, $, oder @zeichnet stehet.

Diese #, $, erheben den Clavem oder die Notam dabeý sie gefunden werden, allzeit umb einen kleinen halben Ton. das b rotundum stehets unten beym clave oder Noten so gibts; stehets oben so nimpts einen kleinen halben Ton. quadratum und #cancellatum, wenn sie unten beý den clavibus oder Noten stehen so nehmen sie; stehen sie aber oben, so geben sie einen kleinen halben Ton.

erhebt erhebt gibt nimpt nimpt nimpt gibt gibt

Alle dreý @, $, und alß Chromata, werden dem Diatonisma, daß ist, da man allezeit von zweýen Tonis zum semitonio gradatim progrediret, immisciret, und genennet auff folgende weise:
The curved tails on the letters mean that either a #, $ or @ is written in front of or next to the pitch or note.

These # and $ signs raise the pitch or note next to which they are found a small half step.\textsuperscript{11} If the round b [b@] sign is written before a pitch or note, then it adds a small half step. If it appears after the pitch [i.e. before the next note] it takes the half step away. The $ and the # signs take away a small half step when they appear before the pitch or note and add a small half step when they are after the pitch [before the next note].

\begin{center}
\begin{tikzpicture}
\node at (0,0) {$\text{raises}$};
\node at (1.5,0) {$\text{raises}$};
\node at (3,0) {$\text{adds}$};
\node at (4.5,0) {$\text{removes}$};
\node at (6,0) {$\text{removes}$};
\node at (7.5,0) {$\text{removes}$};
\node at (9,0) {$\text{adds}$};
\node at (10.5,0) {$\text{adds}$};
\end{tikzpicture}
\end{center}

All three [signs]-@, $ and # are added as chromatic accidentals to the diatonic [scale], that is [the case], since one always proceeds to the semitone by degrees between two [whole] tones. They are designated in the following manner:

\textsuperscript{11} In this rather confusing description that only works if the second pitch ascends, Selle is trying to describe the addition or removal of half tones in relation to the final pitch in each pair. Generally speaking, though, the use of natural, flat, and sharp signs to indicate chromatic changes was not always systematic in the early Baroque. Rules for using accidentals were based on interpretations of modal theory and their application to the emerging tonal system. In this explanation, Selle is probably relying on the training he received under Calvisius. In particular, he notates the pitches F-sharp and B as F# and F$, and B# and B$, respectively, according to their function. For example, the F-sharp a fifth above B is indicated by a natural sign, while the F-sharp occurring as a sixth or third is indicated by a sharp. In this translation, a distinction between the two forms is made for the modern reader by the inclusion of arrows above the staff. For those pitches that were to be intoned slightly higher, upward arrows have been added, and for those that were to be sung slightly lower, downward arrows.
daß b rotundum an seinem gewöhnlichen orte bleibt und heist b@

Wenn es aber beym e' steht, so heist es d♯ oder e@, es,

stehets beym a' so heist es a@, es,

wirdts aber beym ungewöhnlichem clave gefunden und gehet vorher das #oder $

so bedeütt es, daß man das vorige semitonium sol fahren laßen und den rechten
gewöhnlichen clavem intoniren.

Das $quadratim nennen wir zum unterscheid das b rotundi mit den

[45] Teütschen Organisten quasi à forma b. Stehets beym f', so heists [↑] f♯, an der

intonation aber etwas höher als das [↓] f♯
Round b in its usual location remains and is called b.

[Diagram: b]

If a is written next to e', it is called d#. dis or ees.

[Diagram: d#]

a flat

If it is written next to a', it is called aas.

[Diagram: aas]

If it is found next to an unusual note and a # or $ appears before it, then it means that one should abandon the previous semitone and intone the correct usual pitch.12

[Diagram: f sharp f]

We distinguish, along with the German organists, the quadratum [$] from the rounded b by calling the former quasi a forma b [as if in the shape of b]. If the quadratum is written next to f, it is called f#, but its sound is somewhat higher than [chromatic] f#.13

12 The example shows a flat in front of an f (“an unusual note” to be flattened), which was previously sharped, meaning that the sharp is cancelled.

13 The two examples above show the two types of notation for F-sharp. One assumes that the accidental would indicate the harmonic function of each F-sharp in a piece. As Selle clarifies here, the F-sharp notated with a # is slightly higher in pitch than the chromatic F-sharp. They correspond to perfect and imperfect consonances. For more on Calvisius’s theories see Kurt Benndorf, 200, and Braun, 97-9.
Das *Cancellatum*, wenns beym *b rotundo* stehet, heißt man auch *b'*. 

Es wird aber nicht so scharff *intoniret* als das $, weil das *$die Tertiam oder Sextam majorem*; dießes aber veram quintam in compositione zum *fundament* hat.


Wenn das *Cancellatum* beym c' stehet so heißt es *c' cis.*

Stehets beym d' so heißt es *d' dis,*

stehets beym f' so heißt es *f' fis,*
When the cancellation sign is written next to round b [b@ one calls it b' as well.

It [the note raised with a #] is not, however, intoned as high as the [diatonic note] because the # is based on] the major third or the major sixth, while the $ is structurally based on the perfect fifth.  

If the # sign is written next to c', then it is called c# cis.

If it is next to d', then it is called d# dis.

If it is next to f', then it is called f# fis.

---

14 This is due to the fact that meantone temperaments feature two sizes of semitone, with the diatonic semitone (e.g., e - f, c# - d) being larger than the chromatic one (e.g., b@ b, f - f#). Also, Seth Calvisius and many other seventeenth-century theorists differentiate between the # and $ signs according to mode and implied harmonic function. To raise a diatonic pitch a lesser semitone, one generally uses a sharp sign, but natural signs are commonly placed before an F# or B in cantus durus, since a fifth is normally implied as the basis of the chordal structure.
stehets beÿm g' so heißt es g♯ gis,

stehets beÿm e' so zeigt es an, daß man nicht e♮ sondern e' singen soll.

stehets beÿm b', so zeigt es an, daß man nicht b♭ sondern b' singen solle.

\[ce, cis, de, dis, ef, fis, ge, gis,\]

Die strichlein über den buchstaben unterscheiden in *sonis acutis*; die größe aber in *sonis gravibus*; eine octav von der ander.

Hierauff folget nun *Doctrina Intervallorum* nach der heütiges tages gebräuchlichen *scala syntona secundum dimensionem Monochordi*, so wol in *gradibus* als *saltibus*, nach *Noten* und Buchstaben in einer einzigen *Octava*, als vom c' zum c" angedeütet.

[marginalia]  *Soni distingentes per Intervalla.*

*Intervallum* ist eine gewiße Unterscheidung zwischen zweyen *clavibus* oder *Noten*. Oder, ist ein raum zwischen zweyen klängen.\(^{15}\)

[marginalia]  *Intervallum est sonorum gravium & acutorum distantia.*

---

\(^{15}\) This comment was apparently a later addition.
If it is next to g', then it is called g\#, gis.\(^\text{16}\)

If it is next to e', then it indicates that one should not sing e\# but rather e'.

If it is next to b', then it indicates that one should not sing b\# but rather b'.\(^\text{17}\)

\[\text{c'} \quad \text{c#} \quad \text{d'} \quad \text{d#} \quad \text{f'} \quad \text{f#} \quad \text{g'} \quad \text{g#} \quad \text{e''} \quad \text{b'}\]

\[
\text{ce, cis, de, dis, ef, fis, ge, gis,}
\]

The superscript strokes\(^\text{18}\) above the letters distinguish the high pitches, but for low pitches the size [of the letters distinguishes] one octave from another.

Next follow the rules for intervals as they are measured on the monochord according to the syntonal diatonic scale commonly used today. This will be done in both steps and leaps according to notes and letters within one octave, as seen in the octave from c' to c''.

[marginalia] + distinct pitches by intervals

An interval is a certain distinction between two pitches or notes, or it is the distance between two tones.

[marginalia] + An interval is the distance between a lower and a higher pitch.

---

\(^{16}\) In these examples, the \# sign is functioning as a sharp sign.

\(^{17}\) In the previous two examples, though, the \# sign is actually cancelling a flat.

\(^{18}\) In German letter notation, horizontal lines appear above the letters (see transcription). A modern method of indicating register is used here so that it corresponds to that used elsewhere in the translation.
In gradibus

Unisonus

Unisonus intervallum quidem non est, sed intervallorum principium. Was von c' [-] c',
gesagt ist, wird auch von d' [-] d' und andern clavibus auff vier linea oder in einem spacio
stehend, verstanden.

\[\text{ascendens} \quad \text{descendens} \]
\[\text{sursum} \quad \text{deorsum} \]

Semitonium minus semper est fictum. Fermè quatuor commatibus constat.

[marginalia]"Sonorum Comma" est prima & sublissima sonorum incisio. vel
Comma vel incisum est minima pars Toni, quae aliquoties in singulis Tonis &
semitoniis continetes.
By Steps

Unison

\[
\begin{array}{c}
c' - c' \\
\end{array}
\]

The unison is not an interval, but rather the origin of intervals. What is said of c' - c', is also valid for d' - d' and other pitches written on one line or in one space.

Lesser semitone

\[
\begin{array}{c}
\text{ascending} & \text{descending} \\
\text{up} & \text{down} \\
\end{array}
\]

\[
\begin{array}{c}
\begin{array}{c}
\text{up} \\
\text{down} \\
\end{array}
\end{array}
\]

[It] is always chromatically altered [and] usually comprised of four commas.

[marginalia]+ The comma of tones is the first and most sublime division of intervals or rather the comma or division is the smallest portion of an interval, which is sometimes comprised of several single tones and semitones.

[marginalia] Tonus a tonando dicitur eo quae perfecte tonat.

Tonus Major, sonstgen genennet secunda perfecta. Fermè decem continet commata. vel Excedit commata novem, & exceditur a decem.\(^{19}\)

\(^{19}\) The clarification of the precise number of commas was added later.
[Greater semitone]

Ascending descending

\[c# \rightarrow \text{d}' \quad \text{d}' \rightarrow c#\]

[It is] chromatically altered or created by means of the syntonic comma. [It is] otherwise called the imperfect second [and] usually comprised of five commas.

[marginalia] A tone receives its name from “à tonando” [loudly resounding], in that it resounds perfectly.

[Greater whole tone]

Ascending descending

\[c' \rightarrow \text{d}' \quad \text{d}' \rightarrow c'\]

[It is] otherwise called the perfect second [and] usually contains ten commas, or, rather, it has more than nine commas but fewer than ten.
ascend\[ens\] descend\[ens\]

\[\begin{array}{c}
\text{d\# e' e' d\#} \\
\text{Semitonium Majus fictum.}
\end{array}\]

ascendens descendens

\[\begin{array}{c}
\text{d' d\# d\# d'} \\
\text{Semitonium minus.}
\end{array}\]

diesis Enharmonica d' e@ e@ d'

Semitonium Majus.

[marginalia] NB portinacula ferè duorum commatum. Est differentia Semitonum Majoris & minoris
Greater semitone

ascending  descending

\[ \begin{array}{c}
\text{d}^\# - e' \\
\text{e}' - \text{d}\#
\end{array} \]

[It is] chromatically altered.

Lesser semitone

ascending  descending

\[ \begin{array}{c}
\text{d}' - \text{d}\# \\
\text{d}^\# - \text{d}'
\end{array} \]

Enharmonic tone

Greater semitone

ascending  descending

\[ \begin{array}{c}
\text{d}' - \text{e}@ \\
\text{e}@ - \text{d}'
\end{array} \]

[marginalia] NB To be precise, a very small portion of about two commas is the difference between the greater and lesser semitones.
ascend[ens]  descend[ens]

\[\text{Semitonium minus.}\]

d'  e'  e'  d'

Tonus minor.

\[\text{Fermè novem continet commata. Superatur enim a majori per Comma.}\]

[marginalia] vel superat commata octo & Superatur a novem.

Hier wird dem Tono minori ein Comma genommen und dem folgenden

Semitonio Majori e' [-] f' ein Comma gegeben, darumb well in parte residua gute consonantiae dadurch verursacht werden, reine Tertiae und Sextae.\(^{20}\)

\(^{20}\)The passage concerning the \textit{parte residua} was added later to the sentence.
Lesser semitone

ascending  descending

\[ \begin{array}{c}
e@ - e' \\ e' - d & \text{or } e@ 
\end{array} \]

Lesser whole tone

ascending  descending

\[ \begin{array}{c}
d' - e' \\ e' - d'
\end{array} \]

[It] usually contains nine commas. For the greater [interval] exceeds it by one comma.

[marginalia] or rather it has more than eight commas but fewer than nine.

Here, one comma is taken from the lesser whole tone and given to the following greater semitone e' - f', so that good consonances, such as pure thirds and sixths, are thereby produced in the remaining parts.\(^{21}\)

---

\(^{21}\)Heinrich Grimm appears to have coined the term *partes residuae* to describe the intervals produced on the opposite side of string when it is divided and plucked. The cantor used this acoustical phenomenon to generate two-part counterpoint naturally.
Semitonium Majus naturale,  
Tonus major,

Semitonium minus fictum.

Semitonium Majus cum Commate,  
Tonus Major,

Semitonium minus,  
Semitonium Majus fictum.
### Greater natural semitone

- **Ascending**: e' – f'  
- **Descending**: f' – e'

### Greater whole tone

- **Ascending**: e@ – f  
- **Descending**: f – e@

### Greater whole tone

- **Ascending**: e' – f#  
- **Descending**: f# – e'

### Greater semitone with a comma

- **Ascending**: f# – g'  
- **Descending**: g' – f#

### Lesser semitone - altered

- **Ascending**: f – f#  
- **Descending**: f# – f

### Greater whole tone

- **Ascending**: f – g  
- **Descending**: g – f

### Semitone: lesser

- **Ascending**: g' – g#  
- **Descending**: g# – g'

### Semitone: greater - altered

- **Ascending**: g# – a'  
- **Descending**: a' – g#
Hier wirds dem Tono minori ein Comma genommen und dem folgenden Semitonio majori a [-] b, ein Comma gegeben damit die Tertien und Sexten rein sein.

Semitonium Majus cum Commate, Semitonium minus.

Tonus Major, Semitonium Majus naturale
Enharmonic tone     Lesser whole tone

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

The small division produces two commas.  
\[g' - a' \quad a' - g'\]

Here, one comma is taken from the lesser whole tone and one is given to the greater semitone \(a' - b\) so that the thirds and sixths are pure.

Greater semitone with a comma     Lesser semitone

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

\[a' - b\) \quad b\) - a'\]

\[b\) - b' \quad b' - b\]

[51] Greater whole tone     Semitone: greater diatonic

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

\[
\begin{array}{c}
\text{ascending} \\
\text{descending}
\end{array}
\]

\[a' - b' \quad b' - a'\]

\[b' - c'' \quad c'' - b'\]
Tonus Major.

NB. Octavae cujusque clavis eadem est ratio.

In saltibus.

ascendendo. descendendo.

Tertia minor sonst genannt Semiditonus, begreift in sich Tonum, & Semitonium majus.

Ihre folgende Species sind:
**Greater whole tone**

\[
\begin{array}{c}
\text{NB} \text{ The pattern is the same for each octave of a pitch.} \\
\text{[52]}
\end{array}
\]

**By Leaps**

**Minor third**

- ascending
- descending

\[
\begin{array}{c}
\text{[It is] otherwise called semiditonus [and] contains one greater whole tone and one greater semitone.} \\
\text{Its forms are the following:}
\end{array}
\]

125
Tertiae minores.

ascend[endo] descend[endo]

d'  e'  e'  d''

c'     e'    e'     c'

Tertia Major, sonst genant Ditonus[,] begreißt in sich Tonum Majorem & minorem; auch wol 2. Tonosmajores; als vom b biß zum d''.

[55] Ihre folgende Species sind:

d'  f'  e'  g'  f'  a'  g'  b'  a'  c'  b'  d''

+ beyderley Tertien so wol klein als große haben den Nahmen á tribus sonis.
Minor thirds

Major third

[It is] otherwise called *ditonus* [and] contains one greater and one lesser whole tone, as well as two greater whole tones, as in the case of $b\text{"}g\text{"}$.

Its forms are the following:

+ both kinds of thirds, minor as well as major, have the name *á tribus sonis*.\(^{22}\)
ascend[endo] descend[endo]

Quarta vera, sonst genant Diatessaron. begreifft in sich Tonum majorem, Tonum minorem & Semitonium Majus.

Ihre folgende species sind:

d' g' e' a' f b g' c'' a' d'' b e'' b e a f d''

[56]  Quarta falsa, als erstlich,

ascend[endo] descend[endo]

Quarta diminuta hat ein Semitonium minus zu wenig, sonst genant Semidiatessaron.

Ihre folgende species sind:
Perfect fourth

ascending     descending

\[\text{c'} - f' \quad f' - c'\]

[It is] otherwise called diatessaron [and] contains one greater and one lesser whole tone and a greater semitone.

Its forms are the following:

\[\text{d'} - g' \quad e' - a' \quad f' - b@ \quad g' - c'' \quad a' - d'' \quad b' - e'' \quad b@ e@ \quad e@ a@\]

[56] The imperfect fourths:

Diminished fourth

ascending     descending

\[\text{c#} - f' \quad f' - c#\]

First, the diminished fourth, otherwise called semidiatessaron, has one lesser semitone too few.

Its forms are the following:
d# g' e' a @ f # b @ g # c'' b' e @
darnach *Quarta Superflua* hat ein *Semitonium minus* zu viel, und also 3. Volle
*Tonos*, wird sonst genannt *Tritonus*

c' f#  f# c'

Ihre folgende *Species* sind:

+ sind *intervalla prohibita*. Haben beýderleý sowol *verae* als *falsae Quartae*
den Nahmen à *quatuor sonis*.
Accordingly, the augmented fourth has one lesser semitone too many, and since it has three greater whole tones, it is called \textit{tritonus}.

\textbf{Augmented fourth}

\[\begin{array}{cc}
\text{d'} - \text{g}' & \text{e'} - \text{a}\@ \\
\text{f}\# - \text{b}\@ & \text{g}\# - \text{c}'' \\
\text{b}' - \text{e}\@ & \\
\end{array}\]

Its forms are the following:

\[\begin{array}{cc}
\text{d''} - \text{g}'' & \text{e}@ - \text{a}' \\
\text{f}' - \text{b}' & \text{g}' - \text{c}' \\
\text{a}@ - \text{d}'' & \text{a}' - \text{d}' \\
\text{b}@ - \text{e}'' & \\
\end{array}\]

[They] are forbidden intervals. Both the perfect and imperfect fourth have the name \textit{à quatuor sonis}.
Quinta vera, sonst genannt Diapente, bezieht sich in sich 2. Tonos Majores, Tonum minorem, & Semitonium Majus Naturale.

Ihre folgende Species sind:

\[ d' \ a' \ e' \ b' \ e \bar{\flat} \ b' \flat \ c'' \ g' \ d'' \ a' \ e'' \ a \bar{\natural} \ e \bar{\natural} \ b' \flat \p \]

haec species deficit commate.

Quinta falsa, als erstlich,

Quinta diminuta sonst Semidiapente genannt, hat ein semitonium majus zu wenig.

Ihre folgende Species sind:
Perfect fifth

ascending descending

\[
\begin{array}{cccc}
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
\end{array}
\]

c' - g' g' - c'

The perfect fifth, otherwise called *diapente*, contains two greater whole tones, one lesser whole tone, and one diatonic greater semitone.

Its forms are the following:

\[
\begin{array}{cccc}
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
\end{array}
\]

d' - a' e' - b' e@ b@ f' - c'' g' - d'' a' - e'' a@ e@ b@ f''

This type is deficient by a syntonic comma.\(^{23}\)

[58] The imperfect fifths:

Diminished fifth

\[
\begin{array}{cccc}
& & & \\
& & & \\
& & & \\
& & & \\
& & & \\
\end{array}
\]

First, the diminished fifth, otherwise called *semidiapente*, contains one greater semitone too few.

Its forms are the following:

\[^{23}\text{In meantone temperaments the fifth is tempered, or narrowed, in order to create purer sounding thirds. The syntonic comma, which is equal to 22 cents, or the difference between the Pythagorean third (408 cents) and a pure third (386 cents), is used in adjusting individual fifths in meantone temperaments. In this case, Selle is indicating that the fifth has fewer cents than it would otherwise with respect to Pythagorean tuning.}^\]
Quinta Superflua, hat ein Semitonum majus zu viel, ihre folgende Species sind:

d# a' e' b@ f# c" g# d" a' e@ b' f"

darnach Quinta Superflua, hat ein Semitonum majus zu viel, ihre folgende Species sind:

c' g# g# c'

e♭ c# g' d# a@ e" b@ #

[59] + beýderley sowol falsae als verae Quintae haben den Nahmen à quinquem Sonis.

Quintae falsae sind intervalla prohibitia seu intusitata.

ascend[endo] descend[endo]
Accordingly, the augmented fifth has one greater semitone too many.

