Bach Performance Practice in the Late French Romantic Organ School: A Study of Welte Organ Roll Recordings

Christopher Holman

New College

University of Oxford

Thesis submitted for the degree of Doctor of Philosophy in Music

Dedicated to Evelyn Marguerite Sadler Renner (1923–2007)

Acknowledgements

The musical formation of any student takes the support of countless, selfless teachers, colleagues, and friends; as a doctoral dissertation marks the pinnacle of one's time as a student, I wish to thank not only those who have made my time in Oxford so profoundly inspiring, but those who have guided me throughout my musical life.

I must first thank Robert Quinney — his supervision and attention to balancing scholarship and practical experience as a performer have been essential to helping me realise my vision for this study in performance practice. I owe my deepest thanks to Cynthia Holman, without whose keen eye, experience as a research librarian, and encouragement throughout my time at Oxford (especially the COVID-19 pandemic) this dissertation would not have been possible. I am also tremendously grateful to the Choir of Exeter College, Oxford, which I had the great honour of directing; their friendship, support, and spirit made my time in Oxford and the United Kingdom so richly fulfilling.

This project would not have been possible without a tremendous amount of in-kind support of the Museum für Musikautomaten in Seewen, Switzerland, Collection of Dr. Heinrich Weiss-Stauffacher. I am indebted to the Director of the Museum, Christoph Hänggi, and the head of its digitisation projects, Daniel Debrunner, for their wholehearted support of my research, and for providing tremendously detailed archival materials about the organ rolls, the Welte Company, and the Britannic Organ. I also must acknowledge the tremendous grit and perseverance of David Rumsey, who was instrumental in the entire process of the Museum's Welte Philharmonie project; although he died shortly before I began my research, his countless hours of dedication to these rolls made it possible for me (and hopefully many more researchers in the future) to learn from this almost completely unexplored treasure of musical information.

I finally wish to thank my primary teachers in performance and musicology since I began serious study of music. While none of those named below have had a direct hand in this dissertation, the philosophies they espoused during my time learning with each have profoundly influenced my musical thought and have led to this pinnacle of my work as a student. I offer my humble thanks to all those who have played a role in my musical formation, especially Dana Robinson, Cynthia Haymon-Coleman, Charlotte Mattax Moersch, Robert Bates, Matthew Dirst, Betsy Cook Weber, Federico Sepúlveda, and Markus Schwenkreis.

I finally wish to thank my parents for their unwavering support — throughout my doctoral study and entire life.

Table of Contents

Abstract **6**

Part I: Aesthetics and Performance Practice from Written Sources **9**

Chapter 1: The Origins of the French Romantic Organ School **11**

Chapter 2: Influence of the Instruments **37**

Chapter 3: Theoretical Guidelines for Interpreting Bach **50**

Part II: Organ Rolls **84**

Chapter 4: M. Welte und Söhne **87**

Chapter 5: Welte's French Recording Artists: Gigout, Bonnet, and Erb **105**

Chapter 6: Techniques of Organ Roll Analysis **125**

Part III: Francophone Bach Performance Practice in Welte Organ Rolls **145**

Chapter 7: Roll 1586 — Gigout Plays *O Mensch, bewein*, BWV 622 **153**

Chapter 8: Roll 1585 — Gigout Plays *In dir ist Freude*, BWV 615 **169**

Chapter 9: Roll 1079 — Gigout Plays *Toccata in F Major*, BWV 540 **178**

Chapter 10: Roll 1080 — Gigout Plays *Prelude in E-flat Major*, BWV 552 **198**

Chapter 11: Roll 1587 — Gigout Plays *Trio Sonata 5: II. Largo*, BWV 529 **214**

Chapter 12: Roll 1588 — Gigout Plays *Trio Sonata 1: I. Allegro moderato*, BWV 525 **230**

Chapter 13: Roll 1199 — Bonnet Plays *In dulci jubilo*, BWV 751 **239**

Chapter 14: Roll 1200 — Bonnet Plays *Prelude and Fugue in E Minor*, BWV 533 **248**

Chapter 15: Roll 761 — Erb Plays *Concerto in A Minor: II. Adagio*, BWV 593 **262**

Chapter 16: Roll 768 — Erb Plays *Concerto in G Major*, BWV 592 **273**

Written versus Reality: Overarching Findings **287**

Summary and Conclusion **314**

Appendix A: Dataset of Durations of Beats in Gigout's Organ Roll Recording of *O Mensch, bewein*, BWV 622 **321**

Appendix B: Lemmens's *École de la Pédale* **326**

Bibliography **330**

Abstract

During the nineteenth century, Johann Sebastian Bach's keyboard music first received widespread dissemination in France through the pedagogy of Jacques-Nicolas Lemmens, who taught the leading French organists of the century, including Charles-Marie Widor and Alexandre Guilmant. Organists in this pedagogical line comprised the French Romantic Organ School, which developed distinct aesthetics and performance techniques in their own compositions based on their ideas of Bach performance practice. These are transmitted in editions, pedagogical guides, personal correspondence, and concert reviews. However, written sources can only give generalities of performance practice. The extremely fine details of timing, articulation, registration, and more can be seen in the medium of organ rolls by the Welte Company of Freiburg im Breisgau, which can not only reproduce performances today that sound identical to what the recording artist heard, but be analysed in extreme detail.

The heart of this study is ten Bach organ rolls from the collection of the Museum für Musikautomaten in Seewen, Switzerland, recorded by leading members of the French Romantic Organ School by the early twentieth century: Marie-Joseph Erb, Joseph Bonnet, and Eugène Gigout. Comparing new analysis of these rolls with Bach performance practice writings of the French Romantic Organ School will trace the development of Bach interpretation in nineteenth-century France from both theoretical and practical perspectives, establish a foundation for modern organists for performing these works on instruments in the Romantic style, and bridge a critical gap in Bach aesthetics studies. Most importantly, it sheds light on previously unknown details of performance practice, which can be applied in performances of the music of the French Romantic Organ School.

Footnote Abbreviations

For the sake of brevity and clarity in referencing various editions of the organ works of Johann Sebastian Bach, the following are used in the footnotes:

***BGS* [volume number], [page number].** Refers to:

Johann Sebastian Bach, *Bach-Gesellschaft Ausgabe*, ed. Bach Gesellschaft (Leipzig: Breitkopf und Härtel, from 1851–1899, 1926).

Fauré Edition [volume number], [page number]. Refers to:

Bach, Jean-Sébastien, *Œuvres complètes pour orgue*, in three volumes, edited by Gabriel Fauré (Volume 3 co-edited with Joseph Bonnet), (Paris: A. Durand & Fils, 1916–20).

***NBA* [series number]/[volume number], [page number].** Refers to:

Johann Sebastian Bach, *Neue Augstabe sämtlicher Werke*, ed. Johann-Sebastian-Bach-Institut Göttigen and Bach-Archiv Leipzig (Kassel: Bärenreiter, from 1954).

Peters Edition [volume number], [page number]. Refers to:

Johann Sebastian Bach, *Johann Sebastian Bachs Kompositionen für Orgel*, ed. Friedrich Cornad Griepenkerl (and, depending on the volume, Ferdinand Roitzsch), (Leipzig: C.F. Peters); the volumes were published in the following years: 1 (1844), 2 (1844), 3 (1845), 4 (1845), 5 (1846), 6 (1847), 7 (1847), 8 (1852).

Vierne Edition [volume number], [page number]. Refers to:

Johann Sebastian Bach, *Œuvres pour orgue*, ed. Louis Vierne (Paris: Éditions Maurice Senart, 1924).

Widor-Schweitzer Edition [volume number], English, [page number]. Refers to:

Johann Sebastian Bach, *Complete Organ Works: A Critico-Practical Edition*, ed. Charles-Marie Widor and Albert Schweitzer (New York: G. Schirmer, from 1912).

Widor-Schweitzer Edition [volume number], French, [page number]. Refers to:

Johann Sebastian Bach, *Œuvres complètes pour Orgue*, ed. Charles-Marie Widor and Albert Schweitzer (New York: G. Schirmer, 1914).

Part I: Aesthetics and Performance Practice from Written Sources

Introduction

The French Revolution (1789–1799) marked a turning point in the development of organ playing, composition, and building in French-speaking Europe.[1] In the early eighteenth century organ repertoire reflected many of the characteristic features of the wider French Baroque style of composition: extensive ornamentation, *notes inégales*, a single mood throughout the entire movement, and a wide variety of forms.[2] Other aspects, though, were decidedly unique to the French Baroque organ: the serialisation of registrations (which could also indicate the mood of a piece), the continued use of modality long after the major/minor system became widespread, and the occasional use of a plainchant cantus firmus.[3] This French Baroque style of organ playing and building was a unique, widespread, and truly national style, and among the records that note the foreign music played in churches, the works of Johann Sebastian Bach never appear.

At the height of the Revolution, though, churches were seen as institutions which upheld the monarchy; religious services were discontinued, and often artwork with sacred themes was severely damaged or destroyed, including organs.[4] In one of the most turbulent decades in French history, almost no one experienced organ music.[5] Due to the Concordat of 1801 between Pope Pius VII and Napoléon, the Roman Catholic Church's status as the state church was restored, and the long process of rebuilding began.[6] Out of the sorry state of the instruments which had survived the revolutionaries'

[1] Orpha Ochse, *Organists and Organ Playing in Nineteenth-Century France and Belgium* (Bloomington: Indiana University Press, 2000), 10–19.
[2] Fenner Douglass, *The Language of the Classical French Organ: A Musical Tradition before 1800*, new and expanded ed. (New Haven: Yale University Press, 1995).
[3] Douglass, *The Language of the Classical French Organ*.
[4] Ochse, *Organists and Organ Playing*, 10–25.
[5] Ochse, *Organists and Organ Playing*, 10–25.
[6] Ochse, *Organists and Organ Playing*, 10.

purges, an entirely new French Romantic Organ School emerged in the latter half of the nineteenth century, the pedagogy of which was based on the music of Johann Sebastian Bach.

But how did the Francophone world move from their centuries-old, peculiar regional style of organ improvisation and composition into a deep, widespread obsession with the music of a dead eighteenth century composer from Saxony? The answers lie in studying the Franco-Belgian historical and political climate in the years following the Revolution, significant technological developments in French organbuilding, and the use of older music as a pedagogical tool for building organ technique.

Together, these demonstrate that the works of Johann Sebastian Bach comprised the foundation of the French Romantic Organ School, how their performance practice was rooted in nineteenth century Belgium rather than eighteenth century Saxony, and that the pedagogical tradition developed in Brussels carried on well into the early twentieth century throughout the Francophone world.

Chapter 1: The Origins of the French Romantic Organ School

Introduction

The French Revolution brought changes to every aspect of a professional organist's life. Positions were essentially tenured, and when churches reopened many returned to their old posts, the most important in Paris being Nicolas Séjan at Saint-Sulpice, Guillaume Lasceux at Saint-Etienne-du-Mont, and Gervais-François Couperin at Saint-Gervais.[7] Others, such as Isac-François-Antoine Lefébure-Wély and Jacques-Nicolas Lemmens rose to prominence nearly 40 years later as both church musicians and concert artists.[8]

The most influential of these by far was Lemmens, who had studied with Adolph Hesse, a grand-pupil of Johann Sebastian Bach. As the teacher at the Brussels Conservatoire and a regular guest organist in Paris, he was the first to introduce the organ works of Bach to the Francophone world on a large scale,.[9] Yet the central tenets of Lemmens's Bach performance practice — a strict legato achieved through finger substitution and the more extensive use of heels and toes in pedalling than ever before[10] — had nothing to do with eighteenth-century practices in Saxony and Thuringia, despite his pupil Widor's claim that "the art of organ playing has not changed at all since J.S. Bach."[11] Rather, as Kirk Rich's 2018 dissertation concerning articulation in the organ works of Felix Mendelssohn, these practices were largely derived from the early German Romantic style of organ playing, and were adopted and adapted by

[7] Ochse, *Organists and Organ Playing*, 10–11.
[8] Ochse, *Organists and Organ Playing*, 10–25.
[9] Ochse, *Organists and Organ Playing*, 197.
[10] David Yearsley, *Bach's Feet: The Organ Pedals in European Culture* (Cambridge, UK: Cambridge University Press, 2012), 16–17, contends that heels were used before the eighteenth century, but not nearly to the same extent as the Romantic period.
[11] Albert Schweitzer, *J.S. Bach* 1 (Leipzig: Breitkopf und Härtel, 1928), ix. Preface by Charles-Marie Widor.

Francophone keyboardists.[12] As such, Lemmens's style of extremely legato organ playing was new and unique to France and Belgium. Yet the questions of how Lemmens came up with these ideas, and how the Francophone world was almost completely unaware of Bach's organ works until around the 1860s have largely remained unanswered in the secondary literature.

The most comprehensive monograph on the French Romantic Organ School is by Orpha Ochse, which is divided into two sections: a chronological history of the School, and discussion of church musicians, including the most complete biographical information anywhere on Widor's students.[13] While the information is extensive, Ochse's overall measure of the success of organ music is in the number of concerts; yet Widor very rarely played outside of church services, and recollections by Widor's contemporaries never mention concerts — only organ playing in services or masterclasses in private homes. Ochse also does not address the question of how Bach's music arrived in France.

Reviews in French musical publications give some further details of the organ scene, many of which are most notably codified in two monographs by Katharine Ellis.[14] *Music Criticism in Nineteenth-Century France* specifically examines the issues of criticism and influence of the most important musical journal in the French capital. However, she does not discuss issues of organ performance practice, rather focusing on various aesthetic and philosophical movements which shaped reception history.[15] Her

[12] Kirk Rich, "To Lift or Not to Lift: Slurs and Articulation in Mendelssohn's Organ Works" (DMA diss., University of Houston, 2018).
[13] Ochse, *Organists and Organ Playing*.
[14] Katharine Ellis, *Music Criticism in Nineteenth-Century France: 'La Revue et Gazette musicale de Paris', 1834–1880* (Cambridge, UK: Cambridge University Press, 1995). Katharine Ellis, *Interpreting the Musical Past: Early Music in Nineteenth-Century France* (Oxford: Oxford University Press, 2005).
[15] Ellis, *Music Criticism*.

later book *Interpreting the Musical Past* examines the French interest in early music in greater detail.[16] The chapter focusing on 1878–1900 discusses the revival of early organ music with Bach as the centre (especially Guilmant's concerts at Trocadéro), but she does not discuss the renewed interest in Bach's organ works in the previous two decades, nor the transmission history of early Bach organ editions.[17]

Yet because of the distinct characteristics of the French Romantic Organ School's Bach performance practices — especially the novel introduction of absolute legato — studying how Johann Sebastian's music came into prominence in France and Belgium sheds light on the development of this unique Bach tradition.

Bach's Music Arrives in France

In the years following Johann Sebastian Bach's death, most of his music fell into obscurity, with one exception: keyboard fugues. Despite the diminishing of typical baroque compositional techniques in favour of the Galant and Classical styles, keyboardists of the late eighteenth century remained interested in studying counterpoint. Copies of Bach's fugues began to circulate far beyond Saxony: Mozart was well-aware of at least six fugues from the *Well-Tempered Clavier* (*WTC*) — BWV 846–893, thanks to the influence of Gottfried van Swieten, a grand-pupil of Bach via Johann Philipp Kirnberger. Mozart arranged them for string quartet in Vienna in 1782, and by 1790 *WTC* had at least entered the consciousness of some pianists in England.[18]

[16] Ellis, *Interpreting the Musical Past*.
[17] Ellis, *Interpreting the Musical Past*, 81–118.
[18] Matthew Dirst, *Engaging Bach: The Keyboard Legacy from Marpurg from Mendelssohn* (Cambridge, UK: Cambridge University Press, 2021), 59–60, 89–90. The fugues are catalogued as K.405, which are after BWVs 871, 876, 878, 877, and 874 (all from *WTC* 2), likely arranged from a 1770s Berlin manuscript; see Yo Tomita, J.S. Bach's *Das Wohltemperierte Clavier II: A Critical Commentary* 2 (Leeds: Household World, 1995), x–xi.

At the beginning of the nineteenth century in France, Johann Nikolaus Forkel's 1802 Bach biography was the catalyst for a series of renewed interest in Johann Sebastian's life and works; later in the century between the 1870s and early 1900s, this interest resulted in several widely circulated French-language books by André Pirro and Albert Schweitzer, which paint Bach as a legendary composer whom the world should know better.[19]

Around the same time, three printed editions of Bach's keyboard works appeared in Paris: Sieber published the entire *WTC* in 1800; a year later Jean-Jérôme Imbault published only the *WTC* fugues; and in 1802 Chez Vogt published *The Art of Fugue* in open score with four clefs.[20] These publications have no information about performance practice, as the scores are all clear of any editorial markings and lack a preface. Bach's keyboard music had arrived in France — without any interference from German or French editors — and while these pieces slowly gained interest over the next decades, there are no records or editions of Bach's organ works being performed or published in Belgium or France prior to the 1830s.[21]

The earliest significant attempt to bring Bach's organ works into the mainstream came, according to musicologist Albert Palm, around 1820, when the Belgian musicologist and composer François-Joseph Fétis distributed copies of a text

---

[19] Johann Nikolaus Forkel, *Über Johann Sebastian Bachs Leben, Kunst und Kunstwerke* (Leipzig: Hoffmeister und Kühnel, 1802). First French translation: *Vie, talents et travaux de Jean-Sébastien Bach*, trans. Félix Grenier (Paris: J. Baur, 1876). André Pirro, *Jean-Sébastien Bach* (Paris: F. Alcan, 1906); *L'esthétique de Jean-Sébastien Bach* (Paris: Librairie Fischbacher, 1907); *L'orgue de Jean-Sébastien Bach* (Paris: Librairie Fischbacher, 1895). Albert Schweitzer, *J. S. Bach: Le musicien-poète* (Leipzig: Breitkopf und Härtel, 1905).

[20] Johann Sebastian Bach, *Le Clavecin bien tempéré* (Paris: Sieber, 1800); *48 Fugues Pour le Piano Composées Par le Célèbre Jean Sebastien Bach* (Paris: Jean-Jérôme Imbault, 1801); *L'art de la fugue à quatre parties* (Paris: Vogt, 1802). All three editors are unknown. François-Joseph Fétis writes in the article on J.S. Bach in his *Biographie universelle* 1 (Brussels, 1837), 16, that Pleyel published an edition of *Art of Fugue* in 1801, but a surviving copy was unable to be located.

[21] Ochse, *Organists and Organ Playing*, 1–34.

advertising a new complete edition of Bach's organ works; however, he only received three subscribers and dropped the project.[22] The organ repertoire from this period was much simpler and less dense than that of J.S. Bach's works, primarily comprising improvised pastoral scenes, popular songs, and pieces mimicking storms, which were almost always performed in the context of the Roman Catholic liturgy.[23] While organ concerts became an important part of Parisian musical life later in the century, the solo organ recital as it is generally understood today was not in the consciousness of the musical community.[24] The closest thing was the inauguration of a new organ (often called *vérification et réception*, or "verification and reception"), which was really a demonstration of a newly built instrument for an organ committee, and constituted the final hurdle before the acceptance of a newly-built instrument; as the century went on, these events increasingly often became open to the public.[25]

The turning point for Bach's organ music in France came in 1844 when King Louis Philippe I and Jean-Louis-Félix Danjou — the organist at Saint-Eustache, Notre-Dame Cathedral, and organ professor of the Paris Conservatoire — invited Adolph Hesse, a grand-pupil of Bach, to play a series of concerts centred around the Industrial Exposition in June.[26] In a letter to Louis (baptised name Ludewig) Spohr several months prior to the event, Hesse indicated that he was specifically invited to promote German organ music.[27]

---

[22] Albert Palm, "La connaissance de l'œuvre de J. S. Bach en France a l'époque préromantique," *Revue de Musicologie* 52, no. 1 (1966), 90. Palm does not cite a source for Fétis's original text.
[23] Ochse, *Organists and Organ Playing*, 1–19.
[24] Ochse, *Organists and Organ Playing*, 11.
[25] Ochse, *Organists and Organ Playing*, 11.
[26] Ochse, *Organists and Organ Playing*, 41. Hesse studied with both Johann Christian Kittel and Christian Heinrich Rinck.
[27] Louis Spohr and Adolph Hesse, correspondence dated 19 April 1844, reproduced in Hans Jürgen Seyfried, *Adolph Friedrich Hesse als Orgelvirtuose und Orgelkomponist* (Regensburg: G. Bosse, 1965), 28–29.

During this trip, Hesse gave a demonstration of a Daublaine-Callinet organ at the industrial exposition on 9 June 1844, to which the firm invited artists, journalists, and amateurs; Henri Blanchard reported favourably on the event for the *Revue et gazette musical de Paris*:

> "Mr Hesse first presented a fantasy in the fugal style, then the *God Save the King Variations* by [Louis] Spohr, and finally an admirable fugue in G minor by [Johann] Sebastian Bach which allowed us to hear this magnificent instrument in all its richness of its stops, in all its powerful sound, finally in all the perfection with which it was endowed by the talented builders who made it."[28]

The final fugue Hesse played was most likely BWV 542/2 for a number of reasons. Hesse had studied with Kittel, who produced several copies of the fugue between c. 1800 and 1810.[29] Additionally, Kittel marked "Das allerbeste Pedal-Stück" ("the very best pedal piece") at the top of the copy, which may explain Blanchard's notable praise of Hesse's pedal technique later in his review.[30] Kittel's copy was transposed to F major, and Peter Williams, in his monograph *The Organ Music of J.S. Bach*, suggests that this version (originating from C.P.E. Bach) was written to avoid pedal D3[31], which did not exist on most Saxon organs in the eighteenth century; given the generally larger pedal compass of French organs by 1844, Hesse probably returned it to the original key because of its ability to play all the notes.[32] Finally, Hesse played the BWV 542 *Fugue*'s

---

[28] Henri Blanchard, "Audition de l'orgue Daublaine-Callinet a l'exposition des produits de l'industrie," *Revue et gazette musical de Paris* 11, 200: "M. Hesse nous a d'abord fait entendre une fantaisie en style fugué, puis le *God save the king* varié par Spohr, et enfin une admirable fugue en *sol* mineur de Sébastien Bach qui a permis d'entendre ce magnifique instrument dans toute la richesse de ses jeux, dans toute sa puissante sonorité, dans toute la perfection enfin dont il a été doté par les facteurs de talent qui l'ont confectionné."

[29] The Rinck copy (US-NH LM 4838 [Ma21.Y11.B12]) dates from around 1800, and is marked "Fuga. di Seb: Bach. betitelt das allerbeste Pedal Stück" ("Fugue by Sebastian Bach. Entitled the very best pedal piece"), which may further explain several Francophone reviewers' astonishment with Hesse's pedal technique over the course of his Parisian visit.

[30] D-B Mus.ms. Bach P 287, Fascicle 8, 81.

[31] MIDI note names will be used to denote octaves, due to the format produced from scanning organ rolls.

[32] Peter Williams, *The Organ Music of J.S. Bach* (Cambridge, UK: Cambridge University Press, 2003), 85.

corresponding *Fantasy* a few months later in January 1845 during a concert at the Thomaskirche in Leipzig.[33]

The highlight of Hesse's visit was the inauguration of the new Daublaine-Callinet organ at Saint-Eustache on 18 June 1844, which was really a concert in the modern sense — a unique event in French organ history until that point; the reviewer Stephen Morelot proclaimed that "we do not believe that an organ has ever been inaugurated in a more solemn way."[34] The inauguration was well-publicised and attended, and featured Hesse alongside five of Paris's leading organists: François Benoist, Alexandre Pierre François Boëly, Charles-Alexandre Fessy, Louis James Alfred Lefébure-Wély, and Nicolas Séjan; additionally, choral motets were interspersed between the organ works, and Lefébure-Wély performed with a euphonium choir and contrabass.[35] Despite the programme having been reviewed five different times, details of exactly which pieces were played are unclear.[36] Table 1 is a summation of the programme based on the various reviews afterward, though the order is unclear:

Performer	**Composer**	**Title, any details**
Fessy	Improvisation	Pastorale/musette
Lefébure-Wély	Improvisation	Improvisation with "a remarkably powerful crescendo"[37]
L-W et al.	?	Piece for organ, euphonium choir, and contrabass
Séjan	Improvisation	Improvisation on "Carillon de Dunkerque"
Boëly	Alberechtsberger	Fugue, played on jeux doux [soft stops]
Benoist	?	Fugue

[33] Seyfried, *Adolph Friedrich Hesse*, 103.
[34] Stephen Morelot, "Inauguration de l'orgue de Saint-Eustache," *La France musicale* 7 (1844), 230: "Nous ne croyons pas que jamais orgue ait été inauguré d'une manière plus solennelle."
[35] [Writer unknown, article signed "N"] *Revue et gazette musical de Paris* 11, 219. Which choir sang is unclear, but "N" says it was directed by Pierre-Louis Dietsch, who at the time was chorus master of the Paris Opera; the involvement of the chorus master of such a significant institution suggests this was a significant event in the city's cultural life.
[36] Ad. vicomte de Pontecoulant [pseudonym], "Exposition de l'industrie. Pianos: Gaërin. — Orgues: Daublaine et Callinet. — Réception de l'orgue de Saint-Eustache," *La France musicale* 7 (1844), 196–197. ["N"] *Revue et gazette musical de Paris* 11, 219. Morelot, "Inauguration", 230–232. [Writer unknown], "Audition du nouvel orgue A Saint-Eustache," *Le Ménestrel* 11, no. 30 (1844), 2.
[37] *La france musicale* 7, 197: "un crescendo fort remarquable".

	?	[Another piece]
Hesse	J.S. Bach	Toccata in F Major, BWV 540
	?	[A trio]
Choir	Various	[Motets by several composers]

Table 1. Music performed during the inauguration of the Daublaine-Callinet organ at the Church of Saint-Eustache in Paris, 18 June 1844.

The reception of the French organists who played was universally positive, as was Hesse's technical prowess, especially regarding his pedal technique; however, the overall effect of Hesse's playing was controversial.[38] While Morelot commented that "The German school, so little known among us, and which sends us such a worthy interpreter, seems to have achieved a perfection which can hardly be surpassed"[39], another anonymous reviewer remarked that "[Hesse] is passionate about noise and strength; his playing astonishes, but does not appeal to the soul. He always seems to be the minister of an angry God who wants to punish..."[40] The audience, however, seemed to enjoy Hesse's playing, especially the *Toccata in F Major*, BWV 540/1:

> "[the audience] were preparing to leave the place at the moment of the piece of honour which had been entrusted to him began. But then, doubly inspired, the German organist approached a toccata with very particular verve; taking advantage of the crescendo and diminuendo pedal so skilfully introduced on the organ of MM. Danblaine and Callinet, the artist deployed all the resources of his special talent by a combined and perpetual movement of the feet and the hand; so that the audience, held back by the vigour and charm of the performance, soon returned to their places, and the artist's triumph was complete."[41]

[38] Ochse, *Organists and Organ Playing*, 41.
[39] Morelot, "Inauguration," 232: "L'école allemande, si peu connue parmi nous, et qui nous envoie un si digne interprète, paraît avoir atteint à une perfection qui sera difficilement dépassée."
[40] Ad. vicomte de Pontecoulant, "Exposition de l'industrie," 197: "[Hesse] est passionné pour la force et le bruit, son jeu étonne, mais ne va pas à l'âme. Il semble toujours être le ministre d'un Dieu en colère qui veut punir."
[41] *Le Ménestrel* 11, no. 30, 2: "...se disposait-on à quitter le place au moment du morceau d'honneur qui lui avait été confié. Mais alors, doublement inspiré, l'organiste allemand aborda une toccata avec une verve toute particulière; profitant de la pédale du crescendo et du diminuendo si habilement introduite dans l'orgue de MM. Danblaine et Callinet, l'artiste déploya toutes les ressources de son talent spécial par un mouvement combiné et perpétuel des pieds et de la main; si bien que les auditeurs, retenus par la vigueur et le charme de l'exécution, regagnèrent bientôt leurs places, et le triomphe de l'artiste fut complet."

That said, the reviewer then commented that some less-than-enthusiastic attendees attributed the audience's return more to the heavy rain which began just a few moments before the *Toccata*.[42] Reception aside, this reviewer gives some particularly important information about performance practice: Hesse adjusted the dynamics of the organ while performing. Whether this could have been accomplished by the player himself or, more likely, by an assistant, will be discussed in Chapter 2.

The Earliest Bach Organ Editions in France

In secondary literature, the earliest French Bach keyboard editions have not yet been codified. The only discussion of the first Bach organ editions in France is by William J. Peterson, who argued that the first Bach organ work edition to appear in France was Belgian musicologist François-Joseph Fétis's anthology of early organ music from around 1834.[43] Prior to the Bach complete organ works editions by Widor and Albert Schweitzer, and that of Gabriel Fauré (all published in the early twentieth century), most of Bach's works were disseminated in France and Belgium via German editions, which Fétis mentions in several of his publications about Bach's music in the first half of the nineteenth century.[44]

Born to a musical family, as a boy Fétis played continuo for chamber music events his father organised, and regularly performed the works of C.P.E. Bach, Haydn, and Mozart; he matriculated at the Paris Conservatoire in 1800, and in 1821 (no doubt

[42] *Le Ménestrel* 11, no. 30, 2.
[43] William J. Peterson, "Lemmens and Nineteenth-Century Organ Methods," in *French Organ Music from the Revolution to Franck and Widor* (Rochester, New York: University of Rochester Press, 1995), 59.
[44] François-Joseph Fétis, *Le parfait organiste, par F. J. Fétis. Deuxième partie. Style des organistes célèbres de toutes les époques et de toutes les écoles, ou Recueil de morceaux choisis dans leurs oeuvres*, (Paris: Pleyel, c. 1830). Fétis, *Biographie universelle* 1 (1837), 16.

helped by his interest in the works of J.S. Bach) he became professor of counterpoint at the Paris Conservatoire.[45] In 1832, he was appointed *maître de chapelle* to King Léopold I and Director of the Brussels Conservatory.[46]

A few years before beginning this prestigious new post, Fétis published the outline of an organ method in four volumes; the finished product was never released in its entirety, but the final volume — an anthology of musically representative works by French, German, and Italian composers from the sixteenth to eighteenth centuries — includes several works by J.S. Bach.[47] Only one copy is extant and no date is listed, but it must have been printed no later than 1834, when the publisher (Pleyel) ceased its publishing activities (in favour of manufacturing pianos).[48] The organ works by Bach are shown in Table 2.

BWV	**Title given by Fétis**
664	Prélude à trois claviers pour un Cantique [Allein Gott in der Höh sei Ehr]
	Diverses manières de traiter le Chant Choral: *Von himmel* [sic] *hoch da komm' ich her, etc*:
769/1	Canon à l'octave
769/2	Sur la même Chant Choral / Canon à la quinte infèrieure
701	Sur la même Chant fugué par diminution (Petite fugue)
769/3	Sur la même Choral
	[Above the 1er Clavier line:] Cantabile
	[Below the 2e Clavier line:] Résolution
	[Above the Pédale line:] Canon à la septième
700	Fugue sur le même sujet

Table 2. List of organ works by J.S. Bach in Fétis's Le Parfait organiste*, in order of appearance.*

[45] Fétis, *Biographie universelle* 3 (1866), 227, 231.
[46] Fétis, *Biographie universelle* 3 (1866), 235.
[47] The advertisement is in *La Revue musicale* 6 (1829): 357–359. The anthology is Fétis, *Le parfait organiste*; the only extant copy is digitised at https://uurl.kbr.be/1561774, accessed 5 September 2020. This anthology's history is discussed in Peterson, *Lemmens and Nineteenth-Century Organ Methods*, 59.
[48] Rita Benton, "Pleyel as Music Publisher," *Journal of the American Musicological Society* 32, No. 1 (1979), 139.

In 1844, C.F. Peters published the first volume of the complete Bach organ works.[49] The organist Henri Letocart, a pupil of Clement Loret, the organ teacher at the Niedermeyer School, which trained many important Francophone organists in the nineteenth and early twentieth centuries, recalled that he owned the eight volumes of the Bach organ works (edition Peters).[50] This edition seems to have become the default edition in use until the early twentieth century, with no other major Bach editions having appeared except the Bach Gesellschaft edition volumes published beginning in 1867.[51] The Peters edition was initially published in eight volumes and edited by Friedrich Conrad Griepenkerl and Ferdinand Roitzsch, and advertised as a "critical correct edition" ("Kritisch-korrekte Ausgabe"), published between 1844 and 1852.[52] The complete details are shown in Table 3:

Vol.	**Contents**	**Plate No.**	**Published**
1	Trio sonatas, Passacaglia, and Pastorale	2893	1844
2	Free works: *BWVs 534, 536, 536a, 541–548, 542a, 545a*	2910	1844
3	Free works: *BWVs 533, 535, 537–540, 539a, 551, 552, 564, 566, 566a*	2938	1845
4	Free works: *BWVs 531, 532, 532a, 549, 550, 562, 565, 569, 572, 574, 575, 578, 579, 583, 588*	2968	1845
5	Orgelbüchlein, Variations on Vom Himmel hoch	2982	1846
6	"Larger and artistically rich chorale preludes"	3061	1847
7	"Larger and artistically rich chorale preludes"	3062	1847
8	Concertos, single-movement free works, Eight Little Preludes and Fugues	3335	1852

Table 3. The C.F. Peters Bach organ works edition, the edition used most by the early members of the French Romantic Organ School.

[49] Peters Edition.
[50] Ochse, *Organists and Organ Playing*, 211.
[51] Johann Sebastian Bach, *Bach-Gesellschaft-Ausgabe* 15, ed. Wilhelm Rust (Leipzig: Breitkopf und Härtel, 1867). The next volume of organ works (25) was released in 1878.
[52] Peters Edition.

Yet no complete Bach organ works editions appeared in the Francophone world until the early twentieth century.[53] In 1845, Jean-Bonaventure Laurens commented that "no [French] publisher has ever found himself encouraged to engrave and print a single line of these [Bach's] organ works since they all demand the use of the pedals, a technical feat that practically no one in this country seems at the moment to have mastered."[54]

The Origins of Bach Performance Practice

By 1850, Bach's organ works were still not widely performed in France, despite the 1844 Peters edition was available in the Francophone world.[55] As the only Bach edition widely available, the ideas in the preface probably had some impact on those who could read German. The Peters edition preface by Griepenkerl gives the following suggestions surrounding performance practice:

> "J.S. Bach's compositions for the organ require the greatest possible clarity in the performance, because in them several melodies are connected with each other at the same time, which cannot be properly understood and understood neither individually nor in their context if an unclear performance puts any obstacles in the way. The aim is therefore to be as clear as possible, and there are four means to achieve this. 1. Correct separation of the individual phrases by making cuts in the right places, and careful connection of everything that is closely related; both in all voices, but especially in the middle ones. 2. An elastic touch that prevents successive notes from melting together in the individual movements of the voices and also does not tear them apart. 3. Great consideration and care when registering. 4. A moderate tempo appropriate to the piece to be performed and the registers selected."[56]

---

[53] Widor-Schweitzer Edition, French (1914).

[54] See Albert Riemenschneider and Herman Keller, "A Short History of the Basic Griepenkerl edition of Bach's Organ Works," *Eight Music Book*, ed. Hinrichsen (London: Hinrichsen, 1956), 138. *Revue et Gazette musicale de Paris* (2 November 1845), 362, translated by Smith in *Toward an Authentic Interpretation of the Organ Works of César Franck* (New York: Pendragon Press, 1983), 7.

[55] Peters Edition.

[56] Peters Edition 1, ii: "J.S. Bachs Compositionen für die Orgel fordern im Vortrage die grösstmöglichste Deutlichkeit, weil in ihnen mehrere Melodien gleichzeitig mit einander verbunden sind, die weder einzeln noch in ihrem Zusammenhange gehörig aufgefasst und verstanden werden können, wenn ein undeutlicher Vortrag irgend welche Hindernisse in den Weg legt. Höchste Deutlichkeit ist also das Ziel, und dies zu erreichen, bieten sich vier Mittel dar. 1. Richtige Sonderung der einzelnen Sätze durch Einschnitte an den rechten Stellen, und sorgfältige Verbindung alles dessen, was in engerem Zusammenhange steht; beides in allen Stimmen, besonders aber in den mittleren. 2. Ein elastischer Anschlag, der in den einzelnen

In short, Griepenkerl's aesthetics centre around a perfect clarity, achieved through various means.[57] The clarity of articulation is achieved, as described in point 2, not by either extreme of articulation (absolute legato or staccato), but by some amount of separation.[58] Chapter 3 will discuss how these principles and aesthetics surrounding clarity compare to the French Romantic Organ School's understanding of Bach. Points 3 and 4 are related to the instrument and acoustic at hand; the player must choose registrations that are clear and appropriate to their interpretation of the composer's musical idea, while also not playing so fast as to obscure any aspect of the performance.[59] Griepenkerl continues:

> "As for the primary means of clarity in performance, the responsibility lies on the player to carefully analyse the organ piece that he wants to perform beforehand, and to break it down into its main and subordinate clauses, which of course is not there [in the musical text], so that he can play it like a speech, with correct observation of the punctuation, [and] can declaim [the piece]. Much depends on this when playing the organ, because there is no *crescendo*, *diminuendo*, or *sforzato*; indeed, not even forte and piano in the large fugues, and this kind of clarity depends only on correct separation and connection. But to teach such an analysis here would be superfluous, because certainly no organist who cannot break down [Bach's] fugue into main and subordinate clauses, etc. will try to perform Bach's organ compositions. It must only be said that, to attain that end, very often one must not sustain the tones as long as they are written, namely at the end of each period or movement. Composers of all peoples were and are now used to writing out most of the final notes of the main and subordinate phrases in organ, piano and vocal pieces in full, where the player or singer may hold a maximum of three quarters of the note. This also greatly facilitates fingering, which for easily understandable reasons is more difficult on the organ in polyphonic fugues than on the fortepiano. — But it would be a complete misunderstanding of this well-founded and well-intentioned advice if the player meant to follow them by throwing the main and

Sätzen der Stimmen das Zusammenschmelzen auf einander folgender Töne verhindert und sie auch nicht auseinander reisst. 3. Grosse Überlegung und Sorgfalt im Registrieren. 4. Ein dem vorzutragenden Stücke und den gewählten Registern angemessenes mässiges Tempo."

[57] Peters Edition 1, ii.

[58] Peters Edition 1, ii.