**Augmented fifth**

Accordingly, the augmented fifth has one greater semitone too many.

**Augmented fifth**

Its forms are the following:

Both the imperfect as well as the perfect fifth have the name *â quinquem sonis*.

**Major sixth**

Both the imperfect as well as the perfect fifth have the name *â quinquem sonis*.

Diminished fifths are forbidden intervals, or rather are uncommon.

**Major sixth**

Both the imperfect as well as the perfect fifth have the name *â quinquem sonis*.

Diminished fifths are forbidden intervals, or rather are uncommon.

**Major sixth**
**Sexta Major** ist eine kleine umbgekehrte **tertia**, begreifft in sich **2. Tonos Majores**

**2. Tonos minores & Semitonium Majus** d[a]z alias sexta perfecta seu tonus cum **diapente**

Ihre folgende **Species** sind:

---

\[
\begin{align*}
\text{d' b' c\#' e' c\# f d'' g' e'' a\#' a' f\# b\# g'' b' g\#}
\end{align*}
\]

---

[60] **Sexta minor**, ist eine große umbgekehrte **Tertia**, begreifft in sich **Tonum Majorem**, **duos Tonos minores & duo Semitonia majora. das alias sexta impfecta seu semitonium cum Diapente.**

Ihre folgende **species** sind:

---

\[
\begin{align*}
\text{d\# b' c' e' c'' f\# d'' g\# e'' a' f'' b' g''}
\end{align*}
\]

beyderleÿ **Sextae** haben ihren Nahmen á sex **Sonis**.
The major sixth is an inverted minor third. It contains two greater whole tones, two lesser whole tones and one greater semitone. It is also known as the perfect sixth or *tonus cum diapente*.

Its forms are the following:

\[
\begin{align*}
&d' - b' & e@ - c'' & e' - c# & f' - d'' & g' - e'' & a@ - f'' & a' - f# & b@ - g'' & b' - g#
\end{align*}
\]

Minor sixth

ascending descending

\[
\begin{align*}
c# & - a' & a' - c#
\end{align*}
\]

The minor sixth is an inverted major third. It contains one greater whole tone, two lesser whole tones, and two greater semitones. It is also known as the imperfect sixth or *semitonium cum diapente*.

Its forms are the following:

\[
\begin{align*}
d# - b' & e' - c'' & f# - d'' & g# - e'' & a' - f'' & b' - g''
\end{align*}
\]

Both types of sixth have the name *â sex sonis*.

Ihre folgende Species sind:

d'  c''  e'  d''  g'  f''  a'  g''  b'  a''

Septima Major[,] das alias Perfecta, seu ditonus cum Diapete, begreifft in sich 3.


Ihre folgende Species ist:
The minor seventh, also known as the imperfect seventh or *semitonus cum diapente*, contains two greater whole tones, two lesser whole tones and two greater semitones.

Its forms are the following:

\[
\begin{align*}
d' & - c'' \\
e' & - d'' \\
g' & - f'' \\
a' & - g'' \\
b' & - a''
\end{align*}
\]

The major seventh, also known as the perfect seventh or *ditonus cum diapente*, contains three major seconds, two minor seconds, and one greater semitone.

Its forms are the following:

\[
\begin{align*}
c' & - b@ \\
b@ & - c'
\end{align*}
\]
haben beyde so wol major als minor Septima ihren Nahmen à Septem Sonis.

+ sind intervalla minus usitata.


[62-3] Ihre folgende Species sind:

+das Diapason, quod ora intervalla simplicia comprehendat.
Both the major as well as the minor seventh have the name \textit{à septem sonis}.

+ These intervals are seldom used.

\section*{Octave}

\begin{center}
\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,-1) circle (0.5cm);
\end{tikzpicture}
\end{center}

c\textsuperscript{'} - c\textsuperscript{''}

c\textsuperscript{''} - c\textsuperscript{'}

The true octave, also known as \textit{diapason} or \textit{octava perfecta}, contains three major seconds, two minor seconds, and two greater semitones.

\[\text{[62-3]}\] Its forms are the following:

\begin{center}
\begin{tikzpicture}
\draw (0,0) circle (0.5cm);
\draw (0,-1) circle (0.5cm);
\draw (0,-2) circle (0.5cm);
\draw (0,-3) circle (0.5cm);
\end{tikzpicture}
\end{center}

d\textsuperscript{'} - d\textsuperscript{''}  e\textsuperscript{'} - e\textsuperscript{''}  f\textsuperscript{'} - f\textsuperscript{''}  g\textsuperscript{''} - g\textsuperscript{''}  a\textsuperscript{''} - a\textsuperscript{''}  b\textsuperscript{\#} - b\textsuperscript{\#}  c\textsuperscript{\#} - c\textsuperscript{\#}  d\textsuperscript{\#} - d\textsuperscript{\#}  e\textsuperscript{\#} - e\textsuperscript{\#}  f\textsuperscript{\#} - f\textsuperscript{\#}  g\textsuperscript{\#} - g\textsuperscript{\#}  a\textsuperscript{\#\#} - a\textsuperscript{\#\#}

With the service of the chromatic alterations, the octaves are thereby completed.

+ The diapason is understood as the boundary for simple intervals.

\footnote{Half of these examples actually appear on p. 63 as a continuation of the previous category.}
Octava falsa, als erstlich:

\[
\begin{array}{c}
\text{c} \\
\text{c}'
\end{array}
\]
\[
\begin{array}{c}
\text{c} \\
\text{c}''
\end{array}
\]
\[
\begin{array}{c}
\text{c} \\
\text{c}'
\end{array}
\]
\[
\begin{array}{c}
\text{c} \\
\text{c}''
\end{array}
\]

Octava diminuta, d[a]z alias Semidiapason, hat ein Semitonium minus zu wenig,

Ihre folgende Species sind:

\[
\begin{array}{c}
\text{d} \\
\text{d}'
\end{array}
\]
\[
\begin{array}{c}
\text{e} \\
\text{e}@'
\end{array}
\]
\[
\begin{array}{c}
\text{f} \\
\text{f}'
\end{array}
\]
\[
\begin{array}{c}
\text{g} \\
\text{g}'
\end{array}
\]
\[
\begin{array}{c}
\text{a} \\
\text{a}@'
\end{array}
\]
\[
\begin{array}{c}
\text{b} \\
\text{b}@'
\end{array}
\]

Octava Superflua, hat ein Semitonium minus zu viel, Ihre folgende Species sind:
The false octaves:

**Diminished octave**

First, the diminished octave, known as *semidiapason*, contains one lesser semitone too few.

Its forms are the following:

The augmented octave has one lesser semitone too many. Its forms are the following:

---

25 These examples likewise appear on p. 63 as a continuation of the previous category.
+ so wol verae als falsae octavae haben ihren Nahmen ab 8. Sonis. Octavae falsae sind Intervalla prohibita.

Nota. Quodvis intervallum unam Semper minus habet Speciem, quam est numerus sonorum.

Numerus sonorum.
+ True as well as false octaves are so named from their eight pitches.

False octaves are prohibited intervals.

Note: Any interval is always one fewer in quantity than the number of pitches [shown below].

---

26 In this diagram, Selle has assigned numbers to the various pitches and intervals with respect to middle c, which is number one. The numbers therefore correspond to both the pitches themselves and the intervals between them. In other words, interval 1 is found between pitches 1 and 2, or c' and d', etc.
Nota. daß die Semitonia minora, item Tertiae & Sextae minores und theils andere Intervalla ein beschreiben der Majoribus vorgesetzt sein, hat man gethan propter chromatismum u[nd] daß die Intervalla in der ordnung der Scalae auf einander also solchen auch was man In saltibus beýden folgenden Speciebus sursum oder per ascensum angedeutet hat, eben daselbe muß auch deorsum oder per descensum also verstanden werden. 27

Weil MI und FA (das sind die Semitonia so wol majora als minora) wie die lieben alten gesagt, sind Tota Musica, so wie ja höchst von nöthen sein, das dieselben vor allen rein gesungen und gespielet werden müßen, fürnemblich in clausulis formalibus, oder wie es die Teutschen Organisten nennen, in Cadenzien, damit der gesang nicht auf ein Lahm MI auß gehe.

Möchte einer sagen und fragen, warumb man doch eben in dieser octava als vom c' biß zum c" die Intervalla hat wollen darstellen? Respondeo, darumb, weil von diesem clave (der billig Rex oder ein König aller clavium genennet werden mag) häütiges tages alle Organa propriè dicta ihren anfang machen. Wer diese einzige Octavam wol studiret hat, dem gilts gleich viel, ob der Cantus Regularis diaz ist $dur$ oder irregularis seu Transpositus daß ist b mol ist, denn er weiß die Semitonia von den Tonis wol zu unterscheiden und zu sagen das a' [-]b@ in Semitonium Majus, a'[-]b' aber ein Tonus Major, d'[-]d# ein Semitonium Majus, d'[-]e', ein Tonus minor etc. seý.

27 The words “beýden folgenden Speciebus” were added later to the passage.
Note: Since the [descriptions of] lesser semitones, minor thirds and sixths, and, in part, some other intervals have been placed before the descriptions of the major ones, a chromatic alteration has therefore been included. Also, for intervals [that are] arranged one after another in an [ascending] scale and those previously indicated as "By leaps moving upwards or ascending of the following two types," the very same is likewise true for [those] moving downwards or descending.

Inasmuch as MI and FA (that is the greater as well as the lesser semitones) are, as the dear ancients said, *tota musica*, it is indeed absolutely necessary that they above all be sung and played purely, especially in concluding figures, or as the German organists call them, cadences, so that the music does not end on a weak MI.

Would anyone like to say or ask why the intervals have been presented in the octave from c' to c"? I respond, because all instruments are nowadays characteristically said to begin in this clef (which may be called the just king or the king of the clefs). Whoever learns this single octave well, to him it is all the same, whether [the music] is in *cantus regularis*, that is the b$ mode, or in *irregularis seu transpositus*, that is the b© mode. For he knows how to distinguish the semitones from the whole tones and to say that a' to b© is a greater semitone, while a' to b' is a greater whole tone, d' to d♯ a lesser semitone, d' to e' a lesser whole tone, etc., and can be content with the regular scale.

---

28 Literally, the whole of music. This ancient axiom expressed the idea that both solmization and tuning depended on the correct manipulation of semitones. The accuracy of these intervals was important with respect to the various unequal tuning systems used prior to the hegemony of equal temperament.
und kan mit der Scala Regulāri allein zufrieden sein, bedarf zum Solmisiren keiner Transposita, da er clavem signatam quartam d[a]z b rotundum vorgezeichnet findet, da auch die Fa ficta als e[Ω] und a[Ω] zum öfftern mit eingemenget sein, welche eine Languidiorem Harmoniam causiren, (b. e[Ω]t a[Ω]nim pressius trabuntur, #verò et $ paulo altius elevatur.) da nimpt er nur fleißig in acht, was gantz und halb ist, daß er außen Semitonio nicht einen Ton oder ausen Tono nicht ein Semitonium mache. Mit den andern 3 Octaven heists, De octavis est idem judicium. Nur allein, das sie noch ein-, zwey-, oder dreymahl so hoch oder tieff müßen gesungen oder geklungen werden.

Jemehr Semitonia ein Intervallum hat, ie lieblicher es zu singen ist. Wie viel aber Tonos und Semitonia ein jedes Intervallum habe, ist aus vorigen genugsahm angezeigt.

Folgen die Noten neben ihren Pausen und andern characteribus zum Tact gehörig.

Noten sind gewiße figuren, welche anzeigen wie lange man nach dem Tact in einem clave thönen oder singen soll.
He does not have to transpose when doing solmization, because he finds the signatam quartam clef indicated by the b sign. Also, since the chromatic alterations of FA as e and a are often added, which produces a weaker sound (indeed, e and a are played more deliberately, [and] the true # and the $ are raised a little higher), he is assiduous in noting that which is whole and half in order to avoid making a semitone into a whole tone or a whole tone into a semitone. In the case of the other three octaves, there is the same rule of the octaves. The only [difference is] that they are sung and heard one, two, or three times higher or lower.

The more semitones an interval has, the sweeter it should be sung. The number of whole tones and semitones in each interval has already been sufficiently indicated above.

Next follow the notes together with their rests and other characteristics related to rhythm.

Notes are particular figures on the staff that indicate how long one should play or sing, according to the beat.

29 Fourth sign.
Maxima.             Longa.             Brevis             Semibrevis             Minima

gilt 8 schläge.     4 schläge.        2 schläge.       1 schlag.                1/2 schlag

Semi Minima                 Fusa.                 Semifusa                Subsemifusa
gelten 4 einen      1/8      1/16                          1/32
schlag.          gelten 8 einen

Wenn ein punct beÿ einer Nota stehet, so gilt er allzeit halb so viel, als die vorhergehende Nota.

[69]       12. schläge.    6. schläge.     3 schläge.    11/2. schlag.

3/4.

NB. die Teütschen Organisten resolviren die große Noten in Brevem et Semibreven, über die Brevem setzen sie ●, über Semibreven ▲, über Minimam Γ, über Semiminimam ℄, über Fusa ℄, über Semifusa ℄, die Minimas, Semiminimas, fusa etc. copuliren sie wie folget:
Maxima    Longa     Brevis      Semibrevis           Minima
is equal to 8 beats          4 beats     2 beats       1 beat    1/2 beat

Semiminima     Fusa     Semifusa        Subsemifusa
4 equal 1 beat 1/8 beat 1/16 beat       1/32 beat
8 equal 1 beat

If a dot appears next to a note, it always adds half of the value of the previous note.

[69]    12 beats 6 beats         3 beats 1 1/2 beats

Note: The German organists convert the long notes into breves and semibreves.

Above the breves they place a ●, above the semibreves a ′, above the minims a ‱,
above the semiminims a ′′, above the fusa a ′′′, [and] above the semifusa a ′′′′.

They connect the minims, semiminims, fusas, etc. as follows:
Die Puncta setzen sie auch beim ihre characteres wie folgt:

von den gebundenen Noten oder Ligaturen (darunter nur ein Wort oder syllaba muß appliciret werden) seind noch im Gebrauch folgende:


\(^{30}\)The first and last sentences of this paragraph were added later.
They also place dots next to the figures in the following manner:

The following joined notes or ligatures (under which only one word or syllable may appear) are still in use:\(^{31}\)

Every single note has its corresponding rest. Rests are certain figures that indicate on the staff, according to the beat, when and how long one should be silent. There are two kinds: the general, , in which all voices begin or stop at the same time; the special, in which each voice individually rests and is silent, and at a certain point begins again.

\(^{31}\)The numbers beneath the ligatures indicate how many beats each note receives.
Pausa Longae, Pausa Brevis, Pausa Semibr[evis], etc. suspirium, semisuspirium.

4. schläge. 2. schläge 1. schlag 1/2. 1/4. 1/8. 1/16.

die Teütschen Organisten setzen ihre Pausen zwischen die claves, als Pausa Brevis bedeütet 2 schläge, Pausa semibrevis bedeütt 1 schlag. Die andern characteres pausarum haben von den Characteribus Notarum keinen unterscheid, ohne allein das jene über die Noten oder claves, diese aber neben und zwischen die Noten oder claves gesetzt werden.

Tactus ist eine gewiße bewegung entweder mit öffentlichen oder verborgenen Niederschlagen und auffheben darnach man sich im singen richtet. der Tact ist zweyerle: Spondaicus & Trochaicus.

Jeder wird in zwey Theil getheilet als in den Niederschlag und das auffheben. Spondaicus oder aequalis [-] wird in zwey gleiche Theil getheilet, und gibt dem Niederschlage so viel als dem auffheben.
The rest has as much silence as the note to which it corresponds has sound.

| 71 |  
|---|---|---|---|---|---|
| Longa | Brevis | Semibrevis | Suspirium | Semisuspirium |
|  |  |  |  |  |

4 beats 2 beats 1 beat 1/2 1/4 1/8 1/16

The German organists place their rests between the lines of the staff in the following manner: the brevis rest indicates 2 beats, the semibrevis rest indicates one beat. The other figures for the rests are no different than the figures for the notes, except that they are not placed above the notes or the staff, but rather next to or between the notes or pitches.

Meter is a certain movement with either obvious or concealed downbeats and upbeats, which one follows in performing. There are two kinds of meter: *spondaic* and *trochaic*.

Each type is divided into two parts, namely, the downbeat and the upbeat. The *spondaic* or equal meter | - - | is divided into two equal parts and has as many downbeats as upbeats.

---

32 Literally, a breath, or half breath, in the case of *semisuspirium*. However, the two rests correspond to the length of a *seminima* and a *fusa*, respectively.
Deßen *Signum* in *Moteten* und *Concerten* ist ♩. wird sonst genannt *Signum Tactus celerioris oder Diminutionis diminutae*. In *Madrigalen* wird diß *Signum* † gefunden, heist sonst *Signum Tactus tardioris oder Diminutionis*.  

*Tactus trochaicus oder inaequalis á [- u] sonst genennet der Tripel Tact*, wird in zwey ungleiche Theil getheilet, und gibt dem Niederschlage noch ein mahl so viel als dem aufheben. Deßen *Signa* sein in *proportione Tripla* 3, 3/1, [73] ♩, †3. und gelten unter diesen zeichen drey oØ_o. oder derer so viel dagegen gerechnet einen schlag.

[marginalia] +In diesem *Tripel* verlieren die *Pausen* ihrer halben Theil, daß ist, vor 2 schläge *pausiret* einen *minor* einen etc.

![Musical notation](image)


Die *Signa* in *proportione Sesquialtera* sein 3/2. und gelten unter diesen zeichen ♩ o oder derer so viel dagegen gerechnet, 1. Schlag

[marginalia] +hier behalten die *Pausen* ihrer *valor*, daß ist, sie gelten voll.
Its metrical sign in motets and concertos is ₯, and it is otherwise called *signum tactus celerioris* [quicker duple time] or *diminutionis diminutae* [diminished diminution]. The metrical sign Ⓐ is found in madrigals. It is otherwise known as *signum tactus tardioris* [slower duple time] or diminution.

The *trochaic* or unequal meter | - u |, otherwise known as triple meter, is divided into two unequal parts in which the downbeat receives one beat more than the upbeat. Its metrical signs in proportio tripla are 3, 3/1, ₯, Ⓐ, and under this sign three ₯ 인정 ₯, or as many as can be calculated in their place, equal one beat.

[marginalia] +In this triple [meter] the rests lose one half of their value, i.e., for two beats one rests one [beat,] etc.

\[
\begin{array}{cccccccc}
| & - & u & | & - & u & | & - & u & |
\end{array}
\]

downbeat    upbeat    downbeat    upbeat    downbeat    upbeat    downbeat    upbeat

The metrical sign in proportio sesquialtera is 3/2, and under these signs Ⓘ Ⓘ Ⓘ or as many [notes] of an equivalent value are worth one beat.

[marginalia] Here, the rests retain their value, i.e., they have the full value.
Wenn die Tripel zum ende sein, so stehet das C oder dieß C oder auch wol das Membrum periodale, da alle stimmen zugleich auffhalten sollen, auch wol dieß Signum Finale ∙ ∙ ∙


NB Man pflegt diese sextuplam auch wol ad tactum aequalem zu singen, also daß 3 semiminimae auffs Niederschlag und 3 auff das auff heben gesungen werden.
When the triple meter comes to an end, the following signs appear: the \c or this \, or indeed \, the *membrum periodale*, showing that all voices are supposed to stop simultaneously. The *signum finale* \ also shows this.

The major and minor hemiola also belong here, the major hemiola being \, the minor hemiola being \. The major hemiola is no different than proper triple meter; the minor hemiola is no different than *sesquialtera*. The same is true for sextupla, which is indicated by the signatures \ or \, and under these signatures, they are worth six semiminims \ or however many [notes] are equivalent to their value, for example:

\[
\begin{align*}
\text{downbeat} & \quad \text{upbeat} \\
\end{align*}
\]

Note: One customarily sings these sextuplets in an equal manner as well, namely, that three semiminims are sung on the downbeat and three on the upbeat.
der querstrich zeiget an, das die Nota keinen schwantz haben soll. die strichlein zeigen an, daß die 1. Nota auf der linien; die ander im Spacio stehen soll.

*Custos* weiset in welchem Clave die folgende Nota stehen soll.

*Signum repetitionis* wird gesetzt; wenn man die vorige clausul wiederholen soll.

---

*Neuma*, bedeutet, daß alle Stimmen allda zugleich innehalten und wiederumb zugleich anfangen sollen.
The slanted line shows that the tail on the note should be omitted. The little lines show that the first note should be on the line, the second in the space.

The *custos* indicates where the following note will be on the staff.

The *signum repetitionis* is used when the previous phrase is to be repeated.

---

33 The term *custos* literally means “guardian.” This sign indicated the line or space in the following staff on which the next note should appear.
Signum fugantis zeigen an, wenn in minor fuga der Comes oder Nachsinger anfagen soll.

[marginalia] Fuga est ejusdem aut diversae modulationis repetitio. est duplex Ligata & soluta Ligata est per ij totam cantilenam soluta fit tantum in parte ij cantilenae. daß a fugando eo quod vox vocem fuget habet duas partes prior que procedit daß: duplex posterior que sequitur das comes. Fugarum Canones habentes undiquem in libris musicis ea quibus pretendi sunt.34

Signum Convenientiae zeigen an, daß alle Stimmen alda zusammen kommen und das Final machen.

Signum dealbationis, bedeütet, daß die Nota darunter es stehet, sol weiß sein.

Signum repetitionis verborum zeigen an, daß man so offt als es unter den Linien gefunden wird, die vorhergehenden Wort wiederholen soll.


34 The last two words of this sentence are found on page 77.
The *signum fugantis* indicates when the *comes* or next singer should begin singing in a canonic passage.

[marginalia] A fugue is the repetition of either the same or of a varied measure. It is doubly conjoined and resolved. It is conjoined throughout the entire song. It is resolved […] at the end of the song. That [is] creating a fugue by this means, the voice which is in fugue with a voice has two parts. Before that proceeds it renders both the previous one that it follows [and] the accompanying [part]. All aspects of canons are acquired in music books from which they are contrived.35

The *signum convenientiae* shows that all voices should end together there and cadence.

The *signum dealbationis* means that the note below which it is found should be white.

The *signum repetitionis verborum* indicates that one should repeat the previous word as often as it appears under the staff.

Whenever the word *forte* is found, it means that one should sing loudly; *piano* means that one should sing softly; *lento* means that one should sing slowly; *presto* means that one should sing quickly.

---

35 This marginal note applies to the *signum fugantis*. The last two words of this insertion are found on p. 77.
\{Capella\} daß der gantze Chor miteinstimmen soll.
\{Ripieno\}

*Ritornello*, ist eine gewisse *Clausul* die im *Concert etc.* etliche mahl *repetirt* wird.

*Tutti.* daß sie alle miteinander singen oder spielen sollen.

Über mehr bey den *Musicus* gebräuchliche *Terminos* zu wissen, *item*
Manier nach der Italiänschen art zu singen begehret, der schlage auff *Musicam Practicam* H[errn] *Andrea Herbstes*, *item* Michäelis Praetorij *Syntagma*

*Musicum*, da wird er gute anleitung dazu finden.

Aber auch mit *Exemplis*, was in diesem kleinen Tractätlein gehandelt,
wird dargethan haben, der schlage auff aller hand *Libros Musicos*, alt und new, da
wird er solcher gnugsahm finden, unter andern in *Bicinijs Seth Calvisij*,

*Tirociniijs Hinrici Grimmij, Musica Walliseri[,] etc.*
Capella/ripieno, that the entire choir should sing.

**Ritornello** is a certain phrase which in a concert, etc. is repeated several times.

**Tutti**, that all parts should be sung or played together.

However, [if one desires] to know more about the terms most commonly used by musicians as well as how to sing in the Italian manner, one should peruse the *Musica practica* by Mr. Andreas Herbst or Michael Praetorius's *Syntagma musicum*. A good introduction to those subjects may be found there.

But also to find examples of what has been discussed in this little treatise and how they are used, one should consult all available books of music, both old and new. Sufficient examples may be found in books such as Seth Calvisius’s *Bicinius*, Heinrich Grimm’s *Tirocinium*, [and] *Musica Walliseri*, etc.

---


[78] Conclusio

Wer nun nach diesen Buchstaben recht singen gelernt hat, der hat auch zu
gleich einen Vorschmack Musicae Instrumentalis et primario Organicae
überkommen. Denn wenn nur ein rein gestimmtes Clavichordium, Spinett oder
Clavicymbel, auch wol Regal oder Positiv ihm abhanden, so hilft es ihm als ein
Manuductor so trefflich, daß er auch absque viva Praeceptoris voce singen lernen
kan, ja hinter dem Organisten stehend als bald seine parteÿ aus der Tabulatur mit
machen, und darauff sich als dann umb die voces Guidonicas und deren Mutation
weniger als nichts bekümmern.

[79] Objectio.

Eß möchte aber einer ein werffen und sagen, der Modus, nach den
Buchstaben singen zu lernen, were etwas newes und ungebräuchliches; die
Doctrina Intervallorum propter Chromatismum were vor kleine Knaben zu
schwer und zu subtil, und den Theoricis bequemer als den Practicis, und solte
man ihnen an dero stat die Mutationes und gedoppelte Scalam vieleicht ehe, oder
doch ja so bald als insonderheit diese Intervalla beÿbringen. Dem gebe ich
hiermit zur freundlichen richtigen antwort: Vertrauet er sichs, so thue ers, Ihm
wird hierin nichts auffgedrungen, und hier gibt es gleich viel nach welcher art
oder scala einer singet, wenn er nur recht und rein singet. Aber in die 28 Jahr
hero, aus antrieb des sel[igen] H[erm] Sethi Calvisij, und daß man den Sachen ein
wenig weiter nachgesonnen, auch andere zur Nachfolge zu schreiten gesehen, hab
publicè et privatim ich beÿderleÿ wol versucht, hab aber wol erfahren, das das
reine singen erfodere eine richtige fleißige Unterweisung der Intervallen, das man
Conclusion

Whoever has learned the correct manner of singing by using these letters has also acquired a foretaste of instrumental music and basic musicianship. For if he only has a properly tuned clavichord, spinet, or harpsichord, or either a regal or positive organ at hand, it will be of such great help to him as a tutor that he will be able to learn to sing without the praecceptor himself present. He will soon be able to stand behind the organist and perform his part from the tablature. All this he can do without concerning himself at all with the Guidonian syllables and their mutations.

Objections

If one should, however, interject and say that the manner of learning to sing according to the letters is something new and uncommon, [that] the instruction on intervals is too difficult and too subtle for young boys because of the chromaticisms, [that] the theory is easier than the practice, and that one should perhaps teach the mutations and the double scale first or indeed these intervals in particular as soon as possible, then I cheerfully give him herewith the proper answer: If he believes in himself, he should do it. None of this will be forced upon him; and whatever manner or scale he uses in singing is equally valid, if he sings correctly and purely. However, in the last 28 years, having been motivated by the late Mr. Seth Calvisius and after having reflected on the matter a little more, as well as seen other followers make strides, I have indeed tried both methods publicly and privately. I have discovered, though, that correct singing requires a truly assiduous instruction of intervals, namely, that one has to teach
nemblich die distantiam derselben den Knaben wol und fundamentaliter inculciren und einbilden müße, welches dann nach dießem Methodo da eine jede Species ihren richtigen Nahmen und dióti hat beßer als nach dem Ut, re, etc.[,]
welches bald c'[-]d', bald c[#]d, bald f[-]g, bald f[#]g, bald g[-]a, bald g[#]a ist, angehet.

Experto crede Ruperto. Woher kömpt es, daß in vielen Schulen die Jugend so unrein und nach der Tacten singet, ja auch die über 12. und mehr jahr den Figural gesang gebraucht haben? Daher, weil sie in doctrina Intervallorum entweder nicht fundamentaliter unterwiesen sein, oder auch selbige nicht recht gefaßet haben; ob zwar die Intervalla (denn darauff zielen wir in diesem wercklein am meisten) im beschreiben etlichen etwas schwer und weitleuffig zu sein vorkommen möchten so laßen sie sich doch viva praecceptoris voce weit Compendiosius per demonstrationes dociren, auch von denen, die ihr lebtag kein Clavier berühret haben, wenn sie den Sachen nur ein wenig nachsinnen, und sich der geringen Mühe nicht verdrißen laßen wollen, denn eine Octava lest sich ja einen Knaben (wo anders ein ingenium u[nd] Naturalia bey Ihm vorhanden sein) wol einbringen, waß denn von einer Octava wahr ist, daß ist von den andern alle wahr, weil es heist: De octavis est idem judicium. Nun daß die tieffé und höhe darbeß muß observiret werden. Zu dem, so laßen sich auch die buchstaben oder dero sylben als c' [-] ce, c[#]-] cis, d' [-] de, d[#]-] dis, e[[-] es, e' [-] ei, f' [-] ef, f[#] [-] fis, g'[[-] ge, g[#]-] gis, a[[-] as, a' [-] a, b[[-] be, b' vel $[-] ha, viel gelinder, reiner, und zierlicher propter vocales a[.] e[.] et i. ad sonum experimentum
their sizes to the boys from the outset and inculcate them well. Since according to
this method every type of note has its proper name and purpose, it begins to take
root better than [learning] the ut, re, etc., which is first c' - d', then c♯ d', then f' -
g', then f♯ g', then g' - a', then g♯ a'.

Believe the experienced Rupert. Why is it that the youth in so many
[81] schools sing so imprecisely and after the beat--even those who have sung
contrapuntal choral music for 12 or more years? It is because they have either
never had a thorough grounding in the intervals or have not properly understood
them. If the descriptions of the intervals (which, indeed, we aim to teach in this
little volume) appear to be too difficult and extensive to some, they should rather
allow the preceptor to teach the far better way by demonstrating with his own
voice. The same is true for those who have never touched a keyboard in their
lives, once they have considered the matter a bit, and do not shrink from the small
effort. One octave is easily taught to a boy (when he otherwise does not possess
talent or natural ability). And what is true for one octave, is true for all others
[82] since it follows [that]: there is the same rule of the octaves. Only the octave’s
pitch level, whether low or high, has to be observed. Moreover, the letters or
their names--c', ce; c♯ cis; d', de; d♯ dis; e@es; e', e; f', ef; f♯ fis; g', ge; g♯ gis;
a@as; a', a; b@be; b' or $ ha--are much gentler, purer, and more delicate due to
the vowels a, e, and i. With respect to the sounds, they are articulated more easily

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38 Rupert may refer to the Benedictine monk of Liége, Rupert von Deutz, who lived from c. 1075
to 1129. In his Liber de divinis officiis, Rupert discussed music and song at some length. For more on
Rupert von Deutz see Lawrence Gushee, “Rupert of Deutz,” The New Grove Dictionary of Music and
39 Lippius uses a longer version of the same axiom on folio F 1r of the Synopsis musicae novae:
“De Octavis est idem & simile judicium.”

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habiliores von uns teütschen herfür bringen als die voces ut, re, mi, fa, sol, la, da
die lippen propter o et u, t et l, von uns teütschen (ich rede nicht von Italis, Gallis,
Britannis[,] etc[,] die alles leniter pronunciiren) oft gantz zusammen geabißen,
und mit schwerer Zunge die voces ausgesprochen werden müßen; und wo man
uns teütschen anders recht verstehen sol, so müßen wir die vocales von den
diphtongis pronunciando wol unterscheiden.

[83]    Und was ists nötig hier von weiter zu schreiben, weil das fundament auff
den Buchstaben und nicht auff den erdichteten Vocibus ut, re, mi, fa, sol, la, oder
Bo, ce, di, ga, lo, ma, ni, berufen thut, auch, wenn der Sonus nur fundamentaliter
herfürgebraucht wird, hierdurch keine Ketzereý angerichtet ist, als bleibts darbeý,
quod fieri potest per paucá, frustrà fit per plura. Waß sonst en diesem
Tractätlein mit Willen ausgelaßen ist, als Doctrina Modorum, Canones Fugarum,
etc. 40 bittet der Autor freünd fleißigst, wolle der unverdroßene Musicliebhaber aus
anderen haüffig hin und wieder 41 schwebenden libris Musicis darzu thun, und ihm
diese kurtzne anleitung den Sachen weiter nachzudencken vor erst groß gönstig

[84]    belieben laßen. Im fall es aber nach diesem möchte vor rathsahm erachtet werden
selbige hinzu zu thun, erbaüt sich der Autor beý wieder aufflegung dieses
Werckleins solche hinan zu fügen.

[85]    [blank]

40 Canones Fugarum, etc. was a later addition.
41 This was changed from “hin und her” to “hin und wieder.”
by Germans than the notes *ut, re, mi, fa, sol, la* because we Germans often press
our lips together tightly for the sounds o and u, as well as t and l. (I am not
speaking of the Italians, French, British, etc., who pronounce everything more
smoothly.) And the solfege syllables have to be pronounced with a heavy tongue.
In order for us to be understood properly, we Germans have to differentiate
clearly between the pronunciation of [pure] vowels and diphthongs.

And what is necessary to write about here further is [that] because the
fundamental [pitch] makes use of the letter names and not the invented solfege
syllables: *ut, re, mi, fa, sol, la or bo, ce, di, ga, lo, ma, ni*, also if the tone is
produced only with the fundamental [pitch], by which means no heresy is
committed, the proverb remains: what can be done by little means, is done in vain
with much effort. [Concerning] what has otherwise been intentionally omitted
from this little treatise, such as the doctrine of the modes, canonic imitation, etc.,
the author kindly invites the industrious music amateur most earnestly to
supplement frequently with other popular books of music now and again, and to
allow this little introduction, being most graciously left to his pleasure for the
present, to cause him to think about these things further. After doing so, however,

should one want to add to this oneself, one should first be advised that the author
himself intends to add such things to this little work in another issue.

[85] [blank]
Instrumentum
Instrumentorum,
hoc est,
MONOCHORDUM,
vel potius
DECACHORDUM,
Ad utramque Scalam
Diatonam scilicet veterum, et
Syntonam novam
accuratè delineatum,
additâque brevi declaratione
Illustrissimo Celsissimoque Principi ac
Domino,
Domino AUGUSTO, Iuniori,
Duci Brunsvicensi ac Lunaeburgensi,
Principi ac Domino suo clementissimo,
humili ac submissa
animi devotione
Dicatum et oblatum
Ab Henrico Grimmio Holzm[indis]
Anno VoX DoMInI VICTrIX.

\footnote{D-Hs ND VI 5126a, 2: “Instrumentum Instrumentorum/ est/ MONOCHORDUM/ vel potius/
DECACHORDUM/ ad utramq[ue] Scalam/ Diatonam sc[ilicet] Veterum/ &/ Syntonam novam/ accuratè
delineatum/ additâ brevi declaratione.”}
The instrument of instruments, that is, the monochord, or rather the decachord, accurately delineated according to both the ancient diatonic scale and the new syntonal diatonic scale, and including a brief explanation.

Dedicated and offered humbly and modestly with a devotion of spirit to the most illustrious and loftiest prince and lord, Lord August II, Duke of Brunswick and Lüneburg, his most clement prince and lord, by Heinrich Grimm [of] Holzminden in the year of the Lord 1634^2

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^2The text literally reads “victorious voice of the Lord,” but letters in the phrase that also function as Roman numerals are used to spell out the date.
[1v-2r] Tabella synoptica sequentis declarationis.\(^3\)

In declaratione Monochordi tria Sunt consideranda, videlicet: Monochordi

1. Nomen seu Definitio.

2. Dimensio seu Divisio, quae vel

   Binaria          Octavam
   Ternaria         Quintam
   Quaternaria      Consona, ut: Quartam
   Quinaria         Tertiam Majorem et Sextam M[ajorem]
   Senaria          Productique
   Octonaria        Intervalla vel
   Novenaria        Sextam minorem.
   Denaria          Tonum Majorem et Septimam minorem
   Dissona, ut:     Tonum minorem
   Quindenaria      Septimam Majorem.
   Sedenaria        Semitonium Majus
   Vigequinaria     Semitonium minus
   etc              etc

3. Usus, qui septuplex, et consistit in exploratione et demonstratione

   1. Intervallorum Musicorum consonarum [&] dissonarum eorumque ordinis
      naturalis.

   2. Harmoniae omnium Senarii numerorum, ut et totius Systematis Musici
      Sedecupia proportione.

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\(^3\) D-Hs ND VI 5126a does not include a table of contents. Instead, the text begins as it does on folio 3r of the Wolfenbüttel exemplar.
In explaining the monochord, three things must be considered, namely:

I. The name or definition of the monochord

II. The measurement or division of the monochord, which is indeed:

A. [Divisions]  B. Producing intervals of either:

1. Consonances
   i. By two  --  Octave
   ii. By three --  Fifth
   iii. By four --  Fourth
   iv. By five  --  Major third and major sixth
   iii. By six  --  Minor third
   iv. By eight --  Minor sixth

2. Dissonances
   i. By nine  --  Greater whole tone and minor seventh
   ii. By ten   --  Lesser whole tone
   iii. By fifteen --  Major seventh
   iv. By sixteen --  Greater semitone
   v. By twenty-five --  Lesser semitone

   etc.  etc.

III. The uses of the monochord, which are sevenfold, and consisting of the exploration and demonstration of:

A. Consonant and dissonant musical intervals in their natural order

B. All the harmonies of the numbers [derived from its] six-part division, and the proportional division of the whole system of music by sixteen

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3. Harmoniae Triadis harmonicae naturalis in Sonis acutioribus c' e' g'
   [&] gravioribus C E G.
4. Differentiae Scalae veteris, Diatonae [&] novae, Syntonae et Tetrachordi
   utriusquam.
5. Mediationis harmonicae Octavae Quintae et Tertias Majoris et quinam exhinc
   primus Modus Musicus.
7. Sonorum in instrumentis Musicis distantiae verae et naturalis [&] temperaturae
   legitimae

[2v] [blank]

[3r] **Declaratio MONOCHORDI.**

In declaratione Monochordi tria sunt consideranda, videlicet 1. Nomen,

I.

**De Nomine Monochordi.**

*Monochordum* est unius chordae instrumentum; vel, (ut Guido Aretinus
definit) Monochordum est lignum longum, quadratum, intus concavum,
superductâ chordâ, cuius sonitu vocum varietates apprehendimus; vel, est rudis
Magister atque indoctus, doctos faciens discipulos; aliis enim ostendit, quod ipse
non sapit, vera dicit, mentiri nescit, diligenter instruit, ac de sensus tarditate
neminem corripit. Dictum est ab una chorda, sicut Tetrachordum à quatuor;
Decachordum à decem.
C. The harmony of the natural harmonic triad, C-E-G, in higher and lower octaves

D. The differences between the old diatonic and new syntonal diatonic scales and the tetrachords of each

E. The harmonic division of the octave, the fifth, and the major third, and hence the first musical mode, which comes from this

F. The natural process of composing two-part works

G. Tuning musical instruments using true and natural measurements and proper temperaments

[2v] blank

[3r] An Explanation of the Monochord.

In explaining the monochord, three things must be considered, namely: 1) its name, 2) its proportions, and 3) its uses.

I.

**Concerning the Name of the Monochord**

The monochord is a single-stringed instrument. The monochord is either (as Guido of Arezzo defines it) made of wood—long, rectangular, hollow—, with a string drawn across the top, by whose sounding we perceive a variety of pitches; or, it is an inexperienced and unlearned teacher who makes its pupils learned, for it displays to others what it does not know itself. It tells the truth, it does not know how to lie, it carefully instructs, and it accuses no one of stupidity. It is called [the monochord] due to its one string, just as a tetrachord, due to its four strings, and a decachord, due to its ten.
Johan[nes] Lippius in Synopsi Musica⁴ lit: B, 3. Ita definit: Monochordum est Instrumentum simplicissimum et rectissimum, unà vel pluribus simpliciter unisonis chordis inductum, in quotas et quantas vis portiones divisibile, secundum numeros radicales, in duas bisecando, in tres trisecando, in quatuor quadriseecando etc. Canon, Radix, et Mater omnium Instrumentorum Musicorum; siquidem nullum eorum, quod ex hoc non ortum, inque⁵ eodem fundatum sit, ut hinc non immeritò Instrumentum Instrumentorum nuncupari queat.


II.

De Dimensione Monoch[ordi]

Dimensio Monochordi est eius per proportiones secundum numeros radicales accurata divisio.

Proportiones autem sunt diversae; alia enim est proportio aequalitatis, videlicet, inter duos numeros invicem aequales: alia inaequalitatis, inter duos

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⁴ Johannes Lippius, *Synopsis Musicae Novae*.
⁵ D-Hs ND VI 5126a, 3: “in eodem fundamentum sit . . .”
⁶ D-Hs ND VI 5126a, 3: “Occasionem a[utem] et . . .”
⁷ Selle’s list also includes Calvisius’s *Exercitationes musicae duae* (Leipzig: Jacob Apel, 1600). Marginalia in D-Hs ND VI 5126a, 3: “Monochordum [è[st]] Instrument[um] ne quo sonor[um] & portio vel in una chorda vel in plurib[us] iumha (?) exploratur hui[us] ig. (?)”
Johannes Lippius defines it thus in *Synopsis musicae novae*, B, page 3:

the monochord is the simplest and most straightforward instrument, strung with one string or with several of the same pitch, divisible into however great and many parts, according to radical [fundamental] numbers,\(^8\) bisecting in two, trisecting in three, quadrasecting in four, etc. [It is] the canon, the root, and the mother of all musical instruments. Indeed, there is no single instrument which has not been born of it or founded upon it, so it may not without merit be called the instrument of instruments.