[59] Peters Edition 1, ii

> subordinate clauses to the listeners as broken pieces, since he is supposed to deliver a coherent whole."[60]

Griepenkerl here acknowledges that the organ, at least in terms of the instruments familiar to him (and presumably his audience) cannot create significant changes in dynamics; however, for French artists, changing dynamics was a central aspect of their performance practice.[61] Gripenkerl then makes an enormous assumption: that an organist who does not understand the structure of Bach's fugues would be unable to play them. His saying this in such uncompromising terms implies that an artist's understanding of musical architecture was a question even for a serious musician; in order to play the music, a performer *had* to spend time studying large scale form, phrase structure, and presumably harmony and counterpoint. Bach's music, for Griepenkerl, is a musical activity for the highly learned; as Chapter 3 will examine further, this particular aspect was a hallmark of the French Romantic Organ School's understanding of Bach, and even became a fixation for many of its most prominent figures. The final point Griepenkerl makes in the excerpt above refers to the final notes of phrases; on the organ, it is possible to hold the note for its full value, but singers and instrumentalists

---

[60] Peters Edition 1, ii: "Was das erste Mittel der Deutlichkeit im Vortrage betrifft, so legt es dem Spieler die Verpflichtung auf, sich das Orgelstück, welches er vortragen will, vorher sorgfältig zu analysieren und in seine Haupt- und Nebensätze zu zerlegen, so dass er es, wie eine Rede, mit richtiger Beobachtung der Interpunction, die freilich nicht dasteht, declamieren kann. Hierauf kommt bei dem Vortrage auf der Orgel viel an, weil es da kein *crescendo*, *diminuendo* und *sforzato*, ja in den grossen Fugen nicht einmal *forte* und *piano* giebt, und diese Art der Deutlichkeit nur von richtiger Sonderung und Verbindung abhängt. Eine solche Analyse aber hier zu lehren, wäre überflüssig, weil gewiss kein Orgelspieler Bachische Orgelkompositionen vorzutragen versuchen wird, der seine Fuge nicht in Haupt- und Nebensätze etc. zerlegen kann. Es muss nur bemerkt werden, dass man, um jenen Zweck zu erreichen, sehr oft die Töne nicht so lange aushalten darf, wie sie geschrieben stehen, nämlich jedes Mal am Schluss einer Periode oder eines Satzes. Die Komponisten aller Völker waren und sind es nun einmal gewohnt, die meisten Schlussnoten der Haupt- und Nebensätze in Orgel-, Klavier- und Gesangsstücken völlig auszuschreiben, wo der Spieler oder Sänger höchstens drei Viertel der Note halten darf. Auch wird der Fingersetzung, der aus leicht begreiflichen Gründen auf der Orgel in mehrstimmigen Fugen schwerer ist, als auf dem Fortepiano, hierdurch sehr erleichtert. — Ein völliges Missverstehen dieser wohlbegründeten und wohlgemeinten Rathschläge aber wäre es, wenn der Spieler ihnen zu folgen meinte, indem er den Zuhörern die Haupt- und Nebensätze als abgerissene Stücke zuwürfe, da er ein zusammenhängendes Ganzes liefern soll."

[61] Peters Edition 1, ii.

(especially wind instruments) need to breathe, and therefore must shorten the length of the note. Griepenkerl says that this shortening makes it easier to play polyphony on the organ versus the piano, but aesthetically on the organ would create a fractured presentation of phrases that would not come across well to the listener; his reasoning implies that this is because in the organ, the sound does not decay, and therefore stopping notes early will cause the phrase to sound choppy.

Because Griepenkerl's ideas were published in an edition of a composer who was almost completely unknown in Belgium, Fétis, whether he knew it consciously, now had the ability in the Francophone organ world to effectively shape all other details of performance practice and the general understanding of Bach's organ works to his will. This soon extended beyond the realm of musicology — reporting which Bach works were known to be extant and where scores could be found — and into performance practice itself: in 1860, Fétis described the technique of finger substitution specifically for Bach's organ works in the second edition of *Biographie universelle*, which he had been teaching since he arrived at the Brussels Conservatoire:

> "The complicated nature of [Bach's] works for these two instruments, always written in three, four or five parts, had obliged [Bach] to invent a particular fingering, which was known for a long time in Germany as *Bach fingering*, but which can be referred to more often by the name of *finger substitution*, because in the music to which it is applied, one finger often takes the place occupied by another to hold the sound while the other finger, which has become free, acts in execution."[62]

[62] François-Joseph Fétis, *Biographie universelle* 1 (Brussels, 1868), 194: "La nature compliquée des ouvrages pour ces deux instruments, toujours écrits à trois, quatre ou cinq parties, l'avait obligé à inventer un doigter particulier, qui fut connu longtemps en Allemagne sous le nom de *doigter de Bach*, mais qu'on peut désigner d'une manière plus significative par le nom de *doigter de substitution*, parce que, dans la musique à laquelle il s'applique, un doigt prend souvent la place qu'occupait un autre pour tenir le son pendant que l'autre doigt, devenu libre, agit dans l'exécution."

By the 1860s, many German editions of Bach's keyboard works included finger substitution.[63] However, there is no evidence that J.S. Bach himself used finger substitution, and the supposed "Bach fingering" was, in fact, almost certainly not invented by Johann Sebastian — the earliest written example of finger substitution is from 1716, in François Couperin's *L'art de toucher de clavecin*.[64] Among the few examples in which J.S. Bach writes in fingerings (BWVs 928 and 994 from the *Clavier-Büchlein vor Wilhelm Friedemann Bach* and BWV 870a — which, as musicologist Quentin Faulkner points out, may not have been in Bach's own hand), substitution is never used.[65] The generation of German keyboardists following J.S. Bach did allow some finger substitution, most notably Friedrich Wilhelm Marpurg in his 1755 treatise *Anleitung zum Clavierspielen*[66], as does J.S. Bach's son Carl Philipp Emanuel in his *Versuch über die wahre Art das Clavier zu spielen*, published in 1753, only three years following his father's death; however, C.P.E. Bach warns that "Couperin, who is generally so sound, too often and without good reason [calls for] the substitution of a finger which is already playing."[67] André Charles Duvall's 2014 dissertation analyses examples of fingerings written by both J.S. and C.P.E. Bach, and notes the lack of any finger substitutions in Johann Sebastian's examples.[68] According to Duvall, the only

[63] Among the most popular were Carl Czerny's editions of Johann Sebastian Bach, *Well-Tempered Clavier, Book 1* (Leipzig: Peters, 1863), and *Goldberg Variations* (Leipzig: Peters, c. 1850).
[64] François Couperin, *L'Art de toucher le clavecin* (Paris: Chés l'Auteur, le Sieur Foucaut, 1716).
[65] Quentin Faulkner, "J.S. Bach's Keyboard Fingering: New Evidence," *The Diapason* 71, no. 4 (April 1980), 14.
[66] Friedrich Wilhelm Marpurg, *Anleitung zum Clavierspielen* (Berlin: A. Haude & J. C. Spener, 1755), 67.
[67] Carl Philipp Emanuel Bach, *Versuch über die wahre Art das Clavier zu spielen*, Part 1 (Berlin: Christian Friedrich Henning, 1753), 45: "Und dieser Ursache braucht Couperin so gründlich derselbe sonsten ist, zu oft und ohne Noth dieses Ablösen eines schon eingeseßten Fingers."
[68] André Charles Duvall, "The Development and Application of Keyboard Fingering Principles in the Music of J.S. Bach and C.P.E. Bach: An Analysis in Comparison with Modern Approaches to Fingering, and the Utilization of the J. C. Bach-Ricci *Method* for Nurturing a Versatile Technique in the Early Stages of Study" (DMA diss., University of North Carolina at Greensboro, 2014).

"examples in which [C.P.E. Bach] supports the use of substitution involve octave leaps to sustained tones that then move farther in the same direction, as well as for sustained tones of an arpeggio when the hand position must shift to play new figuration."[69] In these instances, there is no way to physically play such a passage without substitution.

By the early nineteenth century, though, C.P.E. Bach had clearly lost the battle over finger substitution, and the technique continued to be used in France — in 1804, Louis Adam, the first piano professor at the Paris Conservatory, published the *Méthode de piano du Conservatoire*, in which he gives many examples of finger substitution, all of which are directly marked "legato," or the articulation is described as being "without interruption" or "a good connection."[70] He also gives several examples of pieces with fingerings written in, and suggests substitution in a Mozart sonata.[71] If Adam did read C.P.E. Bach's *Versuch*, he ignored the warning against finger substitutions: his edition of the *Adagio affettuoso e sostenuto* movement from the *Sonata in F Minor*, Wq. 63/6 (H.75) includes multiple instances of it, always at suspensions, which as Duvall demonstrates later in his dissertation, C.P.E. Bach seems to have intentionally used fingerings that would result in suspensions not being connected.[72] Adam's *Méthode* includes two fugues by J.S. Bach with fingerings,[73] yet neither call for any finger substitution, and many of the fingerings result in a non-legato articulation between pitches, as the right hand in Figure 1.[74]

---

[69] Duvall, "The Development and Application," 110.
[70] Louis Adam, *Méthode de piano du Conservatoire* (Paris: Louis, 1804): legato examples on pages 43, 45, 53; "sans interruption" ("without interruption)": 51; "bien lier" ("good connection"): 64–65.
[71] Adam, *Méthode de piano*, 169.
[72] Adam, *Méthode de piano*, 194. Duvall, "The Development and Application," 132.
[73] BWV 846/II C Major from *WTC Book I*, can be found in Adam, *Méthode de piano*, 212–213; BWV 873/II in C-sharp Minor from *WTC Book II* from the same, 214–217.
[74] Adam, *Méthode de piano*, 215.

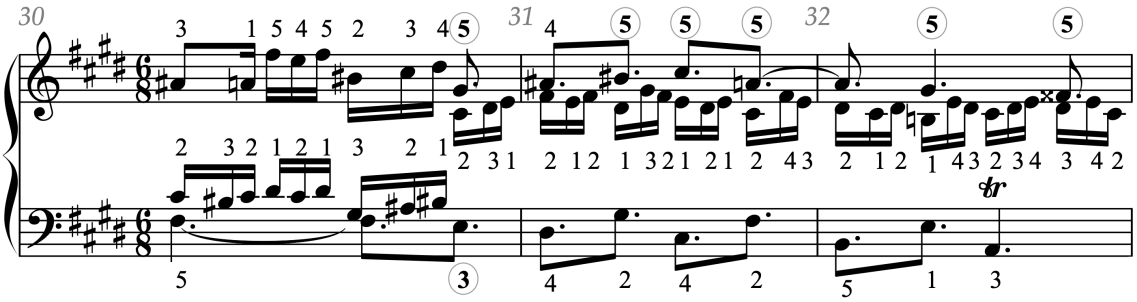


Figure 1: J.S. Bach: Fugue in C-Sharp Minor*, BWV 873, bars 30–32, edited by Louis Adam. The fingerings which result in significant articulation are circled and marked in bold.*

Using the sustain pedal would be the primary method of hiding such gaps in articulation on the piano. While Adam is not against using the pedal, he cautions that certain performers use it "only to dazzle those ignorant of music, or to cover up the mediocrity of their talent", and suggests that it "should only be used in consonant chords when the piece is very slow, and not at the point when the harmony changes..."[75] In the case of Figure 1 above, where Adam marks the fifth finger for three consecutive notes in the soprano line, the harmony is changing every beat and therefore the sustain pedal should not be applied. Using Adam's fingering, making all three soprano notes legato is physically impossible, demonstrating that, while the default keyboard articulation in the nineteenth century was legato, it was not yet the absolute legato which would become a hallmark of the French Romantic Organ School's performance practice.

Curiously, in Fétis's own annotated edition of BWV 851, which are part of his and co-author Ignaz Moscheles's 1840 *Méthode des méthodes de piano*, he does not give the "Bach fingering" in either the prelude nor the fugue.[76] This raises the question as to how Fétis came to know about this supposed "Bach fingering."

[75] Adam, *Méthode de piano*, 219: "La grande pédale ne doit être employée que dans les accords consonants, dont le chant est très lent, et qui ne changent point d'harmonie..."
[76] François-Joseph Fétis and Ignaz Moscheles, *Méthode des méthodes de piano ou Traité de l'art de jouer de cet instrument* (Paris: Maurice Schlesinger, 1840), 106–109.

Fétis was in touch with many of the leading organists in the German-speaking world, and his extensive knowledge of Bach editions published in Leipzig and Vienna indicates he was following the organ scene. The most important German-language treatise on organ playing in the early nineteenth century, the 1807 *Orgelschule* by Johann Gottlob Werner, specifically insists that "the organist must learn the precise connecting of notes with great care."[77] Kirk Rich argues that the default articulation for the leading German organists in the early nineteenth century was legato.[78] Fétis seems to have believed that the German tradition dating from Bach was completely unchanged, yet in the examples of Bach's works to which Czerny and Adam added fingerings, substitution did occur, but was never the default.[79] The codifying of "absolute legato" came from Fétis's prized student who would go on to teach nearly every important organist in France: Jacques-Nicolas Lemmens.

Lemmens and His Bach Study

Lemmens first began studying piano at the Brussels Conservatoire in 1839, and within two years Fétis had invited Christian F.J. Girschner from Berlin to teach organ, specifically because Girschner was interested in the music of J.S. Bach.[80] Further details of Girschner's pedagogy are lost, though in 1891 H.V. Couwenbergh discusses the French Romantic pedagogy in his monograph on the history of the organ:

> "In 1842 [Fétis] instituted in [the Brussels Conservatoire] a special course in organ playing, entrusted to M. Ch. Girschner, of Berlin. The latter, a faithful and

[77] Johann Gottlob Werner, *Orgelschule* (Penig: F. Dienemann und Compagnie, 1807), 16: "Das Genaue Aneinanderfügen der Töne muss der Orgelspieler mit großer Sorgfalt lernen."
[78] Rich, "To Lift or Not to Lift."
[79] *Well-Tempered Clavier, Book 1*, ed. Czerny, and *Goldberg Variations*, ed. Czerny. Adam, *Méthode de piano*.
[80] Peterson, "Lemmens and Nineteenth-Century Organ Methods," 54.

> zealous disciple of Bach, instilled in his students the rules of taste and the true traditions of the great German school."[81]

This and the circumstances of Girschner's invitation indicate that Lemmens studied at least the German Romantic School of organ playing and the music of J.S. Bach in significant depth, especially learning the legato articulation which had become commonplace in the German organ world from Girschner and applying it to the music of Bach.[82] Lemmens excelled in his studies, and in 1845 he was awarded first prize in organ at the Conservatoire.

Fétis had spent many years becoming intimately familiar with the organ scene in both the Francophone world and Germany, and seems to have been looking for ways to legitimise Belgian organ playing; he and Félix Danjou (who had organised Hesse's concert in Paris) held two of the most influential posts in Belgium and France respectively, and both publicly proclaimed that organ playing in Germany was superior.[83] In 1844, Danjou additionally proclaimed that "in Germany not a step has been taken since Seb. Bach: the compositions of Adolph Hesse and of Rinck always belong to the legato fugal style which Bach used exclusively in his organ works."[84] Given the new developments in organbuilding which introduced greater means of expression (discussed further in Chapter 2) and Hesse's recent success introducing Bach in Paris, the time was ripe for a reform in organ playing in France and Belgium.[85] Fétis

---

[81] Hilaire Vital Couwenbergh, *L'orgue ancien et moderne: traité historique, théorique et pratique de l'orgue et de son jeu* (Lierre: Joseph van In & C^{ie}, 1891), 327: "En 1842 il [Fétis] institua en cet établissement [Conservatoire royal de Bruxelles], un course spécial de jeu d'orgue, confié à M. Ch. Girschner, de Berlin. Celui-ci, fidèle et zélé disciple des Bach, inculqua à ses élèves les régles du goût et les vraies traditions de la grande école allemande."
[82] Ochse, *Organists and Organ Playing*, 171.
[83] Discussed in Ewald Kooiman, "Jacques Lemmens, Charles-Marie Widor, and the French Bach Tradition," *The American Organist* 29, No. 3 (March 1995), 56–57.
[84] Kooiman, "Jacques Lemmens, Charles-Marie Widor, and the French Bach Tradition," 57.
[85] Ochse, *Organists and Organ Playing*, 26–34.

seized the opportunity and sent Lemmens to Breslau to study with Hesse; in the 1860 edition of the *Biographie universelle*, he writes:

> "The director of the Conservatoire [Fétis], with the aim of founding in this institution a school of good organists that Belgium lacked, asked the Minister of the Interior for funding so that Mr Lemmens could go to Breslau, the place of the celebrated organist Adolph Hesse, to study the traditions of the art of Jean-Sébastien Bach; [Fétis's] request was granted by the government, and Lemmens departed for the capital of Silesia at the beginning of 1846."[86]

When Lemmens returned from Breslau, he gave Fétis a letter from Hesse, which Fétis reproduced in his review of Lemmens's *Nouveau Journal d'orgue* in 1851:

> "After a long stay with this master [Hesse], [Lemmens] returned, bringing me [Fétis] a letter from the famous organist of Breslau in which he said to me: *I have nothing more to teach M. Lemmens*."[87]

Hesse eventually learned about Fétis's claim through a series of articles in German-language publications.[88] In 1852, Hesse wrote a scathing response in the *Neue Zeitschrift für Musik*:

> "In the article [entitled] "Herr Fétis"... there is a passage referring to me which is grossly contrary to the truth. Mr Fétis himself says in relation to a Mr Lemmens: [Lemmens] concluded his studies with me. After being here for a long time, he returned to Brussels with a letter from me, in which I said: "I did not know what else I should teach Mr Lemmens." — Since it is by no means indifferent to me to see my judgement compromised, I must here clarify the truth, that I never gave Mr Lemmens such a letter. Mr Lemmens came here [to Breslau] in autumn 1846, brought me a letter of recommendation from Mr Fétis, and said he was traveling at the expense of the King of Belgium and wished to take lessons in organ playing from me. Although I now never do this [take on students], since I am lacking a private organ for this purpose [teaching], I made an exception here since Mr Lemmens had come so far. I taught him for a short time (Mr Lemmens

---

[86] Fétis, *Biographie universelle* 5 (1867), 267: "...le directeur du Conservatoire, dans le but de fonder dans cette institution une école de bons organistes qui manquait à la Belgique, demanda au ministre de l'intérieur une pension pour que M Lemmens put aller à Breslau, chez le célèbre organiste Adolphe Hesse, étudier les traditions de l'art de Jean-Sébastien Bach; sa demande fut accueillie par le gouvernement, et Lemmens partit pour le capitale de la Silésie au commencement de 1846."

[87] Fétis, "Revue critique / Nouveau Journal d'orgue, à l'usage des organistes du culte catholique, publié par M. Lemmens, professeur d'orgue au Conservatoire royal de musique de Bruxelles," *Revue et gazette musicale de Paris* 18 (1851), 30: "Après un long séjour près de ce maître, il revint, m'apportant une lettre du célèbre organiste de Breslau dans laquelle celuici me disait: *Je n'ai plus rien à apprendre à M. Lemmens*."

[88] The transmission history is discussed in Peterson, "Lemmens and Nineteenth-Century Organ Methods," 62.

> only stayed here over the winter) on the organ at the Church of St. Bernhardin, where I am employed. The talent of Mr Lemmens then turned out to be highly undistinguished; if he later became the man whom Mr Fétis holds in such great regard, I am completely blameless. That I was unable to teach Mr Lemmens anything more was correct when he left Breslau — without saying goodbye to me and without asking in the least about his [financial] obligations to me. I am only mentioning the latter in order to make it clear that, even if I had wanted to compromise myself, I was unable to give Mr Lemmens the letter that I was said to have done. Breslau, in March 1852."[89]

Lemmens's studies with Hesse clearly did not go well, and apparently the disdain between master and pupil was mutual — in the following letter from Lemmens to his parents, dated 9 November 1846 when he was studying under Hesse, he writes:

> "Mr. Hesse has taught me very little — so little that it is a trip which I made for nothing, but I am not a man not to profit from it. I play the organ three or four hours every day. Mr Hesse comes approximately once a week in order to be able to say that he comes, because he has nothing to tell me. In the beginning he told me that I played too fast. That is the only remark that he has been able to make to me."[90]

However, William Peterson unearthed a document in the private Clerfaÿt family archive signed by Hesse and dated 16 December 1846, just before Lemmens departed without

---

[89] Adolph Hesse, "Kleine Zeitung," *Neue Zeitschrift für Musik* 36 (1852), 163: "Berichtigung. In dem Artikel "Herr Fétis"... findet sich eine auf mich bezügliche Stelle, welche gegen die Wahrheit gröblich verstößt. Hr. Fétis selbst sagt nämlich in Bezug auf einen Herrn Lemmens: er habe seine Studien unter mir fortgeseßt. Nachdem er lange hier verweilt, sei er mit einem Briefe von mir nach Brüssel zurückgekehrt, worin ich gesagt: "ich wüßte nicht, was ich Herrn Lemmens noch lehren sollte." — Da es mir keinesweges gleichgültig sein kann, mein Urtheil bloßgestellt zu sehen, so muß ich hier der Wahrheit gemäß erklären, daß ich Hrn. Lemmens nie einen solchen Brief mitgegeben habe. Hr. Lemmens kam im Herbst 1846 hierher, überbrachte mir ein Empfehlungsichreiben von Hrn. Fétis, sagte außerdem: er reise auf Kosten des Königs von Belgien, und wünsche Unterricht im Orgelspiele bei mir zu nehmen. Obgleich ich nun diesen nie ertheile, da es mir zu diesem Jwede an einer Privatorgel gebricht, so machte ich hier eine Ausnahme, da Hr. Lemmens deshalb so weit hierher gekommen war. Ich unterrichtete ihn kurze Zeit (Hr. Lemmens bleib nur über Winter hier) auf der Orgel der Hauptkirche St. Bernhardin, bei welcher ich augestellt bin. Das Talent des Hrn. Lemmens stellte sich damals als ein höchst mittelmäßiges herans; wenn derselbe später der größe Mann wurde, für welchen ihn Hr. Fétis hält, so bin ich ganz außer Schuld dabei. Daß ich Hrn. Lemmens nichts mehr lehren konnte, hat in sofern seine Richtigkeit, als derselbe Breslau verließ, ohne mir Adieu zu sagen, und ohne im Geringsten nach seinen Verbindlichkeiten gegen mich zu fragen. Letzteres führe ich nur an, damit man entsteht, wie ich, selbst wenn ich mich hätte compromittiren wollen, außer Stande war, Hrn. Lemmens das mir angedichtete Schreiben mitzugeben. Breslau, im März 1852."

[90] Translated by and reproduced in Near, *Widor: A Life Beyond the Toccata*, 13.

saying goodbye or paying Hesse.[91] It paints an entirely different picture of Lemmens's time in Breslau:

> "Mr. Lemmens, a very talented musician, has been with me since September and has enjoyed my lessons in organ playing and composition for this instrument. During this time, Mr. Lemmens was so diligent that he now performs several of the most difficult and largest organ compositions calmly and with true understanding, and he has also composed a fugue for this instrument under my guidance, which testifies to his proficient education in serious music. His knowledge enables him to become a professor of organ playing at a conservatory."[92]

So which was it: were Hesse and Lemmens at odds, or did Hesse indeed regard his Belgian pupil favourably? At this stage in Hesse's life, he was one of the most famous organists in Germany and had already played his famous 1844 recital of Bach's organ music in Paris at the invitation of the King of France — other than complaining that Lemmens had not paid him for the lessons, he had nothing to gain by severely tarnishing Lemmens's reputation, especially as Lemmens had been appointed as professor of organ at the Brussels Conservatoire in 1849.[93] Lemmens and Fétis, on the other hand, had everything to gain by claiming his time in Breslau was a success; not only did Fétis hold Hesse in the highest regard, but Lemmens's study with Hesse had been funded by the Belgian government, the grant for which Fétis had used his influence as music director of the King's royal chapel to secure.[94] In short, if the Ministry of the Interior had learned of Lemmens's failures, it would have reflected poorly on Lemmens, but worse on Fétis. Given this, Fétis clearly was most interested in

---

[91] Peterson, "Lemmens and Nineteenth-Century Organ Methods," 95, note 63.
[92] Reproduced in Peterson, "Lemmens and Nineteenth-Century Organ Methods," 95, note 63: "Herr Lemmens, ein sehr talentvoller Tonkünstler, ist seit dem Monate September bei mir gewesen, und hat meinen Unterricht im Orgelspieler und der Komposition für dieses Instrument genossen. Herr Lemmens war in dieser Zeit so fleissig, dass er mehrere der schwersten und grössten Orgel-Kompositionen jetzt mit Ruhe und der wahren Auffassung vorträgt, auch hat er eine Fuge für dieses Instrument unter meiner Leitung komponiert, die von seiner tüchtigen Bildung in der ernsten Musik Zeugniss giebt. Seine Kentnisse befähigen ihn Professor des Orgelspiels am Konzervatorium zu werden."
[93] Peterson, "Lemmens and Nineteenth-Century Organ Methods," 95, note 63.
[94] Peterson, "Lemmens and Nineteenth-Century Organ Methods."

giving his prized pupil the legitimacy of studying with a prominent German organist and whose teaching lineage included J.S. Bach.

For all these reasons, Fétis continued to reproduce the supposed letter from Hesse, and in the 1860 edition of the *Biographie universelle*, Fétis not only doubled down on his claim, but expanded this fantasy further:

> "After a year had passed [in Breslau], Hesse wrote to the author of this article: *I have nothing more to teach M. Lemmens: he plays Bach's most difficult music as well as I can*."[95]

William Peterson discusses recent debates as to how long Lemmens realistically studied in Breslau, ultimately arguing it only lasted a few months.[96] The documentary evidence supports this: the Ministry of the Interior's document confirming the funding was dated 7 July 1846, and the note from the Clerfaÿt family archive signed by Hesse summarising Lemmens's studies with him in Breslau and is dated 16 December 1846.[97]

Despite this short period of study and the apparent difficulties between master and pupil, Lemmens seems to have learned more about pedal technique than he could have in France or Belgium given the state of pedal playing there.[98] And while it is highly unlikely that Hesse was teaching performance practice which Johann Sebastian himself would have employed, given the default touch in Germany at that time was legato — which Lemmens developed to a greater extreme and first codified in his *École d'orgue*, discussed further in Chapter 3 — the style of playing itself ultimately was irrelevant as far as reputation was concerned. Fétis spread the rumour far and wide that his prize pupil had learned Bach from one of the greatest organists of the age, which

---

[95] Fétis, *Biographie universelle* 5 (1867), 267: "Après qu'il y eut passé une année, Hesse écrivit à l'auteur de cette notice: *Je n'ai plus rien à apprendre à M. Lemmens: il joue la musique la plus difficile de Bach aussi bien que je puis le faire.*"
[96] Peterson, "Lemmens and Nineteenth-Century Organ Methods," 62–63.
[97] Peterson, "Lemmens and Nineteenth-Century Organ Methods."
[98] This is discussed in full detail in Yearsley, *Bach's Feet*, 228–236.

afforded Lemmens great prestige as a recitalist and teacher.[99] His own pupils, especially Charles-Marie Widor, were happy to tout their teaching lineage, and for nearly a century, the myth that Bach performed his works with absolute legato relying on finger substitution and heels more than ever before, and the use of seamless dynamic changes became fact throughout most of the Francophone world.[100]

Fétis was the mastermind behind Lemmens's early successes in France; his letter of introduction to Cavaillé-Coll resulted in several invitations for Lemmens to play various new organs in May 1850.[101] In August the same year, Lemmens returned to play a recital on the 1846 Cavaillé-Coll organ at the Pentemont; the full disposition is lost, but Félix Raugel records the organ as having 24 stops, 12 on the grand orgue, eight on the récit, and four on the pedal.[102] This would have given Lemmens some flexibility in terms of changing dynamics, but it would not have been able to create the same grand effect of crescendo as a larger Cavaillé-Coll organs simply due to its smaller size. Nonetheless, his performances made a distinct impression; reviewer Henri Blanchard (after acknowledging Lemmens's study with "the excellent organist from Breslau" [referring to Hesse][103]) noted that "after having told us some of Sébastien Bach's beautiful fugues, he played us in his own way with a good style and that modern [absolute legato] touch."[104] Blanchard was particularly impressed with "the distinction of [Lemmens's] ideas, always presented and rendered in a pure, elegant, and clear style"

[99] Fétis, *Biographie universelle* 5 (1867), 267.
[100] Ochse, *Organists and Organ Playing*, 180, 189.
[101] Ochse, *Organists and Organ Playing*, 48, 73, 76.
[102] Raugel, *Les grandes orgues*, 251–252.
[103] Henri Blanchard, "Auditions musicales," *Revue et Gazette Musicale de Paris* 33 (18 August 1850), 273: "Elève de l'excellent organiste de Breslau, Lemmens..."
[104] Blanchard, "Auditions musicales," 274: "Après nous avoir dit quelques unes des belles fugues de Sébastien Bach, il nous en a joué de sa façon d'un bon style..."

— features that would soon become hallmarks of Lemmens's pupils, especially the legato touch and clarity.[105]

The aesthetics of the Late French Romantic Organ School were ultimately forged through Fétis's desire to bring Bach to the Francophone world. While the relationship between Fétis, Lemmens, and Hesse was complicated, the details never made it into the eye of the French-speaking musical public, and as such Lemmens's ideas were able to spread unchecked. His new ideas about absolute legato in Bach's works quickly became engrained in Francophone organ pedagogy, but the other most distinctive feature of the French Romantic Organ School's performance practices was their use of dynamics, made possibly through the organ technology pioneered by Aristide Cavaillé-Coll and his colleagues.

[105] Blanchard, "Auditions musicales," 274: "la distinction de ses idées, toujours émises, rendues en style pur, élégant, clair."

Chapter 2: Influence of the Instruments

Introduction

Prior to the French Revolution, organbuilding in the Francophone world was largely serialised: instruments basically all had the same disposition, even if they sounded very different, and the nature of entire pieces would be determined by the registrations composers requested. The years following the French Revolution were a time of great rebuilding and innovation in organ building. Developments in technology allowed organs to make seamless crescendos, and a rich exchange between organ performers and builders resulted in instruments with more subtle expressive capabilities than ever before. The aesthetics of Bach in the French Romantic Organ School were integral to this dialogue, especially the work of organ builders Aristide Cavaillé-Coll and Joseph Merklin.

During the turmoil between 1789 and 1799, many churches and organs had been damaged (if not outright destroyed), and the main focus of organ art in the first decades of the nineteenth century was rebuilding existing instruments or creating new ones.[106] Yet it was Cavaillé-Coll's instruments and innovations which fully enabled the performing practices which are the hallmarks of the French Romantic Organ School. The secondary literature about this organbuilder is extensive; Jesse Eschbach's publications on Cavaillé-Coll's innovations and his rise and success connect the technological innovations to the musical results which Widor and his colleagues would apply to Bach and can be heard on the Welte rolls in Seewen.[107] In contrast to

[106] Ochse, *Organists and Organ Playing*. Jesse Eschbach, *Cavaillé-Coll and the Musicians* 1 (Raleigh: The Sunbury Press, 1980), 1–7.
[107] Jesse Eschbach, *Aristide Cavaillé-Coll: Aspects of His Life and Work* (Paderborn: Verlag Peter Ewers, 2012). Jesse Eschbach, "Aristide Cavaillé-Coll: Master of Masters," in *The Organ as a Mirror of its Time*, ed. Kerala J. Snyder (Oxford: Oxford University Press, 2002), 230–241.

Eschbach, Barbara Owen portrays Cavaillé-Coll as less of an inventor, but a compiler who took many of the best innovations of the day and put them to use in his instruments: the Barker Lever, high wind pressures and the use of multiple chests, and increased use of the swell box.[108] The aesthetic evolution of organs is discussed by Kurt Lueders, who at the end of his exposé on Cavaillé-Coll's activity and the controversial reception history of his instruments, discusses several areas of further exploration which are the subject of this chapter, particularly the relationship between Lemmens, Fétis, Cavaillé-Coll, and his competitor Merklin.[109]

The French Baroque Organ

In the seventeenth and eighteenth centuries, Francophone organs followed the same basic patterns of design, and almost always included three families of pipes: montres or principals, which do not seek to imitate any orchestral instrument; flutes; and reeds, which can imitate any number of woodwind or brass instruments. Certain conventions of Francophone organ design pervaded; for example, one could always expect to find a loud 8' trumpet stop on the Grand Orgue and a contrasting 8' reed on the Positif; the Grand Orgue would often have a Cornet — 8' flute, 4' principal, and flutes 2 ⅔', 2', and 1 ⅗' — all controlled by a single stop knob, where the Positif would have all the individual stops of a Cornet, but they would be softer and each controlled by a separate stop knob. As a result, certain musical forms idiomatic to the organ emerged, which were based on the registration: a Basse de trompette, for instance, would usually

[108] Barbara Owen, "Technology and the Organ in the Nineteenth Century," in *The Organ as a Mirror of its Time*, ed. Kerala Snyder (Oxford: Oxford University Press, 2002), 213–229.
[109] Kurt Lueders, "Reflections on the Esthetic Evolution of the Cavaillé-Coll Organ," in *Charles Brenton Fisk, Organbuilder: Essays in His Honor* 1, ed. Fenner Douglass, Owen Jander, and Barbara Owen (Easthampton, Massachusetts: The Westfield Center for Early Keyboard Studies, 1986), 119–142.

feature a solo in the left hand on a trumpet stop with some accompanying flues (principals and/or flutes); the Grand Jeu includes the Cornet, reeds, and some flue pipes.[110]

The most important organbuilding treatise written prior to the French Revolution was Dom Bédos de Celles's *L'art du facteur d'orgues* (1766); in volume three, he lists twelve dispositions of organs of different sizes, from largest to smallest.[111] The eleventh, the smallest organ with two manuals, would have the disposition shown in Table 1.

I. Positif		II. Grand orgue		Pédale	
Bourdon	8'	Bourdon	8'	Flûte (beginning on C)	8'
Prestant	4'	Montre or Prestant	4'	Trompette	8'
Nasard	2 ⅔'	Doublette	2'		
Doublette	2'	Cymbale	IV		
Tierce	1 ⅗'	Grand Cornet	V		
Larigot	1 ⅓'	Trompette	8'		
Cymbale	III				
Cromorne	8'				

Table 1. Disposition of the eleventh "quote" ("Devis") of "a small [organ based on a] 4' principal" from Dom Bédos de Celle's L'art du facteur d'orgues.

Fenner Douglass's *The Language of the French Classical Organ* includes registration instructions from 11 different treatises written between 1665 and 1766, and the disposition in Table 1 is able to play the vast majority of the French Baroque repertoire.[112]

Unlike Lutheran liturgies during this period where music was the sole focus of certain parts of services, liturgical action and music in the Roman Catholic Mass

[110] For a comparison of different registration combinations, see the tables in Douglass, *The Language of the French Classical Organ*, 115–125.
[111] François Lamathe Bédos de Celles de Salelles, *L'art du facteur d'orgues* 3 (Paris: Dom Bédos, 1766), 489–496.
[112] Douglass, *The Language of the French Classical Organ*, 115–125.

occurred simultaneously and the beginnings and endings of parts of the liturgy only synchronised at designated places.[113] This therefore demanded that organists be especially flexible enough to begin or end a piece at the appropriate moment, and thus most of the organ music was improvised.[114] Nearly all of the surviving French organ repertoire from this period was not designed to serve a specific religious community or occasion, but served primarily as models for improvisation.[115] Both these factors resulted in organ music which was not based on a cantus firmus, and the general effect or mood of the piece was determined by the registration; however, the title alone — almost always a specific registration — would not give the performer all the information needed; for example Guillaume-Gabriel Nivers, an organist who published prolifically in the latter half of the seventeenth century, says that a piece entitled "Voix humaine" should be played on not only the Voix humaine, but the 8' bourdon and tremblant as well.[116] While many prefaces and treatises often disagree exactly which combination of stops one should use in every piece, the overall effect is nearly always identical; for example, nearly every source agrees that a "Fugue" would be played on a cromorne or trompette and an 8' bourdon; there is some disagreement on whether another 4' flue should be added, but the addition of one such softer stop would not fundamentally change the resulting character of the piece.[117]

---

[113] In 1570 Pope Pius V promulgated the use of the *Missale Romanum* (Venice: Joannem Variscum & Heredes Bartholomei Faletti, 1570) throughout the Latin Church. In the late seventeenth century in France new missals were produced with varying rites, but in general, the principle of the music and spoken portions of the Mass were only synchronised at specific moments.

[114] Edward Higginbottom, "The French Classical Organ School," in *The Cambridge Companion to the Organ*, ed. Nicholas Thistlethwaite and Geoffrey Webber (Cambridge, UK: University of Cambridge Press, 1999), 178–179.

[115] Higginbottom, "The French Classical Organ School," 178–179.

[116] Guillaume-Gabriel Nivers, *Livre d'orgue contenant cent pièces de tous les tons de l'Église* (Paris: Ballard, 1665).

[117] See the comparison of different French baroque organists' opinions on how to register fugues in Douglass, *The Language of the French Classical Organ*, 116.

The wealth of writings and surviving music that comprises the French Baroque organ literature indicate several important things: there are very few registration changes within a single organ verset, and when there are changes, they mark the beginning of new material or a new overall mood; therefore, crescendos and decrescendos were only achieved by the addition of notes, not changing stops; and the pedals were primarily used to hold long cantus firmus notes, or slow-moving bass lines.

Post-Revolution Francophone Organbuilding

It was only after the Revolution that Francophone organbuilding began to diverge from this tradition. The widespread introduction of new innovations provided organists greater possibilities for musical expression. The introduction of string pipes allowed organists to use greater tone colours in registration, and milder voicing and more generous flue pipe scaling favoured a less aggressive articulation at the beginning of the note. The introduction of the swell box on most new instruments also profoundly impacted performance practice; while mechanical action organs always allowed a spectrum of articulation due to the player's ability to open the palate as quickly or slowly as they wished, the introduction of the swell box — whereby a division of pipes are surrounded by a wooden box with some sort of opening (most often similar to Venetian blinds) — finally allowed organists to manufacture dynamic changes without changing stops or playing more notes.[118] Organbuilders began to search for new ways to

[118] Abraham Jordan claims to be the inventor of the swell box, and almost certainly built the first example in England in 1712; however, echo boxes, which produced a similar effect, were seen earlier on Iberian organs, the oldest record of which is at the Cathedral in Seville, Spain, installed in 1703 by Antonio Pedro Faleiro. For a discussion on the invention of early swell boxes, see Wesley D. Jordan, "Manoel de S. Bento Gomes, *Magister aenigmaticus*: Notes about an Eighteenth Century Organbuilder from Valladolid, His Work and His Importance to Organography," *Revista de Musicología* 16, no. 6 (1993), 3278–3292.

make the instrument grow in power as well, applying increasingly high wind pressures; the difficulty was that the key actions became correspondingly heavy.

Aristide Cavaillé-Coll championed such organbuilding innovations. Having grown up in obscurity in Montpellier and being self-taught, he got his "big break" from Gioachino Rossini, who heard one of Aristide's Poïkilorgues (a relative of the harmonium) while conducting a Meyerbeer opera in Toulouse; Rossini suggested Cavaillé-Coll's talents were wasted in the provinces, and that he should go to Paris.[119] Aristide took Rossini's advice and moved in autumn 1833, and soon after arriving won a major contract to build a five manual organ for the church of Saint-Denis; it included many mixtures, cornets, reeds, and low-pitched foundations — in short, stops that use a great amount of wind.[120] Making the project increasingly difficult was the promise that all five manuals could be coupled together. With such high wind pressures, Cavaillé-Coll struggled to build palettes small enough to enable a light key action; his problem was solved upon meeting Charles Barker, who had developed a pneumatic lever that, when applied to organ keyboard action, relieved most of the weight.[121] The organ was a success, and secured Cavaillé-Coll's future as one of the leading organbuilders in Paris, while also eventually forcing the competition to adopt higher wind pressures and the Barker lever in basically every large organ.