The observation of the proportions in musical intervals has provided the opportunity and reason for building the monochord. With respect to this matter, the story of Pythagorus is memorable in Boethius, Book I, *De institutione musica*, Chapters 10 and 11; Calvisius, *Exercitationes musicae* 2; and Michael Praetorius, Book 1, *Syntagma Musicum*, fol. 171.\(^9\) But [that is] enough about the definition of the monochord.\(^{10}\)

**II.**

**On the Proportions of the Monochord**

Measuring the monochord consists in accurately dividing it by proportions according to radical [fundamental] numbers.

However, the proportions vary. For with respect to some the proportion is one of equality, as, of course, between two numbers that are equal, while with respect to others it is of inequality between two unequal numbers, which may be

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\(^8\) Grimm uses the terms *radix* and *radicalis* just as Johannes Lippius does in his treatise, *Synopsis musicae novae* (Leipzig: P. Ledertz, 1612), to demonstrate properties of intervallic and triadic inversion with respect to chords. Lippius used the mathematical concepts of radical numbers and finding square roots through “radication” as analogies for the reduction of chordal structures to root or “radical” intervals and triads.


\(^{10}\) Selle adds in the margin: the monochord is an instrument on which the proportion of the various sounds is examined either on one string or on many.
numeros inaequales; qua vel multiplex, ut dupla, tripla, quadrupla, etc: vel
Superparticularis, ut Sesquialtera, Sesquitercia, Sesquiquarta, etc: vel
Superpartiens, etc: de quibus Lippius lit A. 5. Et Baryphonus in Pleiadi[us]

Mus[icis] Quaest: 2. Plejades 1. Numeri verò Intervallorum Musicorum,
et quidem Consonorum radicales\textsuperscript{11} sunt hi sequentes: 1 2 3 4 5 6 7 8.

Dissonorum vero hi \[8\]:9 9:\[10 15:\[16 24:\[25 80:\[81. Quorum omnium
proportiones et intervalla\textsuperscript{12} non tantum in locis allegatis, verum etiam in
sequentibus explicantur. Reducuntur autem ad hasce Radices omnia intervalla
multiplicata seu composita, tam dissona quam consona: exceptis iis, quae vel
defectu vel excessu dissonant; ea enim ad peculiares numeros suos remittuntur, de
quib[us] hic nihil dicemus; pergimus ad ipsam divisionem.

Chorda in Monochordo inter duas extremas Magades immobiles constituta
e instar corporis seu Totius in partes dividendi: Primum igitur (sicut in qualibet
divisione totius in partes fit naturaliter) occurrat divisio binaria (sicuti post

\textsuperscript{11} D-Hs ND VI 5126a, 4: \textquotedblleft... consonorum sunt hi sequentes\textquotedblright.

\textsuperscript{12} D-Hs ND VI 5126a, 4: The Hamburg manuscript has a scribal error here that was corrected.
The words \textquotedblleft multiplicata seu composita\textquotedblright were wrongly inserted at this point, and then crossed through.
either multiple, such as double, triple, quadruple, etc., or superparticular, such as 2:3, 3:4, [and] 4:5 etc., or superpartitive, etc. Concerning these see Lippius A. 5 and Baryphonus’s Pleiades Musicae, Question 2. Pleiades. 1.\(^{13}\)

Indeed the numbers of the musical intervals and, in fact, of the radical consonances are the following: 1, 2, 3, 4, 5, 6, 7, 8.\(^{14}\) Those of the dissonances truly are these: 8:9, 9:10, 15:16, 24:25, 80:81.\(^{15}\) The proportions and intervals of all of these are explained not only in the designated accompanying passages, but truly also in the following ones. Moreover, all multiple or composite intervals may be reduced to these roots, the dissonances as well as the consonances, with the exception of those which are either weak or excessively dissonant, for those are reduced to their own special numbers, about which we say nothing here; we proceed rather to the actual division [of the monochord].

The string on the monochord drawn between two opposite immobile bridges constitutes one body or a totality to be divided into parts. At first, therefore, (just as the division of the whole into parts is made naturally wherever you like) binary division occurs (as a two-fold division itself follows immediately

\(^{13}\) Johannes Lippius, Synopsis musicae novae, Henricus Baryphonus, Pleiades musicae (Halberstadt: Catenii, 1615; Magdeburg, J. Franc, 1630).

\(^{14}\) The intervals listed in numerical fashion are: the octave, the fifth, the fourth, the major third, the minor third, the major sixth, and the minor sixth. Lippius also names these as consonances in the same manner in the Synopsis. According to Lippius, the first three intervals are called perfect consonances, owing to their position within the Pythagorean quaternary (1, 2, 3, and 4); and the other four are considered imperfect consonances, since they fall within the senary and octonary. The number seven is raised here and in the Synopsis because it corresponds to the total number of consonances in the series, although it does not represent a consonant interval itself. Lippius and Grimm no doubt include the number seven for its religious significance, as well as its position in the series from one to eight.

\(^{15}\) These ratios correspond to the following intervals: 8:9 – a greater whole tone, 9:10 – a lesser whole tone, 15:16 – greater semitone, 24:25 – a lesser semitone, 80:81 – the comma.
unitatem statim sese offert binarius) hanc proximè sequitur ternaria (velut binarium ternarius) deinde quaternaria, et sic consequenter.

Sed videamas, quomodo sese habeant hae divisiones, et quaenam procreant intervalla; partes divisionis à dextrà sinistram versùs numerando; scalamque in sinistra Monochordi parte à clave C inchoando; ita enim numeri majores sonis gravioribus pro harmonicâ dispositione correspondebunt.

[4v]

**DIVISIO**

**Binaria** exhibet octavam C, (quae est proportionis duplae in numeris 1[::]2 vel 2[::]1) in una dimidia parte, in medio scil[icet]: Monochordi, vel potius chordae; ubi supposito ponticulo utrinquem partes aequales, et proinde soni aequales.16 Si igitur ad integram chordam, (quam in hac divisione binarius, ut numerus maior, repraesentat, quae duos etiam sonos hosce aequales17 sive unisonos complectitur, sicuti binarius duas continet unitates) pulsetur harum partium duarum aequalium una, audietur statim intervallum Octaveae, dimidium videlic[et] totius, sicut18 unitas medietas, seu dimidium est binarii: et vicissim, sicut unitas bis sumpta vel duplicata exhibit binarium, sui duplum; ita unisonus duplicatus exhibit Octavam. Hinc est quod Lippius Octavam dicat unisonum19 compositum. Res in Monochordo est manifestissima, ut:

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16 D-Hs ND VI 5126a, 5: “nam ubi eadem quantitas, ibi etiam eade qualitas” is added.
17 D-Hs ND VI 5126a, 5: “. . . quae quoque duos hosce sonos aequales. . . ”
18 D-Hs ND VI 5126a, 5: “sicuti.”
19 D-Hs ND VI 5126a, 5: “. . . unisonum duplicatum seü compositum. Res est in Monochordo manifesta; ut.”
upon the whole). A three-fold division follows this directly (just as a three-fold division follows upon a two-fold one); then next, a four-fold division, and so on. But let us see how the divisions themselves function and what sorts of intervals they create, by numbering the parts of the division from right to left and by beginning the scale on the left-hand side of the monochord on the note C, for in this way the larger numbers will correspond in harmonic arrangement to the lower sounds.

[4v]

**Division**

The binary [division] produces the octave c (which is a double proportion in the numerical ratio 1:2 or 2:1) on one half part, namely, in the middle of the monochord, or rather of the string, so that, once a little bridge has been placed underneath, there are equal parts on both sides, and therefore the sounds are equal. For where there is the same quantity, there is also the same quality. If, therefore, one of these two equal parts of the whole string in this division is struck (which the binary, as the larger number in this division, represents, [and] which also encompasses these two equal or unison tones, just as a duality contains two unities), the interval of an octave will be heard immediately. That is to say, the half of the whole, just as each half is [on its own] a unity, if the division is binary, and, in turn, as the whole when divided reveals halves or the two-fold division of itself. Thus, the halved unison\(^{20}\) demonstrates the octave. This is why Lippius calls the octave a composite unison. The monochord makes this perfectly clear:

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\(^{20}\) The term “unisonus duplicatus” means literally doubled over, but the meaning is halved in this case.
Ternaria exhibit quintam G, (proportionis sesquialterius, in numeris 3[:2])
in partibus duabus ad integram chordam trium partium, secundum numeros
proportionales, pulsatis, hoc modo:\n
Exhibet etiam duodecimam, id est, Quintam cum Octava, seu ultra Octavam, g
(proportionis tripla, in numeris 3[:1]) in una parte ad integram chordam pulsata,

\[ \text{una tertia pars} \]

\[ ^{21} \text{D-Hs ND VI 5126a, 5. Caption reads "una secunda vel dimidia pars."} \]
The triple [division] demonstrates the fifth, G (the *sesquialtera* proportion, in numbers 3:2), when struck in two parts in relation to a whole string divided [evenly] into three parts according to the proportional numbers, as follows:

It also demonstrates the twelfth, that is the fifth plus the octave or the upper octave g (the triple proportion, in numbers 3:1), when struck in one part in relation to the whole string, thus:

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22 D-Hs ND VI 5126a has “ut” instead of “hoc modo” on p. 5.
Quaternaria exhibit quartam F, (proportionis sesquitertiae, in numeris 4[::3) in tribus partibus ad integram quatuor partium chordam pulsatis, ut:

\[
\text{integra chorda quatuor partium.} \\
\text{Quarta} \\
\text{tres quartae partes.}
\]

[5v] In duabus partibus attingit Octavam c: in unâ verò producit Disdiapason, id est, duplicem Octavam c', proportionis quadrupiae in numeris 4[::1) ut:

\[
\text{una quartae pars} \\
\text{duae quartae partes.}
\]

Quinaria exhibit Tertiam Majorem E, (proportionis sesquiquartae, in numeris 5[::4) in quatuor partibus ad integram chordam quinquem partium pulsatis, ut:
The quadruple [division] demonstrates the fourth, F (the *sesquitertia* proportion, in numbers 4:3), when struck in three parts in relation to a whole string divided [evenly] into four parts thus:

![Diagram showing the division of a string into four parts to demonstrate the fourth]

[5v] In two parts, it yields the octave, c. In one part it indeed produces a pitch two octaves higher, that is, the doubled octave, c', the quadruple proportion, in numbers 4:1, thus:

![Diagram showing the division of a string into four parts to demonstrate the fourth]

The quintuple [division] demonstrates the major third, E (the *sesquiquarta* proportion, in numbers 5:4), when struck in four parts in relation to the whole string divided [evenly] into five parts thus:
integra chorda quinque partium.\textsuperscript{23} quatuor quintae partes.

Exhibet etiam in tribus partibus Sextam M[ajorem] A, (proportionis superbitertiae in numeris 5[:3]) in duabus Decimam Maiorem e, proport[ionis] duplae sesquialterius, in 5[:2]: et in unà parte Decimam septimam Majorem, id est,

Tertiam M[ajorem] cum Disdiapason, seu duplici Octava e', proportionis quintuplae in numeris 5[:1] hoc modo:

\textit{Senaria} exhibet Tertiam minorem E\textsuperscript{6} (vulgò D\#[, dis[, sed min[us]
rectè,]) proportionis sesquiquintae in num[eris] 6[:3]\textsuperscript{24} in quinquem partib[us] ad

\textsuperscript{23} D-Hs ND VI 5126a, 6: Superscript reads “integra.”
\textsuperscript{24} D-Hs ND VI 5126a, 7: “(alias D\# dis sed minus rectè; proportionis sesquiquintae in numeris 6.5.”
In three parts, it also demonstrates the major sixth, A (the superbitertia proportion, in numbers 5:3). In two parts [it demonstrates] the major tenth, e, the double sesquialtera proportion, in [numbers] 5:2. In one part [it demonstrates] the major seventeenth, which is the same as the major third plus the double octave or two-fold octave, e', the quintuple proportion, in the ratio 5:1, as follows:

[6r]

The sextuple [division] demonstrates the minor third, E (commonly called D#, but less correctly so), the sesquiquinta proportion, in numbers 6:5, [when]
integram chordam\textsuperscript{25} pulsatis: attingit etiam Quintam G in quatuor partibus: Octavam c in tribus: duodecimam g in duabus: et tandem in unâ producit g' decimam nonam, proport[ionis] sextuplae, in num[eris] 6[:]1 hoc modo:

\begin{center}
\includegraphics[width=0.5\textwidth]{diagram.png}
\end{center}

integra chorda sex partium.

Hucusque radices, et proinde radicales divisiones omnium intervallorum consonorum, in senario contentorum; quibus additur et Octonaria, propter Sextam minorem, ex infima Monochordi clave, in numeris radicalibus\textsuperscript{26} 8[:]5 constituentam.

Octonaria igitur in septem partibus nihil exhibet Harmonici, propter septenarii naturam; in sex vero attingit Quartam F; in quinque (quod hoc loco principale)\textsuperscript{27} producit Sextam minorem A\textsuperscript{G}s, proportionis supertriquintae: in quatuor\textsuperscript{28} attingit Octavam c: in tribus exhibet undecimam, id est, Quartam cum Octava f, proport[ionis] duplae superbitertiae in num[eris] 8[:]3: in duabus attingit Disdiapason c': in unâ producit Trisdiapason, id est, triplicem Octavam c", proportionis Octuplae in num[eris] 8[:]1 hoc modo:

\begin{footnotesize}
\begin{enumerate}
\item \textsuperscript{25} D-Hs ND VI 5126a, 7: “... ad integram pulsates...”
\item \textsuperscript{26} D-Hs ND VI 5126a, 7: Word order is reversed: “radicalibus numeris.”
\item \textsuperscript{27} D-Hs ND VI 5126a, 7: “(quod principale).”
\item \textsuperscript{28} D-Hs ND VI 5126a, 7: “... in quatuor vicissim attingit octavam c:...”
\end{enumerate}
\end{footnotesize}
struck in five parts in relation to the whole string. It also yields the fifth, G, in
four parts; the octave, c, in three; the twelfth, g, in two. And, finally, in one it
produces the nineteenth, g', the sextuple proportion, in numbers 6:1, as follows:

These are all of the radical [fundamental] ones, and consequently the radical
divisions for all the consonant intervals that are comprised in the six-fold
division, and to which is also added the division into eight, for the sake of the
minor sixth, being [derived] from the lowest note on the monochord, in radical
[fundamental] numbers 8:5.

Taking seven parts from the eight-fold [division] does not produce
therefore harmonies at all, due to the nature of the seventh. However, one arrives
at the fourth, F, in six [parts]. In five [parts] (its principal reason [to be
considered] here) it produces a minor sixth, A@, the supertriquinta proportion.
In four [parts], it generates the octave c. In three [parts], it demonstrates the
eleventh, that is the fourth with the octave, f, the duple superbitertia proportion,
in the numerical ratio 8:3. In two [parts], it generates the double octave, c'. In
one [part], it produces the triple octave, that is the tripled octave c", the octuple
proportion, in the numerical ratio 8:1, as follows:
Atque ita ex hisce divisionibus claves diversae prodierunt, quarum majores seu graviiores in ambitu Octavae C [-] c sunt hae sex: E @ E. F. G. A. A @ quae singulae cum suis partibus ad infimam clavem C pulsatae (quod mirum, et in sequentibus divisionibus non contingit,) euphoniam constituunt; Exempli gratia:

**Ternaria** divisio producit claves G et g, non tantum inter se, verum etiam cum infima clave C suavissimam consonantiam constituenter:

Quaternaria producit claves hasce: F, c, et c', inter se non tantum consonas (non secus ac C, G, g, in ternaria divisione) verum etiam ad infimam clavem C non malè quadrantes; et sic consequenter. Sed transimus ad intervalla dissona.

**Divisio**

**Novenaria** exhibet Tonum majorem D, (propoisionis sesquioctave, in numeris 9[]): in octo partibus ad integram chordam pulsatis: attingit etiam G in sex: et producit B Septimam minorem in quinquem: item d, in quatuor; attingit g
And thus, out of these divisions various notes are demonstrated, the larger or lower of which, in the range of the octave C – c, are these six: E, F, G, A, A

[When] these individual notes with their divisions are struck in relation to the low note C, (which surprisingly does not happen in subsequent divisions) they create euphony. For example:

A division into thirds produces the notes G and g, forming the sweetest harmony not only with one another, but truly also with the low note C. Likewise, the fourth produces these notes: F, c, and c', [which are] not only consonant between one another (just as C, G, g in ternary division) but also not ill-fitting to low C, and so on. Let us, however, move on to the dissonant intervals.

Division

The [division] by nine demonstrates the greater whole tone D (the sesquioctave proportion, in the numerical ratio 9:8), when struck in eight parts in relation to the whole string. It also yields G in six [parts], and it produces B, the
in tribus; et procreat d' in duabus; d" verò in unà, hoc modo:

Denaria exhibet Tonum minorem D, (proport[ionis] sesquionae in num[eris]: 10[:9] in novem partibus: attingit E in octo: A in sex: c in quinque: e in quatuor: exhibet etiam a in tribus; attingitque 33 e' in duabus; et producit e" in unà, ut:

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33 D-Hs ND VI 5126a, 9: “. . . attingit e' in duabus . . .”
minor sixth, in five [parts], likewise d in four [parts]. It yields g in three [parts], and it produces d' in two [parts], [and] indeed d" in one [part], as follows:

The [division] by ten produces the lesser whole tone D (the sesquinona proportion, in the numerical ratio 10:9) in nine parts. It yields E in eight [parts], A in six [parts], c in five [parts], e in four [parts]. It also renders a in three [parts], demonstrates e' in two [parts], and it produces e" in one [part], thus:
NB Hujus et praecedentis D differentia est comma, 81[.]80. Hic enim est Tonus minor; illic autem Maior, inter C et D. 34

Si forte libet tentare Duodenariam, exhibebit illa e[es], in quinque partibus, et g" in unâ: alias enim attingit E[es]35 in decem: F in novem: c in sex: g in quatuor, c' in tribus, et g' in duabus. 36

**Quindenaria** exhibet septimam Majorem B$ in octo partibus, secundum numeros radicales 15[.]8: item b$ in quatuor: b$ in duabus; et b$ in una: alias attingit E in duodécim: G in decem: A in novem: e in sex: g in quinquem, et e' in tribus, hoc modo:

---

**Sedenaria** exhibet quidem Semitonium Maius in quindecim partibus, secundum numeros radicales 16[.]15 verum à C ad C♯is tale Semitonium non datur, sed minus, ceü sequitur in proxima divisione: poterit ergò explorari in clavibus hisce sequentib[us], in quibus repertitur, videlicet: D, E[es]tem E, F, G,

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35 D-Hs ND VI 5126a, 9: The Hamburg copy omits “es.”
36 D-Hs ND VI 5126a, 9: The following is added: “Sed pergamus.”
NB: The difference between this D and the preceding D is the comma, 81:80. This is namely the lesser whole tone, while the other one is the greater whole tone, between C and D.

If by chance it pleases one to try a twelve-fold division, this produces e\textsuperscript{\#} in five parts and g\textsuperscript{\#} in one. It [the division] also yields other pitches: E in ten, F in nine, c in six, g in four, e\textsuperscript{'} in three, and g\textsuperscript{'} in two.

The [division] by fifteen demonstrates the major seventh B in eight parts, in accordance with the radical numbers, 15:8. The same [applies to] b in four [parts], b\textsuperscript{'} in two [parts], and b\textsuperscript{''} in one part. It yields other pitches: E in twelve, G in ten, A in nine, e in six, g in five, and e\textsuperscript{'} in three, as follows:

\[ \begin{array}{cccccccccccc}
C & 15 & 14 & 13 & 12 & 11 & 10 & 9 & 8 & 7 & 6 & 5 & 4 & 3 & 2 & 1 \\
E & G & A & e & g & b & e' & b' & b'' \\
B
\end{array} \]

The [division] by sixteen indeed demonstrates the greater semitone in fifteen parts, in accordance with the radical numbers, 16:15. Indeed from C to C\textsuperscript{\#} cis, there is no such semitone, but a lesser one, as in the next division that follows.

It can, therefore, be examined clearly with these following notes through which it is ascertained: D - E\textsuperscript{\#} the same [applies to] E - F, G - A\textsuperscript{\#} A, B - c, and the

\[ \text{37} \text{The term comma denotes the slight difference in the pitch of semitones that occurs when unequal temperament is used. Microintervals result when the same note is obtained by combining octaves, perfect fifths, and thirds. In syntonal diatonic tuning the comma equals approximately 22 cents, or 81:80, and is the difference between four perfect fifths and two octaves plus a major third. A difference of six cents may be perceived by a trained musician.} \]
A: G, A: B, c: et similibus; aliàs etiam exhibet c"" quadruplicem octavam, proportionis sedecuplae, in num[eris] 16[ :]1 in unà parte.\textsuperscript{38}

\textbf{Vigequinaria} exhibet Semitonium minus Ccis, in partibus viginti quatuer secundum numeros radicales 25[ :]24 producitque F# in octodecim; G# in sedecim: ccis, in duodecim: fis in novem: ggis in octo.\textsuperscript{39} c# in sex: g# in quatuor, et c# in tribus: aliàs etiam attingit E in viginti: A in quindecim: e in decem, et e' in quinquones partibus.