Yet Cavaillé-Coll was not without competition; the Belgian builder Joseph Merklin was constantly vying for the best organists in France to dedicate his firm's new instruments. His organs follow many of Cavaillé-Coll's principles, yet never received a

[119] Fenner Douglass, *Cavaillé-Coll and the French Romantic Tradition* (New Haven: Yale University Press, 1999), 9–10.
[120] Douglass, *Cavaillé-Coll and the French Romantic Tradition*, 13–15.
[121] For a fully-translated description from Cavaillé-Coll himself on these developments, see Douglass, *Cavaillé-Coll and the French Romantic Tradition*, 18–27. This is also discussed at length in Eschbach, *Cavaillé-Coll and the Musicians* 1, 13–32.

fraction of the attention showed to his competitor; Michel Jurine's 1989 dissertation on Merklin is the only secondary source to study his works in any detail.[122] Like Eschbach's monograph on Cavaillé-Coll, the narrative is concise yet brimming with detail, and indicates that Merklin was forced to adopt many of Cavaillé-Coll's innovations, as they were so popular among organists that Merklin could not sell instruments that did not include technology pioneered by his competitor.[123]

These, plus the inclusion of swell boxes, were employed on the 1844 Daublaine-Callinet organ at Saint-Eustache in Paris, the inauguration of which was discussed in the previous chapter, including in Hesse's performance of the *Toccata in F Major*. The disposition is shown in Table 2:[124]

I. Positif (54 notes)		II. Grand orgue (54 notes)		III. Bombarde (54 notes)	
Flûte (en montre)	8'	Montre	16'	Bourdon	16'
Bourdon	8'	Bourdon	16'	Flûte	8'
Salicional	8'	Montre	8'	2e flûte	8'
Prestant	4'	Bourdon	8'	Cornet	V
Clarabella	4'	Flûte	8'	Bombarde	16'
Nasard	2 ⅔'	Gambe	8'	Trompette	8'
Doublette	2'	Prestant	4'	Clairon	4'
Plein jeu	V	Gambe	4'		
Cornet	V	Nasard	2 ⅔'		
Cromorne	8'	Doublette	2'		
Basson	8'	Fourniture	V		
Trompette	8'	Cymbale	IV		
Clairon	4'	Grand cornet	V		
		1re trompette	8'		
		2e trompette	8'		
		Euphone	8'		
		Clairon	4'		
IV. Récit expressif (42 notes)		Pédale "normal" (28 notes, A–c)		Deuxième pédalier ("à la française")	
Quintaton	16'	Flûte	16'	Contrebasse	16'
Bourdon	8'	Bourdon	16'	Flûte	8'

[122] Michel Jurine, "Joseph Merklin, facteur d'orgues: sa vie et son œuvre" (PhD diss., Université Paris-Sorbonne, 1989).
[123] Jurine, "Joseph Merklin."
[124] Raugel, *Les grandes orgues*, 195–196.

Flûte harmonique	8'	Quinte	12'	Violoncelle	8'
Flûte	4'	1re flûte	8'	Flûte	4'
Prestant	4'	2e flûte	8'	Euphone	16'
Nasard	2 ⅔'	Flûte	4'	Euphone	8'
Doublette	2'	Bombarde	16'	Trompette	8'
Euphone	16'	2e bombarde	16'		
Euphone	8'	Trompette	8'		
Euphone	4'	Clairon	4'		
Hautbois	8'				
Cor anglais	8'				
Voix humaine	8'				
Trompette	8'				
Clairon	4'				

Table 2. Disposition of the 1844 Daublaine-Callinet organ at the Church of Saint-Eustache in Paris, no longer extant.

This organ's disposition and several design features pervaded most nineteenth century French organs: the addition of strings on the Positif and Grand Orgue (Salicional and Gambes, respectively), including a full battery of reeds at 16', 8' and 4' pitches in the manuals (Bombarde and Récit), multiple stops of the same pipe construction (1re and 2e flûtes on Bombarde), the swell box (always designated "expressif" in Francophone stoplists), and Barker levers.[125] Unusually, the organ included international elements, most notably two pedalboards: one French and one German (both containing 28 notes from AA to C; the layout and design of these is, however, unclear).[126] Apparently this decision was made by Barker, specifically to allow the playing of German repertoire.[127] This wide variety of stops of similar design plus a swell box would easily have allowed for the "remarkably powerful crescendo" heard in Lefébure-Wély's improvisation during the inauguration, and Hesse's "taking advantage of the crescendo and diminuendo pedal so skilfully" — referring to the swell pedal — in his performance of

[125] For discussion of the controversy between Cavaillé-Coll and Daublaine-Callinet regarding the use of the Barker lever, see Eschbach, *Cavaillé-Coll and the Musicians* 1, 33.
[126] Eschbach, *Cavaillé-Coll and the Musicians* 1, 35–36.
[127] *Nouveau Manuel Complet de l'Organiste* (Paris, 1905), 118.

Bach's *Toccata in F Major*.[128] Unfortunately, a few days before Christmas 1844, the organ was destroyed by fire; the irony was that the blaze was caused by the very man who made its key action possible: Charles Barker dropped a candle during routine maintenance.[129]

The mishap clearly had no impact on Barker's business in the long run, though, as the leading organbuilders of the next 60 years would use his innovations: Cavaillé-Coll, Joseph Merklin, and many others. Cavaillé-Coll's organs were the most sought after, though, and he built an organ for nearly every major church and concert hall in Paris by the end of his career. The hallmarks of his "mature" instruments were the ability to create a seamless crescendo, achieved by adding stops without attracting the listener's attention. This was in part possible due to the introduction of ventils.

Francophone organbuilders began experimenting with using multiple wind pressures in a single division; the most notable developments were the flûte harmonique (an overblown flue stop resulting in the pipes becoming increasing loud the higher in the pitch), and the reeds being placed on higher pressure windchests. The latter resulted in builders adding mechanisms to control the flow of wind into those chests, which were known as ventils. Most commonly they were placed as foot levers just above the pedalboard, and the stop names were sometimes written in a different colour; when an organist wished to activate the reeds, they could pull whichever stops they wished, knowing that only the "black" stops would play until they activated the ventil, at which point the "red" stops would join.

[128] *La france musicale* 7, 197 and *Le Ménestrel* 11, no. 30, 2.
[129] The details can be found in *La Presse*, Paris edition, 19 December 1844.

By the late 1850s, the French Romantic Organ had fully developed. A typical example is the 1859 Cavaillé-Coll organ at Sainte-Clotilde in Paris, the disposition of which is shown in Table 3.[130]

I. Grand orgue (54 notes)		II. Positif (54 notes)		III. Récit (54 notes)	
Montre	16'	Bourdon	16'	Bourdon	16'
Bourdon	16'	Montre	8'	Flûte harmonique	8'
Montre	8'	Gambe	8'	Viole de gambe	8'
Bourdon	8'	Flûte harmonique	8'	Voix céleste	8'
Flûte	8'	Bourdon	8'	Flûte octaviante	4'
Gambe	8'	Salicional	8'	Octavin	2'
Prestant	4'	Prestant	4'	Basson-Hautbois	8'
Octave	4'	Flûte octaviante	4'	Voix humaine	8'
Quinte	2 ⅔'	Quinte	2 ⅔'	Trompette	8'
Doublette	2'	Doublette	2'	Clairon	4'
Plein jeu		Plein jeu			
Bombarde	16'	Clarinette	8'		
Trompette	8'	Trompette	8'		
Clairon	4'	Clairon	4'		

Pédale (27 notes, C–d)		Pédales de combinaison	*Péd. de comb. Translation*
Quintaton	32'	Tirasse Grand Orgue	*Grand Orgue to Pédale*
Contrebasse	16'	Tirasse Positif	*Positif to Pédale*
Flûte	8'	Tirasse Récit	*Récit to Pédale*
Octave	4'	Grand Orgue sur	*Activate G.O. Barker*
Bombarde	16'	machine	*levers*
Basson	16'	Copula Positif sur G.O.	*Positif to G.O.*
Trompette	8'	Copula Récit sur Positif	*Récit to Positif*
Clairon	4'	Octaves graves G.O.	*G.O. to G.O. 16'*
		Octaves graves Positif	*Positif to Positif 16'*
		Octaves graves Récit	*Récit to Récit 16'*
		Anches Pédale	*Pedal reeds ventil*
		Anches Grand Orgue	*G.O. reeds ventil*
		Anches Positif	*Positif reeds ventil*
		Anches Récit	*Récit reeds ventil*
		Tremblant du Récit	*Récit tremulant*
		Expression du Récit	*Swell pedal*

Table 3. Original disposition of the 1859 Cavaillé-Coll organ at the Church of Sainte-Clotilde in Paris, with a translation/explanation of the Pédales de combinaison.

[130] Félix Raugel, *Les grandes orgues des églises de Paris et du département de la Seine* (Paris: Librairie Fischbacher, 1927), 205–206.

This disposition shows several significant differences from the Daublaine-Callinet organ at Saint-Eustache, many of which would become hallmarks of Cavaillé-Coll's major instruments: the use of ventils ("Anches [division]" under Pédales de combinaison), a relatively small pedal division as compared to every other division, the use of sub-octave couplers in the manual divisions ("Octaves graves [division]"), and changing the order of manuals so that the Grand Orgue was the lowest, not the Positif.

Another example is the 1852 Merklin & Schütze instrument at Saint-Barthélemy in Liège, Belgium, the oldest definitively Romantic organ in Belgium and a major milestone in the firm's output.[131] The disposition is shown in Table 4.[132]

I. Grand orgue (56 notes)		II. Positif (56 notes)		III. Echo expressif (56 notes)	
Principal	16'	Montre	8'	Dolce	8'
Montre	8'	Bourdon	8'	Bourdon	8'
Viole de Gambe	8'	Salicional	8'	Fugara	4'
Flûte	8'	Voix céleste	8'	Flûte	4'
Bourdon	8'	Prestant	4'	Cornet	II-III
Flûte	4'	Flûte traversière	4'	Basson-Hautbois	8'
Prestant	4'	Flageolet	2'	Voix humaine	8'
Doublette	2'	Plein Jeu			
Cornet	V	Trompette	8'		
Fourniture	IV-V	Euphone	8'		
Trompette	16'				
Trompette	8'				
Clairon	4'				

Pédale (30 notes, C–f)		Accessoires (aux pieds)	*Accessoires Translation*
Violon	16'	Tonnerre	*Thunder*
Soubasse	16'	Tirasse Gd Orgue	*Grand Orgue to Pédale*
Flûte	8'	Tirasse Positif	*Positif to Pédale*
Bombarde	16'	Tirasse Récit	*Récit to Pédale*
Trompette	8'	Positif au Gd Orgue	*Positif to Grand Orgue*
Clairon	4'	Gd Orgue à la machine	*Activate G.O. Barker levers*
		Récit au Gd Orgue	*Récit to G.O.*

[131] Jean Ferrard, "François-Joseph Fétis et Joseph Merklin, unis pour le progrès de le facture d'orgues en Belgique," *Revue belge de Musicologie / Belgisch Tijdschrift voor Muziekwetenschap* 62 (2008), 186.
[132] Guido Schumacher and Monique Dehin, "La restauration du grand orgue Merklin de l'ancienne collégiale Saint-Barthélemy à Liège," *Festival d'Orgue de Liège* (2014), 26–28. "Église Saint-Barthélemy (Grand Orgue)," Liège Les Orgues, accessed 5 September 2020, https://liegelesorgues.eu/orgues/eglise-saint-barthelemy-grand-orgue/.

Anches Gd Orgue	*G.O. reeds ventil*
Expression III	*Swell pedal (can be locked in three positions)*
Trémolo III	*Récit tremulant*

Table 4. Original disposition of the 1852 Merklin & Schütze organ at the Collegiate Church of Saint-Barthélemy in Liège, with author's translation/explanation of the Accessoires.[133]

Both Sainte-Clotilde and Saint-Barthélemy are typical examples of significant three-manual French Romantic Organs, and are similar in many ways. The Grand Orgue of both organs are nearly identical: Cavaillé-Coll favours a 16' Bourdon as well as a 16' Montre, while Merklin only has one 16' Montre and instead includes a Cornet. Merklin 's Positif division is considerably smaller; it does not contain the full battery of reeds at 16', 8', and 4' pitches, and is only based at 8' pitch, rather than 16'. Merklin's Echo expressif, though, leaves much to be desired compared to the hallmarks of the Cavaillé-Coll organ: there is no harmonic flute, no trumpet or clairon, and no 2' flue. Merklin includes a second Cornet here, though, whereas Sainte-Clotilde has none. Cavaillé-Coll's pedal is larger, and includes a 32' Quintaton, while the lowest pitch in the Merklin organ is 16'; the pedal reeds are identical, except Sainte-Clotilde also has aa Basson 16', in addition to the loud 16' Bombarde. Merklin favours more flue stops in his pedal, and has a Violon 16', which is missing at Sainte-Clotilde.

The impact of Hesse's Bach at the Saint-Eustache inauguration was already being felt: despite the differences between Cavaillé-Coll and Merklin, the old French pedalboard had given way to the German style, which enabled César Franck to play

[133] This list reflects the stoplist in 1852; the following stops were added during the 2014 restoration: G.O. Nasard 2 ⅔', Récit Cor de chamois 8', and Pédale Bourdon 8'.

Bach's *Prelude and Fugue in E Minor* (whether it was BWV 533 or 548 is unclear) as part of the inauguration concert at Sainte-Clotilde in 1859.[134]

By the 1860s, registration practice in newly composed music was becoming standardised. Composers generally assumed that large works like organ symphonies would be performed on an organ of at least three manuals, with an enclosed Récit, some form of overblown (harmonic) flute, reeds at 8' and 4' pitch, and ventils. Cavaillé-Coll and his contemporaries built many larger organs, too, but these were the hallmarks of the French Romantic organ. The organ's advanced capabilities for dynamics and easy stop changes were very much in play in performing the works of J.S. Bach, especially by those whose teaching lineage stemmed from Lemmens.

These new organs had developed into fundamentally different instruments from the eighteenth-century Saxon instruments J.S. Bach knew. No organ by Gottfried Silbermann, Zacharias Hildebrandt, or Tobias Heinrich Gottfried Trost has ventils, swell boxes, or plays on the kind of high wind pressure that would require a Barker lever, at least that function remotely in the same way as Cavaillé-Coll. Like French Baroque organs, the only way to increase the volume is to add stops, but with such clear voicing that causes an articulation at the beginning of the tone, the kind of subtle, graded crescendo which had made the French Romantic organs famous is simply not possible. Ultimately, new Francophone organs were capable of greater expression — the ability to seamlessly change dynamics — than ever before, and the new capabilities were applied to all music, whether newly-composed or the works of J.S. Bach.

[134] Raugel, *Les grandes orgues*, 206. The question of whether Franck played BWV 533 or 548 is under debate; for a comprehensive summary of the various arguments, see Russell Stinson, *J.S. Bach at His Royal Instrument: Essays on His Organ Works* (Oxford: Oxford University Press, 2012), 69–71.

Chapter 3: Theoretical Guidelines for Interpreting Bach

Introduction

The rise of Lemmens and his ideas on performance practice coupled with the innovations of Cavaillé-Coll and his competitors laid the foundation for what would become the French Romantic Organ School. With Lemmens's legitimacy secured by Fétis (rightly or wrongly), this prized pupil's rise to prominence as the most important and sought-after organ teacher in the Francophone world, and substantial new instruments with astonishing expressive capabilities, the time was ripe for a new style of organ playing to emerge. While Lemmens's pedagogical book *École d'orgue* includes some performance practice information, the vast majority of the information comes not from new compositions, but from Bach editions themselves.

Articulation

The details of Lemmens's teaching in Brussels are codified in his *École d'orgue*, the first pedagogical organ treatise to extensively advocate for finger substitution. While Lemmens learned this technique from Fétis and possibly Hesse, Lemmens took it to the extreme, with the first three pages of exercises solely dedicated to the technique.[135] The preface begins:

> "To correctly execute organ music in four parts, it is essential to be well acquainted with every fingering combination. Piano fingering is insufficient for organists; these [organists] cannot pay too much attention to this important part of the complicated study of the organ, which we will try to simplify as much as possible by trying to give an exact idea of the different ways of fingering.

[135] Jaak Nikolaas Lemmens, *École d'orgue: basée sur le plain-chant romain* (Germany: B. Schotts Söhne, 1862), 5–7. The text of the first edition, Jacques-Nicolas Lemmens, *École d'Orgue basée sur le Plain-chant Romain* (Brussels, 1862) is identical to that of the Schott printing, except Schott contains a German translation, and does not include the *École de la pédale* (see Appendix B). Because the first edition is exceedingly rare, all further citations refer to the Schott edition's French text.

> The connected style, which is in the special character of the organ, presents the greatest difficulties; to resolve them, fingering by substitution offers the most resources. 'Substitute' means, in this sense: replace one finger by another on the same key, without there being any discontinuity in sound..."[136]

Immediately, Lemmens establishes that polyphony is to be performed with finger substitution, and while he never overtly says the aim is a perfect legato, his examples easily achieve that result. Figure 1 is a four-part exercise in which nearly every note requires finger substitution:

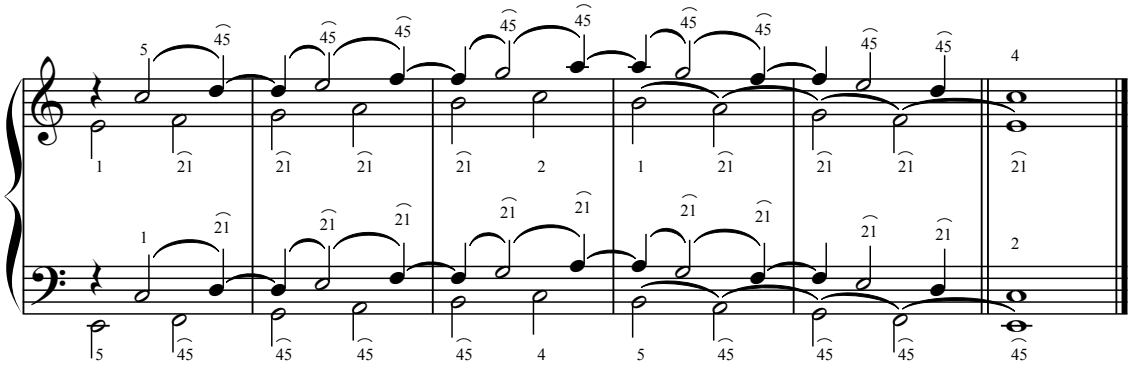


Figure 1. Jacques-Nicolas Lemmens: École d'orgue*, Example 7, which shows a fingering practice which achieves absolute legato.*

In addition to finger substitution, Lemmens also advocates, in certain instances, an extreme fingering technique — the "glide" ("glissé"), used for moving between semitones:

> "The glide is easy when it is done from a black key to a white one, going up or down a semitone; but it requires great dexterity when using the thumb on two white keys. See Example 17, where the range is limited only to the thumb." [137]

[136] Lemmens, *École d'orgue*, 2: "Pour exécuter correctement la musique d'orgue à quatre parties, il est indespensable de bien connaître toutes les combinaisons du doigter. Le doigter du piano est insuffisant pour les organistes; ceux ci ne sauraient porter une attention trop sévère sur cette partie importante de l'étude compliquée de l'orgue, que nous tâcherons de simplifier autant que possible en nous efforçant de donner une idée exact des différentes manières de doigter.
"Le style lié, qui est dans la caractère spécial de l'orgue, présente les plus grandes difficultés; pour les résoudre, le doigter par *substitution* offre le plus de ressources. Substituer veut dire, en ce sense: remplacer un doigt par un autre sur une même touche, sans qu'il y ait discontinuité de son..."

[137] Lemmens, *École d'orgue*, 2: "Le glissé est facile lorsqu'il se fait d'une touche noire à une blanche, en montant ou en descendant d'un demi-tone; mais il exige une grande dextérité, quand il s'opère du pouce sur deux touches blanches. Voir l'exemple 17, où la gamme est liée de pouce seul."

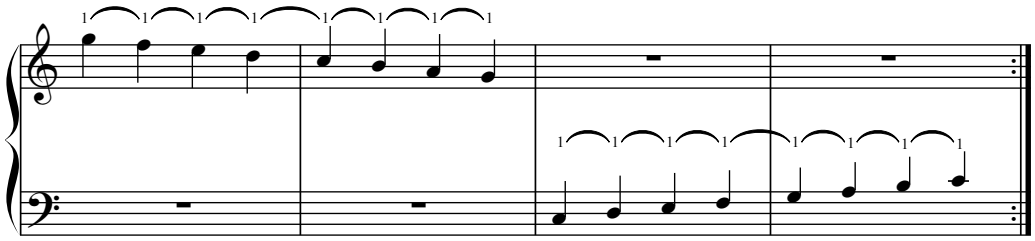


Figure 2. Jacques-Nicolas Lemmens: École d'orgue*, Example 17, for practising the "glide."* [138]

Figure 2 shows how an entire scale beyond semitones could be played with just the thumb. Lemmens goes on to explain exactly how to realise this exercise:

> "This result is achieved by advancing the thumb far enough along the key to be able to hold it down using the second phalanx, while turning the nail above the neighbouring fingerboard. The reverse movement of this fingering is impractical."[139]

This is useful in playing octaves, as seen in a later example in the *École d'orgue*; Figure 3 is a reproduction of a descending chromatic scale:

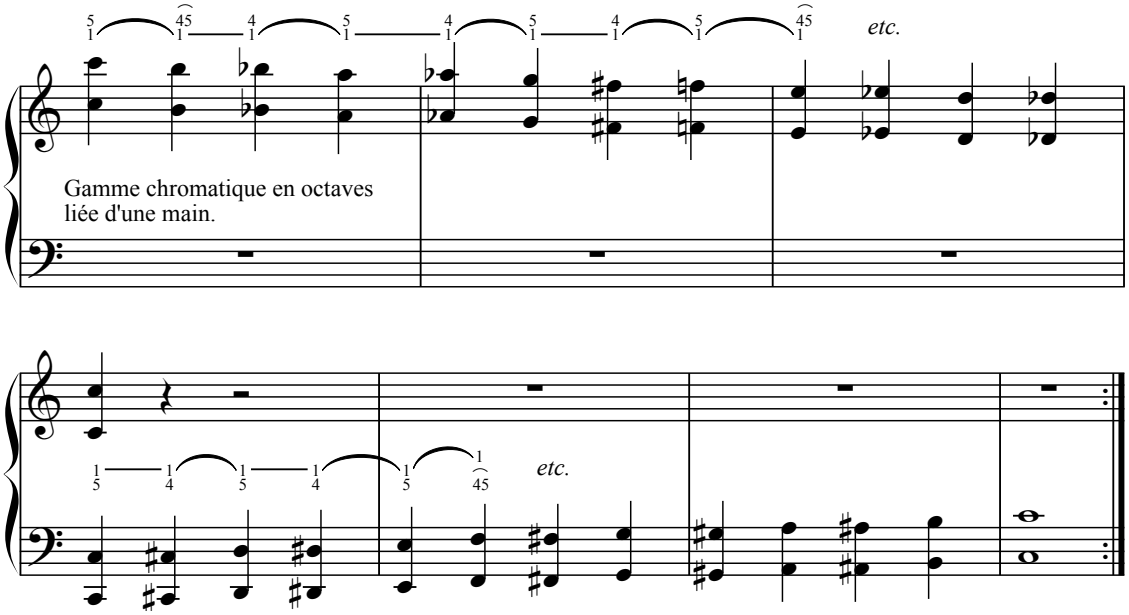


Figure 3. Jacques-Nicolas Lemmens: École d'orgue*, Example 21.*[140]

[138] Lemmens, *École d'orgue*, 7.
[139] Lemmens, *École d'orgue*, 2: "On obtient ce résultat en avançant le pouce assez loin sur la touche pour pouvoir la tenir baissée par la deuxième phalange, pendant qu'on tourne l'ongle au-dessus de la touche voisine. Le mouvement inverse de ce doigter est pour ainsi dire impraticable."
[140] Lemmens, *École d'orgue*, 7.

In this exercise, the top voice in the right hand remains legato through a combination of finger substitution and the thumb performing the "glide"; the left hand does the same, but the top voice achieves absolute legato through the "glide", while the bottom voice relies on alternating keys between different fingers and occasionally finger substitution. These and the dozens of other examples in the *École d'orgue* indicate that, for Lemmens, these techniques were fundamental to developing an organist's default articulation. The following composition later in the *École*, reproduced in Figure 4, shows the ways in which Lemmens's techniques could be applied in polyphony. He never has the same finger play two notes in a row (unless performing a "glide", that would inevitably result in a slight break between pitches), uses some finger substitution, and suggests glides in bars 10 and 12 in the alto.

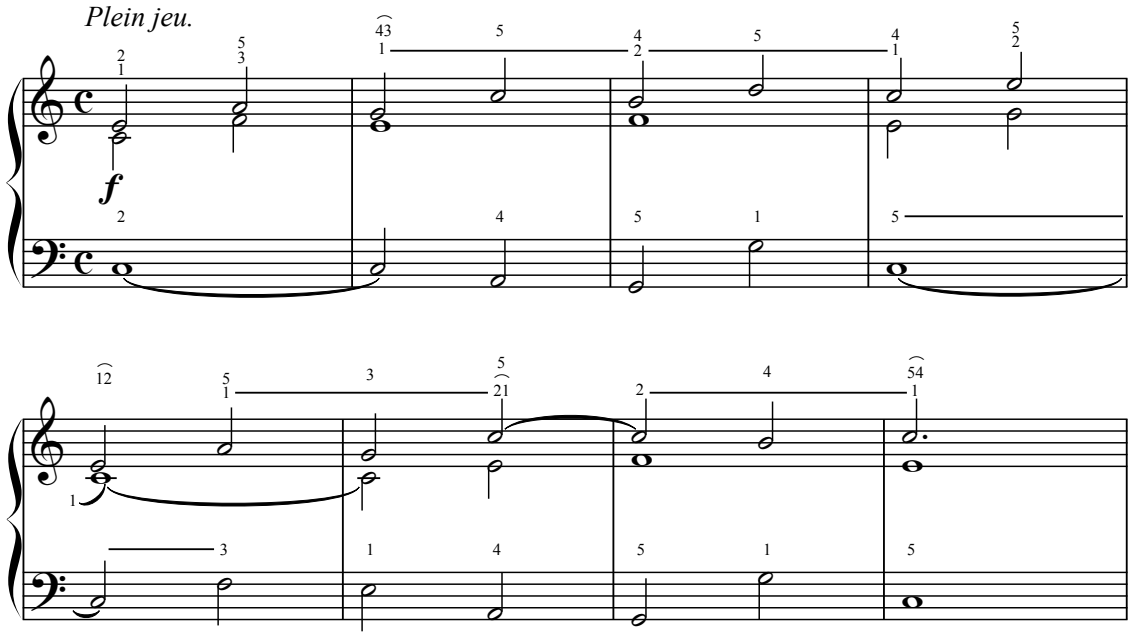


Figure 4. Jacques-Nicolas Lemmens: École d'orgue*, Prélude 1, bars 1–8, with a fingering that easily results in perfect legato.*[141]

[141] Lemmens, *École d'orgue*, 8.

The combination of these techniques result in an absolute legato throughout the exercise.

The Paris Conservatoire before Lemmens

Lemmens's pupils Widor and Guilmant eventually took over the Paris Conservatoire and passed on their teacher's ideas.[142] Their predecessor, the French organist and composer César Franck, had espoused similar fingering and pedal techniques as Lemmens; these resulted in a strong preference for legato, though not strict absolute legato. Yet Franck must have appreciated Lemmens's ideas, as his organ class at the Conservatoire used three method books: Rinck's *Practische Orgelschule* (which Richault had released in 1833 in a French translation as *École d'orgue pratique*), the Lemmens *École d'orgue*, and Lemmens's pupil Clément Loret's *Cours d'orgue et exercise journalier*.[143] Yet apparently Franck did not follow Lemmens's pedallings religiously; Rollin Smith compares the pedallings of Lemmens and Franck on the same musical passage, shown in Figure 5:

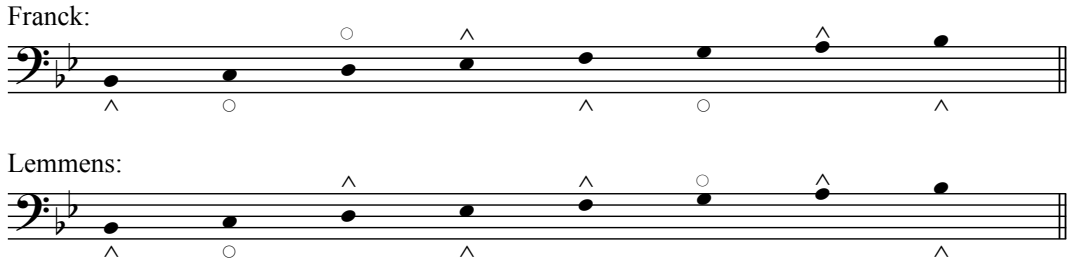


Figure 5. Comparison of pedallings of a B-flat major scale, as marked by Lemmens and Franck. The symbol ^ indicates the pedal should be played by the toe, and the symbol ○ indicates the pedal should be played by the heel; if the symbol is below the note, it is played with the left foot, and if above by the right.[144]

[142] Ochse, *Organists and Organ Playing*, 183–184, 195.
[143] C.H. Rinck, *Practische Orgelschule* (Berlin: Simrock, c. 1794). Clément Loret, *Cours d'orgue et exercise journalier* (Paris: La Maîtrise, 1858–1859). Lemmens, *École d'orgue*.
[144] Lemmens, *École d'orgue*, 8. Franck's pedalling is taken from an arrangement he made of Charles-Valentin Alkan's *Prière:* "Dieu des Armées", reproduced in Smith, *Toward an Authentic Interpretation*, 33.

Both Franck and Lemmens use a combination of heels and toes in the same scale, but alternate feet in different places; both easily result in absolute legato when played, yet diverge enough that it would be hard to believe that one developed his pedalling from the other.

Lemmens's techniques for playing pedals are considerably different from Hesse; these are seen most clearly when comparing the pedallings in Hesse's 1831 *Kleine Pedalschule*, and Lemmens's *École d'orgue*.[145] In the *École de la Pédale*, the second part of his *École d'orgue*, Lemmens goes into much greater detail than Hesse, detailing several additional extended techniques. As the *École de la Pédale* is not reprinted in the Schott edition, which is the most commonly available today, and original copies of the *École* are exceedingly rare, Lemmens's text with a translation can be found in Appendix B. The relevant portion regarding Lemmens's extended pedal techniques is below:

> "One plays the pedal with two feet: first by *pushing* with the toe or the heel; second while *sliding* with the same foot; third by *substituting* one of the feet for the other, or by substituting the tip for the heel and vice versa...
>
> One will notice while playing [scales], that every time one encounters three black keys in a row, either ascending or descending, one is obliged to slide from the point of one of these black pedals onto the other, which is very difficult to execute.
>
> The *glide* is represented by a hyphen, which is between two letters, like P—P.
>
> The *glide* is also done from a *black* [key] to a *white* [key], going up or down a semitone, and by the toes of the foot. (*See exercise no.* 1*, page* 72).
>
> The *glide* is still done on a single *white* key in order to prepare a good position. For example: to tie with the same foot, *D*, *E*, *F sharp*, you must start with the toe on *D*, then you put your heel on *E*, but to arrive then with the toe at *F sharp*, you have to move the foot by sliding from the heel on the *E*. While making the same passage while descending, it is necessary to step back the foot, while sliding from the heel on the *E*, in order to be able to reach by the point with the *D*...
>
> *Substitution* is... done in two ways: first by substituting one foot for the other; second by substituting the heel for the toe of the same foot, or the toe for

[145] Adolph Hesse, "Kleine Pedal-Schule," in *Nützliche Gabe für Orgelspieler* 1 (Breslau: F.E.C. Leuckart, c. 1860).

the heel... One will also see there that it is necessary to substitute for the heel of one foot the point of the other and for the toe of one the heel of the other...

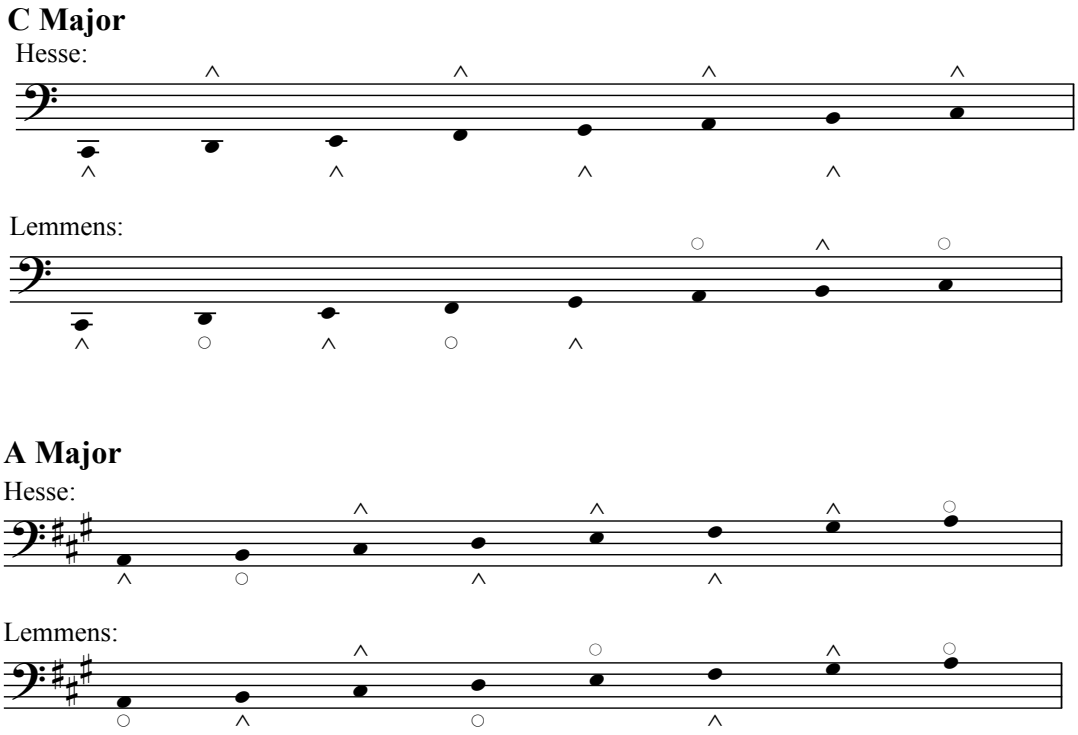
The arpeggios on the pedal have been regarded, until now, as impracticable. However, the execution becomes quite easy if you pass the tip of the left foot behind the heel of the right foot...

The cadences are done in the same way on the pedal as on the manual keyboard. In lively movements, one should play a fewer notes than in the slow movements, to avoid confusion...

Chords rarely have a good effect on the pedal; therefore they should only be used sparingly. One can play, with the same foot, all the intervals of major and minor seconds, all the major and minor thirds, except those which are composed of two black keys..."[146]

The use of the "glide", "substitution", descriptions of arpeggios, and ways to play chords — all of which were basically unknown organ techniques before this point — indicate that for Lemmens, the player could use basically any means necessary to ensure a perfect legato in the pedal.

Figure 6 shows the differences and similarities between Lemmens's and Hesse's methods:



[146] Lemmens, *École d'orgue* (first edition), 68.

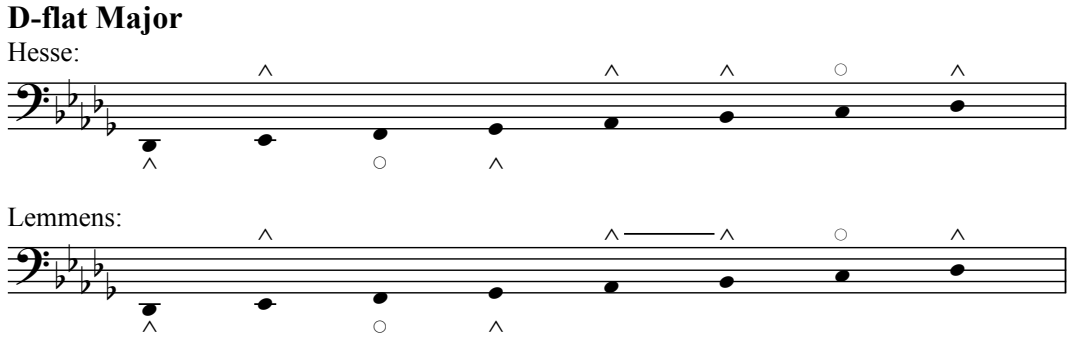


Figure 6. Comparison of pedallings of the same scales, as given in Lemmens's École d'orgue *and Hesse's* Kleine Pedalschule.[147] *See the caption of Figure 5 for an explanation as to the meaning of the symbols.*

In the C major scale, Hesse calls only for the use of toes alternating feet, while Lemmens uses a mix of heels and toes. In the A major scale, the middle two pitches are played by the same feet in the same order, but Hesse prefers toes while Lemmens prefers heels; the last three pitches are identical in both methods. Both methods give the same pedalling for the D-flat major scale, though Lemmens suggests a pedal glide between the fifth and sixth scale degrees. All these pedallings easily result in absolute legato, but the variations between them show significant differences of opinion regarding technique; Lemmens favours the use of heels and toes in basically equal measure, whereas Hesse seems to generally use heels as an exception.

Widor's Organ Class at the Paris Conservatoire

Recollections of Widor's and Franck's student Louis Vierne also shed light on what happened in Widor's studio classes. Rollin Smith's biography of Vierne compiles

[147] Hesse, "Kleine Pedal-Schule," 2. Lemmens, *École d'orgue* (first edition), 70. The original notation of each score is different from what is reproduced in Figure 6, which has been modernised for the sake of simplicity and comparison. In the original, Hesse on page 2 says "*a* means heel, *s* means toe, *l* means left foot, *r* means right foot ("*a*, beduetet Absatz, *s*, bedeutet Spitze, *l*, bedeutet linker Fuss, *r*, bedeutet rechter Fuss."). Lemmens on page 68 describes his chosen notation: "We will indicate the toe with a P, and the heel with a T." ("Nous désignerons la pointe par un P, le talon par un T."). Hesse notates the rhythmic values of his ascending major scales in quavers/eighth notes, except the first and last notes, which are crotchets/quarter notes; Lemmens notates every pitch as a crotchet/quarter note.

several important aspects of his views on Bach, including a bibliography of all of Vierne's writings and recollections.[148] According to Vierne's teacher, Franck was not very interested in performing repertoire, and rather spent most of the five to six hours per week in studio classes teaching improvisation.[149] Part of this was because the focus of all study was always on preparing for the examinations; Vierne said that, from when he was a student to the time of his writing his memoirs between 1931 and 1937, there were four main areas which had remained basically unchanged: accompanying plainsong, "improvisation of a fugue on an assigned subject, free improvisation on an assigned theme, performance by heart [from memory] of an organ piece from the great standard or modern repertoire."[150] According to Vierne, before entering, the Conservatoire also expected that students would already have the manual and pedal technique necessary to play Bach.[151] Rollin Smith compiled a list of examination pieces played by Franck's students between June 1874 and June 1890; out of the 27 pieces on the list, 23 were by J.S. Bach:[152]

Fugue in G Minor, BWV 578
Fugue in C Minor (Legrenzi), BWV 574
Concerto in A Minor (Vivaldi), BWV 593
Fugue in C Minor, BWV 537
Pastorale in F Major, BWV 590
Fugue in G Minor, BWV 131a
Fugue in D Minor, either BWV 538 or 539
Prelude in E-flat Major, BWV 552
Fantasy in C Minor, BWV 537
Fugue in F Minor (WTC I), BWV 857
Fugue in D Minor (WTC II), BWV 875
Fugue in D Minor, BWV 565

---

[148] Rollin Smith, *Louis Vierne: Organist of Notre-Dame Cathedral* (Hillsdale, New York: Pendragon Press, 1999).
[149] Louis Vierne, *Mes Souvenirs. Cahiers et mémoires de l'orgue*, Paris: "*L'Orgue*" (1970), 23. Translation from Jack Crawford, ""Mes Souvenirs" by Louis Vierne: An Annotated Translation" (PhD diss., University of Miami, 1973), 32.
[150] Crawford, "Mes Souvenirs," 31.
[151] Crawford, "Mes Souvenirs," 23.
[152] Rollin Smith, *Toward an Authentic Interpretation*, 107.

Prelude and Fugue in A Minor, BWV 543
Prelude and Fugue in E Minor, BWV 555
Fantasy in G Minor, BWV 542
Fugue in G Minor, BWV 542
Fugue in D Major, BWV 532
Sonata in C Minor, Movement I, BWV 526
Prelude in C Major, BWV 541
Prelude in G Major, BWV 568
Passacaglia in C Minor, BWV 582
Aria (Couperin), BWV 587

This list shows that, at least by 1874, many organ works of Bach were not only available in France, but were an essential part of the training, even if the primary focus in Conservatoire was studying every aspect of organ playing *other* than interpreting an existing piece of music. However, it also shows that many of Bach's most substantial free works, for instance the *Prelude and Fugue in B Minor*, BWV 544 or the *Toccata in F Major*, BWV 540, were absent, and there were no chorale preludes. It does, however, indicate that music from *Well-Tempered Clavier* was being played on organ, though whether the pieces were performed with pedal is unclear.

When Widor succeeded Franck as Professor of Organ at the Paris Conservatoire in 1890, he immediately switched the focus to interpretation of existing works.[153] According to Vierne, Widor's first proclamation as teacher was:

> "In France, we have neglected performance too long in favour of improvisation; it is more than error: it is nonsense. To improvise in the artistic sense of the word, one must have ideas, certainly; but that is not sufficient... In order to translate one's thoughts exactly with all the variety, complexity and flexibility required for its development, the organist must possess an instrumental technique capable of executing any pattern whatsoever at any tempo... I do not see why the organist should be the only artist exempt from the necessity of knowing the entire literature of his instrument... what [organ literature] lacks in quantity is perhaps regained in quality. I shall cite only that incomparable miracle which is the organ work of Bach, the greatest musician of all time. Now, to interpret Bach's work in its absolute integrity, it is necessary to have the technique that I'm talking about... I hesitated a long time before accepting the position which falls to me today. I decided to do it with the determination to

[153] Norbert Dufourcq, *Eugène Gigout* (Paris: Association des amis de l'Orgue, 1982), 4.

> restore the level of organ performance in general, and to revive the authentic tradition in the interpretation of Bach's works in particular. It was bequeathed to me by my teacher Lemmens, who had it from Hesse of Breslau, who had received it from Forkel, the pupil and biographer of the old cantor."[154]

And he did indeed begin to restore an appreciation for organ repertoire (though there is no evidence that Hesse studied with Forkel). Table 1 shows the teaching lineage from J.S. Bach to the major members of the French Romantic Organ School relevant to this dissertation:

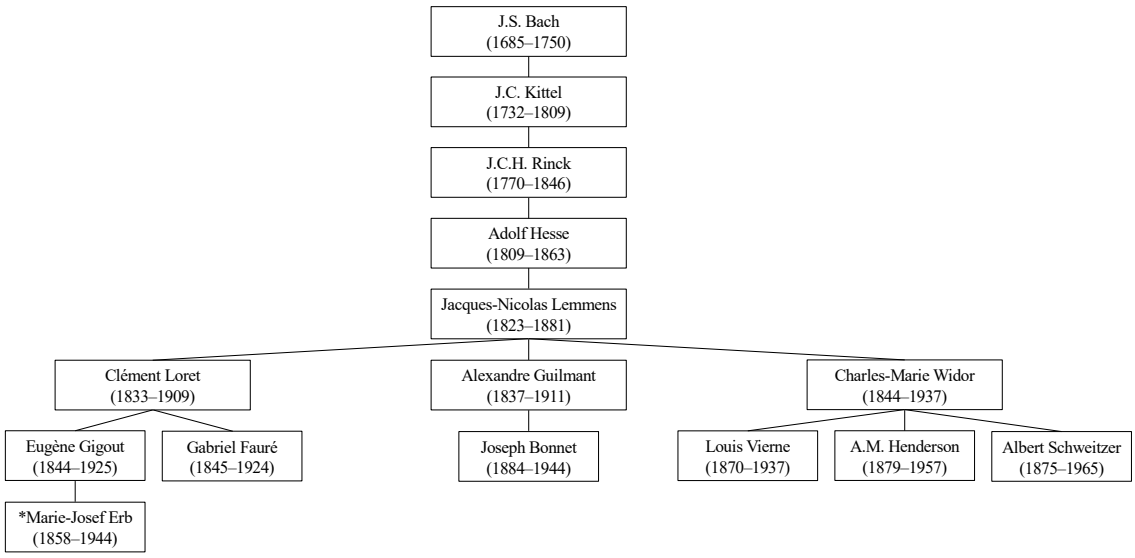


Table 1. The teaching lineage of the major figures of the French Romantic Organ School.
**Indicates Erb studied primarily with Gigout but briefly with Widor.*

Vierne continues, recalling the studio class which followed, in which M. Burgat played Bach's transcription of the *Concerto in G Major*, BWV 592, that Widor instilled the following principles: "Strict legato in all the parts, precise articulation of repeated notes, tying over of common notes, punctuation, breathing, phrasing, shading in all levels..."[155]

These general performance principles are supported and supplemented by the recollections of Glasgow organist Archibald Martin Henderson, who published a series

[154] Crawford, "Mes Souvenirs," 43–45.
[155] Crawford, "Mes Souvenirs," 45.

of articles in *The Musical Times* between 1921 and 1954. These recalled his time studying in Paris with the greatest figures of the French Romantic Organ School: Dubois, Gigout, Guilmant, Saint-Saëns, Vierne, and Widor.[156] Henderson's role as a transmitter of the French Romantic performance practice of Bach's works is invaluable: he recalls specific registrations that Widor used (which are not given in the Widor-Schweitzer edition),[157] which on a typical French Romantic organ produce the kind of clarity that Widor later described as the ideal in his prefaces to the complete Bach organ works edition.[158] In his recollections of Widor's organ classes, Henderson notes that "in the thirty class lessons I attended... Widor taught the organ works of only two composers: Bach and Widor!... The training he gave in Bach... I found invaluable."[159] He remarks further:

> "I am sure, however, that this policy in teaching was not dictated by any narrowness of outlook... but simply because he believed that the best foundation the organ student could have would be laid in the study of Bach..."[160]

This is consistent with Widor's proclamation on his first day at the Paris Conservatoire. Henderson goes on:

> "In the performance of Bach's works Widor insisted particularly on the importance of clarity and good phrasing. Widor always reminded the student that it was necessary to phrase more on the organ than on the piano, and much more decidedly, and this in the interest of clarity, rhythm and accent."[161]

---

[156] All of the following by Archibald Martin Henderson: "Memories of Some Distinguished French Organists: Dubois," *The Musical Times* 78, no. 1134 (1937): 729–731. "Memories of Some Distinguished French Organists: Gigout," *The Musical Times* 78, no. 1133 (1937): 631–632. "Memories of Some Distinguished French Organists: Guilmant," *The Musical Times* 78, no. 1137 (1937): 976–978. "Memories of Some Distinguished French Organists: Saint-Saëns," *The Musical Times* 78, no. 1132 (1937): 534–536. "Personal Memories of Vierne," *The Musical Times* 95, no. 1336 (1954): 318. "Widor and His Organ Class," *The Musical Times* 78, no. 1130 (1937): 341.
[157] Henderson, "Widor and His Organ Class," 342–343.
[158] Widor-Schweitzer Edition 1, French, xij–xxviij, partially translated in Near, *Widor on Organ Performance*, 53–58.
[159] Archibald Martin Henderson, "Widor and His Organ Class," *The Musical Times* 78, no. 1130 (1937): 341.
[160] Henderson, "Widor and His Organ Class," 341.
[161] Henderson, "Widor and His Organ Class," 343.

For Widor, the works of Bach and these particular aesthetics were the heart of his pedagogical philosophy; Henderson concludes that Widor "believed that he was communicating the original Bach tradition, which had been passed on through Lemmens to Guilmant and himself."[162] In learning from Lemmens, the great-grandpupil of J.S. Bach via Hesse, the French Romantic Organ School could legitimately claim, at least in terms of its key figures, a direct teaching lineage to Johann Sebastian, completing the grand plan of Fétis to restore organ playing in Belgium and France, at least according to *Fétis's* aesthetics.

Articulation

The Bach editions by members of the French Romantic School provide the most complete and detailed written source about performance practice, including registration, articulation, and tempo. John Near's *Widor on Performance Practice and Technique*, the only secondary source which deals somewhat directly with Bach performance practice in the French Romantic Organ School, translates and synthesises the most important points regarding performance practice that were taught to many of the leading organists of the day.[163]

The Widor-Schweitzer Edition

In terms of disseminating ideas about performance practice, Widor's most important pupil was Albert Schweitzer, who published a number of monographs about Bach's music and philosophy; the first of these, *J.S. Bach: Le Musicien-poète*, published

[162] Henderson, "Widor and His Organ Class," 343.
[163] John Near, *Widor on Organ Performance Practice and Technique* (Rochester: University of Rochester Press, 2019). Near's biography, *Widor: A Life Beyond the Toccata* (Rochester: University of Rochester Press, 2011), is substantive but does not address Widor's fixation on Bach in great detail.

in 1905, presented a wealth of ideas about Bach organ performance practice.[164] Schweitzer's greatest contribution to performance practice was the publication of a complete Bach organ works edition.[165] This was disseminated worldwide, and even today can be found in most music libraries around the world.

John Near summarised the genesis of a new edition of the Bach organ works in his biography of Widor; in 1910, the publisher G. Schirmer invited Widor to prepare a new edition of Bach's organ works, including a preface with information about performance practice.[166] The contract (dated 6 July 1910) settled the number of volumes at eight.[167] Widor and Schweitzer met together in Paris and Gunsbach, Alsace over the next few years, completing five volumes.[168] The final three volumes, chorale preludes, were close to completion except for the finishing touches, but Schweitzer left on a medical mission to Africa in March 1913.[169] The project languished with the outbreak of World War I, and there was considerable strife between Schirmer and Schweitzer; following the death of Rudolf Schirmer in 1919, the firm lost interest in the project and informed Schweitzer as such, but by 1927 the first five volumes had increased significantly in sales, and Schirmer asked Schweitzer to finish the final three chorale volumes.[170] Widor was able to repair the relationship with the publisher, but the release of the edition dragged on until years after Widor's death.[171] Finally, with the help of Édouard Nies-Berger, Schweitzer published the final three volumes in 1954

---

[164] Widor-Schweitzer Edition, French.
[165] Widor-Schweitzer Edition, French and English.
[166] Near, *Widor: A Life Beyond the Toccata*, 314.
[167] Hans W. Heinsheimer, "The Saga of Schweitzer's Bach Edition," *Music: The AGO and RCCO Magazine* 9, no. 1 (1975), 30.
[168] Albert Schweitzer, *Out of My Life and Thought*, trans. C.T. Campion (New York: H. Holt, 1949), 154. Near, *Widor: A Life Beyond the Toccata*, 314.
[169] Near, *Widor: A Life Beyond the Toccata*, 314.
[170] Near, *Widor: A Life Beyond the Toccata*, 314–315.
[171] Near, *Widor: A Life Beyond the Toccata*, 314–315.

(miscellaneous chorale preludes) and 1967 (Orgelbüchlein and Catechism Hymns; and Schübler Chorales, Leipzig Chorales, and chorale variations).[172]

Widor and Schweitzer produced an edition of the complete Bach organ works in what they referred to as a "critico-practical edition"[173] — the musical text itself is based on what the editors describe in French as "the text of Leipzig," or in English as "the text of the great Bach edition."[174] This does not refer to the Bach Gesellschaft edition, which Widor and Schweitzer describe as being "too inconvenient in size and shape, and the arrangement of the pieces is unfortunate. Moreover the price is too high."[175]

In Schweitzer's monograph *J.S. Bach, le musicien-poète*, published in 1905, he introduces the complete organ works of Bach in chapter 15 by listing the volumes of the Bach-Gesellschaft edition and the Peters edition.[176] This indicates that prior to the Widor-Schweitzer edition, the Peters and Bach-Gesellschaft editions were those most used among Schweitzer's intended audience in *J.S. Bach, le musicien-poète*: musicians in France.

Widor and Schweitzer aimed to present a new musical text "without additions [fingerings, pedallings, dynamics, etc.] of any kind."[177] The musical text of Bach's works, therefore, in the Widor-Schweitzer Edition, speaks very little to the aesthetics of the French Romantic Organ School. However, the preface explains many aspects of interpretation in extensive detail.[178] The edition originally produced for Schirmer was

---

[172] Widor-Schweitzer Edition 6–8, English.
[173] A combination of a critical edition, which is primarily scholarly in nature (referring back to the source material, possibly with an editorial introduction that discusses original instruments and historical performance practice) and a practical edition, in which the editor makes decisions about which sources to use, with or without referencing the source material.
[174] Widor-Schweitzer Edition 1, French, iij; English, iii.
[175] Widor-Schweitzer Edition 1, French, iij; English iii.
[176] Schweitzer, *J. S. Bach: Le musicien-poète*, 174.
[177] Widor-Schweitzer Edition 1, French iij; English, iii.
[178] The most general preface is to the first volume of the Widor-Schweitzer Edition; the prefaces of the additional volumes contain information relevant only to the pieces in those volumes.

published in English and German, and later in 1914 Schirmer's office in France published a version of the complete works with a French-language preface.[179] This was intentional, as Schweitzer explains:

> "The divergencies between the French text, on the one hand, and the German, together with the English which is based on it, on the other, arise from the fact that in respect of the details as to which our opinions differed, Widor and I had agreed that in the French edition his ideas, which fitted better the peculiarities of the French organs, should be dominant, while in the German and the English mine should, taking, as they did, more into account the character of the modern organ."[180]

Given Schweitzer himself admits that Widor's texts reflect his ideas more thoroughly and refer to "the modern organ" (i.e. Germanic and Anglophone organs), the French-language prefaces of Widor will serve the primary source for this study, examining the most relevant portions to performance practice (as opposed to the sections on musical philosophy and thought about Bach). The French-language texts have been in part translated, with extensive commentary, in *Widor on Organ Performance Practice and Technique* by John Near. According to Widor and Schweitzer, absolute legato is the default articulation in Bach:

> "Although it is not historically proven, it is generally admitted that *legato* comes to us from Bach and his school; without doubt Handel and some virtuosos of the time practised the connected style more or less strictly, but it very much appears we owe to Bach and his students the principle of *absolute legato* and from there all the improvements in fingering... Apart from two or three exceptions, one must *completely connect* in the organ works of Bach."[181]

Predictably, Vierne reports basically the same ideas in his edition:

> "Tradition reports that Bach and his school are the promoters of the absolute legato; there is no historical proof of his assertation but there are serious reasons to believe that it was not possible to play legato on instruments before the 18th century. Previous to that time organs, with their broad keys, their heavy

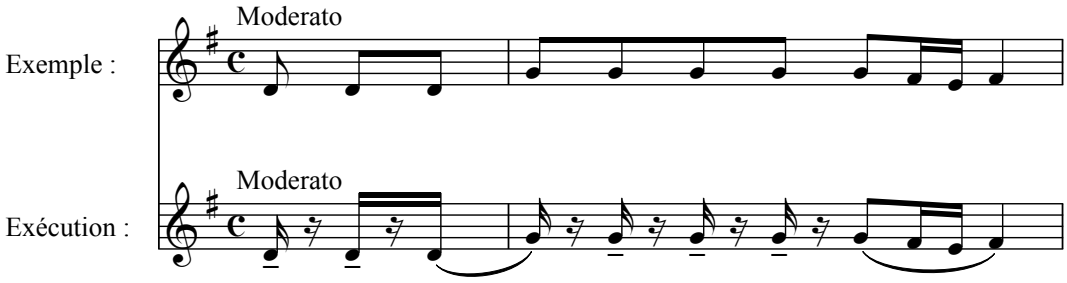
[179] Widor-Schweitzer Edition 1, French.
[180] Schweitzer, *J. S. Bach: Le musicien-poète*, 121. Translated in Near, *Widor: A Life Beyond the Toccata*, 315.
[181] Widor-Schweitzer Edition 1, French, vij; English, vi. Translation found in Near, *Widor on Organ Performance*, 9.

> mechanism, the deep depression of the keys and their hardness, would prevent from playing legato; on the contrary the instruments built in Bach's times, provided with an easy mechanism, with narrower and shorter keys, and easier depression, were marvellously apt to be worked with the technique on which is founded the execution by any organist deserving that qualification."[182]

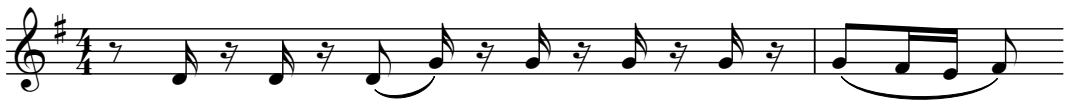
Vierne here reports (notably around a decade after the Widor-Schweitzer Edition's publication) that organs before Bach were more able to play absolute legato than contemporary instruments.

There were, however, many exceptions to absolute legato. The most common musical example used by Widor-Schweitzer, Henderson, and later Bach editions by Widor's pupil Louis Vierne and Guilmant's pupil Jospeh Bonnet was the subject of the *Fugue in G Major*, BWV 541, compared in Figure 7.

Widor-Schweitzer, French:

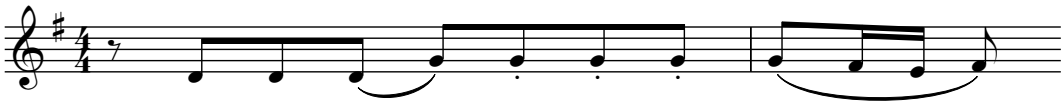


Widor-Schweitzer, English:

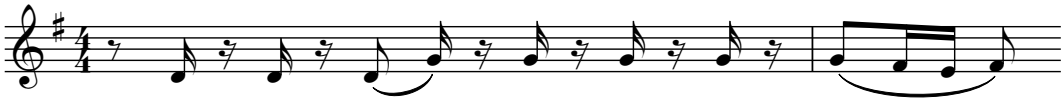


[182] Vierne Edition 1, v: "La tradition dit que Bach et son école sont les promoteurs du legato absolu : la preuve historique manque mais il y a de sérieuses raisons pour croire que c'est seulement au XVIIIe siècle que les instruments permirent le jouer lié. Les orgues antérieures, avec leur large touches, leur mécanique lourde, leur énorme enfoncement et la dureté de leurs claviers ne permettaient certainement pas de lier : les instruments construits au temps de Bach, au contraire, pourvus de mécaniques légères, de claviers à touches plus étroites et plus courtes avec un petit enfoncement se prêtaient merveilleusement à la technique qui fait maintenant le fonds du jeu de tout organiste digne de ce nom."

Henderson:



Vierne:



Bonnet:

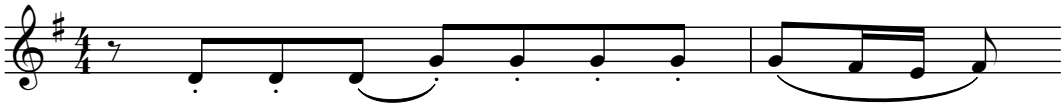


Figure 7. Comparison of the subject of J.S. Bach: Fugue in G Major, BWV 541*, as marked by Widor and Schweitzer, Henderson, Vierne, and Bonnet.*[183]

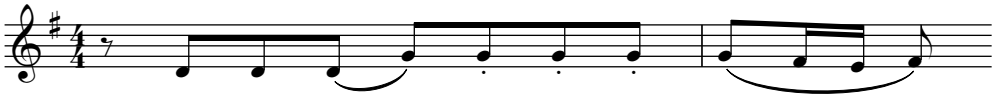
There are small differences between each, namely the exact length of the shortened notes, but several distinct characteristics stand out, summarised as follows:

1. Repeated notes are played shorter than the written value.
2. Any note preceding an accent (such as Bonnet edition bar 3, beat 4) is played staccato.
3. All other notes are played absolute legato.
4. Slurs which cross beats 2.5 and 3.

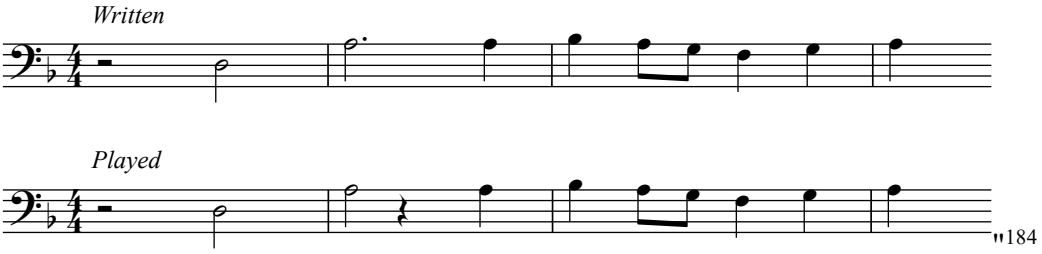
These editions by Widor and Schweitzer and Bonnet, with Henderson's recollections, demonstrate that these major points of articulation practice were, as a matter of course, taught consistently to Widor's pupils. Based on the example by Henderson and Bonnet, the definition of "shorter" from point 1 above is ambiguous. However, Henderson clarifies this as relating Widor's rules for the "original Bach tradition":

[183] Widor-Schweitzer Edition 1, French, vij; English, vii. Henderson, "Widor and His Organ Class," 343. Vierne Edition, VI. Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 108.

"I. In *Allegro*, or *Moderato* tempos, repeated notes in the same voice should be played demi-staccato, the last note in the group being phrased to the following note:



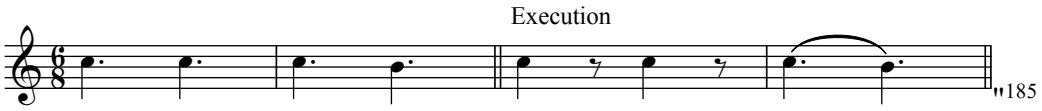
II. A dotted note, when repeated, loses the value of the dot.



[184]

This last point is echoed in the Vierne edition, in which the following example is given:

"In ternary time, the value shall be cut short of either one third or one sixth or of any fraction in relation with the division by 3:



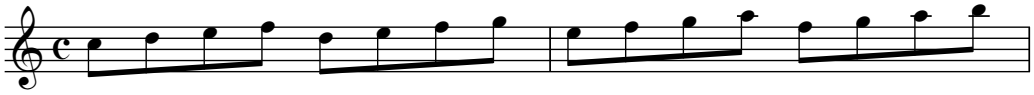
[185]

"Punctuation, Breathing, Phrasing, Shading in All Levels"

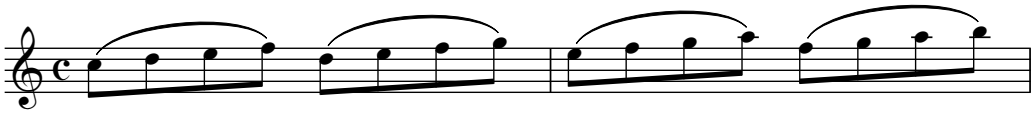
Beyond the maxims of absolute legato and articulating repeated notes, in the English edition Widor and Schweitzer describe further nuance of articulation under the heading "grouping and sub-phrasing within the legato."[186] They argue that in Bach's works, "a succession of sixteenth-notes, or eighth-notes, or quarter-notes [respectively semiquavers, quavers, and crotchets], is not always to be phrased as if the groups of notes simply carried out some scheme of accentuation immediately preceding."[187] They

[184] Henderson, "Widor and His Organ Class," 343
[185] Vierne Edition 1, vi. The text reproduced above is the original English translation in the Vierne edition. French: "Dans les mesures à groupes ternaires, on supprimera soit le tiers, soit, le sixième, soit une autre fraction en rapport avec la division par 3: [Musical example above]."
[186] Widor-Schweitzer Edition 1, English, viii.
[187] Widor-Schweitzer Edition 1, English, viii

suggest that, depending on the secondary accents in a string of runs, the following musical line, without any indication of articulation:[188]



Could be phrased in groups of four, with gaps in articulation between each, as shown here:[189]

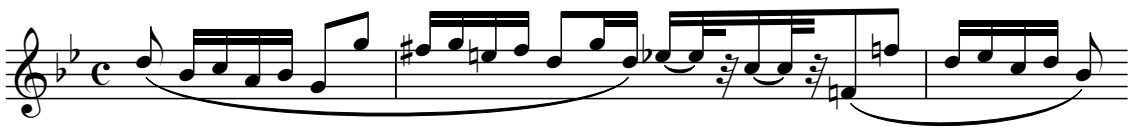


Widor and Schweitzer then conclude that, in doing this, the following grouping — one short note followed by four legato notes, with a slight emphasis on the second note of each legato grouping, emerges, shown here:[190]

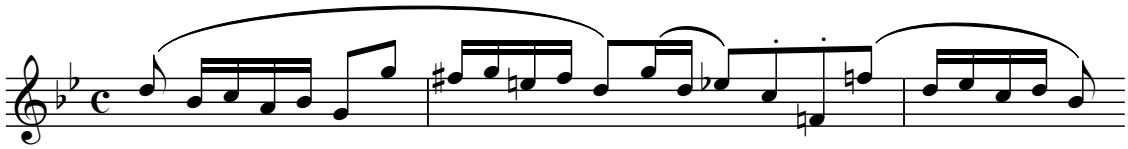
Widor and Schweitzer warn, though, that "the lifted notes, which interrupt the *legato*, are not to be played in a modern *staccato*... but a somewhat sluggish lifting of the notes, corresponding to our *tenuto*."[191] The French Widor-Schweitzer edition contains similar passages in less detail.[192]

This, along with the examples of the *Fugue in G Major* show that Bach articulation in the French Romantic School was generally agreed upon, but there was significant room for individual interpretation. For instance, Widor and Schweitzer present the theme of the *Fugue in G Minor*, BWV 542 as such:[193]

[188] Widor-Schweitzer Edition 1, English, viii.
[189] Widor-Schweitzer Edition 1, English, ix.
[190] Widor-Schweitzer Edition 1, English, ix.
[191] Widor-Schweitzer Edition 1, English, ix.
[192] Widor-Schweitzer Edition 1, French, ix–x.
[193] Widor-Schweitzer Edition 4, French, xviij.



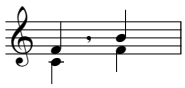
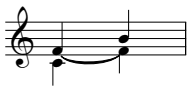
According to the above interpretation, everything is performed absolute legato except for the descending quavers/eighth notes, which are performed at a ratio of sound to silence of 3:1. Bonnet suggests the following:[194]



Here, Bonnet suggests that there should be a slight break in phrasing after the second D, but the rest of the articulation is identical to Widor and Schweitzer. These differences demonstrate the general similarity between these approaches, yet there was some possibility for variation according to an individual's taste.

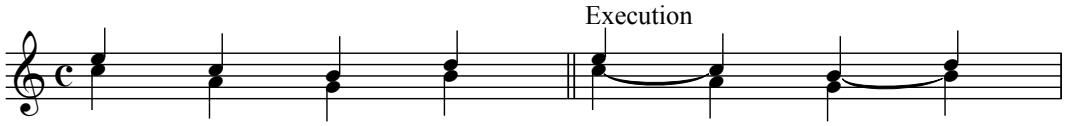
Articulating Chords in Polyphony

When playing polyphony, Widor and Schweitzer in the English edition describe the "tying of common notes," or *notes communes*, Vierne observed in Widor's first organ class:[195]

> "Where some other part takes the [held] note... we have, not a repetition, but a taking-over. The note is then not lifted, for that would give the listener a wrong impression of the part-leading, as if a repetition had taken place in the same part. The note must be bound by keeping the key down.
>
> Do not play this way:  but thus: 
>
> It will not sound to the listener as if a key were held down, but as if one part had taken over the tone from the other."[196]

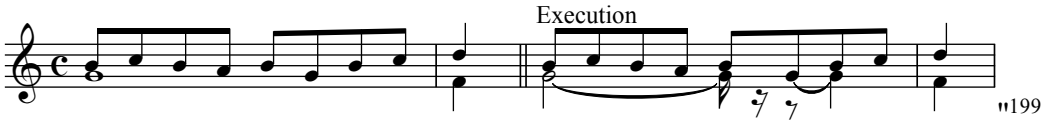
[194] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 123.
[195] Crawford, "Mes Souvenirs," 45.
[196] Widor-Schweitzer Edition 1, English, viii.

The French Widor-Schweitzer Edition gives similar examples, but without such detail.[197] The Vierne Edition agrees with the concept of *notes communes* as described above, giving the following example: [198]



In the first bar of the example, each triad would theoretically be played with some articulation between each crotchet/quarter note; in the right, the common note between each pair of triads (C and B) is tied. The general principle here is that when two voices descend or ascend and there is a common note between each chord, that note is held. Vierne goes on to clarify:

> "This rule is not free from exceptions : every time the clearness of the text requires that a note kept down be momentarily relieved, this must be done until the design it interfered with has been passed through :



"[199]

If one played the first two bars as they are written, the soprano line's quaver/eighth note G would not be re-articulated, but held the entire first bar. Articulating in according to the bars under "Execution" would ensure that the listener hears the soprano G is a separate voice, and not part of the alto, at the expense of holding the alto a full semibreve/whole note. In the case of consecutive chords, Widor and Schweitzer clarify in the English preface:

---

[197] Widor-Schweitzer Edition 1, French, viij. This may have been because they thought Francophone readers would already be familiar with the concept, as it probably came from Lemmens.
[198] Vierne Edition 1, vii.
[199] Vierne Edition 1, vii. French: "Ce principe n'est pas sans exceptions : chaque fois que la clarté du texte exige qu'un son tenu soit momentanément abandonné, il faut le faire jusqu'à ce que le dessin qu'il gênait soit passé : [Musical example as above]."

> "Very frequently the chords are "lifted" so as to have the effect of detached "solid" chords. This may be appropriate in certain cases, but by no means in all. Do not forget, that in Bach these chord-successions usually result from the movement of *obbligato* parts. The chords ought not, therefore, to be lifted bodily, but played according to the rules governing polyphonic playing. Notes repeated in the same part are lifted; play all the rest in strict *legato*. Frequently three or four parts repeat the same tone, and only one or two progress by an interval. The lifted notes, sustained for but half their time-value, preponderate."[200]

This can be seen in an example identical in the French and English versions, bars 7–11 of the *Toccata in D Minor*, BWV 538, reproduced as Figure 8:

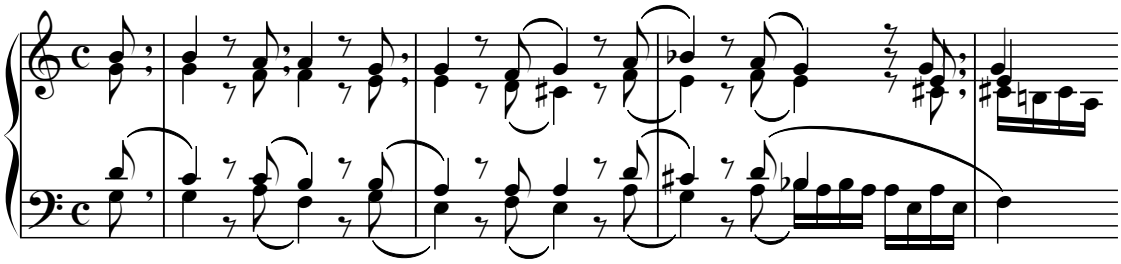


Figure 8. Excerpt of the Toccata in D Minor, BWV 538, bars 7–11, as seen in the Widor-Schweitzer preface in both the English and French versions.[201]

Here all repeated notes are articulated (indicated by breath marks), and notes to be played absolute legato are shown with slurs. The French version of the Widor-Schweitzer Edition is generally more succinct in this discussion, though there are several more musical examples, none are as comprehensive as Figure 8.[202]

To summarise, the basic principles of articulation in Bach performance practice in the French Romantic Organ School are as follows:

1. The default articulation is absolute legato, achieved by finger substitution in the manuals and using both heels and toes in the pedal.

2. Repeated notes in fast movements are played demi-staccato, approximately half value.

[200] Widor-Schweitzer Edition 1, English, xi.
[201] Widor-Schweitzer Edition 1, French, x; English, xi.
[202] Widor-Schweitzer Edition 1, French, x.

Exception (*notes communes*): If a single note is played in one voice part, and that same note appears consecutively in a different voice part, that note is held down, not repeated.

3. Main melodic motives can be articulated according to the player's taste.

Principles of Registration

When discussing registration in the works of Bach, Widor stressed two important concepts above all others:

1. "Clarity of execution must not be interfered with by the registration... Never gain power at the expense of clearness."
2. "Everything undertaken in the way of registration and change of manuals must grow out of the nature and plan of the piece... and be proportioned to the importance of the happening."[203]

Vierne echoes the first point especially, going into detail about the effects of acoustics on tempo:

> "... if a prelude and a fugue are played in a large nave, not the same tempo will be used as if they were played in a bare hall or in a drawing-room; this would betray æsthetic ignorance. Likewise, in a building of vast proportions, the breaks or breathings shall be longer, the punctuation more distinct, and stronger the emphasizing of points that have to be brought to light : a passage of virtuosity which will come out all right in a small room, on a small instrument the mechanism of which will act with the precision of a piano, will become unintelligible if it be played in the same tempo in St Sulpice or in Notre-Dame, under the immense vaultings which prolong the sound, on organs with 100 or 90 stops, which unavoidably emit the sound more slowly in proportion to the vibrating mass to be acted upon."[204]

As described in Chapter 2, the organs J.S. Bach knew — those by Gottfried Silbermann, Hildebrandt, Trost, etc. — were not capable of the same kinds of rapid registration changes as a French Romantic organ. Widor acknowledges this, comparing the performance of trios to those with multiple instruments, remarking "Who, while playing in an orchestra trio, would have taken it into his head to exchange his

[203] Widor-Schweitzer Edition 1, English, xiii; French, xij.
[204] Vierne Edition 1, iii.

instrument for some other!"[205] He also compares and contrasts the Saxon Baroque and French Romantic styles of organbuilding:

> "Finer foundation stops and mixtures than those of Silbermann are not made; at most we succeed in making the Gambas and Salicionals prompter of speech and rounder of tone... The advantages of the modern organ are of threefold sort. The player can couple the manuals together without exertion; the swell-box permits of dynamic modulations of tone which modify the inflexibility of organ-tone; numerous ingenious inventions allow the organist to change the tone-color as rapidly and frequently as he will."[206]

Widor also notes that coupling manuals while one was playing was impossible on the organs Bach knew (at least instruments with shove couplers), but concludes "the modern organist is much better off than [Bach]; he can shift the couplers at pleasure while he is playing."[207] He also notes that the manual order in Bach's day was Rückpositiv — Hauptwerk — Oberwerk, whereas in French Romantic organs the main division is controlled by the lowest manual: Grand orgue — Positif — Récit (in German Baroque terms, the order would be: Hauptwerk — Rückpositiv — Oberwerk).[208] Widor also advocates for each division to have "foundation stops of 8-, 4- and 2-foot tone, besides mixtures and reeds; some of these last, if possible, of 4-foot tone."[209] In short, all the characteristics of the typical three manual Cavaillé-Coll or Merklin organ.

How to Crescendo and Decrescendo

A characteristic of the French Romantic Organ which many performers exploited in Bach's works was the use of registration changes to achieve crescendo and decrescendo. According to Widor, this effect,

[205] Widor-Schweitzer Edition 1, English, xvii.
[206] Widor-Schweitzer Edition 1, English, xiv.
[207] Widor-Schweitzer Edition 1, English, xiv.
[208] Widor-Schweitzer Edition 1, English, xiv.
[209] Widor-Schweitzer Edition 1, English, xiv.