\textbf{Commatis} inquisitio fundata est in novenaria divisione:\textsuperscript{40} siquidem una nona pars divisa in tres, exhibet partes totius 27: harum iterum una in tres divisa exhibet 81. partes totius, quarum 80. ad integram chordam pulsatae comma sonabunt.

\textit{Sequitur Divisionis}\textsuperscript{41}

\textit{Compendium.}

[8v] Totum negotium consistit in divisione binariâ, ternariâ et quinariâ: Ex binariâ enim non difficile est quaterniam, item Octonariam et Sedenariam, etc, producere; similiter ex ternariâ senariam, novenariam, duodenariam, etc; ex quinariâ denariam, quindenariam, etc. quanquam etiam quindenaria ex ternaria produci facilè possit.\textsuperscript{42}

Faciliore itaque modo inferioris Octavae intervalla indagari queunt, si videlicet pars chordae dimidia, à C ad c, tantum dividatur, ut sequitur:

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\textsuperscript{38} D-Hs ND VI 5126a, 10: The Hamburg exemplar also has “Sed vlerius:”
\textsuperscript{39} D-Hs ND VI 5126a, 10: The names cis, fis, and gis are omitted.
\textsuperscript{40} D-Hs ND VI 5126a, 10: The word order is reversed, “divisione novenaria.”
\textsuperscript{41} D-Hs ND VI 5126a, 10: Omitted from the Hamburg copy.
\textsuperscript{42} D-Hs ND VI 5126a, 10: The order of divisions was incorrectly transcribed and then corrected by the Hamburg copyist.
like. It also demonstrates another [interval] in one part: e"', the quadruple octave, the *sedecupla* proportion, in the numerical ratio 16:1.

The [division] by twenty-five demonstrates the lesser semitone C♯, cis, in twenty-four parts in accordance with the radical numbers, 25:24. This also produces F♯ in eighteen, G♯ in sixteen, c♯, cis, in twelve, f♯, fis, in nine, g♯, gis, in eight, c♯ in six, g♯ in four, and c♯ in three. It also yields other pitches: E in twenty, A in fifteen, e in ten, and e' in five parts.

The investigation of the comma is based on the division into ninths. If one ninth is divided into three [parts], it produces 27 parts of the whole [string]. A further division of one of these [parts] into three produces 81 parts of the whole [string], to which 80 [parts] in relation to the whole string sound as a comma.

The compendium of divisions follows.

**Summary**

The entire matter rests upon duple, triple, and quintuple divisions. From duple divisions it is not difficult to produce the quadruple [division], the same for the divisions by eight and sixteen, etc.; likewise from the triple [division], [the divisions by] six, nine, and twelve, etc.; from the quintuple [division], [the divisions by] ten, fifteen, etc., although [the division by] fifteen can also be easily produced from the triple [division].

Consequently, there is an easier way to examine the intervals of the lower octave. If part of the string, from C to c, is clearly divided only in half as follows:
Binaria huius spatii divisio exhibet F, ut:

![Diagram of F between C and C.]

Ternaria exhibet E@t G, ut:

![Diagram of E@G between C and C.]

Spacium Quintae C, G, in tres partes divisum exhibet in parte inferiore Tonum Maiorem D: pars una suprà G monstrat B, ut:

![Diagram showing D, B, and G.]

Spacium Tertia minoris C, E@n quinque partes divisum, unà superadditâ, monstrat E: spacium inter E@t E monstrat distantiam inter B et c: idem

[9r] Spacium bis sumptum à puncto G ascendendo monstrat A: ter sumptum à C exhibet tonum minorem in D (huius et illius D differentia est comma, ut paulò ante notavimus) et in hac divisione spacium Octavae C, c, est quindecim, integra verò chorda triginta partium, ut:

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43 D-Hs ND VI 5126a, 11: The Hamburg scribe uses “spatium” instead of “spacium.”
44 Ibid.
45 Ibid.
46 Ibid.
47 D-Hs ND VI 5126a, 11: Parenthetical note reads: “NB huius D et illius differentia est comma ut paulò ante notavimus.”
48 D-Hs ND VI 5126a, 11: Hamburg copy has: “partitione spatium octavae C. c. erit quindecim.”
The duple division of this spatial unit demonstrates the interval \( F \) thus:

\[
\text{C} \quad F \quad \text{c}
\]

The triple [division] demonstrates \( E \) and \( G \) thus:

\[
\text{C} \quad E_{\flat} \quad G \quad \text{c}
\]

The spatial unit of a fifth, \( C \) – \( G \), divided in three parts produces the greater whole tone \( D \) in the lower portion; one part above \( G \) shows \( B \) thus:

\[
\text{C} \quad \text{3} \quad \text{D} \quad \text{2} \quad \text{G} \quad \text{B}
\]

The spatial unit of the minor third, \( C \) – \( E_{\flat} \), divided in five parts, with the addition of one [more corresponding part], shows \( E \). The interval between \( E \) and \( E \) illustrates the distance between \( B \) and \( c \). Also, the same distance taken twice from the point \( G \) ascending upwards demonstrates \( A \). Taken three times from \( C \), it produces the lesser whole tone \( D \) (the difference in pitch between this one and the former \( D \) is the comma, as we observed a little earlier), and the division of the octave interval from \( C \) to \( c \) is by fifteen, the entire string indeed in thirty parts thus:
NB Spacium C, E, convenit cum E, A: inter C et A verò est intervallum Sextae Maioris; unde liquet, spacium⁴⁹ Sextae Maioris in duas partes divisum exhibere in parte inferiore Teriam Maiorem, et⁵⁰ in superiore Quartam; huius igitur divisionis beneficio indagari etiam potest clavis F♯ fis, inter D et B Sextam Maiorem, spacium⁵¹ idipsum in duas partes dividendo, ut:

Spacium⁵² inter C et E in quinque partes divisum exhibet in parte infima C♯ cis, semitonium minus: harum partium duae supra E monstrant F♯ fis; (huius et illius F♯ fis, differentia est comma) et vicissim duae exhibent⁵³ G♯ gis, ut:

[9v] Spacium G, G♯ bis sumptum infra E, monstrat D♯ dis, Semitonium Maius;

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⁴⁹ D-Hs ND VI 5126a,11: “Spatium” instead of “spacium.”
⁵⁰ D-Hs ND VI 5126a, 11: Hamburg copy omits “et.”
⁵¹ D-Hs ND VI 5126a, 11: “Spatium” instead of “spacium.”
⁵² Ibid.
⁵³ D-Hs ND VI 5126a, 12: Hamburg copy reads: “iterumque duae exhibent . . . ”
NB: The interval C - E combines with E – A. The interval between C and A is indeed a major sixth, from whence it is clear, the interval of the major sixth divided in two parts will produce the major third in the lower part and a fourth in the upper one. Through the benefit of this division, therefore, you can even examine the note F♯/fis, between D and B, the major sixth, the same interval being divided in two parts thus:

\[
\begin{array}{c}
5 & 4 & 3 \\
C & E & A \\
D & F♯ & B
\end{array}
\]

The interval between C and E divided in 5 parts produces in the lowest part C♯/cis, the lesser semitone. Two of these parts above E show F♯/fis (between this one and the former F♯/fis, the difference is one comma) and, in turn, the two show G♯/gis, thus:

\[
\begin{array}{c}
25 & 24 & 23 & 22 & 21 & 20 & 19 & 18 & 17 & 16 \\
C & C♯ & E & F♯ & G♯
\end{array}
\]

[9v] The distance [of the interval] G – G♯ taken twice below E shows D♯/dis, a greater
uterius descendendo quater repetitum attingit C♯ cis, ut:54

vel quod idem: Spacium Tertiae minoris G♯ B, bis deorsum sumptum monstrat

idem D♯ Sextam videlicet minorem cum B, non secus ac sequentes hae species:55

Spacium56 Tertiae minoris E, G, convenit cum G, B; uti C, E♭ cum E♯ G: unde
liquet Quintam in duas partes divisam exhibere infrà Tertiam minorem, suprà
verò Maiorem: hinc Quinta F, c, mediata exhibet A♭ tem spacium F, A inferiūs
assumptum monstrat D (toni scilicet cum C minoris), datā enim huius divisionis
parte unà, manifesta statim est et altera, ut:57
By descending farther four times more it reaches the C♯cis, thus:

Or, likewise, since the distance of the minor third [from] G♯ to B, taken twice downwards, produces the same D♯ clearly the minor sixth with B, [it is] not otherwise and according to this model:

The spatial unit of the minor third E - G combines with [that of] G - B. C - E🌴 used with E - G from whence it is clear that the fifth divided in two parts will demonstrate the minor third below, the major one indeed above. This fifth, F - c, demonstrates A++] between. Likewise, the interval taken below F - A shows D (namely, a lesser whole tone with C), for once one part of this division has been provided, the other immediately becomes manifest, thus:
Atque ita inventae sunt claves Octavae C, c, intermediae omnes, videlicet: C, C♯, D, D♯, E♭, E, F, F♯, G, G♯, A♭, A, B♭, b: Ex quibus non difficile est et reliquas minores elicere, idque per spaciōrum maiōrum homogeneorum (seu Synonymorum) proximarum mediationem; sīquidem quodlibet intervallum acutum est sui gravis homogenei proximi dimidium; sive, quod idem, quodlibet grave est sui acuti homogenei proximi duplum, ratione proportionis duplæ; quod in omnibus Octavis observandum; Exempli gratiâ:

Et sic in reliquis.

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58 D-Hs ND VI 5126a, 13: “Erit” instead of “est.”
59 D-Hs ND VI 5126a, 13: Hamburg exemplar reads “spatiōrum” instead of “spaciōrum,” and omits the parentheses around “seu synonymorum.”
60 D-Hs ND VI 5126a, 13: Hamburg copy has parentheses instead of commas to offset “quod idem.”
And the notes in the octave C – c, are thus discovered to be the mediators of all notes, namely: C, C#, D, D#, E, E#, F, F#, G, G#, A, A#, B, c. From these it is not difficult to derive the remaining smaller ones, and they by means of the spatial units of the closest same major type (or similar type) having been divided in half. Accordingly, whatever high interval you take, its closest low type is the half; whatever low one is its closest high type doubled—the rule of double proportion. This may be observed in all octaves, for instance:

```
c"—d"  
c'—d'  
c——d      
C——D
```

And so it is for the remaining octaves.
NB. Intervallum inter D\# et E@ item, inter G\# et A@ dicitur Diesis,\textsuperscript{61} portiuncula duorum ferè Commatum, differentia Semitonii Maioris et minoris, in numeris 128:125.

Verùm haec de Monochordi divisione in Scala Syntona nova, (maximam partem privatim observata) sufficiant.\textsuperscript{62} De veterum dimensione nonnihil in sequentibus. Sequitur de Usu.\textsuperscript{63}

III.

De Usu Monoch[ordi]

De Usu Monochordi ita refert Andreas Ornitoparchus in 	extit{libello suo}

Musico: Ad\textsuperscript{64} hoc imprimis excogitatum Monochordum existit, ut index sit Musicalium vocum atq[ue] intervallorum, et (sicut Berno, Abbas Cluniacensis lib[er] 2 Mus[ica] ait) ut quantum una quaeq[uem] vox alterâ sit gravior, subtiliorvē cognoscamus.

Tum, Cantus verús ne sit an falsus, praebeat experimentum, deinde ut cervicosis ac falsis Musicis erroris semitam recludat, ac veritatis viam aperiat. Postremûm, ut pueris ad Musicam aspirantibus iter facile praebeat, incipientes

\textsuperscript{61} D-Hs ND VI 5126a, 13: Word order in Hamburg copy is reversed: “... dicitur diesis item inter G\# et A@.”

\textsuperscript{62} D-Hs ND VI 5126a, 13: Hamburg copy has “... Monochordi dimensione maximam partem privatim observata sufficient.”

\textsuperscript{63} D-Hs ND VI 5126a, 13: The word “eiusdem” is added.

\textsuperscript{64} D-Hs ND VI 5126a, 13: “At” instead of “ad.”
NB: The interval between D♯ and E♭ is called diesis, likewise for the interval between G♯ and A♭. It is nearly twice the size of a comma, the difference between a greater and a lesser semitone, in the numerical ratio 128:125.

But let this suffice for the division of the monochord in the new syntonal diatonic scale (very much of this may be observed privately). Something concerning the ancient measurement [will arise] in what follows.

[What] follows is about its use.

[10v]

III.

On the use of the Monochord

Andreas Ornithoparchus states the following about the use of the monochord in his little book on music:

In relation to this the monochord, having been invented, exists chiefly so that it may be a guide for vocal music and also for intervals and (just as Berno, Abbot of Cluny says in Book 2, Music) so that we may learn how much lower or more exact one tone should be in relation to another.65

Next, singing, whether it is proper or improper, offers experience, for it [the monochord] then reveals the path through obstinate or improper errors in music, and it also discloses the way of truth. Finally, since it presents the easy way to boys who have aspired to become musicians, it encourages beginners, it

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alliciat, progredientes dirigat, atq[ue] ita ex indoctis doctos faciat, etc.

Haec illi, et quidem de Monochordo Scalae Diatonae veteris. Sed videamus alias de Monochordi usu, non tantûm in inquirendis intervallis, verùm aliis etiam iisq[ue] non vulgaribus rebus Musicis in Scalâ novâ Syntonâ observationes ut dignissimas ita jucundissimas.

1.

**In Monochordo** explorantur et demonstrantur omnia intervalla Musica, consona et dissona; in serie sua naturali: ex qua liquet, quodnam eorum sit naturâ primum, quodnam secundum, tertium, etc. 66

Quamvis autem haec intervallorum inquisitio et demonstratio ex praecedentib[us] de Divisione allatis manifesta satis esse queat, libet tamen ulterioiris declarationis gratiâ verbum unum atq[ue] alterum adjicere. 67

Indagatio et Demonstratio intervallorum fit, ut diximus, per proportiones ratione numerorum. Proponantur ergò primùm numeri, naturali serie, ab unitate ad septenarium usque se sequentes, et fiat initium applicationis ab unitate et binario; deinde à binario et ternario, etc. et prodibunt consequenter intervalla quaesita.

Major proportionis numerus dicitur Denominator, et minor Numerator; ille, ut Totius denominator, solet in scribendo praeponi, hic verò, ut partium

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66 D-Hs ND VI 5126a, 14: The Hamburg copy includes “quartum” in the list.
67 D-Hs ND VI 5126a, 14: Word order in Hamburg copy differs: “. . . et demonstratio manifesta satis esse uqeat ex praecedentibus de divisione allatis. . .”
directs the advanced ones, and also in this way makes the unskilled into teachers, etc.

These are the well-known [uses] and indeed are with respect to the monochord in the ancient diatonic tuning. We shall, however, see another use for the monochord, not only for investigating the intervals, but for observations of other things as well, and for those unusual matters of music in the new syntonal diatonic scale, that are most worthy and, thus, most pleasant.

1.

All musical intervals may be explored and shown on the monochord, both consonant and dissonant ones in their natural series, from which it is clear which of them are primary by nature, which ones secondary, tertiary, quaternary, etc. Moreover, however sufficiently clear this investigation and demonstration of the intervals from the preceding [discussion] on the division may have been, it is nevertheless pleasing to add a word or two for the sake of explanation.

The investigation and demonstration of the intervals is accomplished, as we have said, by means of the ratios of numbers. Therefore, the numbers shall first be displayed in their natural order from the unison to the seventh continuously following one another, and the beginning of the application occurs from the unison and the second, then from the second and the third, etc.; and the selected intervals will proceed in an appropriate order.

The larger number of the proportion is called the denominator, and the smaller one, the numerator. Since the former one, or denominator, is the whole
numerator, postponi.

In hisce numeris\textsuperscript{68} igitur 1.2. vel 2.1. binarius, ut major, Denominator est, unitas Numerator. Juxta Denominatorem chorda divenda est, juxta Numeratorem verò tot partes ad integram chordam tangendae sunt, quot ille (Numerator scil\[icet\]) continet unitates.

Factâ igitur ad Monochordum applicatione, (ceu suprà in Divisione vidimus) prodit Octave intervallum, omnium intervallorum Musicorum naturâ primum, tanquam Mater et Regina sequentium intervallorum\textsuperscript{69} omnium.


Et huc usque series numerorum harmoniorum continua; si accesserit octonarius, constituetur Sexta minor in numeris 5, 8. vel 8, 5: sicut Sexta Major in 3, 5. vel 5, 3. discontinuis. Eodem etiam modo reliqua intervalla in numeris discontinuis octavam transcendentia explorantur, utpote tripla, quadrupla, etc.

Deinde applicentur etiam numeri reliqui, videlicet 8, 9: et 9, 10: item 15, 16: 24, 25: et 80, 81. et prodibunt reliqua intervalla, sed dissona; sicut ea omnia

\textsuperscript{68} D-Hs ND VI 5126a, 14: Hamburg copy omits “numeris.”
\textsuperscript{69} D-Hs ND VI 5126a, 15: Hamburg copy omits “intervallorum.”
unit, it is customarily placed first, while the latter one, or numerator, as a portion, is indeed placed afterwards.

Therefore, in these numerical relations, 1:2 or 2:1, the denominator is the two, as the largest, the numerator, the one. The string is divided in accordance with the denominator; indeed as many parts of the entire string will be struck as in the numerator, as many units as the latter (the numerator, namely) contains.

Once the application has been accomplished on the monochord, therefore, (as we observed in the preceding section on division), the octave is revealed to be the mother and the queen of all subsequent intervals, by its nature the first interval of all musical intervals.

Next, follows the fifth, in the next numerical proportion, 2:3 or 3:2. Then [there is] the fourth in the [ratio] 3:4 or 4:3, followed by the major third in the [relation] 4:5 or 5:4 and, lastly, the minor third in the [proportion] 5:6 or 6:5.

And if you extend the series of harmonic numbers all the way here, if the eight-fold division is added, the minor sixth is established, in numbers 5:8 or 8:5, as the major sixth in [the ratio] 3:5 or 5:3 is discontinued. By means of this method, the remaining intervals extending beyond the octave are also investigated in the ratios that have not been included, namely, the third, fourth, etc.

Then, the rest of the ratios are also applied, namely, 8:9 and 9:10, likewise 15:16, 24:25 and 80:81, and the remaining intervals will appear, indeed the dissonant ones. Inasmuch as all these things were noted in the previous
ex praemissis nota sunt; nec opus, ut hoc loco pluribus repetantur. Videatur Plejas Septima Baryphóni fol. 237 et seq[uentes].

Sed non praetereundum híc, quod admiratione et consideratione dignissimum, vidèl[icet] Septenarium numerum esse quasi terminum ac limitem inter consonantias et dissonantias: siquidem omnes numeri Senario contenti, et simul et seorsim invicem, quomodocunque] libuerit, considerati, bonam pariunt harmoniam, Septenário interim, ut sacro quietario et virgineo quiescente,

[Marginalia] Lipp[jus] A 4 fac. 2 item E 6, f. 2.

[12r] nullamq[ue] consonantiam pariente, omnes tamen, quod mirum, numerante;
(septem enim sunt consonantiae, scil[icet]: Octava, Quinta, Quarta, Tertia Major, Tertia minor, Sexta M[ajor] et Sexta minor.) Post Septenarium autem statim ab octonario incipiant Dissonantiae; ceu vidimus.

Senarius etiam, qui primus perfectus, et in omnibus suis partibus, ut diximus, numerus est harmonicissimus, non injucundam nobis hoc loco praebet occasionem considerandi magnum illud et admirandum creationis opus, quod sex dierum spacio absolutum est,70 et de cujus operibus singulis ac universis extat:

70 D-Hs ND VI 5126a, 15: Hamburg copy reads “. . . quod sex diebus absolutum est, . . .”
discussion, it is not necessary to return to this point in detail. See *Pleiades musicae*, Chapter 7 by Baryphonous pg. 231 and following.\textsuperscript{71}

This, however, must not be omitted, which is most worthy of admiration and contemplation, namely, the septenary, as the numerical limit and also the boundary between consonance and dissonance. Accordingly, when all of the six proportions have been included, and have been considered together and separately in alternation, in whatever way it may please, they produce good harmony. The septenary, however, like a sacred refuge or a sleeping maiden, and not

[Marginalia] Lippius A 4, f. 2; the same for E 6, f. 2

producing any consonance, is nevertheless considered wonderful by everyone. (Indeed there are seven consonances: namely, the octave, the fifth, the fourth, the major third, the minor third, the major sixth and minor sixth.). After the septenary, however, the dissonant intervals begin at once beyond the octonary, as we have seen.

Also the six-fold division or senary, which is first perfect, and, as we have said, is the most harmonious ratio in all of its parts, offers us here a not-unpleasant opportunity for considering that great and admirable work of Creation, which was completed within the period of six days, and by whose works each individual and

valdè bona, ideoq[ue] harmonicissima, fuisse omnia: (hinc Lippius eum vocat mundanum.) Quapropter,

[ marginalia ] Lip[pius] A 4, f. 2. 72

2.

In Monochordo, (eâ de causâ pluribus chordis inducto) non absq[ue] jucunda admiratione attendi et demonstrari potest egregia illa omnium Senarii numerorum, chordis applicatorum simulq[ue] pulsatorum Harmonia.

Oportet autem omnes chordas simpliciter esse unisonas.

Et sic prima sive infima chorda integra exhibebit C magnum: chorda proxima sive secunda in dimidia sive altera sui parte dabit c parvum, Octavam seu duplam, id quod indigitat binarius in medio Monochordi ad marginem positus:

Tertia chorda monstrabit g, duodecimam sue triplam, in parte tertia sub ternario:

Quarta sub quaternario, in quarta scilic[et] parte exhibebit c', quadruplam, id est, duplice[m] Octava[m]: Quinta in quinta parte sub quinario monstrabit e', quintuplam, id est, duplicem octavam cum Tertia Majore:

Et tandem sexta chorda in sexta parte sub senario dabit g', sextuplam, id est, duplicem octavam cum Quintâ.

---

the whole world exists: all of which were very good, and therefore most harmonious. (Hence Lippius calls it the cosmic [number].)\textsuperscript{73}

[Marginalia] Lippius, [Synopsis musicae], A4, fol. 2.

2.

For what outstanding harmony of all six of the numbers cannot be demonstrated on the monochord (on account of its many added strings), by means of the strings having been depressed and struck simultaneously, or listened to without pleasant amazement?

It is necessary, moreover, that all strings simply be unisons. And thus if the first or lowest entire string produces great C [C], the next nearest string or next one divided in half or one part of its two [parts] will render low c [c], an octave or duple [proportion], which [the number] two indicates by a position midway on the monochord at the edge. The third string will demonstrate g, a twelfth or triple [proportion], in the third part under [the number] three. The fourth under [the number] four in the fourth part, of course, will produce c', quadruple [proportion], that is a doubled octave. The fifth in the fifth part under [the number] five will demonstrate e', quintuple [proportion]; it is two octaves plus a major third. And, finally, the sixth string in the sixth part under [the number] six will render g', sextuple [proportion], that is two octaves plus a fifth.

\textsuperscript{73} D-Hs, p. 15: Many of these pleasant things concerning the sixth are clarified in Boethius, [De institutione musica] fol. 130 g. Anicius Boethius, De institutione musica, ed. Godofredus Friedlein, Boethii de institutione musica libri quinque (Leipzig: B. G. Teubner, 1867) 177-225.
Si forte libet chordam septimam addere (ad habendam Sextam minorem) producit illa in parte octava, sub Octonario, c”, Octuplum, id est, triplicem Octavam; suppositis ubique magadibus seu ponticulis, ut patet ex sequenti Schematismo:

\[
\begin{array}{c}
\text{sexta minor} & \text{sexta major} \\
\text{dupla} & \text{tripla, quadrupla, quintupla, sextupla, octupla}
\end{array}
\]

[13r] In Notularum Systemate des Scribitur hoc modo:

Quarta
Sexta min[or]
Tertia minor
Tertia Major
Sexta M[ajor]
Quarta
Quinta
Octava

219
If perhaps it pleases to add a seventh string (creating a minor sixth), that will produce c" in the eighth part, under [the number] eight, in octuple proportion, that is a tripled octave. The movable stops or little bridges have been placed in all these [positions], as is clear from the following diagram:

On a musical staff it will be represented as follows:
Ita ulterior in reliquis tribus chordis addita intervalla consona, sub numeris 10, 12, 16 in clavibus e", g", c"", exhibebunt totum Systema Musicum in proportione sedecupla, 16[:1] quibus omnibus conjunctis Decachordum hoc absolvitur.

Sed manifestum est ex hoc Schematismo omnes hosce sonos recurrere ad tres tantùm radicales, videl[icet] ad c', e', g', quibus reliqui in octavis correspondent: unde exurgit Trias harmonica admiranda; de qua quid notandum sit, videre licet in sequenti observatione tertia.74

3.

In Monochordo docetur et demonstratur, quid de Triade harmonica notandum; quòd videl[icet] et quomodo illa audiatur in sonis Senarii acutioribus; item, si in sonis gravioribus constituatur,75 quaenam ibidem in partibus residuis procreet intervalla.

Trias harmonica constat tribus sonis radicalibus, diversis quidem sed egregiè consonis, et fundatur in numeris Senarii extremis hisce: 4, 5, 6 diciturq[ue] Trias harmonica radicalis proxima, propter sonos et numeros consonos proximos, in intervallo nimirum Quintae, cujus altera pars Tertia Major, altera minor.

Positis igitur in Monochordo ponticulis seu Magadibus sub numeris majusculis ad marginem notatis 4, 5, 6 (velut antea factum) audietur jucunda

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74 D-Hs ND VI 5126a, 17: “... videbimus in sequenti tertia observatione.”
75 D-Hs ND VI 5126a, 17: “... si in sonis gravioribus monochordi constituatur...”
In addition, therefore, when consonant intervals have been added under the numbers 10, 12, 16, on a scale e'', g'', and c''', the remaining three strings will demonstrate the entire musical system in the \textit{sedecupla} ratio, 16:1, all of which is summarized, since this has been connected to the decachord.

It is evident, however, from this diagram that all of these pitches harken back to the three radical [fundamental] ones, namely to c', e', g', to which the rest correspond in octaves. The admirable harmonic triad arises from this; what ought to be observed concerning this triad it will be possible to see in the following third observation.

3.

On the monochord is taught and demonstrated what needs to be understood about the triad; what, of course, also may be heard in tones higher than a sixth, and how it may be done; likewise, if it is formed with lower tones, what intervals it produces in the same place in the remaining parts.

The triad consists of three radical tones, diverse, yet exceptionally harmonious, and is based on the last [few] numbers of the senary: 4, 5, [and] 6. This triad is also called the closest radical one, on account of its tones and consonant numbers being closest, that is, of course, in the interval of the fifth, of which one part [is] a major third, the other a minor [third].

Therefore, when the little bridges or movable stops on the monochord have been placed under the somewhat larger numbers indicated at the edge [as] 4,

Et hinc ortum est Theorema Melopoëticum, Tertias videlicet non in sonis gravioribus, sed in acutioribus esse usurpandas.

Singuli autem hi numeri seorsim considerati in partibus suis residuis euphoniam quidem exhibent, ut: Quaternarius duodecimam, id est, Octavam cum Quinta, in clavibus F, c': Quinarius duplicem Octavam in E, e'; et Senarius duplicem Octavam cum Tertia Majore in E@g', ut:  

\[ \begin{align*}
\text{Vel sic: partes residuae} \\
\text{Verum si in sonis profundioribus}\; & C, E, G, (\text{ex divisione ternaria et quinaria ortis}) \text{ considerentur, deprebendetur in partibus residuis Trias harmonica diffusa, (id est, cujus soni ab invicem sunt remoti et per octavas diffusi) juxta numeros 1, 3, 5 in clavibus C, g, e', ut:} \\
\end{align*} \]

---

\(^{76}\) D-Hs ND VI 5126a, 17: “... cum tertia maiore ut:”

\(^{77}\) D-Hs ND VI 5126a, 18: “gravioribus” instead of “profundioribus.”
5, [and] 6 (just as illustrated previously), the pleasing harmony of the plucked string will be heard in these higher notes: c', e', g', ut, mi, sol.

And the theorem in the poetics of music is derived from this; the third clearly must not be used for lower pitches, but for higher [ones].

Moreover, each of these single numerical proportions considered separately indeed shows euphony in its remaining parts. Thus, the quadruple [division produces] the twelfth, that is, an octave plus a fifth (in note names, F - c'), the quintuple [division produces] the doubled octave (E - e''), and the sextuple [division produces] the doubled octave plus a major third (E g') in this manner:

\[
\begin{align*}
E^b & \rightarrow F & E & \rightarrow E^b \\
\text{Or thus:} & \quad \frac{4}{5} \quad \frac{6}{6} \\
\end{align*}
\]

Truly, if the lower tones C, E, G, (derived from the triple and quintuple divisions) are considered, the diffused triad will be observed in the remaining parts, (that is [one] whose tones are distanced from one another and are spread out over the octaves) just as the numbers 1:5:3 in note names C, g, e', thus:
Et haec diffusa Trias in omni corpore Musico sonoro grandiore percipi potest facilimè, juxta hanc numerorum illorum dispositionem:

Referatur huc schema Triadis harmonicae in Monochordo triangulari formâ descriptum; ex quo liquidò\textsuperscript{78} constat omnes sonos consonos ad tres radicales naturaliter revolvi et restringi, eosq[ue] conjunctim in Unitate, ut omnium principio, fundari.

Res profectò summa admiratione dignissima, de qua Lippius ita F 4: Trias harmonica simplex et recta, radix vera est unitrisona omnis harmoniae perfectissimae plenissimaeq[ue], quae dari in mundo potest, sonorum etiam mille, et millies mille, qui omnes referri posse debent ad partes ejus in unisono simplici et composito, \textit{magni istius Mysterii DIVINAE solùm adorandae}

\textsuperscript{78} D-Hs ND VI 5126a, 18: “liquidè” instead of “liquidō.”
And this diffused triad can be perceived easily in the entire range of musical tones, according to this arrangement of their proportions:

Here the pattern of the harmonic triad may be represented in triangular form, from which it is clearly established that all consonant tones are naturally returned and restricted to three radical numbers and they are conjointly founded in unity as the principle of all things.

The matter worthy of the greatest admiration, which Lippius indeed [states] on [fol.] F 4, the harmonic triad, simple and proper, is the true and unitrisonic foundation of all of the most perfect and complete harmony that can be rendered in the world. [It is the source] of even thousands and millions of sounds, all of which should be able to be returned to its parts in unison and at the octave. [The triad] is the image and semblance of that great divine mystery, the one and
UNITRINITATIS imago et umbra; an ulla luculentior esse possit, nescio.

Haec Lippius; sed pergamus.

4.

**In Monochordo demonstratur differentia Scalae Syntonae novae, et Diatonae veteris: item Tetrachordorum veterum et Syntonii novi**, cum partium

Syntoni et Diatoni residuarum discrepantia.

Octava, Quinta et Quarta in utraque Scala conveniunt, verùm in Sextis, Tertiis, Tonis et Semitionis occurrit diversitas.

Veteres enim in sua scala progressi sunt per meros Tonos Majores, sesquioctavae proportionis in numeris 9:8 atq[ue] exinde, quando illi duos ejusmodi Tonos conjunxerunt, prodiit Tertia Major in proportione 81:64 intervallum nempe auribus ingratum, atq[ue] eam ob causam ab iis, cum Tertia

[minore et Sexta utraq[ue] rejectum. Tertia enim haec Diatona Major integro commate (81:80) major existit, contrà verò Tertia minor eàdem portione destituitur atq[ue] imperfectur.

Deinde à Tertia ad Quartam in Scala Diatona reperitur Semitonium, in hac minus dictum, in nova autem Syntona Majus, sed hoc loco commate Syntono deficiens, atq[ue] ita etiam imperfectum, in numeris 256:243.
only adored Three in One. Can it be that anything more splendid may exist? I think not. This [is from] Lippius; but let us proceed.79

4.

The difference between the new syntonal diatonic scale and the ancient diatonic one is manifest on the monochord. The same is true for the ancient tetratonic scale and the new syntonal diatonic one, with the difference between the syntonic and the diatonic [scales] being the remaining parts.

The octave, the fifth and the fourth correspond in both scales, but differences certainly occur in the sixth, the third, the whole tone, and the semitone.

For the ancients proceeded with their scale by means of pure major whole tones, in the *sesquioctave* proportion, in a numerical ratio of 9:8. Also, therefore, when those two tones of that kind are juxtaposed, the major third results in the ratio 81:64, truly an unpleasing interval for the ear, and also for this reason on account of them, with the minor third and the sixth having both been rejected.

Indeed this diatonic major third is larger by a whole comma (81:80), however, the minor third lacks this same amount and has not been made perfect.

Then, from the third to the fourth [note] in the diatonic scale the semitone is obtained, in this [scale] it is termed the lesser [semitone], in the new syntonal [diatonic scale] also the greater one. Even this interval, however, is lacking a syntonic comma, and is likewise imperfect, in the numerical proportion 256:243.

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In Monochordo res est manifestissima; inter C enim D habetur Tonus Major: inter D et E vicissim Tonus Major: item, inter F et G idem Tonus; inter G et A iterum: ultimò etiam inter A et B; item inter B atq[ue] c: atq[ue] ita meri Toni Majores in hac Scala veteri reperiuntur.

Semitonia verò E, F: item A, B @ et B, c (respectu Scalae Syntonae) commate Syntono deficiunt: contrà Semitonium Majus, quod habetur inter B @ B, duobus commatibus Sytonis abundat, unde in hac Scala Majus, in Syntona verò minus dicitur,\textsuperscript{80} et hinc error ille in plerisq[ue] libellis Musicis de Semitonio Majore et minore.\textsuperscript{81}

Eadem ratio quoq[ue] est in Tetrachordis. Syntona verò Scala cum suo Tetrachordo aliter progreditur, sicut in Monochordo conspicuum; adscripti igitur utrinq[ue] sunt numeri, quibus utriusq[ue] Scalae, ut et Tetrachordum intervalla, beneficio radicationis\textsuperscript{82} (id est, majorum numerorum ad minores reductionis) fundamentaliter possunt erui et demonstrari.

De radicatione numerorum Baryphonus in sectione prima Plejadis tertiae.\textsuperscript{83}

Sed videamus, quid in partibus residuis occurrat:

Tetrachordum Syntonum in clavibus E, F, G, A, descriptum, sicut in singulis clavibus seorsim, ita in omnibus etiam partib[us] residuis simul jucundissimam exhibet harmoniam, et cum primis, si pro fundamento subjungatur

\textsuperscript{80} D-Hs ND VI 5126a, 19: “. . . duobus abundat, unde in scala Diatona maiora, in Syntona vero minora dicuntur, . . . ”
\textsuperscript{81} D-Hs ND VI 5126a, 19: Hamburg copy has “vid. Lippius C. 2. item C. 4.” in the margin.
\textsuperscript{82} D-Hs ND VI 5126a, 19: “. . . sunt numeri, ex quibus utriusque scalae intervalla, beneficio radicationis, . . . ”
\textsuperscript{83} D-Hs ND VI 5126a, 19: Hamburg lacks “in” and has “Barŷph. sed. 1. pleiad.3.” in the margin.
On the monochord this property is most evident: Between C and D, namely, a greater whole tone is found; between D and E, again, a greater whole tone. The same [occurs] between F and G, likewise a whole tone; between G and A, once more. Finally, between A and B also a whole tone; likewise between B and c. And thus the pure greater whole tones in the scale of the ancients are obtained.

Truly, the semitone E-F, likewise A-B and B-c (with regard to the syntonal diatonic scale), lack a syntonic comma. Conversely the greater semitone, which is found between B and B, exceeds [the smaller one] by two syntonic commas, from which is [it] called the greater one in this scale, but in the syntonal diatonic scale the lesser one. And this is the source of that error found in very many music books concerning the greater and the lesser semitone.

The same principle is evident in all of the tetrachords. The syntonal diatonic scale indeed proceeds differently with its tetrachord, as is seen on the monochord. Written, therefore, on both sides are numbers, which are from each of the scales, so that intervals of the tetrachord, by means of mathematical roots (that is, the larger numbers are reduced to the smaller ones) can be fundamentally uncovered and demonstrated.

Baryphonus [discusses] the reduction of fractional numbers in Part One of the Pleiades, Book III.

Let us, however, consider, what occurs in the remaining parts.

The syntonic tetrachord spelled out in the notes E, F, G, A, whether as the single notes separately, or all of them simultaneously with the remaining parts as well, exhibits the most pleasing harmony, and especially if it is joined with the
clavis Monochordi infima C: E enim producit e': F dat c': G exhibet g: et A procreat e, hoc modo:

\[\begin{array}{c}
\text{E} & \text{F} & \text{G} & \text{A} \\
\text{e} & \text{e} & \text{g} & \text{e} \\
\end{array}\]

Talis autem harmonia in Diatonico\(^84\) (reliqua enim duo Tetrachorda studiò híc præterimus) non reperitur: Quinta G quidem et Quarta F cum Syntono conveniunt, sed Tertia E, G et F, A nequaquam, siquidem in hác comma circa A abundant,\(^85\) in illa verò circa E deficit.

Aliás etiam haec Tetrachorda apud veteres inchoantur vel in clave A vel B: sed eadem omnium est ratio.\(^86\)

[16r]

5.

In Monochordo demonstrantur etiam harmonicae intervallorum mediationes, cumprimis Octaeae, Quintae, et Tertiae Majoris: et quinam ratione hujus mediationis primus sit Modus Musicus.

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\(^{84}\) D-Hs ND VI 5126a, 20: “Diatono” instead of “Diatonico.”
\(^{85}\) D-Hs ND VI 5126a, 20: “. . . siquidem in hác circa A comma abundat, in illa verò circa E deficit.”
\(^{86}\) D-Hs ND VI 5126a, 20: “. . . Tetrachorda inchoantúr apud vetetes vel á clave A vel B sed eadem omnium est ratio.”
lowest C of the monochord as the foundation: E indeed produces e', F yields c', G exhibits g, and A generates e, in this manner:

\[\begin{array}{cccc}
E & F & G & A \\
e' & c' & g & e \\
\end{array}\]

or thus:

\[\begin{array}{cccc}
& e & & A \\
\text{remaining parts} & g & & \\
& c' & c & F \\
& e' & & E \\
\end{array}\]

Such harmony, however, is not obtained through the diatonic [scale] (for the remaining two tetrachords we omit here in our study): the fifth G and the fourth F certainly correspond to the syntonal [diatonic scale], but the thirds E-G and F-A by no means, since the A exceeds its boundaries by this comma, and likewise to that same degree the E falls short of its boundaries.

Previously, these tetrachords were actually established by the ancients, or on the note A or B. Yet the principle is the same for all of them.

5.

On the monochord, harmonic divisions of the intervals may indeed be demonstrated, especially the octave, the fifth, and the major third; and indeed because of such division it is the primary musical method.
Octavae mediatio est in hisce numeris: 6, 4, 3 exhibens in parte inferiore Quintam, in superiore Quartam, infimâ chordâ in sex partes divisâ, et proximâ in quattuor partibus pontículo supposto discretâ; tertiâ verò in tribus, in medio scilicet chordae, in clavibus C, G, c, ut:

Consonant etiam partes residuae in secundâ et tertiâ chordâ, videlicet g et c.

Quintae mediatio est in numeris 15, 12, 10 exhibens in parte inferiore Tertiam Majorem, in superiore minorem, infimâ chordâ in 15 partes divisâ, et proximâ in duodecim discretâ, tertiâ verò in decem, in clavibus C, E, G, ut:

NB Spacium inter G et A est pars chordae decima quinta.


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87 D-Hs ND VI 5126a, 20: Hamburg copy adds “videlicet.”
88 D-Hs ND VI 5126a, 21: “spatium” instead of “spacium.”
89 D-Hs ND VI 5126a, 21: “hisce clavibus” instead of “clavibus hisce.”
The division of the octave is in these numeric proportions: 6:4:3, demonstrating a fifth in the lower part, a fourth in the upper part, the lowest string having been divided in six parts, and the next one having been divided in four parts by the positioned bridge, the third indeed in three, clearly in the middle of the string, on the notes C, G, c, thus:

Furthermore, the remaining parts resonate by means of the second and third strings, clearly g and c.

The division of the fifth is in the numerical proportion 15:12:10, demonstrating a major third in the lower part, a minor [third] in the upper one, the lowest string having been divided in 15 parts, and the next one having been divided in twelve [parts], the third one indeed in ten [parts], on the notes C, E, G, thus:

[16v] These parts also resonate: the second and the third strings, [producing] the remaining ones, e', g, as we observed a little while ago in the harmonic triad with its pitches.
Tertiae Majoris mediatio est in numeris 45, 40, 36 exhibens in parte inferiore Tonum Majorem, in superiore minorem; infimâ chordâ in 45 partes divisâ, et proximâ in 40: tertia verò in 36, in clavibus C, D, E, ut:

Spacium inter B et B exhibet unam 45 partem.