> "produced by opening and closing the swell-box, should not be limited to this manual alone, but should render it possible to influence, through the intercoupling of the manuals, the dynamic effects of the entire instrument. It is only when employed in this dual capacity that the swell-box performs its full duty. By its aid a continuity in crescendo and decrescendo may be effectuated, which were otherwise wholly impracticable, and which is of high importance in the interpretation of Bach."[210]

Widor goes into further detail on his aesthetic ideal for creating this crescendo and decrescendo; he does not favour adding individual stops, but adding groups of similar stops, likening this to Bach's orchestration:

> "In the [Brandenburg Concertos], too, Bach operates with groups. He lets the wood-wind, or the trumpets, enter or cease all together. The individualization of the modern art of instrumentation is foreign to him... On the organ his procedure is the same. The foundation stops correspond to the strings, the mixtures and reeds to the wood-wind and the brass... The sweeping grandeur of the preludes and fugues permits of no attempt at introducing effects with solo stops, and at seeking variety within the group of affiliated foundation stops on the same manual."[211]

Put simply, the kind of gradual crescendo achieved by a crescendo pedal — adding one stop at a time — was not part of the aesthetic of the French Romantic Organ School's aesthetic for Bach performance. According to Widor, these are the steps to move from foundation stops to full organ:

1. Close the swell box and add first the mixtures, then the reeds.
2. Open the swell.
3. Add the mixtures and reeds of the choir, then great.[212]

He then describes reversing the same procedure to create a diminuendo.[213] The simpler method of achieving a similar dynamic change would be to use some form of a crescendo pedal or simply pushing in the stops one by one. But Widor vehemently

[210] Widor-Schweitzer Edition 1, English, xv.
[211] Widor-Schweitzer Edition 1, English, xviii.
[212] Widor-Schweitzer Edition 1, English, xv.
[213] Widor-Schweitzer Edition 1, English, xv.

argues against this: "To a sensitive ear this splitting-up and shredding of a chord... will always be a torture."[214]

Pro organo pleno

Widor addresses several specific registration instructions in Bach's works. He says that "pro organo pleno" does not mean that the piece is played with full organ throughout, but that the piece is composed for a "whole organ" — "that is, an instrument with two manuals and a complete pedal."[215] Widor also discusses the use of reeds, concluding ultimately that, while in old organs "the reed-stops... although their workmanship is imperfect... they blend well with the foundation stops and mixtures, and have a tendency to clarify and brighten the tone-color."[216] He concludes with the following:

> "...thus the reed-stops on our organs, and the trumpets... although in many respects an improvement over those which Bach had at his disposal, are not so well suited for performing his works as could be desired. But this does not mean, that we must do without them... reed-stops are to be employed for the preludes and fugues, but not without caution and calculation. Excessively strong and blaring stops are to be excluded... The tone should be reinforced by reeds only in so far as the foundation stops and mixtures can naturally absorb and cover them."[217]

Widor adds that the best solution would be to have two sets of reeds: one for older music and the others for more modern use.[218] He also says that the reeds on the récit and positif should not be used when playing on those manuals alone, as they detract from

[214] Widor-Schweitzer Edition 1, English, xv.
[215] Widor-Schweitzer Edition 1, English, xvi.
[216] Widor-Schweitzer Edition 1, English, xvi.
[217] Widor-Schweitzer Edition 1, English, xvi.
[218] Widor-Schweitzer Edition 1, English, xvi.

the legato — those reeds should instead only be used along with the foundation stops when coupled to the grand orgue.[219]

Registration in the Free Works

According to Widor, "the Preludes will, in general, be played louder throughout than the Fugues... in both, the blending of foundation stops and mixture to be considered as the fundamental timbre; provided, that the former are clear and the latter not too shrill."[220] Echoing the general maxim of favouring clarity over all in Bach, Widor warns against using pedal couplers — "although the pedal without coupling is weaker, it still possesses an individual timbre which renders it easily distinguishable; with couplers drawn, it becomes louder, but loses its peculiar timbre among the low tones of the manual foundation stops..."[221] He also reminds the reader to not forget the 4' Principal.[222]

The use of the 16' register in the manuals is, according to Widor, unclear; "it can hardly be right to keep them drawn throughout entire preludes and fugues. The Master probably used them for chord-effects."[223] He then describes the plenum registration: foundations at 8' and 4' pitch, along with 2' — which should be to brighten the tone, rather than strengthen it — and then adding the mixtures, and finally the reeds.[224]

Widor notes that solo stops should not be used for special effects in the preludes and fugues; however, "this does not signify, by any means, that the various preludes and fugues are all to be played with one and the same registration. Each has its own peculiar

[219] Widor-Schweitzer Edition 1, English, xvi.
[220] Widor-Schweitzer Edition 1, English, xvii.
[221] Widor-Schweitzer Edition 1, English, xvii.
[222] Widor-Schweitzer Edition 1, English, xvii.
[223] Widor-Schweitzer Edition 1, English, xvii.
[224] Widor-Schweitzer Edition 1, English, xvii.

fundamental tone-colour. It is for the organist to discover the nuance suited to the character of each."[225]

He expresses strong opinions about the general character of the free works and how they relate to registration:

> "Preludes and fugues should invariably start on the great-manual with a suitable fullness of tone, precisely as the introductions of the cantatas and the Brandenburg concertos begin with a *tutti* in the orchestra... it is an abomination to the Lord when a fugue-theme is first whispered out upon the swell, and only gradually gains courage to speak out on the great. Such a theme... must announce itself with decision at the very outset."[226]

Widor spends several paragraphs discussing whether to bring out the subject in a fugue; ultimately, he is in favour as long as it does not detract from the overall effect, nor distract from the polyphony.[227] He then discusses the use of crescendo in fugues; he concludes that the effect can be good, but it should be gradual — he is against "bring[ing] out a sudden swell to "full organ" in the last few measures or — still worse — on the very closing chord. As a rule, the tone-level in which the fugue ends should be already reached with the final decisive entrance of the theme in the pedal."[228] He suggests the following registration plan:

1. Begin on the Grand Orgue with at least 8' and 4' foundations.
2. Add mixtures and reeds at the beginning of each new major section.[229]

That being said, Widor then notes that Bach probably did not add stops, and relied on the composition itself to produce a grand effect.[230]

[225] Widor-Schweitzer Edition 1, English, xviii.
[226] Widor-Schweitzer Edition 1, English, xviii.
[227] Widor-Schweitzer Edition 1, English, xix.
[228] Widor-Schweitzer Edition 1, English, xx.
[229] Widor-Schweitzer Edition 1, English, xx.
[230] Widor-Schweitzer Edition 1, English, xx.

The Vierne and Fauré Editions

Widor's edition may have been compiled by the towering figure of the French Romantic Organ School, but the most detailed Francophone Bach organ works edition of the early twentieth century was made by his pupil Louis Vierne. Vierne's journey as an organist and Bach interpreter is the most interesting and extreme of any major member of the French Romantic Organ School. Having studied with Franck, who as noted previously was fairly relaxed in his interpretation of Bach, then Widor, the most strict until Marcel Dupré, Vierne's opinions on Bach ended clearly on the side of Widor, as evidenced by his major edition of the free works. Published in 1924 by Editions Maurice Senart, the *Œuvres pour orgue* comprises three volumes, with only a few copies surviving today. The edition is also entirely bilingual, with French on the left and English on the right. It is likely that Vierne intended to produce an entire set of the organ works, but he only made it through the free works, released in three volumes.

Like Widor-Schweitzer, the edition begins with an extensive preface in the first volume which goes into extensive detail on performance practice. The general principles are identical to the Widor-Schweitzer Edition, but his ideas about each individual piece's interpretation are given in much greater detail, and the articulation of individual motives differ in a similar vein to that of Bonnet and Widor-Schweitzer discussed above.

The Fauré Edition

Another major Francophone Bach organ works edition in the early twentieth century was by Gabriel Fauré, who had studied at École Niedermeyer de Paris, founded

in 1853 by Louis Niedermeyer.[231] The School primarily focused on church music, not on repertoire performance, and it served as a replacement for the traditional choir schools which had run out of funding.[232] Unlike the Paris Conservatoire, it had none of the rigorous entry requirements, and thanks to government grants could be attended for nearly free.[233] Fauré recalled singing the works of Bach whilst a pupil in 1853 (at the age of eight), claiming Bach was introduced there before the Paris Conservatoire (but as Orpha Ochse points out, that was inaccurate, as records of Bach's organ works appeared in 1852).[234] During this time, François-Xavier Wackenthaler was the organ professor at the Niedermeyer School, succeeded in 1856 by Georges Schmitt; two years later, Clément Loret, a former Lemmens pupil, took the position and became Fauré's teacher.[235] As noted previously, one of Loret's other pupils, Henri Letocart, recalled that he owned the eight volumes of the Bach organ works (edition Peters), and Loret's students were required to play the Bach *Passacaglia* (BWV 582) and another fugue of their choice.[236] As musicologist Orpha Ochse points out, "it is important to note that Lemmens's techniques and his emphases on the performance of composed music and on Bach as the cornerstone of organ repertoire were the bases of organ instruction at the Niedermeyer School long before Widor promoted the same ideas at the Paris Conservatory in 1890."[237] A further influence on Fauré from the Lemmens school was being colleagues with Widor at Saint-Sulpice from 1871–1874, where Widor was the

[231] Fauré Edition.
[232] Ochse, *Organists and Organ Playing*, 204.
[233] Ochse, *Organists and Organ Playing*, 208–209.
[234] Gabriel Fauré, "Souvenirs." *La Revue musicale* 22 (October 1922): 3–9. Ochse, *Organists and Organ Playing*, 209.
[235] Ochse, *Organists and Organ Playing*, 210
[236] Lecotart, Henri. "Quelques souvenirs." *L'Orgue* 36 (December 1938): 2–7; 37 (March 1939): 4–6. *Revue et gazette musicale* 25, 243, cited and translated in Ochse, *Organists and Organ Playing*, 210–211.
[237] Ochse, *Organists and Organ Playing*, 211.

principal organist and Fauré accompanied the choir.[238] For these reasons, the Fauré Bach edition espoused many of the same ideals as that of Widor and Lemmens.

The Fauré edition is divided into three sets of volumes:

Vol.	Cahier	Contents	Plate No.	Copyright
I	–	8 Petits préludes et fugues et pièces diverses *BWVs 553–560, 590, 572, 588*	9440	1917
	1	Préludes et fugues *BWVs 535, 566 (C major version), 551, 549, 532, 565, 538*	9441	1919
	2	Préludes et fugues *BWVs 545, 541, 536, 542, 534, 546*	9442	1917
	3	Préludes et fugues *BWVs 540, 552, 533, 531, 550, 564*	9443	1919
	4	Préludes et fugues *BWVs 539, 537, 543, 548, 544, 547*	9444	1919
II	1	Chorals variés [Partitas] *BWVs 766, 767, 768, 769*	9445	1916
	2	Chorals variés [*Orgelbüchlein*] *BWVs 599–644*	9446	1920
	3	Chorals variés [*Clavier-Übung III*] *BWVs 669–689*	9447	1920
	4	Chorals variés [Schübler and Leipzig] *BWVs 645–668*	9448	1920
	5	Chorals variés [Kirnberger and misc.] *In order of appearance: BWVs 697, 703, 698, 704, 699, 691, 711, 717, 716, 718, 695, 720, 748, 712, 701, 696, 690, 706, 713, 700, 693, 705, 723, 724, 725, 709, 727, 733, 734, 653b, 735, 736, 737, 740*	9449	1920
III	1	Concertos d'après Vivaldi *BWVs 592–595*	9826	1920
	2	Pièces diverses *In order of appearance: BWVs 589, 582, 591, 1027/I[239], 585[240], 586, 583, 587, 571, 597, 561, 570, 562*	1926	1920

[238] Jean-Michel Nectoux, *Gabriel Fauré: A Musical Life* (Cambridge, UK: Cambridge University Press, 2004), 18–19.
[239] A transcription of the first movement of the *Trio Sonata for Viola da gamba and Harpsichord in G Major*, BWV 1027. This transcription first appears in Peters Edition 9.
[240] A transcription of a trio sonata which is now attributed to Johann Friedrich Fasch.

The musical text of the Fauré edition is nearly as clean as the Widor-Schweitzer, except it contains many dynamic and tempo markings that never appear in Bach manuscripts; more of the intricate differences will be discussed in further detail in Part III. The very short preface categorises each of these as follows:

> "In the majority of the works of J.S. Bach... the indication of the tempo is misleading. For example, the first movement was the "tempo giusto" which is equivalent to [crotchet/quarter note] = 60 on the metronome...
> The indications of manual, registration and "nuances" are not absolute... Given all this, one may use:
>
> | | |
> |---|---|
> | for *f* or *ff* | All foundations with reeds |
> | for *mf* | All 8' foundations with Récit reeds (box closed) |
> | for *p* | 8' foundations |
> | for *pp* | Soft foundations[241] |

Fauré's specific instructions from each piece, along with Vierne, Widor-Schweitzer, and the few editions by Joseph Bonnet will be examined in detail in Part III of this dissertation.

Summary of Part I

The organ works of J.S. Bach reached France largely through the influence of François-Joseph Fétis, head of the Brussels Conservatoire; Fétis believed that organ building and playing in the German-speaking world was superior to that of France or Belgium, in large part due to the free works of J.S. Bach and the advanced pedal technique his music required. In order to raise the standard of Francophone organ playing, he sent his pupil Jacques-Nicolas Lemmens to study with Adolph Hesse in Breslau, who was a grand-pupil of Bach. Lemmens and Hesse had a tumultuous relationship, details of which Fétis completely ignored, proclaiming widely over many

[241] Fauré Edition 1, ii.

decades that Lemmens had learned the true art of Bach performance in Breslau. In reality, Lemmens left Hesse, most likely on very poor terms, having learned almost nothing from his famed teacher. The central tenets of Lemmens's Bach performance practice were absolute legato achieved by finger substitution (which Fétis called the "Bach fingering"), and the use of registration changes and the swell box employed to great effect in Aristide Cavaillé-Coll's organs to create seamless dynamic changes, and articulation. However, these techniques never appear in Bach's own manuscripts and were impossible to achieve on an eighteenth-century Saxon organ, indicating they were an entirely new invention by Fétis and Lemmens. This foundation of French Romantic organ study was evidenced in pedagogical guides such as Lemmens's *École d'orgue*.

Lemmens became organ professor at the Brussels Conservatoire and taught Clément Loret and Charles-Marie Widor, who went on to teach organ at the two most important centres for organ study in Paris: the Niedermeyer School and the Paris Conservatoire. Widor in particular perpetuated the ideas of Lemmens, famously saying "the art of organ playing has not changed at all since J.S. Bach." In reality, Widor did acknowledge that the French Romantic Organ School did take some liberties from what J.S. Bach had known, and the accounts of his students showed that he taught Bach's music in a remarkably uniform way throughout his entire career. These accounts are corroborated by Widor and Albert Schweitzer's edition of the complete Bach organ works, whose preface gives extensive detail of performance practice. The similar edition by Gabriel Fauré, who was educated in the Niedermeyer School and a colleague of Widor for several years at Saint-Sulpice, shows that the aesthetics of Lemmens and Fétis were entrenched in Francophone organ culture and playing.

Part II: Organ Rolls

Introduction

Written sources on performance practice in the French Romantic Organ School help clarify the general aspects of articulation, registration, tempo, but the extremely fine details of timing are very difficult to describe in words alone. Additionally, Francophone descriptions of registration practice in the major sources discussed in Part I focus almost entirely on playing Bach's works on a three-manual organ in a large space. This leaves several important questions unanswered. For example, if following an edition's registration suggestions, how did Francophone organists adapt their performance if the instrument at hand had a significantly different stoplist (e.g. two manuals instead of three, or when performing abroad)? How did they deal with balance issues if an edition calls for a loud Trompette but only a softer Hautbois is available? What tempo is appropriate for any given piece, and how does that change based on the acoustic? Most importantly: how strictly did organists follow the suggestions in editions made by their teachers and close colleagues?

Audio recordings of Bach's works by students of Widor provide a wealth of information that help clarify these questions. Yet the audio quality from the early twentieth century is extremely poor compared to the professional standard of recording today; the amount of background noise can often be so extreme that it obscures any nuances in the performance, and if a record has deteriorated enough, it can even distort pitch. Even with records in good condition, any accumulated dust in the grooves will result in crackles and pops, which can obscure nuances in the performance and from the instrument itself. As many of these recordings are now quite old, preservation is a growing concern. Many such recordings have been digitised and re-mastered; while the

former solves the issue of preservation, the latter can result in the loss of certain frequencies in the attempt to reduce the background noise. While wax cylinders and records were the most commonly-produced form of early recordings, the one type of audio recording which can be reproduced today with no loss of quality are paper rolls; the majority of these are for piano, but a number of important artists recorded organ rolls. The technology which enabled this is very complex, and took years of research and development before everything was viable.

At the turn of the twentieth century, the application of pneumatics and electricity to organs enabled new technology that could capture an organist's performance in real time. These organ rolls — machine-made representations of a performance using paper and ink — when played through the appropriate equipment and instrument, produce a sound today which is nearly identical to what the recording artist experienced. The two largest firms to develop these recordings were the M. Welte und Söhne in Freiburg im Breisgau, Germany, and Aeolian in New York, USA. These rolls contain a great deal of evidence about organ performance practice and aesthetics, including tempo, registration, and ornamentation practice. Unlike LPs, wax cylinders, or other early audio recordings which deteriorate over time, these organ rolls can be digitised, and performances which took place over 100 years ago can be reproduced to sound almost the same as the performers themselves heard. As Welte recorded primarily European artists, and the collection which forms the basis of this study — that of the Museum für Musikautomaten in Seewen, Switzerland — has primarily Welte rolls, specifically several of the master copies which have annotations from the company editors, this study only includes organ rolls from Welte. The technology Welte developed for

recording organ performances in the early twentieth century is the most reliable method of learning exactly what an artist did at the organ.

Chapter 4: M. Welte und Söhne

Introduction

The Welte firm over the nineteenth century grew from humble beginnings as a simple musical automaton maker to one of the world's leading manufacturers of fine self-playing instruments. The culmination of their work was the Welte Philharmonie Organ, which for the first time in history could record a performance of a live person's playing in a format other than audio, and in far greater detail than any other recording technology available.

The Beginnings

In 1832 at age 25, Michael Welte founded a firm in Vöhrenbach, Germany after eight years of training under the music box maker Jakob Blessing in Unterkirnach, Germany.[242] The company primarily made self-playing musical pianos and organs, but for the first 80 or so years, the performances Welte instruments reproduced were created without live performing artists, but rather through careful and highly technical work done by craftspeople — no keyboardist recorded a piece of music directly onto a Welte instrument, rather company technicians perforated paper or added pins to barrels in a precise, technical manner, similar to coding.

The resulting instruments and paper rolls or pinned barrels were primarily sold to wealthy individuals for entertainment purposes (many did not even have keyboards, and could only play recordings produced by Welte).[243] Instead of music being replayed through vinyl records, wax cylinders or CDs, Welte's early instruments, like those of all

[242] Peter Hagmann, *Das Welte-Mignon-Klavier, die Welte-Philharmonie-Orgel und die Anfänge der Reproduktion von Musik* (Bern: Peter Lang, 1984), 14–15.
[243] Hagmann, *Das Welte-Mignon-Klavier*, 14–21.

his competitors, relied on pinned barrels. The mechanism is simple: the pipes sit on top of a windchest like any mechanical action organ, but instead of the pallets being connected to and opened via keys, they are moved via the rotation of the barrel, which has small metal pins which, through a simple mechanical transfer (designs vary by maker), cause the pallets to open and close. However the use of pinned barrels in organs was not a new invention; Dom Bédos described the craft in his *L'art du facteur* in 1766, and famous composers such as Haydn, Mozart, and Beethoven composed pieces for mechanical clocks that used this technology between 1772 and 1799.[244]

The Orchestrion

Welte first produced self-playing barrel organs, and as time passed he later attached these to clocks which would play a piece of music at regular intervals of time (depending on the model, every fifteen minutes to only once an hour).[245] Over time, Welte began to add more kinds of pipes, especially strings and reeds, and the function of the machine as primarily an entertaining clock evolved into a large self-playing organ capable of playing highly sophisticated pieces of music.[246] The most well-documented of these early Welte instruments was a large self-playing organ built between 1845 and 1848 for a customer in Odessa; prior to shipment, the company presented this new invention to the public in Frankfurt am Main, where the reception was largely positive; the *Karlsruher Zeitung* praised "its formidable power and tonal richness," but also noted that the instrument was still "not yet to perfection."[247] Despite this, the firm had great

[244] Bédos de Celles, *L'art du facteur d'orgues* 4, 596–634. Haydn: Hob.XIX, composed between 1772 and 1793; Mozart: K.594, composed c. 1790; Beethoven WoO 33a, composed 1799.
[245] Hagmann, *Das Welte-Mignon-Klavier*, 15.
[246] Hagmann, *Das Welte-Mignon-Klavier*, 15, footnote 5.
[247] Hagmann, *Das Welte-Mignon-Klavier*, 15, footnote 7.

commercial success with this new organ, which, due to the nature of mimicking the orchestra, was dubbed "Orchestrion."[248]

In 1862 during the World Exhibition in London, Welte brought an enormous self-playing instrument he had built for Grand Duke Frederick of Baden, which *The Illustrated London News* describes as having "39 barrels, 15 different registers, with 524 pipes — imitating flutes, flageolets, piccolos, oboes, trumpets, horns, trombones, &c... Besides the wind instruments already named, the instrument contains a big-drum, kettle-drum, small military-drum, triangles, and cymbals."[250] The *News*'s illustration of this instrument is reproduced in Figure 1. The article goes on to describe various pieces the orchestrion was capable of playing (primarily opera overtures and Beethoven symphony movements), and praises its ability to change dynamics effectively — "when the full number of instruments is played the tone is very powerful, and the effect almost equal to a small band."[251] The article also reports that Welte had solved the issue of the barrels only being able to play short pieces: "The barrels or cylinders move in a spiral line, and are pushed forward after each revolution in order to bring a different set of pins under the keys... thus long pieces of music can be played without a change of barrels. Each barrel makes eight

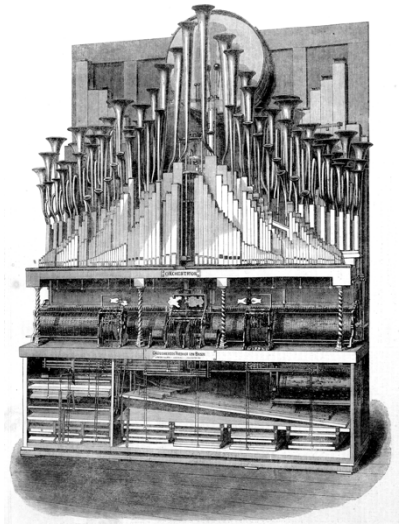


Figure 1: Illustration of the Welte orchestrion displayed at the 1862 World Exhibition in London.[249]

[248] Hagmann, *Das Welte-Mignon-Klavier*, 15.
[249] [Illustration], *The Illustrated London News* 41, no. 1165 (20 September 1862), 321.
[250] "Mr. M. Welte's Orchestrion," *The Illustrated London News* 41, no. 1165 (20 September 1862), 323.
[251] "Mr. M. Welte's Orchestrion," 323.

revolutions..."[252] These details, particularly the writer's astonishment at and detailed explanation of the workings of the organ and note how much longer pieces could be played on mechanical instruments than by a simple pinned barrel, indicate that Welte had moved well beyond the technology for which Mozart and his contemporaries had written, and that his self-playing instruments had reached a level of sophistication greater than any of his competitors.

The success at the 1862 exhibition in London provided further orders, and in 1872 the firm moved to Freiburg im Breisgau to expand its operation and continue developing self-playing instruments.[253] In the following years Welte began experimenting with and introducing more sophisticated ways to reproduce music, primarily through pneumatics, using punch books and perforated paper rolls to replace the cumbersome barrels.[254] In 1883, Michael's eldest son Emil, who had emigrated to the United States, patented the use of perforated paper to control wind-based musical instruments.[255] Due to the lack of any major organ developments until 1892 at the Chicago World's Fair, the Welte company in the years following appears to have spent much of their artistic energy researching ways to build self-playing pianos, as they were smaller and cheaper than organs, and therefore had a wider market. The instruments have considerably more variables to consider than organs, such as dynamics (achieved by the rate of key attack) and the sustain pedal. Though there must have been considerable effort put into the organ division as well; at the Chicago World's Fair in 1892, Welte first exhibited its newest invention: the "Style 10 Cottage" Orchestrion.[256]

---

[252] "Mr. M. Welte's Orchestrion," 323.
[253] Hagmann, *Das Welte-Mignon-Klavier*, 16–17.
[254] Hagmann, *Das Welte-Mignon-Klavier*, 17–18.
[255] United States Patent 287,599 (30 October 1883).
[256] For full details of the piano technology, see Hagmann, *Das Welte-Mignon-Klavier*, and Gerhard Dangel, "Archäologie eines Klangs," in *'Recording the Soul of Music': Welte Künstlerrollen für Orgel*

This instrument reproduced music from paper rolls; each roll had many parallel ruled lines called tracks, each of which was assigned to a certain aspect of the organ. Each track could cause one pitch to sound, a stop to turn off and on, and others would make the swell box move.[257] The "Style 10 Cottage" orchestrion was the largest model, with rolls using up to 120 tracks; the music that could be played on these instruments was becoming increasingly complex — orchestral transcriptions of symphonies and opera overtures abounded, with works by Beethoven, Brahms, Gounod, Mendelssohn, Mozart, Rossini, Saint-Saëns, and many more filling the Welte catalogue.[258] Yet the art of creating the rolls themselves was left to perforation artists, rather than recording a live organist's playing. According to David Rumsey, who played a major part in cataloguing the many master rolls at Seewen, many from the late orchestrion period (c. 1880–1909) were most likely arranged by Franz Xaver Franz, a trumpeter and violinist of the Freiburg City Orchestra, who made many hand-perforated rolls; the other was listed as "M. Welte," which could refer to Michael Welte the father (1807–1880) or the son (1846–1920).[259] Until this point, the recordings of Welte still relied, in terms of the actual production of music, entirely on highly calculated measurements to produce a musical product; the special magic of the human element — a recorded performance by a human being playing the organ — became possible just over a decade after the Chicago World's Fair.

---

und Klavier als authentische Interpretationsdokumente?, ed. Christoph Hänggi (Bern: Hochschule der Künste Bern, 2013): 13–19.

[257] David Rumsey, "The Big Picture — Welte's Instruments, Rolls, Recording, Digital Editing," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011): 17.

[258] Rumsey, "The Big Picture," 71.

[259] Rumsey, "The Big Picture," 67.

The Welte Philharmonic Organ

Welte's next major international success in organ-making was the grand unveiling of the largest, most complex, and most accurate machine used to reproduce live performances; this took place between April and November 1911 at the Esposizione internazionale delle industrie e del lavoro in Turin, Italy.[260] The event was on a huge scale, with as many as 150,000 visitors per day, and the display of musical instruments had an entire 4000 square metres of floorspace.[261] Welte's presentation space was advertised in the official catalogue of the Exhibition as follows:

> "Welte M. & Söhne, makers of pneumatic musical instruments, Freiburg/B. New York Branch, 273, Fifth Avenue. Automatic "Welte-Mignon" piano in four different models, to faithfully reproduce the original execution of the best masters. Welte Philharmonic Organ, Piano Orchestras, etc."[262]

Given the immense size of the audience that would read this advertisement, Welte appears to have taken great care in the wording. They first advertise their automatic piano, which, being smaller and less expensive than an organ, would naturally have the largest audience. They also make a point to advertise how their rolls "faithfully reproduce the original execution of the best masters."[263] This refers entirely to the piano rolls, as the first organ rolls to reproduce a live organist's performance were recorded on 18 July 1912.[264] However, this goal of "faithful reproduction" was a consistent point in much of Welte's advertising from around this period forward.

---

[260] Nicola Cittadin, "L'Esposizione Internazionale di Torino nel 1911, Marco Enrico Bossi e la ditta Welte," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011): 188.
[261] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 188.
[262] Reproduced in Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 190: "Welte M. & Söhne, Fabbrica di istrumenti musicali pneumatici, Freiburg/B. Filiale New York, 273, Fifth avenue. Piano automatico "Welte-Mignon" in 4 modelli diversi per riprodurre fedelmente l'esecuzione originale dei migliori maestri. Organo filarmonico Welte, Piani orchestrali, ecc."
[263] Reproduced in Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 190.
[264] Rumsey, "The Big Picture," 65 and Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 191.

Nicola Cittadin's in "L'Esposizione Internazionale di Torino nel 1911" discusses the early Welte Italian organ rolls, and brings together all the important sources which discuss the early reception of the Welte-Philharmonie at the Turin Exposition of 1911; these all agree that Welte's exhibition was a tremendous success, both artistically and commercially.[265] Many of Europe's most important conductors and keyboardists attended, who later recorded rolls on either the Welte Mignon piano or organ, including even the likes of Debussy and the famous Italian organist Marco Enrico Bossi; he played a major concert on 31 October 1911, which given its prominence in the Exhibition timetable, would likely have attracted the most important listeners.[266] There is no record of Welte having met Bossi during this time, but Bossi recorded at the Welte factory in Freiburg im Breisgau less than a year later.[267] It is unclear whether Welte heard Bossi at the concert, but given the importance of the first organ roll recordings made by a living organist, a businessman on the level of Welte surely would not have left the artist to chance, and following the success of such a major concert, Bossi would have had the name recognition among Welte's prospective customers who were interested in organ music. All the firm's instruments made a clear impact: Welte was awarded the Exposition's coveted Gran Primo diploma, signifying the artistic and technological triumph of their instruments.[268]

As to what music the Philharmonic Organ played during the Exposition, at first it played rolls originally for the smaller Orchestrions that Welte's technicians reworked by hand.[269] According to David Rumsey's research, which compiled the conversions

[265] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 188–195.
[266] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 190.
[267] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 191.
[268] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 191.
[269] Rumsey, "The Big Picture," 66–67.

from 120-track Cottage orchestrion rolls to 150-track Philharmonie rolls between 1912 and 1927, only one piece out of over 80 rolls on offer was originally composed for organ.[270] The rest were transcriptions and arrangements of popular orchestral works, the vast majority of which were made by Franz, and there was not a single piece by Johann Sebastian Bach.[271] This indicates that, at least in terms of conversions from orchestrion to Philharmonie, the company's priority was aimed more toward commercial sales for entertainment purposes, rather than promoting serious art, as the Welte Mignon piano had done.

Welte continued to engage the leading organists and composers of the day to record, many of whom studied with leading figures of the Romantic period. Bossi, as the first Welte recording artist, recorded several of his own compositions, plus transcriptions of works by Debussy, Haydn, Dubois, and more; he also recorded several pieces originally for organ: César Franck *Cantabile*, and J.S. Bach *Prelude and Fugue in D Minor "Fiddle"*, BWV 539.[272] Later in 1912, Alfred Sittard, Franz Joseph Breitenbach, Marie-Joseph Erb, and Eugène Gigout in turn came to record their own compositions, transcriptions, and solo organ works by various composers; in 1913 even more organists recorded, the most famous of whom were Joseph Bonnet, Max Reger and Edwin Lemare.[273] Unfortunately, details of exactly how each artist was scouted are lost, but a reasonable assumption would be that Welte followed the organ scene throughout Europe. The details of the sessions with Erb, Gigout, and Bonnet, all major figures of the French Romantic Organ School, will be discussed in Chapter 6.

---

[270] Rumsey, "The Big Picture," 69–70. The one organ piece was Théodore Dubois's *Cantilène nuptiale*.
[271] Rumsey, "The Big Picture," 69–70.
[272] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 193. The roll of BWV 539 was released in 1922; whether it was recorded then or in Bossi's first session in 1912 is unclear.
[273] For the full list, see Rumsey, "The Big Picture," 71.

The commercial success inspired fierce competition worldwide, particularly between the Aeolian company in the USA; the enormous leaps in recording technology were highly secretive, to the point that Welte intentionally never patented its recording technology to keep the competition in the dark — there are almost no patents by either company, because doing so would require a full public disclosure of how the technology works .[274] Because of the secrecy in technological development, the records which would have clarified the progress of the technology and how much of it was designed were lost forever. The greatest of these losses, due to the bombing of the Freiburg factory during the Second World War, were the original recording organ that the aforementioned artists played, and the apparatus to transfer those performances to paper.

Despite these losses, Welte had a smaller branch in Poughkeepsie, New York, which had a second recording studio and organ. Mervin Fulton, who acquired this second recording apparatus several years after the branch's closure, noted his recollections of Welte's second machine in their New York branch for Seewen, Switzerland's Museum für Musikautomaten's book in a chapter entitled "How the Welte Pipe Organ Rolls were Made."[275] He not only describes the mechanical details, but how the factory workers hand-perforated the commercial copies from the original inked master rolls, which are some of the only pieces of written evidence as to Welte's practices.

[274] Hans-W. Schmitz, "Untersuchungen am Aufnahmeapparat für die Welte-Philharmonie-Orgelrollen," in *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, ed. Christoph Hänggi (Bern: Hochschule der Künste Bern, 2013): 53–54.
[275] Mervin E. Fulton, "How the Welte Pipe Organ Rolls were Made," in *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, ed. Christoph Hänggi (Bern: Hochschule der Künste Bern, 2013): 162–168.

However, the Poughkeepsie recording apparatus was not immediately delivered to Fulton; he laments that "without taking photographs or making drawings how each part was hooked up, [the previous owners] tore the whole works down all at once... They forgot where the parts went, or lost their enthusiasm for the project, and they never got around to reassembling anything. [The apparatus] was stored in warehouses... and it eventually ended up being sold, somewhat rusted and minus some critical parts."[276] It therefore fell to the Museum für Musikautomaten, who purchased the machine from Fulton, to piece together how the mechanism worked, and the speed at which the recording was made and playback was intended.

David Rumsey's article "The Speed of Welte's Organ Rolls" addresses the problems in determining the speed of organ roll recording playback.[277] On Welte's instruments there was always a lever by which the operator could adjust the speed of playback which could be adjusted as a spectrum of speeds (as opposed to having a set number of playback speeds).[278] Rumsey notes that "we might thus conclude that accuracy of registration and tempo were not a major priority of the firm... However, it is equally evident that Welte took correct tempo and registration very seriously at the time of recording." [279] This is substantiated by Alfred Hollins, an English recording artist for Welte, who in his autobiography recalls that a technician noted the reception.

Several experts have made independent analyses of the mechanics Fulton described: Hans-Werner Schmitz performed a series of mechanical tests on the existing

[276] Fulton, "How the Welte Pipe Organ Rolls were Made," 167.
[277] David Rumsey, "The Speed of Welte's Organ Rolls," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011), 68–80.
[278] Rumsey, "The Speed of Welte's Organ Rolls," 68. The Welte organ at the Museum für Musikautomaten in Seewen has such a lever.
[279] Rumsey, "The Speed of Welte's Organ Rolls," 68.

apparatus.[280] His analyses revealed a number of technologies which were previously undiscovered, largely due to lack of the second apparatus and technical designs; the most important of these were a "precision paper guide system and a tachometer with scale capable of continuously monitoring the paper speed."[281] Ultimately his work determined that the recording speed was indeed the same as the "normal" playback speed on a Philharmonie organ. This was additionally confirmed in David Rumsey's article "The Speed of Welte's Organ Rolls," which successfully replicated Schmitz's experiments and confirmed Fulton's recollections.[282]

How Welte Recorded Organists

Welte's paper rolls were simple, yet could record a tremendous amount of information. The blank master roll, which had 150 parallel ruled lines, was loaded into the machine, and the rate of recording was set to 13 revolutions per minute, controlled by a rheostat.[283] 175 little discs made of the same type of rubber used in printing presses were attached to a metal rod, though only 150 were used.[284] According to Fulton, there was a mechanism that would constantly ink the discs, though this has since been lost.[285] When an electrical contact was activated by a keystroke, stop change, or swell pedal movement, the associated disc was pressed against the roll of paper, leaving a line.[286]

---

[280] Schmitz, "Untersuchungen," 66.
[281] Schmitz, "Untersuchungen," 66.
[282] David Rumsey, "The Speed of Welte's Organ Rolls," 68–80.
[283] Fulton, "How the Welte Pipe Organ Rolls were Made," 162. This is confirmed in conducted in independent studies: Schmitz, "Untersuchungen," and David Rumsey, "The Speed of Welte's Organ Rolls," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011), 68–80.
[284] Schmitz, "Der New Yorker Aufnahmeapparat," 122. The extra 25 unused tracks were probably intended for further expansion.
[285] Fulton, "How the Welte Pipe Organ Rolls were Made," 163–164.
[286] This was not a new concept, as Johann Friedrich Unger invented a remarkably similar device in 1752, which was reconstructed by the Royal Prussian Academy of Sciences. See Schmitz, "Untersuchungen," 52, esp. footnote 4. Specifically, according to Fulton in "How the Welte Pipe Organ Rolls were Made,"

After the ink had dried, the technician would perforate the lines by hand, creating the master roll.[287] The technician would play the roll back on the organ and make any corrections or edits, usually annotating changes directly on that master copy. See Figure 2:

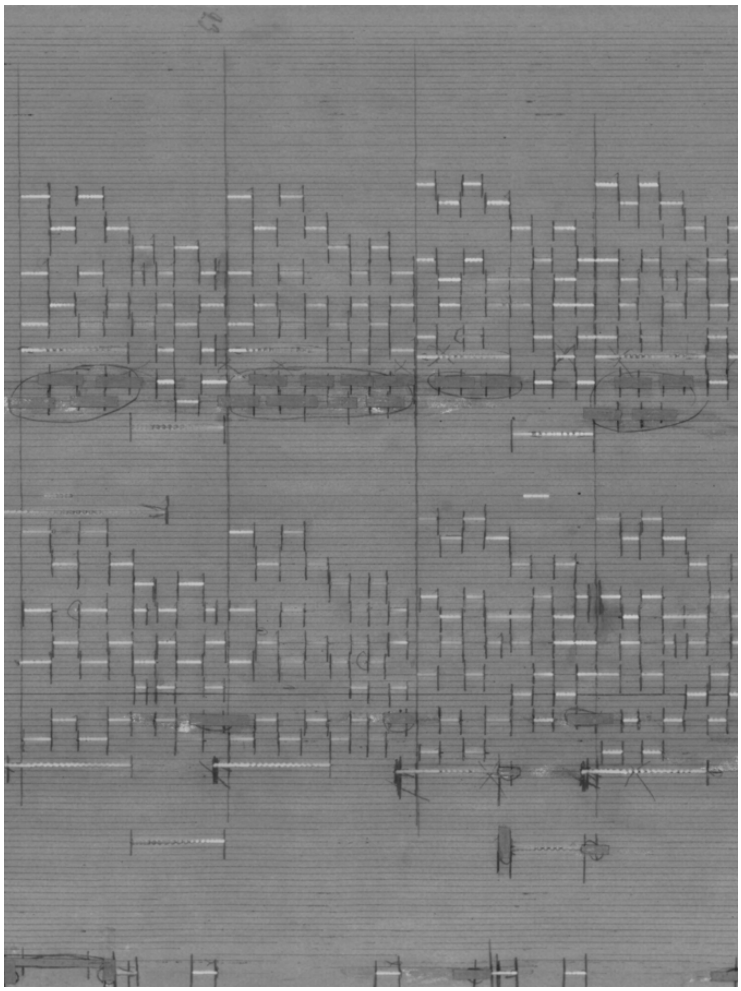


Figure 2: Section of Welte Roll 0768, master roll: Joseph-Marie Erb's performance of the opening of J.S. Bach: *Concerto in G Major*, BWV 592: III. [Presto]. Image courtesy the Museum für Musikautomaten.

162, "Each of the 150 flat rods were connected by linkages to 150 vacuum-actuated pneumatics underneath the machine. The vacuum was supplied by a 120 volt, 60 Hz motor-driven vacuum pump located in the bottom of the cabinet. Electrical impulses from the organ console's stops went through a separate pneumatic relay box that gave the required momentary off-on signals to make short inked lines, instead of a lot of long lines cluttering up the sides of a master roll."

[287] Fulton, "How the Welte Pipe Organ Rolls were Made," 164–166.