Consonantia in hisce omnibus simul pulsatis esse non potest propter clavem intermedium D, utrinq[ue] dissonantem, interim tamen quaelibet clavis in secunda et tertia chorda seorsim considerata cum parte residuâ egregiè convenit, ut:

vel sic in sonis acutioribus:

verūm de hac graduali sonorum progressione in observatione proxima pluribus.91

Liquet ex hisce mediationibus, quaenam omnium Octavarum naturâ sit prima, videlicet, quae in mediatione Quintae loco inferiore habet Ditonum, id est, Tertiam Majorem, in superiore verò semiditonum seu Tertiam minore[m];93 et vicissim in mediatione Ditoni loco inferiore Tonum Majorem, superiore minorem, ut:

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90 D-Hs ND VI 5126a, 21: “spatium” instead of “spacium.”
91 D-Hs ND VI 5126a, 21: “... verūm de hac graduali progressione in sonorum observatione proxima pluribus.”
92 D-Hs ND VI 5126a, 21: “omnia” instead of “omnium.”
The division of the major third is in the numerical proportion: 45:40:36, demonstrating a greater whole tone in the lower part, a lesser [whole tone] in the upper one; the lowest string having been divided in 45 parts, and the next one [having been divided] in 40: the third one indeed in 36 [parts], on the notes C, D, E, thus:

\[ \begin{array}{c}
\text{C} & \text{D} & \text{E} \\
\text{C} & \text{d''} & \text{e'}
\end{array} \]

Or thus for higher forms of the pitches:

\[ \begin{array}{c}
\text{c} & \text{d} & \text{e} \\
\text{c} & \text{B} & \text{A}
\end{array} \]

In fact, the position of pitches is developed further in the next observation by means of this progression.

It is apparent from these divisions, what the primary character of every octave is. One may see that the division of the fifth contains the *ditone*, that is the major third, in the lower part, [and] the *semitonum* or minor third indeed in the higher one; and, in turn, in the division of the *ditone*, [there is] a greater whole tone in the lower part [and] a lesser one in the higher one, thus:

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93 D-Hs ND VI 5126a, 21: Hamburg copy omits “seu Tertiam minorem.”
His igitur si reliquae claves inserantur, ut F ex divisione quaternaria, A ex quinaria, et B ex quindenaria, integra habebitur Octava haec à C ad c, quae est Ionici Modi; nec enim alia rectius commodius ve applicari potest. Proinde potius ab Ionico (qui aliüs in ordine undecimus) quàm à Dorio inchoatur Modorum Musicorum ordo.

Sicut idipsum ètiam in Organis noviter fabricatis animadvertim[us], quamvis veram ejus rei rationem ut plurimum ignorant eorum fabricatores.

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By means of this, therefore, if the remaining pitches are inserted, so that F [is rendered] from the division of the fourth, A from the fifth, and B from the fifteenth, this complete octave will be contained from C to c, which is the Ionian mode; indeed nothing else as proper or suitable can be applied. Hence, the order of the musical modes is better established from the Ionian (which [is] the eleventh [mode] in another ordering), than from the Dorian.

Likewise, we observe this very thing on a newly-made instrument, even if its makers do not have any knowledge of the rationale behind its construction.

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96 Seth Calvisius, *Exercitationes musicae duae* (Leipzig: Josef Apel, 1600).
6.

In Monochordo animadvertisitur et demonstratur etiam naturalis Bicinii componendi modus; incipiendi in medio Monochordi puncto, videlicet: in clave c, et gradatim adscendendo; idque vel in una, si placet, chordâ tantum, vel in pluribus seorsim.

Proponatur ergo\textsuperscript{97} tema talia gradatim adscendens: c, d, e, f, g et tangatur hae claves (in eadem chordâ) gradatim adscendendo, statimque ab altera parte prodibunt soni egregie consoni, bicinium constituentes, ut:

\begin{center}
\includegraphics[width=0.5\textwidth]{diagram.png}
\end{center}

unisonus utrinque
Tertia Maior
Quinta
Sexta Maior
Octava

Vel in totidem chordis, suppositis Magadibus, partibusque tantum residuis quam demensis seorsim pulsatis, hoc modo:

\begin{center}
\includegraphics[width=0.5\textwidth]{diagram2.png}
\end{center}

\textsuperscript{97} D-Hs ND VI 5126a, 22: “igitur” instead of “ergo.”
6.

On the monochord, the natural method of composing with two parts may also be observed and demonstrated, by beginning at a point in the middle of the monochord, i.e., clearly on the pitch c, and by gradually ascending; either, if you please, the same on one string alone, or on many separately.

Therefore, such a subject is represented in ascending step-by-step [order]:

c, d, e, f, g, and by striking these pitches (on this string) ascending step by step, and immediately from the other part will come forth extraordinarily consonant tones, generating the two parts, thus:

![Diagram showing ascending step-by-step order of pitches on a monochord]

Or on just as many strings, having positioned the bridges, and the parts struck separately, on the remaining ones just as on the measured ones, in this manner:

![Diagram showing multiple strings with bridges and part labeling]
Nec aliter fieri potest, quantum enim chorda ab unà parte minuitur, tantum ab altera augetur: Demonstratio per numeros et proportiones talis est:

Inter c et d habetur Tonus Major, ut ostendunt numeri 9. 8: novenarius igitur harmonicè repraesentat c, et octonarius d: integra autem chorda, cujus medium est novenarius, erit octodecim partium: posito igitur ponticulo in c, erunt utrinq[ue] unisoni, sicut utrinq[ue] aequales proportiones, seu partes: deinde moto ulterius ponticulo in d, chorda ab hoc latere, dextram versùs, unà decimà octavâ parte miminuitur; ab altero contrà eãdem augetur, ita ut híc sint octo, illic verò decem, sicut in subtractione 8 ab 18, relinquuntur 10. (vel sic: Differentia inter 9 et 8 est unitas, quae addita novenario, efficit 10.) 10 autem et 8. (per radicationem 5 et 4.) constituunt Tertiam M[ajorem] quam licet in chorda attendere, d scilicet ab uno, B@erò ab altero latere, ut:

vel in numeris majorib[us]: hoc modo:
And it cannot be done otherwise, indeed however much a string is reduced by one part, that much is added to the other [part]. The demonstration by means of numbers and proportions is thus:

\[
\begin{array}{cccc}
B' & c & d \\
18 & 10 & 9 & 8
\end{array}
\]

A greater whole tone is contained between c and d, as the numerical proportion 9:8 shows. With respect to harmonic proportions, the nine therefore represents c, and the eight, d. The complete string, whose middle is nine, however, is divided in eighteen parts. Therefore, when the bridge has been positioned on c, the note shall be the same on both sides, just as on both sides equal proportions or parts. Then, after the bridge has been moved farther to d, the string from this side [moved] towards the right, one tenth of an octave is reduced. From the other [side], conversely, the octave is enlarged. Thus, since this is 8 [and] that indeed 10, just as in the subtraction of 8 from 18, 10 are left over (or thus: the difference between 9 and 8 is one unit, which when added to 9 yields 10). However, 10 and 8 (by reduction, 5 and 4) form a major third that one may observe on the string, d is evident from one, B truly from the other side, thus:

\[
\begin{array}{cccc}
18 & 9 & 8 \\
\hdashline
10
\end{array}
\]

or, in larger numerical proportions in this manner:
Inter 90 et 80, differentia 10; eadem quoque inter 90 et 100. additis enim 10 ad 90, producuntur 100: 100 verò et 80. (per radicationem 5. et 4.) constituunt Tertiam Majorem.

[Marginalia] 100./5. 80./4.

Similiter inter 80 et 72, differentia 8. eadem quoque inter 100 et 108: vel si placet hoc modo: inter 90 et 72, differentia 18, eadem quoque inter 90 et 108: 108 autem et 72. (per radicationem 3 et 2) exhibent intervallum Quintae, hoc loco inter A et e: et sic porrò in reliquis.

<table>
<thead>
<tr>
<th>108</th>
<th>72</th>
</tr>
</thead>
<tbody>
<tr>
<td>halb</td>
<td>54</td>
</tr>
<tr>
<td>halb</td>
<td>27</td>
</tr>
<tr>
<td>dritter</td>
<td>9</td>
</tr>
<tr>
<td>Theil</td>
<td>3</td>
</tr>
</tbody>
</table>

Quinta

---

98 D-Hs ND VI 5126a, 23: Figure is in margin of Hamburg copy, located under the previous fractions.
Between 90 and 80 the difference [is] 10, likewise therefore between 90 and 100. Indeed, when 10 has been added to 90, 100 is yielded; truly, 100 and 80 (by reduction, 5 and 4) form a major third.

[Marginalia] 100/5  80/4

Similarly, between 80 and 72 the difference [is] 8, likewise therefore between 100 and 108. Or, if one wishes, in this manner, between 90 and 72 the difference [is] 18, likewise therefore between 90 and 108. However, 108 and 72 (by reduction 3 and 2) demonstrate the interval of the fifth, here between A and e, and so on for the rest.
Et hic simplicissimus progrediendi modus est in duabus vocibus formandis, (in motu contrario) alterâ adscendente, et alterâ descendente,\(^99\) quantum Natura hac ratione indigitat: Singula intervalla quidem, ut Semitonia, etc, hoc modo exhibere non potest,\(^100\) sed hic defectus ab arte repletur; Exempli gratia;

\[\text{Sic procedit Natura:} \quad \text{Sic vero Ars:} \]

\[\begin{array}{c}
\text{vel sic:} \\
\text{vel sic:}
\end{array}\]

[19r] ita etiam voce superiore descendente, et inferiore ascendente:

\[\text{Natura.} \quad \text{Ars ita:} \quad \text{vel sic:} \quad \text{etc.} \]

\[\text{vel sic coniunctim} \quad \text{sed pergamus ad ultimam observationem.} \quad :^{101}\]

---

\(^{99}\) D-Hs ND VI 5126a, 24: Hamburg copy reads “(in motu videlicet contrario) altera ascendendo, et descendendo, . . . ”

\(^{100}\) D-Hs ND VI 5126a, 24: “. . . exhinere hoc modo non potest, . . . ”

\(^{101}\) D-Hs ND VI 5126a, 24: Hamburg copy omits “ita” and has “vel sorsim” instead of “vel sic coniunctim.” It also omits the entire last sentence.
And this, the simplest method of proceeding, should generate the two parts (by means of contrary motion), the one ascending, the other descending, as nature through this method requires. This method is not able to produce several intervals, certainly, such as semitones, etc., but this deficiency is made up for by means of artifice; for example:

Nature proceeds thus:  Artifice, however, thus:

[Music notation]

Or thus:

Nature proceeds thus:  Artifice thus:

[Music notation]

Also, the upper voice descending and the lower one descending, thus:

Nature:  Artifice thus:  Or thus:

[Music notation]

Or thus in combination:

[Music notation]

Let us, however, proceed to the final observation.
7.

In Monochordo demonstratur naturalis sonorum in Instrumentis Musicis distantia, legitimaq[ue] eorundem temperatura.

Distantia intervallorum naturalis et genuina desumitur ex eorundem proportionibus,\textsuperscript{102} sicut ex praecedentibus manifestum. Examinabimus exempli gratiâ hac vice unicum tantûm Instrumentum illud Musicum, Clavichordium dictum, propriéq[ue] et primariò ex Monochordo productum et fabrefactum.

Occurrunt autem in hoc instrumento saepius duae, vel tres, vel quatuor claves, unam eandemq[ue] chordam tangentes, et vel Tonum vel Semitonum sonantes, quod si non fiat secundum debitas proportiones, contingit ibidem error, prodens fabricatoris inscitiam.

Quia verò ex superioribus constat, Tonum esse vel majorem vel minorem; itidem Semitonium esse vel majus vel minus; sequitur Toni Majoris spatium\textsuperscript{103} esse debere nonam ejus chordae, quam attingit, partem, scilicet à puncto contactus extremo ad magadem fixam (dextram versus) numerando, juxta numeros proportionales 9. 8 ut:

\textsuperscript{102} D-Hs ND VI 5126a, 24: Hamburg copy has “. . . proportionibus eorundum. . . ”
\textsuperscript{103} D-Hs ND VI 5126a, 25: “spatium” instead of “spacium.”
7.

On the monochord, the distance between natural tones on musical instruments may be shown, and the proper temperament for them.

The distance between natural and characteristic intervals is deducted from their same proportions, as is evident from the preceding [discussion]. For example, we will examine by means of this change only a single, well-known musical instrument, called the clavichord, having been produced and fashioned especially after the most distinguished monochord.

Moreover, when striking one string and sounding either a whole tone or semitone, two, three, or four pitches often occur on this instrument, for if the appropriate proportions do not take place immediately, at that very instant an error happens, revealing the ignorance of the maker.

Since, however, it is evident from the preceding that a whole tone is either greater or lesser, similarly a semitone is either greater or lesser, it follows [that] the distance for a greater whole tone should be the ninth of a string that it touches, the part, clearly numbering from the extreme point of contact to the fixed bridge (towards the left), as in the numerical proportion 9:8, thus:
Toni verò minoris spatium\textsuperscript{104} esse debere partem chordae decimam, juxta numeros proportionales 10. 9: item Semitonii Majoris spatium\textsuperscript{105} esse decimam sextam, 16. 15. et minoris vigesimam quintam partem, juxta numeris 25. 24. sed de horum omnium temperatura in sequentibus:

In quibus autem clavibus propriè reperiantur Toni Majores et minores; item Semitonia illa diversa, id ex numeris eruendum est.

Ponamus igitur numeros Quartae, (ut intervalli in Quaternario Pythagoréo minimi,) radicales, in serie naturali, 3, 4, cum proximè sequentibus 5, 6 (ad complendam Octavam in 3, 6,) ut inde sonorum intermediorum proportiones cognosci possint, hoc modo:

\begin{center}
\begin{tabular}{cccccc}
3 & 4 & 5 & 6 & 8 & 9  \\
6 & 8 & 9 & 10 & 12 &  \\
12 & 15 & 16 & 18 & 20 & 24  \\
24 & 25 & 27 & 30 & 32 & 36 & 40 & 45 & 48 \\
\end{tabular}
\end{center}

\begin{center}
\begin{tabular}{cccccccc}
Tonus Maior & Tonus minor & Semitonus & Tonus & Tonus & Tonus & Semitonius & Tonus & Tonus \\
8 & 9 & 10 & 8 & 9 & 15 & 16 &  \\
\end{tabular}
\end{center}

\textsuperscript{104} D-Hs ND VI 5126a, 25: “spatium” instead of “spacium.”

\textsuperscript{105} D-Hs ND VI 5126a, 25: “spatium” instead of “spacium.”
Truly, the distance for the lesser whole tone should be a tenth of the string, as in the numerical proportion 10:9. Likewise the distance for the greater semitone should be a sixteenth, 16:15 and the lesser one, one twenty-fifth, as in the numerical proportion, 25:24. Concerning, however, all of the temperaments [see the following.]

Moreover, the greater and lesser whole tones are obtained specifically with these pitches, likewise the various semitones. This should be revealed through the numerical proportions.

Let us place, therefore, the numbers of the fourth (as the very small intervals of the Pythagorian fourth), the radical [numbers], in the natural series, 3 and 4, with the next ones following, 5 and 6 (until the octave is completed on 3 and 6), so that the proportions of the intermediate tones from that can be examined, in this manner:
Conspicitur híc in infimo intervallo 24. 27. (per divisionem ternarium, 8, 9.) Tonus Maior: in proximo minor 27. 30: (9. 10.) in tertio Semitonium Majus 15. 16.

Semitonium autem Majus est in vocibus musicalibus proximis MI et FA. Proinde datis hisce duabus, non difficile erit reliquas sequentes voces applicare. Vocem enim Mi deorsum sequitur RE, et hanc vicissim sequitur Ut. Atque ita Tonus Maior erit hoc loco in vocibus Ut et Re; Ton[us] minor in Re et Mi, et Semitonium Majus, ut dictum est, in Mi et Fa.

Et haec est prima species Quartae: (est enim praeter hanc alia, quae habet in vocibus Ut, Re, tonum minorem, et in Re, Mi, tonum Majorem, ut ex subsequentibus patebit.) ita ulterius in reliquis numeris conspicitur primò Tonus Major, deinde minor, tertió iterum Major, et tandem vicissim Semitonium Majus.

Dato itaq[ue] vicissim Semitonio MI, FA, reliquae voces facilè subnectuntur, hoc modo:

\[
\begin{array}{cccccccc}
24 & 27 & 30 & 32 & 36 & 40 & 45 & 48 \\
Ut & Re & M1 & FA . & Ut & Re & M1 & FA \\
\end{array}
\]

Quarta

24  27  30  32  36  40  45  48

Ut    Re    MI   FA    Ut    Re    MI   FA

\[\begin{array}{cccccccc}
251
\end{array}\]

---

106 D-Hs ND VI 5126a, 25: Hamburg copy omits the ratios.
107 D-Hs ND VI 5126a, 25: Hamburg omits “9.10.”
108 D-Hs ND VI 5126a, 26: “maior” instead of “minor.”
109 D-Hs ND VI 5126a, 26: Hamburg omits “ut dictum est.”
110 D-Hs ND VI 5126a, 26: Hamburg copy omits “vicissim.”
111 D-Hs ND VI 5126a, 26: Hamburg copy omits “voces.”
The greater whole tone is seen by means of the lowest interval, 24:27 (through the ternary division, 8:9), by means of the next one, 27:30 [or] 9:10, the lesser whole tone, by means of the third one, 15:16, the greater semitone.

The greater semitone, moreover, in the solfege system is specifically the adjacent [pitches] Mi and Fa. When these two have been produced in the same manner, it will not be difficult to apply to the following remaining notes. Indeed below the syllable Mi, Re follows, and in turn follows Ut. Also, therefore, the greater whole tone in this instance will be by means of the syllables Ut and Re, the lesser whole tone by means of Re and Mi, and the greater semitone, as it is called, by means of Mi and Fa.

And this is the first type of fourth (indeed, this is before the other, which has in the syllables Ut and Re the lesser whole tone, and in Re and Mi the greater whole tone, as will be obvious through the following.). Thus, the last one is seen through the remaining numbers, chiefly the greater whole tone, then the minor one, the third again a greater whole tone, and finally, in turn, the greater semitone.

Therefore, when the semitones Mi to Fa have been given in turn, the remaining syllables are added easily below, in this manner:

```
24 27 30 32 36 40 45 48
Ut Re Mi FA Ut Re Mi FA
```

[20v]
Si iam omnes Octavarum species examinenterur, nulla reperietur, quae hisce numeris rectius applicari velit aut possit, quàm ea, quae est Ionici, à clave C ad c, Systematis regularis; siquidem illa vocem Ut habet in imo, et in medio Octavae loco harmoniciè dissectae, id est, in imo Quintae et in imo Quartae harmoniciè invicem dispositorum, in quibus Semitonium Majus ita constitutum reperitur, pro ut à numeris monstratum est ut:

\[
\begin{array}{cccccccc}
24 & 27 & 30 & 32 & 36 & 40 & 45 & 48 \\
C & D & E & F & G & A & B & c \\
Ut & Re & Mi & Fa & Sol & La & \\
Quinta & & & & & & & \\
\end{array}
\]

\[
\begin{array}{cccccccc}
24 & 27 & 30 & 32 & 36 & 40 & 45 & 48 \\
C & D & E & F & G & A & B & c \\
Ut & Re & Mi & Fa & Sol & La & \\
Quarta & & & & & & & \\
\end{array}
\]


Similiter in numeris 24. 25. Semitonium minus, quod est inter C et C\#cis; hoc imitantur reliqua omnia, ut F[,] F\#: fis; G[,] G\#: gis; B[,] B; D[,] D\# dis; item E[,] E\#es, et A[,] A\# as.

Et haec vera est et genuina intervallorum distantia.

\textsuperscript{112} D-Hs ND VI 5126a, 26: Hamburg copy adds “tonum.”
If all octave species are considered, none will be obtained that can or will be applied, which by means of these numbers is more proper than the Ionian one, which is the regular system from the pitch C to [the pitch] c. Accordingly, the syllable *Ut* is the highest [pitch], and when the octave has been divided in the middle position harmonically, that is, more correctly when the fifth and the fourth have been arranged in turn harmonically, the greater semitone that is formed is then obtained, as has been shown by the numerical proportions, thus:

<table>
<thead>
<tr>
<th>24</th>
<th>27</th>
<th>30</th>
<th>32</th>
<th>36</th>
<th>40</th>
<th>45</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
<td>G</td>
<td>A</td>
<td>B</td>
<td>c</td>
</tr>
<tr>
<td>Ut</td>
<td>Re</td>
<td>MI</td>
<td>FA</td>
<td>Sol</td>
<td>La</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

It is clear, therefore, from this: between C and D a greater whole tone is to be found, between D and E a lesser [whole tone], between E and F a greater semitone, between F and G, in turn, a greater whole tone, between G and A a lesser [whole tone], between A and B a greater [whole tone], and between B and c a greater semitone.

Similarly, in the numerical proportion 24:25, the lesser semitone, which is between C and C# *cis*, [is found]. All the remaining ones imitate this, such as F [to] F# *fis*; G [to] G# *gis*, B [to] B; D [to] D like wise for E [to] E@ *es*, and A [to] A@ *as*.

And this is the true and natural distance between the intervals.
Sed notandum, quòd in Quinta D et A defectus commatis occurrat, ex Semiditono seu Tertia minore D, F, oriundus.

Semiditonus enim legitimus constat ex Tono Majore et Semitonio Majore,

\[\begin{array}{c}
15 & 16 & 18 \\
\text{Sem.M.} & \text{Ton.M.} & \text{S.M.}
\end{array}\]

vel

\[\begin{array}{c}
18 & 16 & 15 \\
\text{F.} & \text{M.} & \text{S.M.}
\end{array}\]

in hoc autem Semiditono D, F, non major sed Minor Tonus reperitur cum Semitonio Majore, ut:

\[\begin{array}{c}
\text{D} & \text{E} & \text{F} \\
\text{Ton[us]} & \text{S[emitonio]} & \text{M[ajore]}
\end{array}\]

siquidem Toni Majoris et minoris differentia est comma.

Et hinc difficultas illa in accordandis Organis\textsuperscript{114} et instrumentis pennatis.

etc.

Deberet ergò quidem nova clavis infrà D addi, quae cum F Semiditonum justum, similiter cu[m] A Quintam perfectam constituieret; prius enim D propter G, cum quo bonam Quartam exprimit, mutari non vult; sed exinde clavium pluralitas oriretur, nec in hac tantùm, verùm etiam in pluribus aliis; dato enim uno inconveniente sequuntur plura.

\textsuperscript{113} D-Hs ND VI 5126a, 27: Hamburg copy reads “... deficit enim commate...”

\textsuperscript{114} D-Hs ND VI 5126a, 27: “Regalibus” is added.
However, it should be observed, that in the fifth [between] D and A an absence of one comma occurs, originating from the *semitone* or minor third D [to] F. The *semitone* is properly formed from the greater whole tone and greater semitone, thus:

![Diagram of semitone formation](image)

By means of this *semitone*, D [to] F, however, not the greater, but the lesser whole tone is obtained with the greater semitone, thus:

![Diagram of lesser whole tone and greater semitone](image)

Therefore, it lacks a whole comma, for the difference [between] the greater and lesser whole tones is a comma.

And for this reason, [there is] a difficulty in tuning organs and string instruments, etc.

Therefore, it was certainly necessary for a new pitch to be added below D with F [to make] a proper *semitone*; similarly with A it forms a perfect fifth. To be sure, the aforementioned D does not want to be modified on account of the G, with which it demonstrates a good fourth. The pitch, however, therefore arose from many [pitches], and not by this means only, [but] truly by means of many others; for when one has indeed been produced, many unsuitable ones follow.
Quapropter ne talis clavium pluralitas confusionem pareret, inventa est commoda et necessaria\textsuperscript{115} sonorum \textit{Temperatura}, de qua notandum:

Intervallum Octavae ubiq\[ue\] perfectum et justum esse oportere, ut et intervallum Ditoni seu Tertiae M\[ajore\]: (Tertiae enim Majores inaccordando seu Temperatura sunt Quintarum deficientium censores.) Similiter intervallum Sextae minoris; (Sexta enim minor idem est quod Tertia Major per inversionem ceu liquet ex Scala circulari Monochordo inscripta)

\[\begin{array}{c}
\text{c} & \text{e} \\
\text{c: vel sic} & \text{c e,}
\end{array}\]

Reliqua 3 M\[ajor\] 6 m\[inor\] c autem\textsuperscript{116} intervalla (utpote Quinta, Quarta, Semiditonus, Sexta Maior, Tonus uterq\[ue\] cum Semitoniis utrisq\[ue\],) non item; sed ea partim minuuntur, partim augentur.

Sed videamus et examinemus Quintas.

Quaelibet Quinta perfecta constat ex duob\[us\] Tonis Majoribus, uno minore, et Semitoni Maiore, ceu paulò ante vidimus.

Iam si considerentur Quintae in ambitu Octavae C, c, contentae, videbitur defectus in Quintâ D, A, ut:

\footnotesize
\textsuperscript{115} D-Hs ND VI 5126a, 27: Hamburg copy reverses the order, “necessaria et commoda.”

\textsuperscript{116} D-Hs ND VI 5126a, 27: Hamburg copy omits “autem.”
On account of the confusion arising from such a multitude of pitches, the appropriate and necessary temperament of sounds was invented. On this subject, the following must be observed:

The interval of the octave is required to be perfect and proper in any case, as [is] the interval of the ditone or major third. (Indeed major thirds through tuning or temperament are the arbiters for the deficiency of fifths.) [This is] the same for the interval of the minor sixth (Indeed the minor sixth is the same as the major third through inversion, as is clear from the circular scale written on the monochord).

\[ \text{\texttt{c}} \quad \text{\texttt{e}} \quad \text{\texttt{c'}} \quad \text{or thus} \quad \text{\texttt{c'}} \quad \text{\texttt{e}} \]

The remaining intervals, however, (such as the fifth, the fourth, the semiditone, the major sixth, and both types of whole tones and semitones,) [are] not the same, but they are partly reduced, partly increased [in size].

Let us, however, consider and examine fifths. Whatever fifth you please is comprised of two greater whole tones, one lesser [whole tone] and a greater semitone, as we have seen a little earlier.

Now if the disputed fifths in the octave range from C to c are considered, the deficiency in the fifth from D to A will be seen, thus:
Perfect C D E F G _ duo Toni majores, unus minor, cum Semitonio Majore.

Imperfect D E F G A _ unus Major, duo minores, cum Semitonio Majore.

Perfect E F G A B _ duo Toni Majores, unus minor, cum Semitonio Majore.

Perfect F G A B c _ duo Toni Majores, unus minor, cum Semitonio Majore.

[22r] Quatuor híc sunt Quintae, è quibus tres perfectae, una propter commatis defectum imperfecta: Quaelibet igitur perfecta commatis quadrante minuenda,

üsq[ue] tribus quadrantibus imperfectae illi succurrendum, ut reliquis queat adaequari; atq[ue] ita omnes aequaliter commatis tantum modò quadrante deficient, ut:

Octava perfecta

C D E F G A B c
There are four of these fifths, three of which [are] perfect, [and] one imperfect on account of the missing comma. Therefore, whatever perfect one you please will be reduced by a quarter of a comma, and the imperfect one will be supplied from them with three-fourths [of a comma], so that the remaining one is able to be made equal. Also, therefore, they will all lack a fourth of a comma equally, thus:
Manifestum hinc est Quintas C, G; E, B; et F, c; quadrante commatis esse diminutas; contra verò Quintam D, A; totidem quadrantibus esse adauctam, uno scilicet supra A, ut Ditonus inter F et A iterum perficeretur; et duobus infra D, ut Semiditono D[,] F subveniretur, et Quarta D[,] G reliquis adaequaretur. Omnes enim Quartae quadrante commatis augmentur, idq[ue] ex diminutione suarum Quintarum; siquidem, quod in terminis Octavae, velut Totius, uni parti (ut Quintae) decedit, id alteri (Quartae nimirum) contrà accedit, ut possit servari Totum.


Semitonia etiam minora, ut Majora, quadrante augmentur, idq[ue] ex diminutione Semiditoni. Semiditonus enim et Semitonium minus constituunt Ditonum; quicquid ergò Semiditono detrabitur (videlicet quadrans commatis) id contrà additur Semitonio minori, ad conservandam integritatem Ditoni.

Sed haec Semitonia in temperatura instrumentorum, per auditum,\textsuperscript{119} beneficio Ditoni, ex suis clavibus eruuntur et dijudicantur, videlicet F fis ex D:

\textsuperscript{117} D-Hs ND VI 5126a, 28: Hamburg copy has “... conta augetur minor...”
\textsuperscript{118} D-Hs ND VI 5126a, 28: Hamburg copy reads “... quadrante...”
\textsuperscript{119} D-Hs ND VI 5126a, 28: Hamburg copy omits “... in temperatura instrumentorum, per auditum, ...”
From this it is clear the fifths C - G, E - B, and F - c are reduced by a fourth of a comma. Conversely, the fifth from D to A is to be increased indeed by just as many fourths, one, of course, above the A, so that the ditone between F and A is perfected in turn; and two below D, so that the semiditone from D to F is supplied, and the remaining fourth D - G is made equal. All of the fourths are thus enlarged by a fourth of a comma, and that from the reduction of their fifths. Since, as far as within the limits of the octave, as the whole, one part (namely that of the fifth) falls short, the other one (certainly the fourth) conversely is added to so that the whole can be maintained.

Similarly, the greater semitones E - F and B - c, likewise the major sixths C - A and D - B are increased by a fourth. Conversely, to be sure, the minor thirds D - F, E - G, and A - c lack the same [amount]. Whole tones, in turn, are made equal. The greater whole tone C - D is thus reduced by two-fourths, by which, conversely, the lesser whole tone D - E is increased. In the same manner, the greater whole tone F - G decreases by two [fourths], the lesser whole tone G - A certainly increases by just as many, and similarly the [whole tone] A - B decreases.

Also lesser semitones, like greater ones, are increased by a fourth, and that from the reduction of semiditones. The semiditone and the lesser semitone thus form the ditone. Whatever, therefore, is removed from the semiditone (clearly a quarter of a comma) the same conversely is added to the lesser semitone so that the purity of the ditone will be maintained.

These semitones, however, are revealed and determined through their pitches in the temperaments of instruments, by listening, through the service of
Das ist gewiß, wenn die Consonantiae sollen recht klingen, so müssen Sie rein in ihren proportionibus stehen, und weder überheißet noch geringert werden; und dasselbe befindet sich also in voce humana, auch in Posaunen, und in andern, welchen man mit Menschlichen Arthen etwas zu geben oder nehmen kan. Dann vox humana lenckert sich natürlich zu der rechten proportion der intervallorum, und legets ihnen zu, wo etwas mangeln, oder nimmet weg, wo was überley sein solte.

Auff den Instrumenten aber und Orgeln hat es eine andere Meynung, da seind der Clavier zu wenig, darumb muß man alda etlich Consonantiis etwas nehmen, auff daß solches alles nicht auff einem Clave allein mangele.

Die Claves seind also:

<table>
<thead>
<tr>
<th>Klaviaturgruppe</th>
<th>Tono Majore/Minore</th>
</tr>
</thead>
<tbody>
<tr>
<td>C und D.</td>
<td>9/8</td>
</tr>
<tr>
<td>D und E.</td>
<td>10/9</td>
</tr>
<tr>
<td>E und F.</td>
<td>16/15</td>
</tr>
<tr>
<td>F und G.</td>
<td>9/8</td>
</tr>
<tr>
<td>G und A.</td>
<td>10/9</td>
</tr>
<tr>
<td>A und c</td>
<td>16/15</td>
</tr>
</tbody>
</table>

Die Claves seind also:

D und E. Tono minore 10/9.
E und F. Semitonio Majore 16/15.
G und A. Tono minore 10/9.
A und c Semitonio Majore 16/15.

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120 D-Hs ND VI 5126a, 28: Hamburg copy omits “pagellae.”
121 D-Hs ND VI 5126a, 28: Hamburg copy does not cite full quotation. Instead it reads “us[que] ad fine[m] qui[us] Capitis.”
ditones. One may see F♯(fis) from D, G♯(gis) from E, c♯(cis) from A; and D♯(dis) from B. Conversely, [one may] indeed [see] B♭(bom d and E♭(bes) from G, [but] these do not otherwise include C and E, F and A, G and B, etc.

Concerning this matter Calvisius therefore writes to Michael Praetorius (in Syntagma musicum, Michael Praetorius, p.m. Book 2 On Organology, folio 156, at the bottom end of a little page) [as follows]:

To be sure, in order for the consonances to sound right, they must be pure in their proportions, and be neither enlarged nor reduced. The same thing is also true, therefore, for the human voice, as well as for trombones and other [instruments] to which one can add or remove something by human means. The human voice naturally tends toward the correct proportion of intervals, and adds to them where something is lacking, and takes away [from them] where there may be some excess.

On [keyboard] instruments, but also [on] organs, there is another opinion. Since there are too few pitches, one must therefore take something from several consonances so that something is lacking from all of them and not from just one single pitch.

The notes are therefore:

<table>
<thead>
<tr>
<th>Note Pair</th>
<th>Description</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>C and D</td>
<td>A greater wholetone apart, 9:8</td>
<td></td>
</tr>
<tr>
<td>D and E</td>
<td>A lesser wholetone apart, 10:9</td>
<td></td>
</tr>
<tr>
<td>E and F</td>
<td>A greater semitone apart, 16:15</td>
<td></td>
</tr>
<tr>
<td>F and G</td>
<td>A greater wholetone apart, 9:8</td>
<td></td>
</tr>
<tr>
<td>G and A</td>
<td>A lesser wholetone apart, 10:9</td>
<td></td>
</tr>
<tr>
<td>A and B</td>
<td>A greater wholetone apart, 9:8</td>
<td></td>
</tr>
<tr>
<td>B and c</td>
<td>A greater semitone apart, 16:15</td>
<td></td>
</tr>
</tbody>
</table>

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122 Michael Praetorius, Syntagma musicum II.
123 When Praetorius uses the term “instrument,” he usually means the clavicembalo or harpsichord.
Wenn nun die Instrumenta nach diesen proportionibus solten gestimmet werden, so würde allbald aus dem D ins F, Semiditonim imperfectus; denn es ist Tonus minor cum Semitonio, und fehlet ein gantz comma; item, aus dem D ins A würde in der Quinta auch ein comma mangelen, welches dann gar zu viel, und die Ohren können solchen mangel nicht erdulden. Darumb solte man billich mehr Clavier haben, also, daß man zwey D hatte, die nur ein comma von einander weren; aber weil solches auch in andern Clavibus geschieht würden der Clavier, sonderlich, wenn die gedoppelte Semitonia auch noch darzu kemen, gar zu viel werden; darumb müß man die Temperatur brauchen, die ist also:

Dem Tono Majori wird ein halb comma genommen; dem Tono minori hergegen wird ein halb comma gegeben. Hinc manifestum, quòd Tertiae Majori, quae constat Tono Majore et minore, nihil decedat; und bleibt rein; und altera pars, videlicet, Sexta minor, (daß die Octava erfüllet werde) bleibt auch rein.

Dem Semitonio Majori aber wird ein Viertheil eines Commatis gegeben; daher kompts, daß nunmehr eine Quarta, welche einen Tonum Majorem und minorem, und ein Semitonium Majus hat, zu grob ist, weil den Semitonio quarta pars commatis zugeleget ist.

Also die Quinta hat zween Tonos Majores, einen minorem und ein Semitonium; weil alhier jedern Tono Majori ein halb comma, und also beyden ein gantz comma genommen wird, und hergegen nur drey Viertheil Commatis gegeben werden, folget daß die Quinta in Instrumenten nicht vollkommen sein kan.

Weil aber eine Quarta und eine Quinta, eine Octavam machen, welche nicht kan geandert werden, so folget nothwendig, wenn ein Theil grösser wird, daß das ander kleiner werde, und darff ferner keiner demonstration nicht. Divide Großum in duas partes, sunt utrobiq[ue] sex nummi: Si iam alterutri parti dabis septe[m] nummos, necesse est, altera pars habeat tantum quinq[ue] nummos, si Großus integritatem custodire debet, et non minui aut augeri.

Wenn aber die Orgelmacher sagen, die Quarta D [-] G schwebet; die Tertia minor G [-] B schwebet auch: Ergò so ist die Sexta minor D [-] B rein, etc: das ist wol etwas nach ihrer art, aber nicht recht secundum artem et demonstrationem geredet, sondern wenn Ich demonstriren wil, daß die Sexta minor rein sey, muß Ich also sagen:

Tertia Major et Sexta minor constituunt Octavam; sed Tertia Major in temperatura retinet veram suam proportionem; Ergò necesse est, ut et Sexta minor suam retineat, et legitima sit. Sic Quinta et Quarta constituunt dupla[m] sive Octavam; et Quinta in temperatura per quartam partem commatis minuitur: Ergò necesse est, ut Quarta, quae conjungitur,
If the [keyboard] instruments were then tuned according to these proportions, the [interval from] D to F would become an imperfect semiditone (i.e., a step and a half), for it is a lesser whole tone with a semitone, and an entire comma is lacking. Likewise, from D to A, the fifth would lack a comma, which [would be] too much then, and the ear could not tolerate such a deficiency. Therefore, one should, reasonably, have more keys, so that a performer has two D’s, only they would be one comma apart.

Since this, however, also occurs on other notes, the keys would become too numerous, especially if the doubled semitone were added as well. That is why one has to use temperament, which is as follows:

One half of a comma is taken from the greater whole tone, while to the lesser whole tone, conversely, a half of a comma is given. This is evident because the major thirds, which consist of greater and lesser whole tones, give up nothing, and remain pure. And the other part, namely the minor sixth ([so that] the octave is rounded out), also remains pure. To the greater semitone, however, a fourth of a comma is added. As a result, the fourth, which contains a greater whole tone, a lesser [whole tone], and a greater semitone, is now too large--because a quarter part of a comma has been added to the semitone.

Thus, the fifth contains two greater whole tones, a lesser [whole tone], and a semitone. In this instance, since a half of a comma is taken from each greater whole tone, and thus from both [together] a whole comma, and, conversely, only three-quarters of a comma are added, it follows that the fifth on [keyboard] instruments cannot be perfect.

Since, however, a fourth and a fifth comprise an octave, which cannot be changed, it necessarily follows that when a part becomes larger, the other becomes smaller, and this requires no further demonstration. Divide a whole in two parts [so that] there are six units in each of the two parts. Now, if one of the two parts is given a seventh, it is necessary that the other part have only five units, in order for the whole to preserve its purity, and not be reduced or enlarged.

If, however, the organ builders say: “the fourth from D to G fluctuates, the minor third from G to B also fluctuates, and thus, the minor sixth from D to B is pure, etc.”, then that is indeed something addressed according to their method, but not discussed properly with respect to knowledge and demonstration. Rather, if I wish to demonstrate that the minor sixth is pure, then I must say:

“The major third and the minor sixth form the octave. However, the tempered major third maintains its true proportion. It is therefore necessary that the minor sixth also maintain its [proportion] and be proper. Thus, the fifth and the fourth form a double [interval], which is to say, an octave; and the tempered fifth is reduced [in size] by a quarter portion of a comma. It is therefore necessary that the fourth, which is connected [to it], is enlarged by a quarter portion of a comma. And, conversely, in this
quarta parte commatis augeatur: Et contrà, sic de aliis. Necesse enim est, ut de partibus judicetur ex integro.

Huc usq[ue] cum Calvisio Praetorius. Et haec vera est et legitima sonorum Temperatura, (Organicibus et cumprimis Organopoeis scitu necessaria, imò aliis ingeniis μονοσχοιάτους non indigna nec injucunda,) quae ut est ingeniosior, ita quoq[ue] difficilior, et non nisi acutissimis doctissimisq[ue] auribus dijudicanda.

Sed haec quoq[ue] de Usu Monochordi, breviter et planè, quo ad fieri potuit, prolata sufficiant.

'Ιῶ Θεώ δόξα!

[25r]

Fuga 30. voc[es]: sed trium solummodò Notularum in Hexagóno delineata:

![Diagram](image)

Alia 4. voc[es] unisona Mathematicè adsignata.
way for the other [intervals]. It is necessary indeed that the whole be determined by its parts.”

To this extent, Praetorius [agrees] with Calvisius. And this is the true and proper temperament of tones, (concerning the instruments and chiefly the organ it is necessary to know, indeed neither unworthy nor unpleasant for other music-loving spirits) which is more ingenious, in such a way that is also more difficult, and, unless by the wisest and most learned, should not be distinguished by the ear.

But these uses of the monochord, presented briefly and thoroughly, as far as can be done, are sufficient.

To the glory of God.

[25r] A fugue for thirty voices, but only a triad of the notes drawn as a hexagon:

![Diagram](image-url)

Another four-part canon distributed mathematically:
Brunopoli

28. Aug[ust] ipso
die August:
absolut.
The Victorious Voice of the Lord

Brunswick

August 28th

Completed on this very day of August, [1634].


Calvisius, Seth. Exercitationes musicae duae. Leipzig: Jacob Apel, 1600.


___________. “The Place of Music in German Education from the Beginnings through the 16th Century.” *Journal of Research in Music Education* 19/2 (1971), 144-67.


_____________. *Syntagma musicum II*. Wolfenbüttel: Elias Holwein, 1618, 1619, 1620.

_____________. *Syntagma musicum III*. Wolfenbüttel: Elias Holwein, 1618, 1619.


__________. "Harmonic Theory in Musical Treatises of the Late Fifteenth and Early Sixteenth Centuries." *Music Theory Spectrum* 1 (1979), 93-95.


BIOGRAPHICAL SKETCH

Joanna Carter was born in Vero Beach, Florida in 1962. She graduated from Vero Beach Senior High School with honors in June 1980. She received a B.A. in vocal performance from the University of North Carolina at Chapel Hill in May 1984. Between 1984 and 1988 she attended New York University, where she completed a Master of Arts degree in historical musicology in February 1988 and began doctoral coursework. From 1988 to 1995 she worked and conducted research in Hamburg, Germany. After one year of teaching as an adjunct instructor in Orlando, Florida, she resumed her doctoral studies at The Florida State University in 1996. She earned the Certificate in Early Music and the Ph.D. degree at The Florida State University in December 2002.