In the Seewen Museum für Musikautomaten's scan of master roll above, each ruled line represents a track, and each white portion a perforation. Among the organ rolls of Bach's works made by members of the French Romantic Organ School, Welte's editors added short vertical lines to the beginnings and endings of every individual perforation, as seen in Figure 2. The longer vertical lines in Figure 2 show each bar of the score; in some rolls the bar numbers are marked in the roll. Registration changes are sometimes marked with abbreviations.

The lengths of notes were determined by the length of the line or perforation, and stop changes were determined by a switching signal that would command a register that was on to turn off, or vice versa. The swell pedal worked similarly: four tracks were dedicated to the controlling the position of the shutters, and the switching command would cause the shutters to move between any of the programmed positions, ranging from 0° to 45°.[288]

According to documents from the Museum, the functions of the each of the 150 tracks in use by Welte are shown in Table 1:

1	Pedal		77	forzando forte
2	Pedal Solo		78	forzando piano
3	Principal Chorus		79	II-C
4	Violonbass 16'		80	Cs
5	Subbass 16'		81	D
6	Cello 8'		82	Ds
7	Harfe		83	E
8	Viol d'orchestre 8'		84	F
9	Gamba 8'		85	Fs
10	Fagott 8'		86	G
11	Flöte 4'		87	Gs
12	Principal 8'		88	A
13	Vox celestis 8'		89	B

[288] Daniel Debrunner, "Von der Welte-Rolle zur parametrisierbaren Wiedergabe auf synthetischen Instrumenten und MIDI-fähigen Selbstspielklavieren," in *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, ed. Christoph Hänggi (Bern: Hochschule der Künste Bern, 2013), 98–99.

14	Traversflöte 8'		90	H
15	I-C		91	c0
16	Cs		92	cs0
17	D		93	d0
18	Ds		94	ds0
19	E		95	e0
20	F		96	f0
21	Fs		97	fs0
22	G		98	g0
23	Gs		99	gs0
24	A		100	a0
25	B		101	b0
26	H		102	h0
27	c0		103	c1
28	cs0		104	cs1
29	d0		105	d1
30	ds0		106	ds1
31	e0		107	e1
32	f0		108	f1
33	fs0		109	fs1
34	g0		110	g1
35	gs0		111	gs1
36	a0		112	a1
37	b0		113	b1
38	h0		114	h1
39	c1		115	c2
40	cs1		116	cs2
41	d1		117	d2
42	ds1		118	ds2
43	e1		119	e2
44	f1		120	f2
45	fs1		121	fs2
46	g1		122	g2
47	gs1		123	gs2
48	a1		124	a2
49	b1		125	b2
50	h1		126	h2
51	c2		127	c3
52	cs2		128	cs3
53	d2		129	d3
54	ds2		130	ds3
55	e2		131	e3
56	f2		132	f3
57	fs2		133	fs3
58	g2		134	II-g3
59	gs2		135	Wienerflöte 8'

60	a2		135	Harmonieflöte 8'
61	b2		136	Viola 8'
62	h2		137	Aeoline 8'
63	c3		138	Bourdon 8'
64	cs3		139	undefined
65	d3		140	Trompette 8'
66	ds3		141	Horn 8'
67	e3		142	Oboe 8'
68	f3		143	Clarinette 16'
69	fs3		144	Glocken
70	g3		145	Tremolo
71	gs3		146	Vox humana 8'
72	I - a3		147	Vox humana echo
73	crescendo forte		148	Pauke
74	crescendo piano		149	Tutti
75–76	[not in use]		150	Posaune 16'

Table 1: List of the function of each individual track of Welte Philharmonie Rolls, courtesy the Museum für Musikautomaten.

The Welte recording organ, seen in Figure 3, was a two-manual instrument; the stoplist is given in Table 2, determined from documents collected by Christoph Hänggi:[289]

[289] Christoph Hänggi, "Die Seewener Welte-Philharmonie-Orgel," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011), 205.

Manual I		Manual II	
Bordun	16'	Wienerflöte	8'
Principal	8'	Bordun	8'
Traversflöte	8'	Viola	8'
Gambe	8'	Aeoline	8'
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	4'	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	Oboe	8'
Harfe		Vox Humana	8'
Glocken		Tremolo	
Misc.		Pedal	
II to I		Violonbass	16'
II sub to I		Subbass	16'
super-I		Cello	8'
II super		Gedackt	8'
I to Pedal		Posaune	16'
II to Pedal			

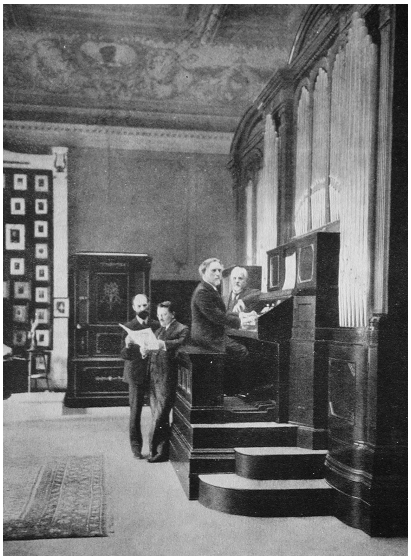


Figure 3: Photograph of Eugène Gigout at the Welte recording organ in Freiburg im Breisgau, 1912. Photo courtesy the Museum für Musikautomaten.

Table 2: Disposition of the 1909 Welte organ at Welte's recording studio in Freiburg, no longer extant.

The entire instrument was enclosed behind the swell box, except for the Principal 8' pipes in the façade. It had an electrical contact for every key, stop, and the swell pedal; these were connected via cable to the recording apparatus, shown in Figure 4.

Of the 1500 rolls in the collection in Seewen, over 1200 are the original master rolls, whose annotations contain information about the editing process.

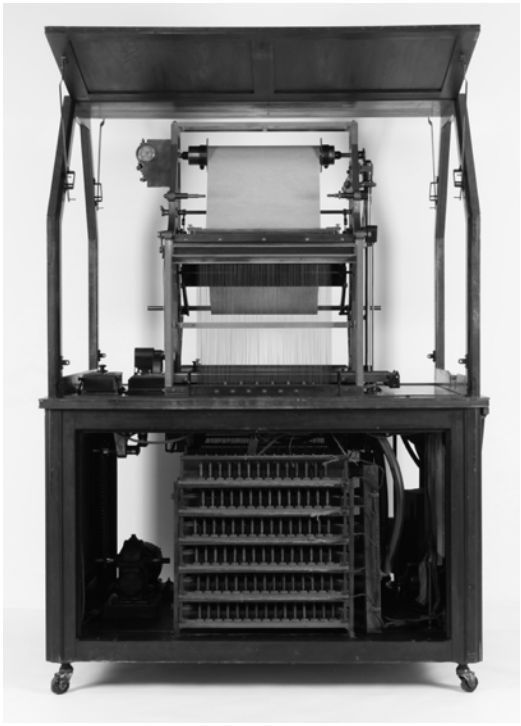


Figure 4: Photograph of the c. 1909 Welte recording apparatus built for the Poughkeepsie, New York branch. Photo courtesy the Museum für Musikautomaten.

The recording organ had pneumatic key action, which operates on a binary system — the pipe either sounds or not. Therefore the duration of the recorded rhythmic values is clear. The other aspects of performance, such as tempo and registration, are dictated through the recording technology — tempo based on the speed at which the roll was recorded and then replayed, and the registration and swell pedal by a relay system.[290] This incredibly complex technology had successfully converted the art of organ playing to a simple set of binary signals, very similar to modern MIDI technology. As such, when played back on an appropriate organ, audiences today can hear a sound that was almost identical to what the recording artist experienced, without the flaws of background noise picked up by conventional microphones or sound degradation.

At many expositions and fairs at which Welte presented, their advertisements always included the phrase "to faithfully reproduce the original execution of the greatest masters."[291] In the case of a blocked chord, for instance, organists are generally taught

[290] For full details, see Fulton, "How the Welte Pipe Organ Rolls were Made," 164.
[291] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 190: "Per riprodurre fedelmente l'esecuzione originale dei migliori maestri."

to play all the notes together, but if one slowed down the exact moment at which the keys are depressed, it is impossible to play all three notes at the exact same moment. For the first time, such tiny technical imprecisions like this could physically be seen, literally in black and white. Given the numerous editorial notes on the rolls and the precision with which the rest of the firm operated, Welte likely viewed these small faults as constituting a more human and therefore "faithful" performance, giving even more credibility to the value of the company's rolls.

As such, organ rolls in general are among the strongest records of performance practice in existence — the minutia of detail in each recording is far greater than what could ever be practically conveyed in writing, and as we will see in Part III, often artists contradict themselves between their written instructions on performance and actual practice. As such, the organ rolls by members of the late French Romantic Organ School are some of the strongest evidence as to how Bach was performed. Because the contracts between Welte and the artists are lost, there is no way to know exactly how the repertoire to be recorded was chosen, but it seems reasonable to guess that the artist would have some say in the matter. The fact that Bach appears in every one of Welte's French recording organists' roll output further supports the importance of Johann Sebastian's music.

Chapter 5: Welte's French Recording Artists: Gigout, Bonnet, and Erb

Introduction

M. Welte und Söhne commissioned many of the world's leading organists in the early twentieth century to record organ rolls.[292] Because the Freiburg factory was destroyed, the details of their engagements are lost, and therefore secondary evidence gives the most complete picture of what happened in the recording studio. Despite the majority of Welte organ rolls being transcriptions of orchestral works, there are many performances of organ repertoire spanning around five centuries. While Welte's primary aim was profit, based on the illustrious list of artists he invited and his consistent advertisements that his recordings "faithfully reproduce[d] the original execution of the best masters," Welte knew that these recordings represented more than an income — they would serve as testaments to the artists' work for generations to come.[293] An invitation to record for Welte generally only went to highly accomplished and successful organists, and a wide variety of national backgrounds. Among Francophone organists, the four to receive invitations between 1912 and 1926 were Eugène Gigout, Joseph Bonnet, Marie-Joseph Erb, and Marcel Dupré. Each studied in Paris around the same time, and as we will see, received instruction in Bach organ performance in the style of Lemmens. However, because Marcel Dupré was of a slightly younger generation and further developed his own very distinct ideas about Bach performance practice (seen most clearly in his own editions), his recordings of Bach's organ works will not be discussed in this dissertation.[294] Part III will further demonstrate that the

[292] David Rumsey, "The Big Picture": 64–81.
[293] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 188.
[294] Dupré recorded three Bach works for Welte in 1926, comprising numbers 2037–2039:
2037: *Trio Sonata 2 in C Minor*, BWV 526
2038: *Prelude and Fugue in E Minor*, BWV 548

other three interpreted Bach's organ works similarly to the written sources discussed in Part I.

Eugène Gigout

The most famous of Welte's three Bach recording artists whose rolls are preserved at Seewen was Eugène Gigout. He first apprenticed at the maîtrise (choir school) of Nancy Cathedral, and from 1857–1863 attended the Niedermeyer School in Paris, where he studied organ with Clément Loret, a Lemmens pupil.[295] According to Norbert Dufourcq in his special edition short biography and summary of Gigout's letters and correspondence, Loret "taught [Gigout] the technique of Adolf Hesse of Breslau" which Loret had learned from Lemmens.[296] Following graduation, Gigout taught organ, plainchant, counterpoint, and fugue at the Niedermeyer School, and was organist at Saint-Augustin in Paris, though for the first five years he only played harmonium while awaiting a new organ.[297] In 1885, Gigout founded a new School of Organ, Improvisation, and Plainchant in Paris, and in 1911 left to succeed Guilmant as organ professor at the Paris Conservatoire until 1925.[298]

Like every prominent French organist of the time, Gigout played Bach regularly in concerts and in church services; Table 1 lists some major occasions at which Gigout played Bach's organ works.

2039: Three Chorale Preludes: *Wo soll ich fliehen hin* [Schübler], BWV 646; *Christ lag in Todesbanden* [Orgelbüchlein], BWV 625; *Nun freut euch*, BWV 734

[295] Dufourcq, *Eugène Gigout*, 4.

[296] Dufourcq, *Eugène Gigout*, 4: "[Gigout] s'initie à l'orgue avec Clément Loret qui, par-delà Lemmens, lui enseigne la technique d'Adolf Hesse de Breslau."

[297] Dufourcq, *Eugène Gigout*, 4.

[298] Dufourcq, *Eugène Gigout*, 4. Ochse, *Organists and Organ Playing*, 214.

BWV	Title	Date	Venue
?	"Gigout transcribed for organ an aria for soprano from the cantata for Pentecost of Bach."	20 February 1879	Trocadéro, Paris
?	[transcription of a Bach air]	21 March 1879	Saint-Eustache, Paris
540	Toccata in F (Major)	3 July 1879	Trocadéro, Paris
	Fantasia and Fugue in G Minor [Bach is not specifically mentioned as the composer]	10 July 1879	Trocadéro, Paris
532?	Fugue in D Major	24 June 1880	Trocadéro, Paris
565	Toccata and Fugue (in D Minor?)	1 July 1880	Trocadéro, Paris
?	[piece unspecified]	September 1888	Palau de la Música, Barcelona
572	Fantasia in G Major	February and March 1894	Salle d'Harcourt, Paris
582	Passacaglia (in C Minor)	February and March 1894	Salle d'Harcourt, Paris
?	[piece unspecified]	17 May 1894	Notre-Dame-de-la-Couture du Mans
540	Toccata in F Major	1899	Saint-Augustin
548?	Prelude and Fugue in E Minor	1899	Saint-Augustin
?	[piece and composers unspecified, but it seems likely some Bach was performed]	18 April 1904	Concert for the société Bach, Salle de l'Union, rue de Trévise
?	[piece unspecified]	7 June 1909	Home of Bérenger de Miramon, with Wanda Landowska
548?	Prelude and Fugue in E Minor	11 May 1911	Home of Bérenger de Miramon
	[Various works, see Table 2]	26 November 1912	Welte recording session, Freiburg im Breisgau
?	[piece unspecified]	6 April 1913	Saint-Maurice de Bécon-les-Bruyères, Courbevoie
552	Prelude and Fugue in E-Flat Major	23 June 1917	Sainte-Clotilde, Paris

552	Prelude and Fugue in E-Flat Major	23 March 1924	Cathedral, Nancy
548?	Prelude and Fugue in E Minor	19 November 1925	Saint-Augustin, Paris
540	Toccata in F Major	19 November 1925	Saint-Augustin, Paris

Table 1. A list (not comprehensive) of some major occasions when Gigout played Bach's organ works.[299]

The works most performed are the *Toccata in F Major*, BWV 540, and one of the *Prelude and Fugues in E Minor* (whether this was BWV 548 or 533 is unclear), each performed three times. Dufourcq points out a few details of Gigout's Bach programming in his biography, attributing several pieces to Gigout's repertoire that never appear in Dufourcq's list of Gigout's performances:

> "It seems that [Gigout] only performs a few large preludes and fugues (A Minor, B Minor, E Minor, E Flat Major), to the exclusion of the others (G Major, F Minor, C Major, A Major)... Sometimes he includes in his concerts the Passacaglia, the Fantasy and Fugue in G Minor, often the Toccata and Fugue in D Minor; never the Dorian, the Toccata, Adagio, and Fugue in C Major; on the other hand, he often calls for the Toccata in F to end a concert. But it appears that he ignores the concertos, even the sonatas of which he will give only the first and the allegro of the second. More curious: Gigout never calls upon a chorale..."[300]

Dufourcq goes on to speculate as to why Gigout avoided chorales in concerts: Gigout may not have performed Bach chorales or trio sonatas in concerts (but as shown in Table 1, there are many questions as to exactly what repertoire Gigout played), but this was not unusual in concert programmes, as the majority of Bach works which appear at

[299] Unless specifically noted, all this information was taken from Dufourcq, *Eugène Gigout*, 4–15. The concerts at Saint-Eustache and Saint-Augustin are discussed in Ochse, *Organists and Organ Playing*, 96 and 184.

[300] Dufourcq, *Eugène Gigout*, 16: "De Bach, dont il a vu paraître toute l'œuvre, il semble qu'il n'exécute que quelques grands Préludes et fugues (la mineur, si mineur, mi mineur, mi bémol), à l'exclusion des autres (sol majeur, fa mineur, ut majeur, la majeur)... Parfois, il inscrit à ses concerts la Passacaille, la Fantaisie et fugue en sol mineur, souvent la Toccata et fugue en ré mineur; jamais la « Dorienne », la Toccata, adagio et fugue en ut majeur; en revanche, il en appelle souvent à la Toccata en fa pour terminer un concert. Mais il apparaît qu'il ignore les concertos, voire les sonates dont il ne donnera que la première et l'allegro de la seconde. Plus curieux : Gigout ne fait jamais appel à un choral..."

major venues like Trocadéro were the large free works. Gigout obviously did play some trios and chorales, as he recorded a few of them for Welte. Table 2 lists the Bach works that appeared in Welte's catalogue and are in the collection at Seewen:

Welte No.	Title	BWV
1079	Toccata in F Major ["E Major" in catalogue]	540
1080	Prelude in E-flat Major	552
1585	In dir ist Freude	615
1586	O Mensch, bewein dein Sünde gross	622
1587	Largo (Trio Sonata V)	529/II
1588	Allegro moderato (Trio Sonata I)	525/I

Table 2. List of organ rolls by J.S. Bach which Gigout recorded for Welte.

One of the two pieces which appear most in Gigout's concert output — the *Toccata in F Major* — was one of the pieces he chose to record for Welte. Given the importance and status of receiving a recording invitation from Welte, Gigout probably chose works which he felt the most confident playing.

There is very little written information about how Gigout specifically interpreted Bach's organ works overall. The only limited description of Gigout's Bach aesthetics comes from Fannie Edgar Thomas, a New York music journalist whom *The Musical Courier* sent to Paris from 1893–1894 to observe and write articles about the state of French organ music in her time; Agnes Armstrong collected Thomas's reports into *Organ Loft Whisperings*, which includes reproductions of all the articles with annotations by Armstrong.[301] Armstrong's insightful annotations point out every instance of shortcomings in Thomas's reporting, namely where there is evidence to directly contradict Thomas's reports; despite this, Thomas sat in the organ loft during many Sunday services to watch organists play, and even if some details were inaccurate,

[301] Agnes Armstrong, *Organ Loft Whisperings: The Paris Correspondence of Fannie Edgar Thomas, 1893–1894* (Altamont, New York: Sicut tuum, 2003).

her recollections in a general sense are worthy of scrutiny at least. In 1894, Thomas reported the following of Gigout's opinions on Bach:

> "Bach is [Gigout's] favorite for the organ. As to the speed of playing, "there must be masterful fluctuations." No two play the same composition in the same tempo; the tempo, too, depends much upon the place in which it is played. In a small sound concentrating chamber one can play a selection much more rapidly than in a huge space as St-Sulpice. The main thing is to make the escaping harmonies stand out, and to adopt the style of playing to the sentiment. He regards Widor as the great Bach apostle."[302]

Thomas's summation of Gigout's ideas about Bach performance practice are wholly consistent with that of the French Romantic Organ School's aesthetics discussed in Part I. Despite never having studied with Widor, his aesthetic values, especially clarity and adjusting to acoustics were clearly instilled in Gigout.[303]

In terms of Gigout's taste in instruments, he is also highly consistent with his contemporaries; Dufourcq quotes Gigout as having praised the work of Cavaillé-Coll above all others: "Organbuilding has made immense progress, thanks above all to M. Cavaillé-Coll. The music of our first old masters was made for instruments a long way removed, in terms of resources and as perfection, from those we have now."[304]

Gigout's appreciation for Cavaillé-Coll's craft is particularly evidenced by the work he had done on the organ at Saint-Augustin. In 1868, Charles Barker and Albert Peschard built a new 42-stop instrument, the first to use electric action in Paris.[305] Around 1890 Cavaillé-Coll took charge of the instrument's maintenance[306], but based on

---

[302] Armstrong, *Organ Loft Whisperings*, 68. Originally published as Fannie Edgar Thomas, "Gigout. — St-Augustin.," *The Musical Courier* 28, no. 2 (10 January 1894).
[303] Perhaps this was from hearing Widor and his students play, as Gigout was clearly in the upper echelons of the French Romantic organ scene; perhaps it came from his grand-teacher Lemmens.
[304] Dufourcq, *Eugène Gigout*, 5: "La facture des orgues a fait un immense progrès grâce surtout à M. Cavaillé-Coll. La musique de nos premiers maîtres anciens a été faite pour des instruments bien loin, comme ressources et comme perfection, de ceux que nous avons maintenant."
[305] Ochse, *Organists and Organ Playing*, 82.
[306] Raugel, *Les grandes orgues*, 209.

the correspondence of Thomas, who visited the organ in 1894 and reported reactions by major figures of the French Romantic Organ School, it was clear that that the Peschard key action was unsatisfactory:

> "The organ is in bad condition... American lightning makers, lightning lovers, lightning utilizers will be astonished to know that their beloved but subtle agent is not considered "the thing" by the organ artists here... "something in the touch," Guilmant says... "something in the touch, no it's not the same, not the same."
>
> "I do not love it," says Widor emphatically... his big brown eyes snapping confirmation of the words.
>
> ""You see," deliberately and politely says M. Dubois... "it is scarcely the place for electricity — it —"
>
> "Gigout pulls out three unnecessary stops and pushes them back again as he asserts the same truth. "There is something unresponsive, slow, not — tender enough — something — so much so that at the next renovation, which I hope for soon, I am going to do away with it altogether!""[307]

Gigout got his wish; by 1899 Cavaillé-Coll had built a new mechanical action with Barker levers and increased the number of stops to 54.[308] This brief interaction between Guilmant, Widor, Dubois, Gigout, and Thomas shows that, at least in 1894, there was a universal agreement among the leading figures of the French Romantic Organ School: electric action had no place in the organ. Further, modernisation in terms of instrument and musical aesthetics was never something to which Gigout aspired. Reflecting upon the aesthetic changes toward the end of Gigout's life, Dufourcq concurs that "Gigout only practised the romantic aesthetic."[309] Gigout's ideas and aesthetics of performing Bach ever matched the ideals of the older generation of Widor, Schweitzer, Guilmant, and Fauré.

---

[307] Armstrong, *Organ Loft Whisperings*, 67. Originally published as Fannie Edgar Thomas, "Gigout. — St-Augustin.," *The Musical Courier* 28, no. 2 (10 January 1894).
[308] Raugel, *Les grandes orgues*, 209–210.
[309] Dufourcq, *Eugène Gigout*, 16: "Mais Gigout n'a pratiqué que l'esthétique romantique."

Gigout's Recording Sessions

The details of how Eugène Gigout came to record organ rolls are, like nearly all information about the business end of Welte's operation, lost or were never written down in the first place. According to documents at the Museum für Musikautomaten in Seewen, Gigout came to Freiburg im Breisgau (age 67 at the time) and recorded in a series of sessions beginning on 26 November 1912, resulting in 33 new organ roll recordings.[310] A list of these recordings is given in Table 3; rolls without a date are marked "unknown" on the table, and information in brackets under the "Title" column refers to how the piece was listed in the published Welte Catalogue.

Welte No.	Composer	Roll Date	Title
1079	Bach, J.S.	1920	Toccata in F Major ["E Major" in catalogue][311]
1080	Bach, J.S.	[unknown]	Prelude in E-flat Major
1081	Boëllmann	1913	Marche réligieuse, Op. 16
1082	Boëly	1913	Andante con moto, Op. 45, No. 7
1083	Franck	1913	Andantino in G Minor
1084	Gigout	1913	Toccata
1085	Gigout	1913	Communion
1086	Gigout	1913	Grand Chœur dialogué
1087	Gigout	1913	Minuetto
1088	Mendelssohn	1913	Sonata, Op. 65, No. 6: I and II
1089	Mendelssohn	1913	Sonata, Op. 65, No. 6: III and IV (partial)
1585	Bach, J.S.	1915	In dir ist Freude
1586	Bach, J.S.	1919	O Mensch, bewein dein Sünde gross
1587	Bach, J.S.	[unknown]	Largo (Trio Sonata V)
1588	Bach, J.S.	[unknown]	Allegro moderato (Trio Sonata I)
1589	Boëllmann	1914	Offertoire in C Major, Op. 29, No. 2
1590	Boëllmann	1914	Elévation in E-flat Major, Op. 29, No. 1
1591	Boëllmann	1914	Communion in B-flat Major, Op. 30, No. 5
1592	Boëllmann	1914	Sortie in C Major Op. 30, No. 5
1595	Chauvet	1914	Andante con moto No. 6 (arr. Dubois)
1596	Chauvet	1914	Andantino No. 9 (arr. Dubois)
1597	Gigout	1915	Marche des rogations

[310] Rumsey, "The Big Picture," 71.
[311] The "E Major" is an error, as Gigout's recording of BWV 540 was played in F major.

1598	Gigout	1915	Marche réligieuse
1599	Gigout	1915	Chant (from Suite) [“Lied” in catalogue]
1600	Gigout	1915	Marche de fête (Suite)
1601	Gigout	[unknown]	Fughetta
1602	Gigout	[unknown]	Cantilene
1603	Gigout	1914	Allegretto grazioso
1604	Lemmens	1914	Scherzo (Symphony concertant)
1605	Lemmens	1914	Prélude in E-flat Major
1606/4513	Lemmens	1914/1926	Fanfare
1607	Lemmens	1914	Cantabile
1608	Lemmens	1914	Prière [“Gebet” in catalogue]
1609	Saint-Saëns	1922	Sarabande

Table 3. List of all organ rolls which Gigout recorded for Welte.[312]

As Table 3 shows, Gigout played a variety of repertoire, the majority of which was by various members of the French Romantic Organ School, from Lemmens to Gigout himself. The exceptions to this were the works by J.S. Bach and Felix Mendelssohn, the latter of whose music is reflected in recordings by other French Romantic organists. The date associated with each roll refers only to the label on the cover — that is, the date of release in Welte's catalogue; it does not necessarily correspond to when Gigout recorded the pieces. However, the publication date is still valuable, as it demonstrates the sometimes-extraordinary length of time it took for some of these recordings to proceed through the editing and production processes. Most of Gigout's session in 1912 was published between 1913 and 1915; those that were released later were all the Bach rolls except *In dir ist Freude* and the Saint-Saëns *Sarabande*.[313]

[312] From a catalogue compiled by David Rumsey.
[313] There is no evidence that can explain why the Bach rolls were nearly all released so much later; perhaps the Bach works were viewed as not being as musically compelling as more recent music, or perhaps Welte thought they would not sell as many copies.

Joseph Bonnet

The second of Welte's French recording artists, Joseph Bonnet, was less famous than Gigout, but more cosmopolitan, and made a significant impact on organ art in North America. He first received lessons from his father in Bordeaux, and as a teenager became organist at Saint-Michel, where his organ recitals were very popular.[314] He then studied at the Paris Conservatoire with Alexandre Guilmant, graduating with first prize and the Grand Prix Alexandre Guilmant; in 1906 he became organist at Saint-Eustache, eventually succeeding Guilmant as organist of the Concerts du Conservatoire in 1911, and recorded for Welte on 6 February 1913.[315] During the First World War he served two years in the trenches, but later the French government allowed him to move to the United States to play concerts to raise funds for the war effort.[316] After the War, he returned to France, and in 1937 became professor of organ, following Vierne, at the École César Franck.[317] Unfortunately the position was short-lived, as in 1940 he moved his family permanently to North America after the occupation of France.[318]

There are no writings about Bonnet's understanding of Bach by others, but there is no evidence to indicate that the training he received from Guilmant, a student of Lemmens, was markedly different than other students of the Paris Conservatoire. A.M. Henderson recalls listening to Bonnet's teacher Guilmant playing Bach in Glasgow:

> "I remember the profound impression his playing made upon me, especially in the qualities of clarity and rhythm... Guilmant's solo in the second part of the programme was the Bach Fantasia and Fugue in G minor, which always remained a specialty with him. The Fugue, which he commenced quite quietly,

[314] "Joseph Bonnet," *The Musical Times* 85, no. 1221 (November 1944), 351.
[315] "Joseph Bonnet," *The Musical Times*, 351. The recording date is from documents provided by Christoph Hänggi to the author from the Museum für Musikautomaten in Seewen.
[316] "Joseph Bonnet," *The Musical Times*, 351.
[317] "Joseph Bonnet," *The Diapason* 418, no. 10 (September 1944), 10.
[318] "Joseph Bonnet," *The Musical Times*, 351.

> he built up very gradually in tone, increasing as the interest of the movement intensifies, until he closed in a blaze of tone, the performance raising the audience to a great pitch of enthusiasm." [319]

The most important details of Henderson's recollection are Guilmant's emphasis on clarity and rhythm and the use of dynamics, all of which are hallmarks of the French romantic Organ School established in Part I.

The other clues as to Bonnet's aesthetic values come from his series of editions entitled "Historical Organ-Recitals." Seth Bingham, in an article entitled "Joseph Bonnet as He Knew Him; Intimate Picture of the Man," published in *The Diapason* just after Bonnet's death, describes the importance of these editions: "Second only in influence to his concertizing are Bonnet's editions of early organ masterworks, especially those preceding or contemporaneous with Bach."[320] In six volumes, each published by G. Schirmer, Bonnet collected and prepared a collection of works, each containing a different specialisation:

> I. Forerunners of Bach (Maîtres primitifs et Précurseurs de Bach) (1917)[321]
> II. Johann Sebastian Bach (1918)[322]
> III. Handel, Mozart, and Masters of the Eighteenth and Early Nineteenth Centuries. (1918)[323]
> IV. Romantic Period: Schumann, Mendelssohn, Liszt (1919)[324]
> V. Modern Composers: César Franck to Max Reger (1929)[325]
> VI. Old Spanish Masters (1940)[326]

---

[319] Henderson, "Memories of Some Distinguished French Organists: Guilmant," 976.
[320] Seth Bingham, "Joseph Bonnet as He Knew Him; Intimate Picture of the Man," *The Diapason* 418, no. 10 (September 1944), 4.
[321] Joseph Bonnet, "Forerunners of Bach (Maîtres primitifs et Précurseurs de Bach)," *Historical Organ-Recitals* 1 (New York: G. Schirmer, 1917).
[322] Joseph Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, edited by Joseph Bonnet (New York: G. Schirmer, 1918).
[323] Joseph Bonnet, "Handel, Mozart, and Masters of the Eighteenth and Early Nineteenth Centuries," *Historical Organ-Recitals* 3 (New York: G. Schirmer, 1918).
[324] Joseph Bonnet, "Romantic Period: Schumann, Mendelssohn, Liszt," *Historical Organ-Recitals* 4 (New York: G. Schirmer, 1919).
[325] Joseph Bonnet, "Modern Composers: César Franck to Max Reger," *Historical Organ-Recitals* 5 (New York: G. Schirmer, 1929).
[326] Joseph Bonnet, "Old Spanish Masters," *Historical Organ-Recitals* 6 (New York: G. Schirmer, 1940).

Unlike the Widor-Schweitzer or Fauré editions of Bach's organ works, Bonnet's is heavily marked with articulations, registration suggestions, dynamic markings, some fingerings and pedallings, and manual changes which are nearly identical to the suggestions in the other French Bach editions' prefaces.[327] The details of Bonnet's edition will be fully discussed in Part III.

Bonnet's Recording Sessions

In a series of sessions beginning on 6 February 1913, Joseph Bonnet (age 68 at the time) recorded 40 pieces onto organ rolls.[328] These are shown in Table 4; rolls without a date are marked "unknown" on the table, and bracketed test under the "Title" column refers to how the piece was listed in the published Welte Catalogue.

Welte No.	Composer	Roll Date	Title
1199	Bach, J.S.	[unknown]	In dulci jubilo, BWV 751
1200	Bach, J.S.	1913	Prelude and Fugue in E Minor, BWV 533
1201/4501	Berlioz	[unknown]/1926	L'adieu des bergers à la sainte Famille, trans. Guilmant
1202/4502	Lully	1922/1926	Riguadon (Collection of Airs for the Band of Louis XIV), arr. W.T. Best
1203	Boëly	1917	Andante con moto, Op. 45, No. 7
1204	Bonnet	[unknown]	Dédicace, Op. 7, No. 1
1205	Bonnet	1913	Romance sans paroles
1206	Bonnet	1914	Rêverie, Op. 5, No. 6
1207	Bonnet	1925	Claire de la lune, Op. 7, No. 3
1208	Bonnet	[unknown]	Pastorale, Op. 7, No. 9
1209	Buxtehude	[unknown]	Fugue in C Major "Gigue", BuxWV 174
1210	Chauvet	[unknown]	Andantino in D-flat Major
1211	Debussy	1914	Cortége (Petite Suite)
1212	Clérambault	1917	Prélude de la suite du 1er ton — Basse et dessus de trompette
1213	Martini	1921	Gavotte (Sonata 12), arr. Guilmant
1215	Schumann	1914	Esquisse No. 4
1611	Bonnet	[unknown]	In memoriam Titanic

[327] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2.
[328] Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 191.

1612	Bonnet	1913	Berceuse
1613	Bonnet	1913	Epithalase, Op. 5, No. 9
1614	Bonnet	1915	Poèmes d'Automne, Op. 3: I. Lied des Chrysanthèmes
1615	Bonnet	1919	Angelus du soir, Op. 10, No. 10
1616	Bonnet	1913	Paysage, Op. 10, No. 9
1617	Bonnet	1913	Lamento, Op. 5, No. 2
1619	Bonnet	1915	Consolation, Op. 5, No. 4
1620	Bonnet	1913	Stella matutina, Op. 7, No. 4
1621	Bonnet	1913	Songe d'enfant, Op. 7, No. 5, moment musical
1622	Bonnet	1915	Zweite Legende
1623	Corelli	1913	Preludio, arr. Guilmant
1624	Marcello	[unknown]	Salmo XIX, arr. Guilmant
1625	Frescobaldi	1913	Toccata per l'elevation
1626	Gluck	[unknown]	Ariette
1627	Gluck	[unknown]	Scène des champs élysées
1628	Gluck	1914	Tambourin in D Major, Menuet in D Major
1630	Grieg	1913	Sarabande, Op. 40, No. 2
1631	Guilmant	1913	Communion aus noël, No. 3
1632	Moussorgsky	[unknown]	Boris Godunov, Act 3: Duett, Scène, Finale
1633	Mozart	[unknown]	Andante favori, Op. 14, No. 1
1635	Ropartz	1921	Thème varié
1636	Schumann	1914	Esquisses, Op. 58, No. 3
1643	Handel	1914	Violin Sonata in A Major, Op. 1, No. 3 (Violin accompaniment part)

Table 4. List of all organ rolls which Bonnet recorded for Welte.[329]

Bonnet played a wider variety of repertoire than Gigout, but the majority were new transcriptions and his own compositions. The only repertoire he recorded which was originally written for solo organ are works by members of the French Romantic Organ School — Boëly, Chauvet, Guilmant, and Ropartz — and five older pieces: two Bach works, a Buxtehude fugue, an organ verset by Clérambault, and a Frescobaldi elevation toccata. The inclusion of the five older pieces is particularly notable, as Bonnet's

[329] From a catalogue compiled by David Rumsey.

performances are the only Welte roll of a Frescobaldi organ work, and the only rolls by a French organist playing Clérambault and Buxtehude.[330]

Bonnet's choice of Bach works was probably intended as a way to show his skill at interpreting Bach's music: an entire free work and a chorale prelude were the major two genres, as evidenced by the volume classifications of the Fauré Bach edition (the volumes were grouped into Preludes and fugues, chorales, and miscellaneous pieces such as sonatas and concertos).

Beyond the music of J.S. Bach, Bonnet recorded a vast amount of repertoire for Welte, including works by Berlioz, Boëly, Clérambault, Corelli, Debussy, Frescobaldi, Grieg, Mozart, and Robert Schumann, many more. Table 5 lists the two Bach works that appeared in Welte's catalogue and are in the collection at Seewen, recorded on 6 February 1913:[331]

Welte No.	Title	BWV
1199	In dulci jubilo	751[332]
1200	Prelude and Fugue in E Minor ("Little"/"Kleine")	533

Table 5. List of organ rolls by J.S. Bach which Bonnet recorded for Welte.

Marie-Joseph Erb

There is little secondary literature about Welte's third French recording artist, the Alsatian organist Marie-Joseph Erb. He was born in Strasbourg and studied at the Belley-Mougel Institute; he then moved to Paris to study at the Niedermeyer School from 1874–1880.[333] In a recollection of Erb's time there, he describes being seen as an

[330] From a catalogue compiled by David Rumsey. American organist Clarence Eddy recorded a Clérambault Basse de Trompette (roll 1652), and many German organists recorded works of Buxtehude.
[331] Rumsey, "The Big Picture," 71.
[332] It is worth noting that *In dulci jubilo*, BWV 751 was a misattribution, and is most likely by Johann Michael Bach. However, Bonnet includes it in his volume II of the "Historical Organ-Recitals" edition series, which, given the volume was dedicated to J.S. Bach, indicates Bonnet thought the piece was a work of Johann Sebastian. See Reinmar Emans's critical report in NBA IV/10, 419.
[333] "En hommage à Marie-Joseph Erb," *Dernière nouvelles d'Alsace* (20 November 2019), 37.

outsider, almost a curiosity due to his region of origin; he describes not knowing much at all about the organ culture or major figures in France at the time.[334] This seems to have changed quickly — according to a website maintained by Erb's granddaughter and great grandson, Marie-Joseph studied composition with Saint-Saëns and Fauré and organ with Gigout and Widor.[335] Erb reportedly was also a highly gifted baritone, with a particular affinity for French- and German-language art song.[336] At the conclusion of his studies he returned to Strasbourg, where in 1883 he became organist at Saint-Georges in Sélestat, and thereafter spent many years composing.[337] Around 1896, Erb's eight year old son Jean fell ill and had to be sent to the mountains; this began a period of extreme work for Marie-Joseph to supplement the extra expenses — composing, organ playing the daily offices at Saint-Jean, and teaching piano, harmony, counterpoint, and composition.[338] In 1911 he was appointed professor at the Strasbourg Conservatoire, teaching composition and organ.[339] In 1912, Erb recorded for Welte in Freiburg.[340] Part of his reason for accepting the invitation was due to financial strain.[341] His money woes seem to have continued well into his professional life; apparently his pay at St-Jean was minimal, as in 1919 and on several other occasions, he requested better pay from the Conservatoire.[342] He retired from the Conservatoire in 1937.[343]

---

[334] Marie-Joseph Erb, "Mon entré à l'Ecole Niedermeyer," in *Marie-Joseph Erb: Sa vie et son œuvre* (Strasbourg: Éditions F.X. Le Roux et Cie., 1948), 39–49.
[335] "Biographie," Marie-Joseph Erb's website, accessed 5 September 2020, https://sites.google.com/site/mariejosepherb/biographie.
[336] Jane Erb, "Marie-Joseph Erb, né à Strasbourg le 23 Octobre 1858, mort à Andlau le 9 Juillet 1944," in *Marie-Joseph Erb: Sa vie et son œuvre* (Strasbourg: Éditions F.X. Le Roux et Cie., 1948), 14.
[337] "Biographie," Marie-Joseph Erb's website.
[338] Jane Erb, "Marie-Joseph Erb," 16.
[339] Jane Erb, "Marie-Joseph Erb," 22.
[340] Rumsey, "The Big Picture," 71.
[341] Jane Erb, "Marie-Joseph Erb," 25–26.
[342] Jane Erb, "Marie-Joseph Erb," 25–26.
[343] Jane Erb, "Marie-Joseph Erb," 34.

Having studied with Loret, Gigout and Widor, and given Erb himself touts the supposed Bach-Hesse-Lemmens-Loret teaching lineage, one would assume that Erb's Bach playing fit very neatly into the boxes.[344] In reality, as Chapters 15 and 16 will show, his aesthetics are more individualistic and complex. According to Albert Schweitzer, for him the most striking thing about Erb's musicmaking was:

> "The flexibility of his playing and his profound acquaintance with all the resources of the sacred instrument. He did not seek to produce effects with his registration, yet his execution, so simple in appearance, brought out the meaning of the work he was interpreting by means of the sonorities he employed. In many respects his playing resembled that of Alexandre Guilmant."[345]

While Guilmant, Widor, and Gigout generally held the same aesthetic views, some of Schweitzer's descriptions — notably the flexibility of his playing, and not seeking to produce effects with registration — would go against that of the rest of the French Romantic Organ School from Part I. Schweitzer also describes how he and Erb oversaw the restoration of the 1741 Johann Andreas Silbermann organ at Saint-Thomas in Strasbourg; Schweitzer recalls that this "was the first time, so far as my knowledge goes, that an old organ was restored instead of being replaced... I was greatly relieved when Erb said he was ready to share the responsibility with me."[346] The result, finished around 1909, was apparently spectacular:

> "When the restored instrument was dedicated, Erb was the first to play on it, using an organ concerto of Bach's. The rendering of this concerto showed the musicians who were present at the dedication that the task of conserving this ancient instrument was fully justified and had been well carried out. For the first time we learned how Bach's music must have sounded when executed by a great builder of his age; and we were able to imagine the effects which could be produced with the resources offered by the sonority and the arrangement of keyboards in these ancient instruments." [347]

---

[344] Marie-Joseph Erb, "Mon entré à l'Ecole Niedermeyer," 39.
[345] Charles R. Joy, *Music in the Life of Albert Schweitzer* (New York: Harper, 1951), 183. This is a translation of Schweitzer's tribute in *Un Grand Musicien Français: Marie-Joseph Erb* (Strassburg-Paris: Editions F.-X. Le Roux & Cie., 1948), 84–88.
[346] Joy, *Music in the Life of Albert Schweitzer*, 183.
[347] Joy, *Music in the Life of Albert Schweitzer*, 183–184.

This description shows that Erb was interested in looking backward and learning from historic instruments, rather than only using the more modern enhancements of Cavaillé-Coll and his contemporaries when playing Bach's works. Yet Schweitzer mentions the changing of manuals; the Widor-Schweitzer and Fauré Bach editions both suggest many manual changes, but Bach himself indicates manual changes only in the organ concertos (e.g. BWV 592). Ultimately, Erb's views on Bach organ playing were rooted most in that of Widor and Gigout, as Schweitzer recalls that Erb and Widor maintained a good relationship, with Widor always visiting Erb whenever he was in in Strasbourg.[348]

There is no mention of any involvement with Welte in any of the major secondary sources about Erb's life until the publications of the Museum für Musikautomaten. This is unusual, given many of those secondary sources were written by members of Marie-Joseph Erb's family and his close colleagues, but given the extent to which Welte guarded their secrets of recording, Erb could have been urged not to tell anyone of his activities, or since Welte's artists came to record for short amounts of time, Erb's family may not have fully understood the long-lasting impact nor importance resulting from such a short visit.

Erb's Recording Sessions

Despite not being an internationally famous organist, Erb recorded for Welte, which most likely came about in part due to Strasbourg's close geographical proximity to Freiburg im Breisgau. In a series of sessions beginning on 30 September 1912, Marie-Joseph Erb (age 53 at the time, over a decade younger than Gigout and Bonnet at

[348] Joy, *Music in the Life of Albert Schweitzer*, 185.

the time of their Welte sessions) recorded 11 pieces onto organ rolls, the smallest output of the Welte's three French artists under consideration here.[349] These are shown in Table 6; rolls without a date are marked "unknown" on the table, and bracketed test under the "Title" column refers to how the piece was listed in the published Welte Catalogue.

Welte No.	Composer	Roll Date	Title
759	Guilmant	[unknown]	Elevation, Op. 25
760	Guilmant	1913	Invocation in B Major, Vox humana
761	Bach, J.S.	[unknown]	Concerto in A Minor, BWV 593: II. Adagio
767	Mendelssohn	1912	A Midsummer Night's Dream: Wedding March
768	Bach, J.S.	[unknown]	Concerto in G Major, BWV 592 (complete)
769	Debussy	[unknown]	Prélude de l'enfant Prodigué
770	Guilmant	1919	Funeral March and Hymn of Seraphs, Op. 17
771	Guilmant	1913	Melodie, Op. 45
772	Guilmant	1925	Grand Chorus in D Major, Op. 18
773	Wagner	1924	Meistersinger von Nürnberg: Walters Preislied
774	Franck	1913	Pastorale, Op. 18, No. 3

Table 6. List of all organ rolls which Erb recorded for Welte.[350]

This table shows that, unlike Gigout and Bonnet, Erb's recording output was mostly French, the only exceptions being Mendelssohn and Wagner. Erb's choice of repertoire is in contrast to his two colleagues, as most of the pieces he recorded are not nearly as virtuosic. While the Bach Concertos he recorded require considerable skill, the other pieces Erb selected are less ambitious.

The recording session took place on 30 September 1912.[351] Table 4 lists the two Bach works that appeared in Welte's catalogue and are in the collection at Seewen:

[349] Rumsey, "The Big Picture," 71.
[350] From a catalogue compiled by David Rumsey.
[351] Rumsey, "The Big Picture," 71.

Welte No.	Title	BWV
761	Concerto in A Minor after Vivaldi: II. Adagio	593/II
768	Concerto in G Major (complete)	592

Table 7. List of organ rolls by J.S. Bach which Erb recorded for Welte.

Because the restoration of the Saint-Thomas organ took place around three years before Welte's session, Erb's recordings could show evidence of the French Romantic Organ School's understanding of Bach, or something more in line with what was possible on a Johann Andreas Silbermann organ.[352]

Conclusion

Gigout, Bonnet, and Erb represented three artists who were at the forefront of French organ culture at the moment Welte was seeking musicians to record new rolls. Guilmant's retirement in 1911 left two important openings in the French musical scene — the Paris Conservatoire and the Concerts du Conservatoire, which Gigout and Bonnet respectively filled, making them natural heirs to the organ dynasty of Fétis, Lemmens, Widor, and Guilmant. There is some question as to whether Welte allowed his artists to choose which pieces they recorded; in the case of Gigout and Erb, there is significant evidence that the most substantial and virtuosic works each chose to perform — respectively the *Toccata in F Major*, BWV 540 and *Concerto in G Major*, BWV 592 — were already firmly established in their repertoire and performed at major events. Given the importance of Bach's music to the French Romantic Organ School, the high percentage of Bach among the recordings from artists from that training makes sense. Yet Welte's commissioning recordings of Bach's organ output — concerto, free works,

[352] Namely, the inability to make dynamic changes seamlessly.

chorale preludes, and trio sonatas — was highly comprehensive for only including ten total Bach rolls in his catalogue by these three artists.[353] These ten recordings provide a wealth of insight and detail, yet analysis today would not be possible if it were not for the efforts of the Museum für Musikautomaten in Seewen.

[353] It is possible Welte wanted a wide diversity of Bach's compositional styles in his catalogue from French organists, but with so many recordings produced, it probably is more a coincidence. Without further insider evidence of Welte's business practices, the reasons for choosing those particular pieces will remain unclear.

Chapter 6: Techniques of Organ Roll Analysis

Introduction

The organ rolls at the Museum für Musikautomaten represent a huge diversity of repertoire and serve as both entertainment and as important historical records. However, as the field of organ roll recordings has received very little attention in scholarship, there is no standardised methodology by which organ rolls can be analysed. The introduction of digitisation and conversion into MIDI data by the Museum's team makes extremely detailed analysis not only possible, but meaningful to performers.

Recent Developments in Recording Analysis

A significant analysis of organ roll recordings has never been done. In the body of recording studies, which is constantly evolving, there are some analytical methodologies which can be applied effectively to organ rolls. There are two basic approaches: observational, which relies on the author's ear to draw conclusions and formulate data; and empirical, which in most cases uses computers to either create a sonic visualisation from which the researcher can then draw measurable data, or analyse MIDI recordings.

Daniel Leech-Wilkinson's chapter in *The Cambridge Companion to Recorded Music* codifies many of these observational methodologies and discusses general trends and the use of expressive devices in classical music recordings from the twentieth century, comparing those made before the Second World War to those after.[354] His commentary consists primarily of observations about several aspects of performance

[354] Nicholas Cook, Eric Clarke, Daniel Leech-Wilkinson, and John Rink, *The Cambridge Companion to Recorded Music* (Cambridge, UK: Cambridge University Press, 2009), 246–262.

practice: tempo, rubato, the use of vibrato, and more. Having listened to several of the recordings he references, it is difficult to disagree with his conclusions, but his observational methodology is inherently subjective and cannot truly be replicated.

A study by José Antonio Bowen used more empirical observational techniques in comparing a much larger sample of the jazz standard *Body and Soul*.[355] In analysing over 200 recordings, Bowen generates tables comparing the recording date, musical form used, tempo (based on using a computer and tapping along to the larger beats while the recording plays, then averaging the tempo), key, and other genre-specific parameters such as lyric choice and whether other pieces were quoted. Using this data, he traced the development of the standard as it was performed over the decades.

The primary method of purely empirical analysis of sound recordings comes from creating a sonic visualisation — a graph, chart, or other visual representation of sound — from which the user can draw data. Today this is normally accomplished using computers. Before that, one of the earliest forms of sonic visualisation was pioneered by Joseph Tiffin and Carl Seashore, who used cameras, film, and pieces of paper glued to the tails of piano hammers to create the Iowa Piano Camera, which gives "an objective photographic record of the duration, time of incidence, and time of ending as well as a relative measure of intensity of each note struck for a piano selection under normal conditions of performance."[356] The recording itself can be transferred into a notation which looks similar to a score, but it can show minutia of detail with regard to rhythm and rate of key attack, which Seashore later used to determine the relation

[355] José Antonio Bowen, "Who Plays the Tune in "Body and Soul"? A Performance History Using Recorded Sources," *Journal of the Society for American Music* 9, no. 3 (2015), 259–292.
[356] Joseph Tiffin and Carl E. Seashore, "The Iowa Piano Camera," *Science*, New Series 72, no. 1858 (8 August 1930): 146–147.

between the duration of certain melody notes and intensity.[357] Similarly, in the late 1970s Dirk-Jan Povel developed a technique using a tape recording fed through a high-pass filter to create a visualisation; his first major study compared tempo and timing in three recordings of J.S. Bach's *Prelude in C Major*, BWV 846 performed by Gustav Leonhardt, Zuzana Ruzickova, and Helmut Walcha.[358] Using the visualisation, he measured the differences in timing using criteria of milliseconds in increments of five to determine the minutiae of timing, but concluded that further technological developments were needed to measure other parameters such as vibrato.

Thanks to computers, measuring further parameters is possible; the leading techniques are codified in Nicholas Cook's chapter "Methods for analysing recordings" in *The Cambridge Companion*.[359] Cook demonstrates how computer-generated visualisations can measure aspects such as the speed of vibrato, piano articulation, and the speed and exact pitch of a vocal slide.

Anna Kounadi's 2016 dissertation includes elements of both observational and empirical analysis.[360] Kounadi began by listening to recordings and marking down various adjectives in relation to each performance, then she used empirical methodology — specifically spectrum analyses, the "tapping along" method (using a computer to measure average tempo), then numerical analysis of tempo and rubato — to confirm or refute what she heard. However, the order of Kounadi's method — beginning by listening to the recordings and then returning to use more empirical methodology — could lead to confirmation bias.

---

[357] Carl E. Seashore, *Psychology of Music* (New York: McGraw-Hill, 1938), 225–253.
[358] Dirk-Jan Povel, "Temporal Structure of Performed Music: Some Preliminary Observations," *Acta Psychologica* 41 (1977), 309–320.
[359] Nicholas Cook, "Methods for Analysing Recordings," in *The Cambridge Companion*, 223–232.
[360] Anna Kounadi, "Scriabin *Sonata-Fantasy op. 19 n. 2* on Record: A comparative Study of Sound Recordings and Piano Rolls" (PhD diss., Goldsmiths, University of London, 2015), 23–36.

In the end, none of these methods are very useful for analysing organ recordings, as piano articulation is easily seen in a sonic visualisation due to the instrument's sound decaying. When entering audio recordings of organ rolls into the Sonic Visualiser computer program developed at Queen Mary, University of London, most of the result is a solid block of sound, as opposed to the many peaks and valleys in piano or harpsichord recordings — instruments whose sound is characterised by a strong attack followed by decay.[361] Observational techniques can be useful when comparing multiple performances of the same piece, but the three French organists who recorded on organ rolls for the Welte Company played completely different Bach works.

For these reasons, previous organ-specific studies of sound recordings have relied on observational methodology. Colleen Jane Edgecombe's dissertation presents the primary written sources of information about performance practice in the works of César Franck and then compares it with a wide variety of recordings of Franck's works played by the composer's grand- or great-grand-pupils. She, like Leech-Wilkinson, provides a detailed commentary, but again did not utilise a replicable methodology. The articles comprising *The Organ in Recorded Sound* similarly rely almost entirely on subjective observation. Christopher Anderson's chapter on pursuing performance practice based on Karl Straube's activity in Leipzig mentions Straube's Welte organ roll recordings, but Anderson does not analyse them, citing studies by Kurt Binniger and Peter Hagmann which had incorrectly concluded that Welte's recording technology was an unreliable source of performance information due to issues regarding playback speed, registration, and interference of editors between when the recording was made to

[361] "Sonic Visualiser," accessed 5 September 2020, www.sonicvisualiser.org.

when it was released commercially.[362] However, these results were disproven through independent studies by Debrunner and Rumsey at the Museum für Musikautomaten.[363] Hagmann's flawed findings, combined with the lack of a replicable methodology with which to analyse organ rolls, specifically by the Welte company, have contributed to a lack of interest in organ roll analysis.

The Museum für Musikautomaten in Seewen, Switzerland

Recent research on the mechanics of self-playing instruments at the Musuem für Musikautomaten in Seewen, Switzerland has shed new light on the value of organ roll recordings. The Museum owes its existence to Swiss philanthropist Heinrich Weiss (1920–2020), who spent much of his life collecting musical automatons, mainly music boxes and self-playing keyboard instruments. He opened a private museum to showcase his collection in 1979, and in 1990 the museum was donated to the Swiss Confederation, when it became part of the Swiss National Museums.[364] The collection includes a Welte philharmonic organ, the largest model organ the company produced, along with over 1000 organ rolls, most of which are the Welte *Mutterrollen*, master copies from which commercial rolls were duplicated. Many of these master copies also contain annotations, either by the artists or the editors, which give insight into the artistic process of editing. The Museum has spent several decades restoring a Welte player organ (hereafter referred to as the "Seewen organ") that was originally on the

[362] Christopher Anderson, ""... wie ich es eingtlich meine...": In Pursuit of the Straube School via Recorded Evidence," in *The Organ in Recorded Sound: History, Sources, Performance, Practice*, ed. Kimberly Marshall (Göteborg: Göteborg Organ Art Center, 2012), 53–57. Kurt Binniger, "Die Welte-Philharmonie-Orgel," *Acta* organologica 19 (1986): 179–208. Peter Hagmann, *Das Welte-Mignon-Klavier*.
[363] Rumsey, "The Speed of Welte's Organ Rolls," 68–80.
[364] "Museumsgeschichte" Musuem für Musikautomaten, accessed 5 September 2020, www.musikautomaten.ch/mma/de/home/museum/museumsgeschichte.html.

HMHS *Britannic*, and digitising the entire collection and converting it to computer data to preserve the paper rolls. The Seewen organ can play back the organ rolls using software developed by Daniel Debrunner of the Fachhochschule in Bern.[365] The original apparatus which captured the performer's movements has also survived, and recent analyses of its mechanics have clarified the issues previously associated with this recording medium. The work at the Museum forms the basis of this study.

To entice the world's leading organists to record, Welte would have to build an instrument capable of the latest technology that would enable things like quick registration changes, a seamless crescendo and decrescendo, and the ability to play both solo organ repertoire through the ages as well as new music and orchestral transcriptions, all effectively, and in a way that would appeal to their wide audience of affluent customers. The Welte recording organ in Freiburg im Breisgau was erected in 1909, and was a 26 stop, two-manual pneumatic key action organ with pedal, with the entirety of the organ behind swell shutters, with the exception of the Principal 8' on Manual I, which was in the façade. A disposition of the organ is shown in Table 1 (identical to what was previously listed in Chapter 4, Table 2).[366]

[365] The original plans for the *Britannic* indicate that the organ on board was to be built by the Aeolian company. In the end, Welte won the contract; see Rumsey, "The Big Picture," 65. For full information about the Britannic Organ, see Christoph Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200–210.
[366] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 205–206.

Manual I		Manual II	
Bordun	16'	Wienerflöte	8'
Principal	8'	Bordun	8'
Traversflöte	8'	Viola	8'
Gambe	8'	Aeoline	8'
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	4'	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	Oboe	8'
Harfe (G–a''')		Vox Humana	8'
Glocken (C–g)		Tremolo	
Misc.		Pedal	
II to I		Violonbass	16'
II sub to I		Subbass	16'
super-I		Cello	8'
II super		Gedackt	8'
I to Pedal		Posaune	16'
II to Pedal		I to Pedal	
		II to Pedal	

Table 1. Disposition of the 1909 Welte organ at
Welte's recording studio in Freiburg, no longer extant.

The instrument's disposition is typical of German Romantic instruments of the period — a wide variety of foundation stops at 8' pitch and no mixture. What is atypical of church organs in the region are the various orchestral reed stops: Clarinette 16', Horn 8', and a Vox Humana 8'. The inclusion of the Harfe and Glocken percussion stops are unusual to find on German organs (though they do appear regularly on organs in North America, a major market for Welte). The Harfe, or harp, produces sound via metal bars (like a xylophone), which are placed on top of tuned resonators that are struck by padded pneumatic hammers; the entire stop on Welte organs is activated by a foot switch.[367] The Glocken operates similarly, but with resonators that are most like tubular bells, also

[367] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 205.

activated by a foot switch, and the range is not as large as the Harfe.[368] These effects are used in the works of Bach recorded by members of the French Romantic Organ School, and were also noted as being used on French Romantic organs; Carl Locher, organist in Bern, in his encyclopaedia-style book *An Explanation of the Organ Stops*, praises the "Carillon (Bells)" as used by Cavaillé-Coll: "I found [the Carillon] surprisingly effective for secular music, as for instance in the new concert organ of the Trocadero Palace, Paris."[369]

The recording organ had some special registration aids as well under Manual I. II sub–I is a sub-octave coupler, which made it possible to play all the stops on Manual II an octave lower on Manual I. Activating Super–I would play all the selected registers on Manual I at the pitch written on the stop tab, plus an octave higher; for instance, pulling Principal 8' and Super–I and pressing the lowest C key would result in two pipes being played: the low C, and the C an octave above. The advantage to this is it adds a great deal of brilliance to the sound. The disadvantage is that when both C and c are depressed, while theoretically four pipes should sound — C, c, c, and c' — there are only three pipes on the organ: C, c, and c'. Activating II super has the same effect as Super–I, except on Manual II. I– and II–Pedal each take all the stops on the respective manual and transfer them to the pedal. On an organ like the Freiburg studio recording instrument, which has a relatively small pedal division compared to the manuals, this can be very useful for adding clarity, and balancing the pedal with the manuals.

Additionally, the recording organ had at a cancel function, which would turn off all selected stops; a tutti, which turns on all the stops; "Registerschweller ab", which

[368] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 205.
[369] Carl Locher, *An Explanation of the Organ Stops with Hints for Effective Combinations*, trans. Agnes Schauenburg (London: Kegan, Paul, Trench and Co., 1888), 5.

would deactivate the crescendo pedal; "Zungen ab", which would deactivate all the reed stops; "Mixturen ab", which takes off all the mixtures; Pedalpiano (the function of this is unclear); and crescendo and swell pedals, which would respectively add stops in order from softest to loudest, or open the swell box.

Many of these playing aids were typical of organs from the period, with the exceptions of the orchestral reeds and the percussive stops. With the entire organ enclosed, it could also produce a seamless crescendo and decrescendo. In short, the recording organ could perform both organ music composed for the church or transcribed for the orchestra with ease.

The Britannic Organ at Seewen

Welte produced a wide range of orchestrion models around this period, the largest being the Philharmonic.[370] Unlike the standard "stock" models — identical organs produced en masse in different sizes — Philharmonic organs could be modified according to the wishes of the customer.

The original customer of the organ now in Seewen was White Star Line, a British shipping company which offered passenger and cargo services between the USA and British Empire, most famous today as the owner of the RMS *Titanic* which famously sank on 15 April 1912. Because the premiere of the Welte Philharmonic organ at the World Exposition in Turin took place after the interior of the *Titanic* had begun, it was therefore too late for White Star Line to order an instrument for the *Titanic*.[371] By 1915 when the HMHS *Britannic* was being built, Welte had seen great commercial

[370] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 206.
[371] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200.

success with the jewel of its offerings, the Philharmonic, and White Star Line ordered a new organ for the ship.[372] Despite the sinking of the *Titanic* and plans for the *Britannic* being considerably revised to address safety, it seems the organ was not affected; the organ was planned for installation in the first class section.[373]

Fate intervened, though — in August 1914, the ship was requisitioned for the British army and the ship was turned into a hospital ship. Its maiden voyage was 11 December 1915, sinking less than a year later due to a land mine in the Aegean Sea on 21 November 1916; from that point, details of the organ's status — including whether it was even installed for certain on the ship in the first place — were lost.[374]

A few years later, around 1920, Welte sold an unspecified organ to August Nagel (1882–1943), the owner of a successful camera manufacturing company, who lived in Stuttgart; in 1935 he sold his home and returned the same organ to Welte, who then sold it to Eugen Kersting (1888–1958), co-owner of the Radium lamp factory in Wipperfürth, Germany, who moved it to the company's meeting room.[375] At this point, Kersting entrusted the maintenance to Werner Bosch, a Welte technician who went on to build and export many organs around the world.[376] The Kersting factory was bombed, but the organ only suffered water damage; Bosch took over care of the instrument, which in 1961 was recorded playing organ rolls by Max Reger.[377] Nearly a decade later, Heinrich Weiss-Stauffacher took note of the instrument and acquired it to add to his collection; organbuilder Bernhard Fleig assisted in transporting the instrument, which

[372] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200.
[373] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200.
[374] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200–202.
[375] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 202.
[376] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 202.
[377] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 202.

was voiced by Bosch in Seewen and inaugurated on 30 May, 1970.[378] Christoph Hänggi reports that Bosch was so impressed by the collection in Seewen that he offered to sell Weiss around 1,230 master rolls which were in Bosch's possession from the Welte company's estate.[379] The Seewen Museum was renovated between 1998 and 2006, and the organ was put into storage; in the spring of 2006, Orgelbau Kuhn restored the organ, with the instrument going back on display in autumn 2007.[380]

The Museum discovered the word "Britannik" or "Briton" on six different parts of the organ, and, according to Christoph Hänggi, catalogues in the Museum's collection note that "a Welte Philharmonic Organ on the SS Britannic of the White Star Line... are stored in the Ulster Folk and Transport Museum in Belfast, as are architectural sketches describing the same organ case in the stairwell area of the Britannic."[381] Hänggi further explains that the original organ would have fit exactly into the space the *Britannic* architectural plans described.[382] Diving expeditions by Simon Mills and Mark Chirnside to the sunken wreckage of the *Britannic* have also found no evidence of an organ or a case on the ship.[383]

According to Hänggi, "the pipework, windchest and possibly the key action are all either original or have been modified by the manufacturer itself."[384] Around 1920, there were modifications to the organ when Nagel owned it; he replaced the original

[378] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 202.
[379] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 202–203.
[380] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 203.
[381] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 203–204: ""WELTE-PHILHARMONIE-ORGEL auf der S. S. Britannic der White Star Line" zeigen, lagern im Ulster Folk and Transport Museum in Belfast, ebenso Architekturskizzen, die das gleiche Orgelgehäuse im Treppenbereich der Britannic beschreiben." Photographs of the various parts of the organ marked for the *Britannic* can be seen on 201.
[382] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 204.
[383] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 209.
[384] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 203: "Das Pfeifenwerk, die Windlade und möglicherweise die Traktur sind alle entweder original oder wurden von der Herstellerfirma selbst modifiziert."

Wienerflöte 8' with a harmonic flute, but the pipes of both stops were by Welte and survived, and the Seewen organ now retains the former.[385] Only a few pipes were missing or damaged, and Kuhn reconstructed them using the methods Welte employed during the early twentieth century.[386] It seems as if there has never been a true case for the Seewen organ, because the instrument was installed behind a wall in Nagel's home, and otherwise it sat open to the world.[387] Therefore a new case was constructed, which can be seen in Figure 1.

Figure 1: The Welte-Philharmonie organ originally built for the HMHS *Britannic* at the Museum für Musikautomaten in Seewen, Switzerland. Photo courtesy the Museum für Musikautomaten.

[385] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 203.
[386] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 203.
[387] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200–203.

The Seewen organ's disposition is similar to the recording instrument, a variant of the basic model V through VI of the Welte Philharmonic Organ.[388] It is only slightly larger, as it has a 16' stop on the first manual and separated mutation stops on the second. Table 2 shows the current disposition of the Seewen organ, with annotations that compare its stoplist to the recording organ's: additions are marked in grey, stops in the same family (principal, string, flute, or reed) as the recording organ but with a different name are marked in italics, and the only stop that was missing on the Seewen organ but was present on the recording organ (Sesquialtera II) has a strikethrough:[389]

Manual I		Manual II		Pedal	
Bordun	16'	*Harmonieflöte*	8'	Violonbass	16'
Principal	8'	Bordun	8'	Subbass	16'
Traversflöte	8'	Viola	8'	Gedackt	16'
Gedeckt	8'	Aeoline	8'	Cello	8'
Gambe	8'	*Blockflöte*	4'	Gedackt	8'
Viol. d'orch.	8'	Quinte	2 ⅔'	Posaune	16'
Vox coelestis	8'	Terz	1 ⅗'	Trompete	8'
Rohrflöte	4'	Sesquialter	II	Clairon	4'
Octave	4'	Quintzimbel	1'	Sing. Cornett	2'
Nachthorn	2'	Clarinette	16'		
~~Sesquialter~~	~~II~~	Trompette	8'		
Fagott	8'	Horn	8'		
Mixtur	III	Oboe	8'		
Trompete	8'	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 2: The disposition of the Britannic Organ, with annotations showing the differences between it and the recording organ in Freiburg.

Based on several visits to the Britannic Organ in Seewen, the instrument is capable of quick registration changes, a seamless crescendo and decrescendo, and has many of the same orchestral stops. It also has the same percussion effects, couplers, and registration aids as the recording organ. The major differences are the addition of the

[388] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 204.
[389] Hänggi, Die Seewener Welte-Philharmonie-Orgel." The history of the organs is on 200, and a comparative disposition on 205.

Mixtur III, a stop which plays three high pitched pipes based on the overtone series per note; this adds brilliance to the sound and is an integral part of a registration called plenum, the combination of all principal stops on the main manual that was most likely the default registration used by J.S. Bach when playing his own free works.[390] Though, as discussed earlier, there is no awareness of this performance practice among the organists who recorded for Welte.

The Digitisation of the Rolls in Seewen

Many of the Welte rolls are around 100 years old, and preservation is a major concern. The Museum in Seewen worked with the Fachhochschule in Bern to build a specialised scanner for the rolls and develop software that can both play the digitised rolls on the Britannic Organ and edit any mistakes resulting from scanning.[391] Daniel Debrunner, who designed and led the project to digitise the entire roll collection of the Museum in Seewen, wrote two articles on the process. The primary aim was preservation, yet some of the rolls were already so fragile, a careless method of digitisation would destroy (in many cases the only copy of) the roll. His team at the Fachhochschule in Bern developed software that could convert the scans into MIDI files, which could be played on a computer. Debrunner explains how Welte's system of recording organ performances made this possible:

> "The available Welte master rolls from 1904 to 1930 first contain purely digital information: with a punch, without a punch. This binary switching information is used in the case of the Welte Philharmonic [Organ] with 150 tracks in four ways:

[390] George Stauffer, "Bach's Organ Registration Reconsidered," in *J.S. Bach as Organist*, ed. George Stauffer and Ernest May (Bloomington: Indiana University Press, 1986), 193–211.
[391] Daniel Debrunner, "Die Entwicklung des Musikrollenscanners der Bernerfachhochschule — Aus Musikrollenbildern wird Musik — Die Elektronische Steuerung der Welte-Philharmonie-Orgel," in *Wie von der Geisterhand: Aus Seewen in die Welt*, ed. Christoph Hänggi (Seewen, Switzerland: Museum für Musikautomaten, 2011), 35–59.

1. As commands to change notes in the manuals and the pedal.
2. As binary switching information for the registration, pedal coupling, timpani, and re-rolling [following a playthrough of the paper roll].
3. Two tracks left and right of centre as the paper position slider.
4. As a change instruction for the positioning of the swell shades."[392]

The Debrunner roll scanner, shown in Figure 2, scans rolls on a continuous process — the roll is run through the machine in the same way the roll moves through a Welte organ: without stopping.[393]

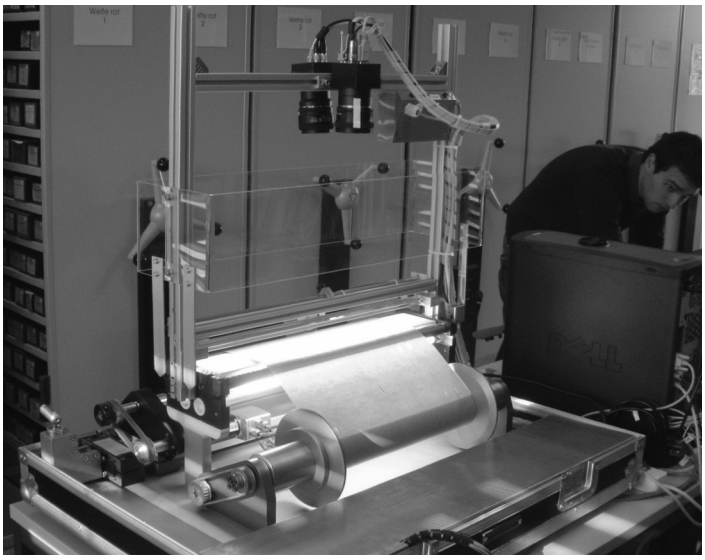


Figure 2: The Debrunner roll scanner in operation.[394]

The scanner uses a line-scan camera — instead of traditional cameras which have a matrix of pixel sensors, this camera has a single row of pixel sensors which capture lines; these are continuously sent to a computer which then creates an image by joining

[392] Daniel Debrunner, "Von der Welte-Rolle," 97: "Die zur Verfügung stehenden Welte-Masterrollen von 1904 bis 1930 enthalten zuerst einmal rein digitale Informationen: Loch ja, Loch nein. Diese binären Schaltinformationen werden im Falle der Welte-Philharmonie mit 150 Spuren auf vier Arten verwendet:
1. als Tonschaltbefehle für die Manuale und das Pedal,
2. als binäre Schaltinformation für Register, Pedalkoppeln, Pauke und Rückholung,
3. zwei Spuren links und rechts der Mitte als Papierpositionsregler,
4. als Änderungsanweisung für die Positionierung der Schwellerjalousie."

[393] Debrunner, "Die Entwicklung des Musikrollenscanners," 37.

[394] Reproduced from Debrunner, "Die Entwicklung des Musikrollenscanners," 40, with permission of the Museum für Musikautomaten, Seewen.

them together.[395] At the same time, the Debrunner scanner has a second line-scan camera to capture the various hand-written comments by Welte editors on the master rolls.[396] Specialised software, Musikrollenscanner (MRS), then takes the input and converts the digital information from the Welte rolls — with perforation or without — and processes the data into image (.png), MIDI (.mid), and specialised file formats (.dsp, .mrs, and .rec).[397] The software has a number of safeguards and systems to detect errors and missing data.[398] With regard to tempo, Debrunner notes that "all 1500 rolls of the Welte Philharmonic organ are converted at a playing speed of 50 mm/s of the playing speed. This is a standard value that makes all the scanned rolls comparable in terms of speed."[399] In terms of a MIDI file, Debrunner clarifies that resulting files "are created at 480 quarters per minute, which is a "120" on the metronome (the default of MIDI)."[400]

Debrunner then discusses how his team dealt with issues such as paper shrinkage.[401] According to Debrunner's report on the digitisation project, 85% of the rolls were able to be scanned without problems.[402] However, in some cases the paper had shrunk, or on well-used commercial copies especially, there were rips and tears, or the paper had become very fragile. Specialists would have to take what they could from the scan and then correct the information manually to create a new digital record of

[395] Line-scan cameras are commonly used in fax machines. For further detail, see Carsten Steger and Markus Ulrich, "A Camera Model for Line-Scan Cameras with Telecentric Lenses," *International Journal of Computer Vision* 129 (January 2021), 80–99.
[396] Debrunner, "Die Entwicklung des Musikrollenscanners," 39.
[397] Debrunner, "Die Entwicklung des Musikrollenscanners," 44–47.
[398] Debrunner, "Die Entwicklung des Musikrollenscanners," 44–46.
[399] Debrunner, "Die Entwicklung des Musikrollenscanners," 58: "Sämtliche 1500 Rollen der Welte-Philharmonie-Orgel werden mit einer Abspielgeschwindigkeit des Papiers von 50 mm/s gewandelt. Dies ist ein Normwert der alle gescannten Rollen in Bezug auf Geschwindigkeit vergleichbar macht."
[400] Debrunner, "Die Entwicklung des Musikrollenscanners," 48: "Alle Dateien werden mit 480 Vierteln pro Minute erzeugt, also ein "120" auf dem Metronom (Standardvorgabe von MIDI)."
[401] Daniel Debrunner, "Von der Welte-Rolle," 96–104.
[402] Daniel Debrunner, "Von der Welte-Rolle," 97.

these problematic rolls.[403] However, these particular issues do not apply to any of the rolls in the present study.

Another issue is the on/off signal — brief markings on the roll which activate stop changes and swell pedal positions; if the roll had been damaged in any way, sometimes stops could be activated randomly. These could be edited digitally for use on the organ at Seewen, the process of which Rumsey describes in the last part of his article.

Another of Rumsey's articles, "The Big Picture," is a gentler introduction to how the Welte system functioned than Schmitz's, aimed, at least in the beginning, toward general audiences.[404] He ends, however, with a lengthy discussion of his work editing the existing organ rolls which were scanned. Much of Rumsey's editing methodology comes from examining scores, when extant, and adjusting any error which was clearly a result of wear and tear on the roll. The Museum in Seewen owns many master rolls, which were extensively annotated by the editors, and less commonly, by the artists themselves. By comparing both, Rumsey was able to solve many problems. Many of the results of his work can be heard on the recording series *The Britannic Organ*, a collection of twelve albums of the most important rolls, which were either presented "as is", or with minor corrections to faults in the scan by Rumsey.[405]

Christoph Hänggi, the present Director of the Museum, wrote an article which focuses on the history, rediscovery, and restoration process of the organ which was originally built for the HMHS *Britannic*.[406] He reconstructs the timeline of the organ

[403] Rumsey, "The Big Picture," 77–80.
[404] David Rumsey, "The Big Picture," 64–81.
[405] *The Britannic Organ* (vols. 1–11: Munich: Oehms Records, 2011–2015; vol. 12: Hong Kong: Naxos of America).
[406] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 200–210.

and includes various diagrams and correspondence between the *Britannic*'s designers and Welte, resulting in several design drafts of the organ. The instrument can now be played from its console using the original tubular pneumatic action, or a computer; the restorers added pull-down magnets below each pallet, which are then activated by the computer. The software that could interpret MIDI files was designed by Debrunner and his team.

Before David Rumsey's death, he published several articles in an attempt to disseminate and begin interpreting the information now available at Seewen. The most relevant of these is entitled "Afternoons with Eugène Gigout," an introduction to Rumsey's work intended for a general audience that specifically analyses rolls of Gigout playing works by Franck, Lemmens, Chauvet, Boëly, Mendelssohn, Saint-Saëns, his own works, and Bach.[407] Though Rumsey includes details about registration and the duration of the entire work, details about Bach articulation and ornamentation practice are vague, and are not evaluated using any objective methodology; in the one instance where he does evaluate Gigout's decisions about playing mordents from the upper or main note, he concludes that they are all from the main note. However, this is incorrect — Gigout varies according to what makes for a more conjunct melody.[408] He also does not put any aspect of Bach performance practice into historical context; however, his few comments about problems that arose during the scanning of individual pieces are critical records. When discussing Welte Roll 1585, for instance, he notes, "The roll technology needs some intervention: the pedal advance is at times disturbing. The scan is slated for further checking and possible correction, but this is not expected to change

[407] David Rumsey, "Afternoons with Eugène Gigout," *The Diapason* 1216 (March 2011), 25–33.
[408] Rumsey, "Afternoons with Eugène Gigout," 23.

registration, tempo, agogic or articulation."[409] During a visit to Seewen, Christoph Hänggi explained that whenever David Rumsey modified a file, he would always keep the original from the raw scan, and if there were issues, he would duplicate the file and edit it, adding a note to his new version.[410] Unfortunately, Rumsey never edited the rolls which form the basis of this study.

In MIDI files, the organ rolls at Seewen are now open to new empirical analytical techniques which have never been used on organ music. These are codified in Eric Clarke's chapter "Empirical Methodology" in his and Nicholas Cook's 2004 book *Empirical Musicology*.[411] The portion of the article most relevant to this dissertation are his techniques for analysing articulation using the interonset interval, the time from the start of any note to the start of another note.[412] Clarke recommends several computer programs which can accurately assign numerical values to any given note on any MIDI recording; for instance, in the rhythm crotchet-quaver-quaver/quarter-eighth-eighth, the respective values if a computer were generating the sound could be 1000-500-500.[413] However, when a human records into a MIDI device, the level of precision will inevitably be slightly imperfect; as Clarke points out, the variation between the numbers can then be quantified, with the largest gaps being "staccato" and the smallest being "legato."[414]

Using the research on Welte technology from the Museum and Clarke's empirical analytical techniques of MIDI recordings, this document will objectively

[409] Rumsey, "Afternoons with Eugène Gigout," 23.
[410] Christoph Hänggi, discussion with the author at the Museum für Musikautomaten in Seewen, 14 January 2019.
[411] Eric Clarke, "Empirical Methods in the Study of Performance," in *Empirical Musicology: Aims, Methods, Prospects* (Oxford: Oxford University Press, 2004), 76–101.
[412] Clarke, "Empirical Methods," 76–101.
[413] Clarke, "Empirical Methods," 81–82.
[414] Clarke, "Empirical Methods," 81–84.

analyse every aspect of organ performance as it was recorded on these organ rolls. That analysis will be compared to the editions and writings on Bach performance practice by members of the French Romantic Organ School. This will clarify every minutia of detail that could not possibly be captured in writing, illuminating the French understanding of Bach in greater detail than ever before. Together, they paint a picture of this style of performance practice that the rolls or the writings alone could not sufficiently clarify.

Part III: Francophone Bach Performance Practice in Welte Organ Rolls

The French Romantic Organ School's written aesthetics of Bach performance practice comprise two characteristic techniques: articulation, namely absolute legato as the default articulation except for *notes communes* and shortening the lengths of repeated notes; and the use of new organ technology to create a seamless crescendo. As Welte's artists were all members of this deeply engrained pedagogical tradition, one could reasonably assume the playing of Gigout, Bonnet, and Erb exhibits these hallmarks. Close analysis of the digitised organ rolls will show that there are indeed common trends, yet there were highly individualised elements in each's playing, and Widor's strict rules were not necessarily always followed, especially in complex situations.

The digitised rolls at Seewen bring together leading technology from Welte in the early twentieth century and the Hochschule in Bern in the twenty-first. Daniel Debrunner's work in digitisation and the work of the Museum team, especially Christoph Hänggi and David Rumsey, has resulted in recordings which, as Welte advertised in 1911, "faithfully reproduce the original execution of the best masters."[415] Whether these performances are on the original organ rolls or in their new digitised versions, the performances of Bach's works by Gigout, Bonnet, and Erb represent the tradition in which they were trained.

The physical rolls and their digitisations provide a variety of important data that is often lost in audio-only recordings such as LPs or wax cylinders. The switching signals on each roll give the exact registrations, including swell shade movements, that the performer used. Because the pitches themselves are binary data — on or off — any

[415] Reproduced in Cittadin, "L'Esposizione Internazionale di Torino nel 1911," 190.

ambiguities or defects in the instrument (i.e. a pipe is speaking extremely flat) on which a roll is being played back can be clarified. The durations of notes are also perfectly clear, which makes determining the exact tempo and minor changes in pulse (i.e. rubato) possible.

Determining Tempo

There are two possible methods to determine the average tempo of a piece. The first involves choosing a unit of the piece's pulse — crotchet/quarter note, minim/half note, etc. — and measuring the physical distance between the beginnings of each unit of pulse. The distance can then be converted into time, depending on the speed at which the paper was moved through the recording apparatus at the time it was recorded. This, however, is extremely tedious, because each pitch is assigned a track on the roll, and if every instance of the pulse occurs on extremes of the keyboard, measuring the distance can be prone to error.

The second method, which is the approach of this study, is to use computers to determine the values based on the digitised MIDI files of the Welte rolls. As mentioned, entering an audio recording of the Seewen organ playing the organ roll into the Sonic Visualiser program results in basically a block of sound, as shown in Figure 3.

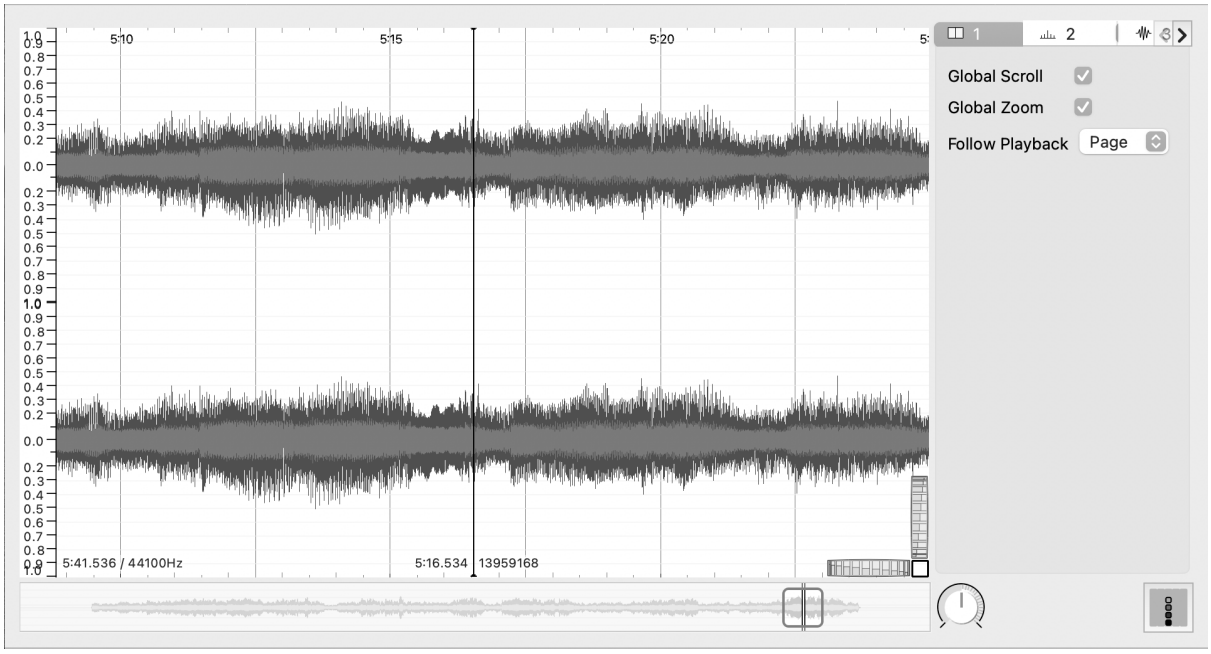


Figure 3: Screenshot of the Sonic Visualiser program's representation of an audio recording of the Seewen organ playing Gigout's performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*.

Using this visualisation alone, there is no way of knowing at what point each measure of the pulse (in this case, crotchets/quarter notes) begins or ends. To solve this issue, the MIDI digitisation is converted to an audio file format with the data played using a piano voice.[416] Because the hallmark of the piano's tone is an initial sharp percussive attack followed by a decay, the beginning of each pitch is shown clearly in the visualisation. The same moment in the audio recording of the organ roll shown in Figure 3 is now shown in Figure 4 with the MIDI file played by a computer's piano sound.

[416] When opened in any MIDI sequencing program, the Debrunner MIDI digitisations are set to a piano by default. There are also a total of five tracks: one blank, three for the pitches themselves, and one for the switching signals (registration changes, swell shade movements, couplers, etc.). In the MIDI file, the data from these switching signals is assigned an extremely low pitch; when played on the Seewen organ, these only control the parts of the instrument Welte intended them to, but in MIDI they sound as actual pitches. Therefore this track must be deleted in order for the visualisation to be clear.

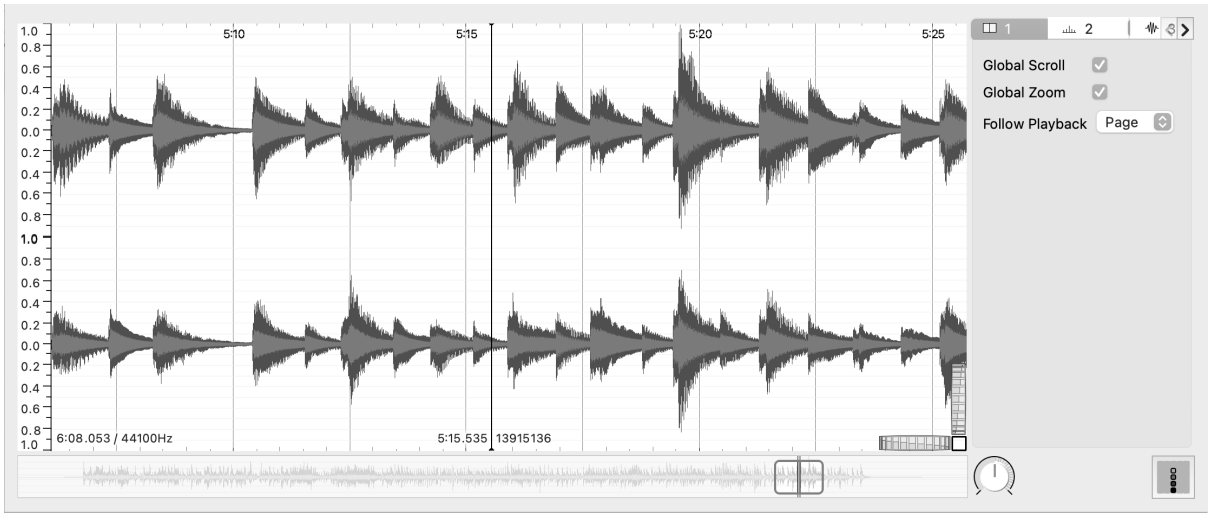


Figure 4: Screenshot of the Sonic Visualiser program's representation of a MIDI digitisation of Gigout's performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*, showing the onset of each pitch.

In this visualisation, the onset of each pitch can be clearly seen. Markers are then added to the beginnings of each now-clearly-visible beat of the pulse, as seen in Figure 5.

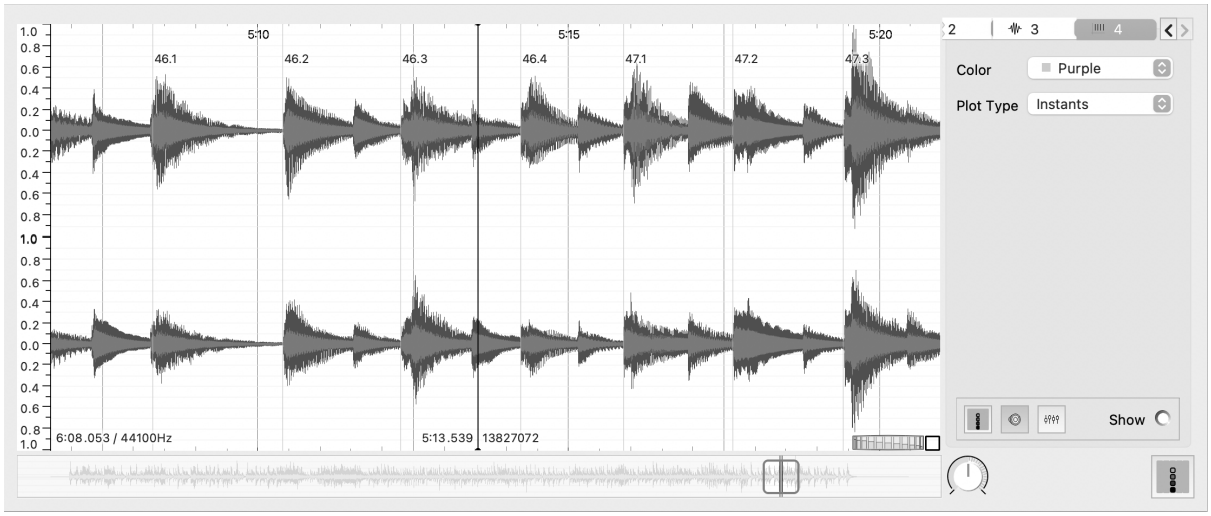


Figure 5: Screenshot of the Sonic Visualiser program's representation of a MIDI digitisation of Gigout's performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*, showing the onset of each pitch, with added visual markers.

From here, the Sonic Visualiser can export the durations of each gap between the pulse. It is worth noting that the sharp attack of the piano sound tends to magnify any tiny imprecisions.

This dataset can then be used to find the average tempo of the entire piece, and excerpts, for example during a moment of rubato, can be quantified to determine various numerical values like the percentage reduction in speed. A step-by-step method of determining the average tempo of an organ roll and viewing the numerical amount of rubato a performer takes is summarised as follows:

1. Open a digitised MIDI file of an organ roll in any MIDI sequencing program.
2. Change the instrument voice to a piano.
3. Open the resulting MIDI file in the Sonic Visualizer.
4. Add a new Time Instants Layer.
5. Add a marker to each beat.[417]
6. Export Annotation Layer and save the resulting .csv file.
7. Open the resulting file in a spreadsheet program. Column A shows the timestamp of each marker from Step 5, and column B shows the number of each marker.
8. Add one row above Row 1, and add a 0 to Column 8.
9. In Column C, type: =SUM(A2-A1) and hit return.
10. Copy cell C1 and select cells C2–[penultimate cell of data in that column] and paste the same formula.
11. Column C now shows the amount of time taken between each beat. The larger the number, the greater the amount of rubato taken.
12. To find the average tempo, divide the total number of seconds of the recording from the first note of the piece to the beginning of the last note of the piece by the total number of beats from the first note of the piece to the beginning of the last note of the piece. This results in the average seconds per beat.

[417] An easy way to do this is to have the program play the piece, and then tap whichever key on the operating system creates a marker. Once all the beats are marked, go back and line up each Time Instance marker with the beginning of each chord/note on the waveform.

13. Divide 60 seconds by the resulting number from step 12. This final number is the average number of beats per minute in the recording, i.e., the average tempo marking.

Using this data set, it is possible to express rubato as a percentage. However, realistically, it is nearly impossible to accurately imagine what, for example, a 28.69% reduction in speed sounds like at crotchet/quarter note equals 45bpm. For this reason, this study will only use this method and data to find the average tempo of a piece, and will speak more generally in terms of rubato in particular moments.

Measuring Articulation

Clarke's methodology of checking the interonset interval between two pitches (i.e. measuring the silence) is possible with the rolls digitised at Seewen. Measuring very small units on a MIDI file can be informative, but when played on an organ, the pipes are subject to changes in weather — humidity in particular — which can affect the rate of their speech and release. Further, while the Seewen organ is nearly identical to the recording organ in disposition and vintage, it has undergone restoration work; given the care the restorers (Kuhn) put into researching Welte's instruments and building practices, it is likely that what the Seewen organ reproduces is very close to that of the original Freiburg recording instrument. However, there is no way to be certain when it comes to miniscule details. To complicate things further, reed pipes especially are the least stable in any organ in terms of tuning, and so when measuring the articulation of a loud piece that employs them, the clarity and amount of silence between pitches can vary even more so than pieces that only employ flue pipes.

Finally, putting these considerable variables aside, and measuring only in terms of computers, the interonset intervals produce values that are extremely difficult to

visualise. While assigning a range of values a label, such as "legato", would be helpful in one piece, in another work at a very fast tempo, listeners may perceive that same value as "staccato." Ultimately, reducing articulation to a series of numbers and using those to describe a performer's interpretation is very difficult for audiences to perceive without hearing the performance. For these reasons, this study will only examine articulation when it is extreme. In these instances, the silence between notes will be described relative to the articulation around it.

Measuring the gaps between each note results in the articulation; in the French Romantic Organ School, as established in Part I, a "demi-staccato" note is defined as played approximately half to two-thirds the value of the written note (i.e. a dotted minim/half note is played so that the pitch only sounds for approximately as a minim/half note or slightly less). Absolute legato, the default articulation of the French Romantic Organ School, is achieved by playing as small a gap as possible between pitches.

The figures that demonstrate this most clearly in Part III are a mix of reproductions of paper rolls scanned by the Museum in Seewen, while others are visual representations of the MIDI files, generated from the digitisation process in Seewen; both will be used, with preference given to the clearest versions of each.

The visualisations of the MIDI digitisations are generated in MIDI sequencing software as a series of grey boxes, where each box represents a pitch. The vertical placement corresponds to a pitch on the keyboard as shown on the left (C3 is middle C on the modern piano), and the horizontal length of the bar determines the duration of the pitch. If there is a gap between the grey bars, this results in silence. An example can be seen in Figure 6.

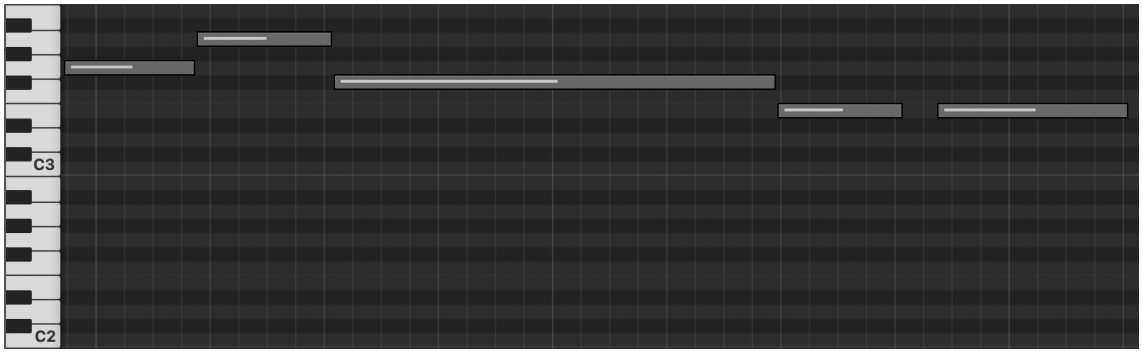


Figure 6: Screenshot of a MIDI digitisation of Erb's performance of
J.S. Bach: *Concerto in G Major, BWV 592: II. Grave*, bar 17 (soprano line only).
The last two notes have a gap between them, resulting in silence.

Analysis Summary per Roll

Each chapter of Part III focuses on one organ roll recording of a Bach work played by a member of the French Romantic Organ School. Every analysis will begin with an overview of the piece's source history and editions which were most likely familiar to the performers, followed by a discussion of which stops the performer chose, information about their use of dynamics and any registration changes if applicable, the average tempo using the methodology described earlier, concluding with a comparison of these aspects of the performance to the Francophone Bach editions which appeared shortly after the date of recording. Commentary on each of these parameters will follow, with comparison to the writings mentioned in Part I, plus recollections and concert reviews about performances by members of the French Romantic Organ School playing the same or similar Bach works. Most of the organ rolls recordings in Part III also offer a unique insight into a certain aspect of performance practice — ornamentation, tempo modification, notations by the Welte editors, even how organists approached technically difficult moments in a piece. Together, the ten recordings in the collection at Seewen clarify the inevitable ambiguities which arise when trying to use words to describe music.

Chapter 7: Roll 1586 — Gigout Plays *O Mensch, bewein*, BWV 622

Das Orgelbüchlein

J.S. Bach's chorale prelude on *O Mensch, bewein dein Sünde Groß*, BWV 622 was composed for *Das Orgelbüchlein*, a collection of organ chorale preludes which would have served as preludes before congregational singing of the same hymn in a church service.[418] The autograph of the collection contains entries for 164 chorale titles; 60 of these are for specific liturgical seasons such as Advent, Lent, Easter, etc. or are based on Martin Luther's Catechism chorales, and 104 are for general use in any season.[419] Out of these chorales in the index, Bach only set 42 to music, with *O Mensch, bewein* falling into the category of Passiontide. The nature of the collection, beyond serving as chorale preludes, was educational, as evidenced by the title page:

> "Little Organ Book, in which guidance is given to an inquiring organist in how to implement a *chorale* in all kinds of ways, and at the same time to become *practised* in the *study of pedalling*, since in the *chorales* found therein the *pedal* is treated *completely obbligato*." [420]

The autograph of *O Mensch, bewein* is given in two staves and is marked "à 2 Clav. et Ped." ["for two keyboards and pedal"] with the tempo "Adagio assai."[421] The 1846 Peters edition transcribes this in three staves, with the soprano line played on one manual, the tenor on a second manual, bass in the pedal, and alto on whichever of the two top staves makes the most sense or serves the musical form.[422] However, there is no

---

[418] Russell Stinson, *Bach: The Orgelbüchlein* (Oxford: Oxford University Press, 1999), 1–2.
[419] Staatsbibliothek zu Berlin Mus.ms. Bach P 283.
[420] Title page of D-B Mus.ms. Bach P 283, translated in Williams, *The Organ Music of J.S. Bach*, 227: "Orgel-Büchlein Worinne einem anfahenden Organisten Anleitung gegeben wird, auff allerhand Arth einen *Choral* durchzuführen, anbey auch sich im *Pedal studio* zu *habilitiren*, indem in solchen darinne befindlichen *Choralen* das *Pedal* gantz *obligat tractiret* wird."
[421] D-B Mus.ms. Bach P 283.
[422] Peters Edition 5, 48–49. The placement of the alto voice is sometimes determined based on the musical form; in an ornamented chorale, such as *O Mensch, bewein*, BWV 622, the soprano voice is played on one keyboard, and the alto and tenor on another. In that instance, the soprano is on the top staff, and the alto and tenor, for the left hand, are on the middle staff.

preface nor performing instructions, and, as discussed previously, the Francophone editions of *Das Orgelbüchlein* were released many decades after Gigout's recording.

Registration

In this recording, number 1586 in the Welte catalogue, Gigout plays the soprano line on Manual I, alto and tenor on Manual II, and bass in the pedal. During the digitisation process at Seewen, this roll was scanned and digitised without difficulty. In his performance of *O Mensch, bewein*, Table 2 shows the stops that Gigout selected on the recording organ:

Manual I		Manual II	
Bordun	16'	**Wienerflöte**	**8'**
Principal	**8'**	Bordun	8'
Traversflöte	**8'**	Viola	8'
Gambe	8'	**Aeoline**	**8'**
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	**8'**	Quinte	2 ⅔'
Flöte	4'	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	Oboe	8'
Harfe		Vox Humana	8'
Glocken		Tremolo	
Manual II to I			
		Pedal	
		Violonbass	16'
		Subbass	**16'**
		Cello	8'
		Gedackt	8'
		Posaune	16'
		I to Pedal	
		II to Pedal	

Table 2: Gigout's registration in his Welte organ roll performance of J.S. Bach: *O Mensch, bewein, dein Sünde groß*, BWV 622. The stops selected are shown in bold.

Gigout is mostly using the softest 8' stops, excluding the Principal 8' (typically the loudest flue stop the organ). His avoidance of the louder string registers like the Gambe

8' in Bach demonstrates Widor's influence, who in the preface to his complete Bach works edition (co-edited with Schweitzer) comments that the Gambes' "acidity of timbre renders them intolerable in a polyphony made of calm and grandeur."[423] Gigout also employs the Vox coelestis, a string stop tuned slightly flat, which, when added to normally-tuned register creates an undulating effect; Gigout's choice here shows the influence of the French Romantic Organ School, as detuned stops were very common on Cavaillé-Coll and other Francophone organs from that period, but exist on only a few surviving Saxon organs that Bach played; as such in Bach's day, they were used as a special effect only on very large organs.[424] Additionally, most French Romantic organs have a detuned string stop on the Récit, not the dominant division (in the Welte organ, the dominant division is Manual I).[425]

Ornamentation Practice

As Bach's chorales in this collection were for pedagogical purposes, many of the pieces focus on a a technical demand on the performer or particular compositional device, such as canon (such as *In dir ist Freude*, BWV 615), style brisé (*Nun komm, der Heiden Heiland*, BWV 599), ways to pivot to both extremes of the pedalboard (*Alle Menschen müssen sterben*, BWV 643), or, in the case of *O Mensch, bewein*, a heavily ornamented chorale melody with accompaniment. While there are several other chorale preludes in this style in the collection (*Wenn wir in höchsten Nöten sein*, BWV 641 and to a much lesser extent *Ich ruf zu dir, Herr Jesu Christ*, BWV 639), *O Mensch, bewein*

[423] Widor-Schweitzer Edition 1, French, 12–19, translated in Near, *Widor on Organ Performance*, 54.
[424] For a collection of stoplists of such organs, see Lynn Butler and Christoph Wolff, *The Organs of J.S. Bach: A Handbook* (Urbana: University of Illinois Press, 2012).
[425] See Jesse Eschbach, *A Compendium of Known Stoplists by Aristide Cavaillé-Coll* (Paderborn: Verlag Peter Ewers, 2003).

is particularly notable for its use of many kinds of ornamentation — trills, mordents, and rising and falling accents — in many different contexts. The most reliable source on how to interpret these various shorthand forms of notating ornamentation as the composer himself would have done is J.S. Bach's table in the c. 1720 *Clavier-Büchlein vor Wilhelm Friedemann Bach*.[426] This collection contains portions of the *WTC* and Inventions and Sinfonias, as well as a preface explaining the various clefs, and the ornament table. This table is reproduced in the first volume of the Widor-Schweitzer Edition in both the French and later English version, the former of which is reproduced in Figure 1.

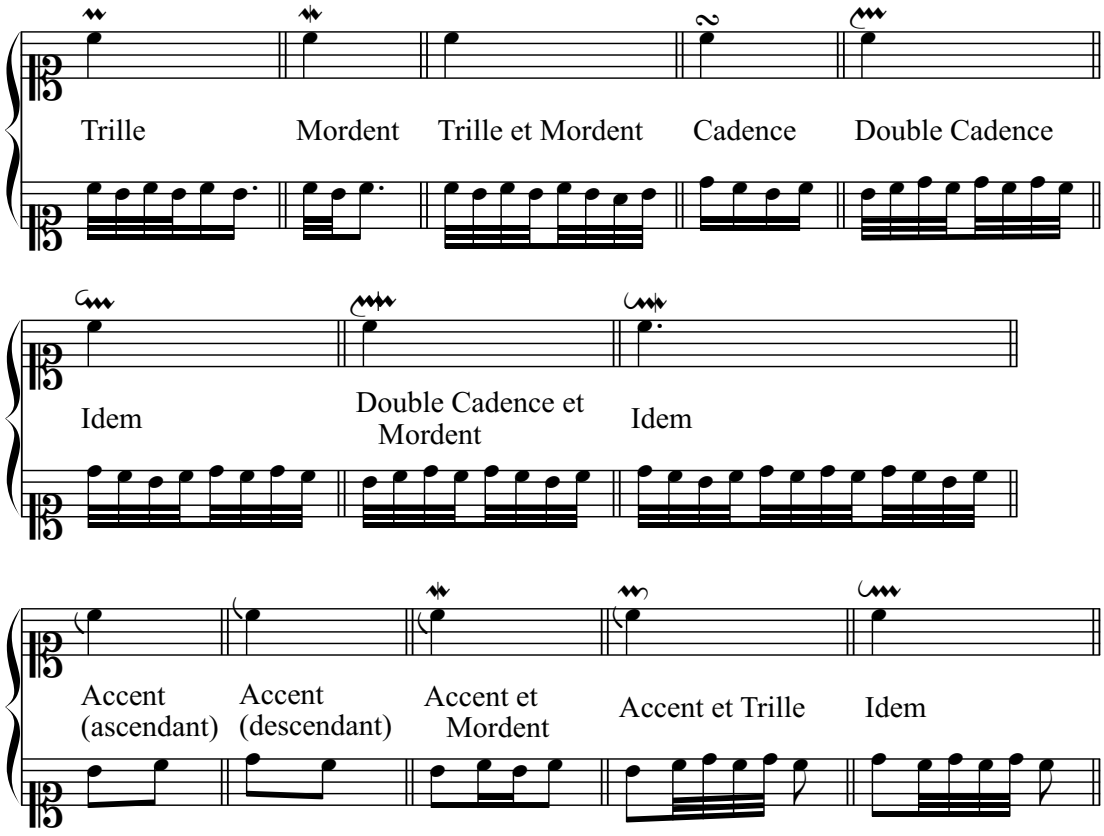


Figure 1: Johann Sebastian Bach's ornament table, as it appears in the preface of the Widor-Schweitzer Edition, French version.[427]

[426] Johann Sebastian Bach, *Clavier-Büchlein vor Wilhelm Friedemann Bach*, Yale University Beinecke Library (US-NHub) Music Deposit 31, fol. 3r.
[427] Widor-Schweitzer Edition 1, French, lij.

The transcription of the notes matches that of Bach's hand, though Widor and Schweitzer translated the names of each ornament to French. The ornament table does appear in the first volume of the English- and German-language version of the Widor-Schweitzer edition, published in 1912. The French-language Widor-Schweitzer Edition, which also contained this ornament table, was published in 1914, two years after Gigout recorded *O Mensch, bewein* for Welte. While the Widor-Schweitzer Edition did eventually include a volume for the *Orgelbüchlein*, the first four volumes contained only the free works, and all the chorales appeared beginning in the 1960s, long after Widor's death.[428] As to whether Gigout had access to the 1912 Widor-Schweitzer edition, Fannie Edgar Thomas noted that when she met Gigout around 1894 that "[Gigout] does not speak a word of English."[429] Despite this, it seems likely that, given Gigout's close relationship with Widor and both organists' heavy study and use of Bach in their own teaching, Gigout would have known of the table's existence before the publication date, especially as this same table also exists in the Bach-Gesellschaft edition, published in 1895.[430] If Gigout were interested in following Bach's table, he should have performed every trill from the note above the written pitch.

In practice, Gigout followed Bach's table very loosely in the performance captured on the Welte organ roll, in favour of his own taste. Curiously, he does not follow the typical nineteenth century convention of performing trills only from the main note; in the first two phrases of the chorale, Gigout does a mixture of main and upper note trills. Figure 2 is a comparison between the melody of *O Mensch, bewein*, taken from Bach's four-part harmonisation of the chorale (BWV 402), the organ chorale

[428] Schweitzer's *Orgelbüchlein* edition, co-edited by Édouard Nies-Berger, was volume seven, published in 1967: Widor-Schweitzer Edition 7, English (co-edited by Schweitzer and Édouard Nies-Berger).
[429] Armstrong, *Organ Loft Whisperings*, 68.
[430] *BGS* 45, no. 1, 213.

version from the *Neue Bach Ausgabe*[431], and a transcription of exactly which notes Gigout is playing on every ornament in the first six bars taken from the organ roll; above every pitch marked with a trill there is a short clarification whether Gigout begins from the main or upper note. This was determined by pitches on the roll, which show exactly on which notes Gigout began his ornaments. Every nuance of rhythm captured in the roll cannot clearly be shown using standard notation, and significant deviations are noted. Gigout also uses the swell box to affect dynamic changes, but the box is only ever completely open or completely shut; in Figure 2, these are shown as "p" for closed and "f" for open. For the ease of the reader looking at most modern scores, the bar numbers used going forward will be given according to those in the *Neue Bach-Ausgabe*.[432]

[431] Johann Sebastian Bach, "O Mensch, bewein, dein Sünde groß," in *NBA* IV/1, 40, bars 1–6. Which Bach edition Gigout used in the recording is unknown; the most likely candidates would be the 1846 Peters edition or Bach-Gesellschaft, as the Widor-Schweitzer edition of *Orgelbüchlein* was not published until 1967. The Peters and Bach-Gesellschaft are nearly identical, except Peters shows the trills in bars 1–2, soprano line, as a trillo (rather than the abbreviation "tr."), and Accent ornaments throughout (e.g. bars 5 and 6) as semiquaver/sixteenth note grace notes.
[432] *NBA* IV/1, 40–41.

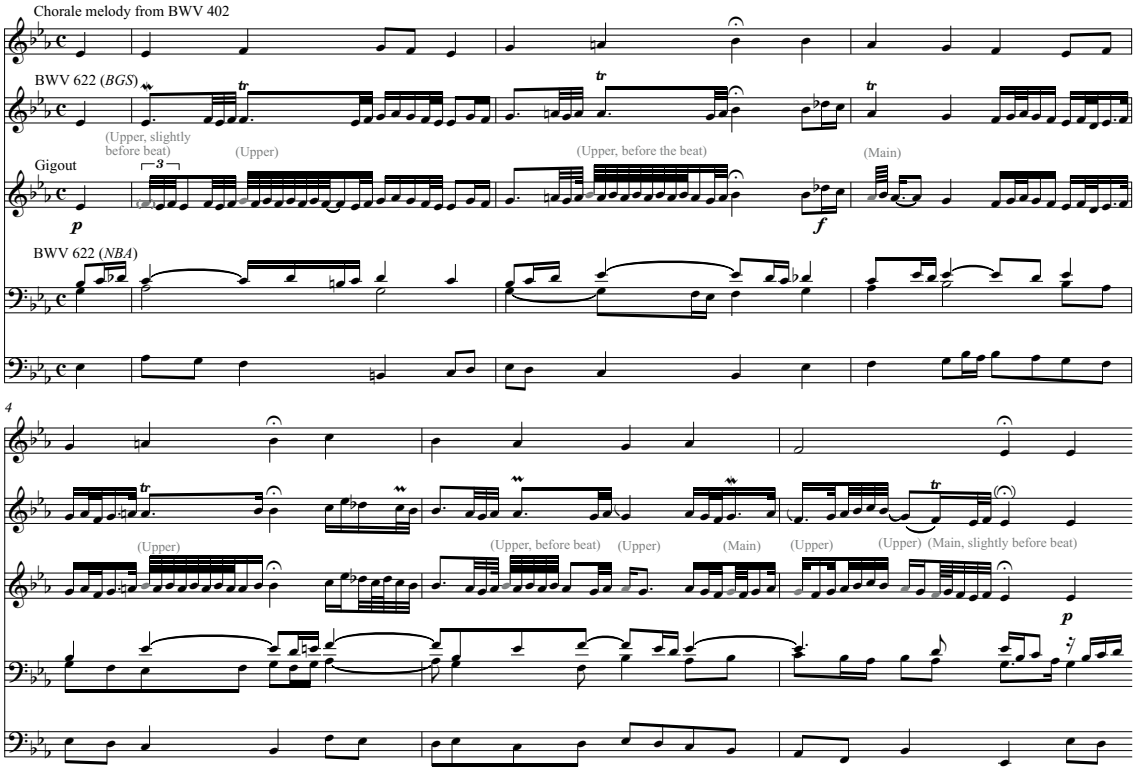
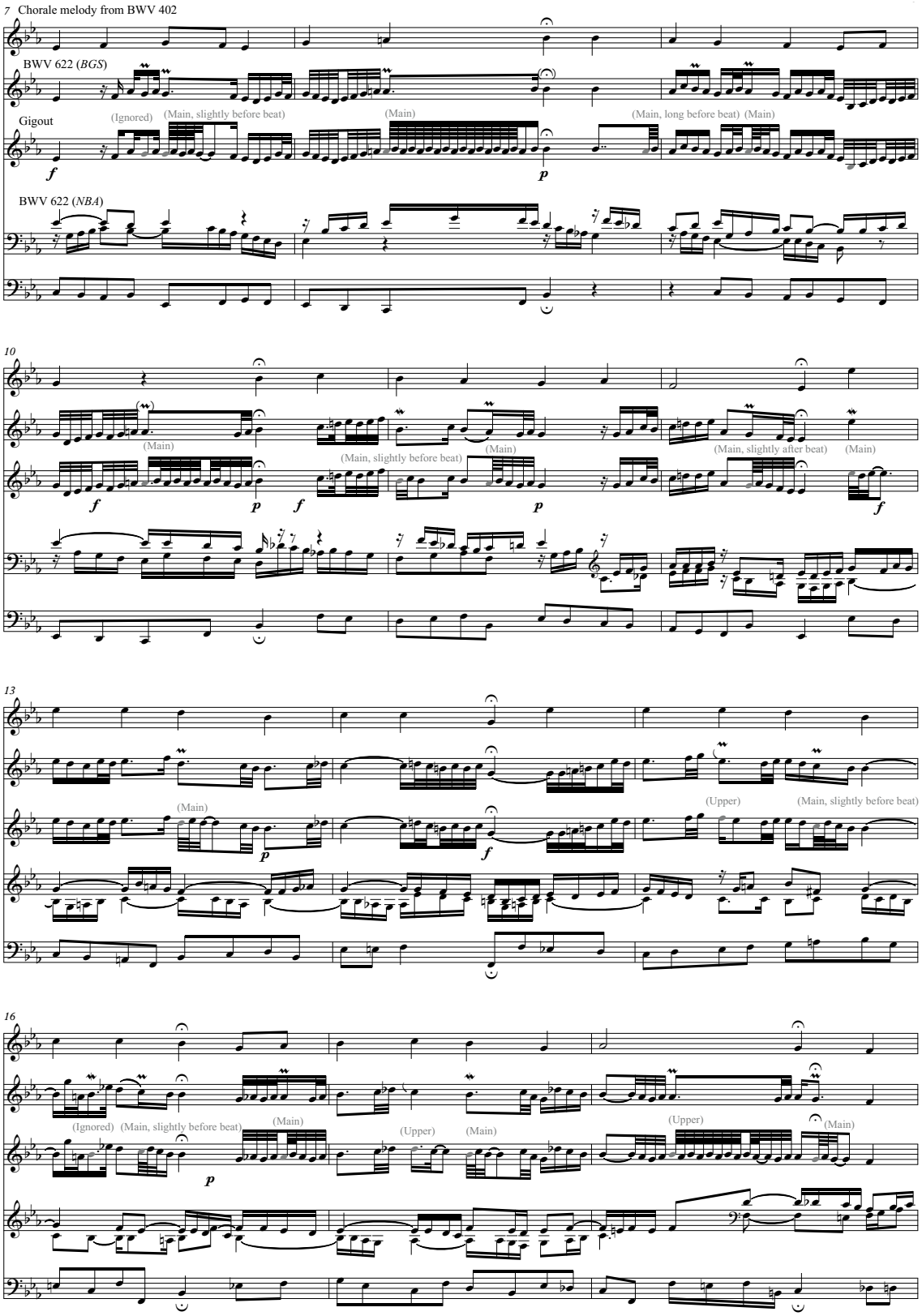


Figure 2. J.S. Bach: *O Mensch, bewein dein Sünde groß*, BWV 622, bars 1–6. The top line is the chorale melody from Bach's four part harmonisation (BWV 402); the second line is the soprano line of the organ chorale as it appears in the *Bach-Gesellschaft* edition; the third line is a transcription of Gigout's ornamentation practice decisions along with his use of the swell pedal shown as dynamics ("p" for closed and "f" for open); the bottom two lines show the alto, tenor, and bass voices of the organ chorale from the *Bach-Gesellschaft* edition.

Gigout's default in these first three phrases is to begin trills from the upper note. The first exception to this is the trill in beat 1 of bar 3, which may have resulted from Gigout intending to highlight the A-flat of the chorale melody. Otherwise, his choice of upper or main note seems to be mostly based on creating the most conjunct line and avoiding repeated notes. In contrast to the W.F. Bach table, Gigout usually starts the ornaments slightly before the beat, and always terminates them before the final written-out turns which lead into the next note (as opposed to continuing the trill until the last possible moment before the turn). However, the next phrases, as seen in Figure 3, show a very different approach:


7 Chorale melody from BWV 402
BWV 622 (BGS)
Gigout
(Ignored)
(Main, slightly before beat)
(Main)
(Main, long before beat)
(Main)
BWV 622 (NBA)
10
(Main)
(Main, slightly before beat)
(Main)
(Main, slightly after beat)
(Main)
13
(Main)
(Upper)
(Main, slightly before beat)
16
(Ignored)
(Main, slightly before beat)
(Main)
(Upper)
(Main)
(Upper)
(Main)

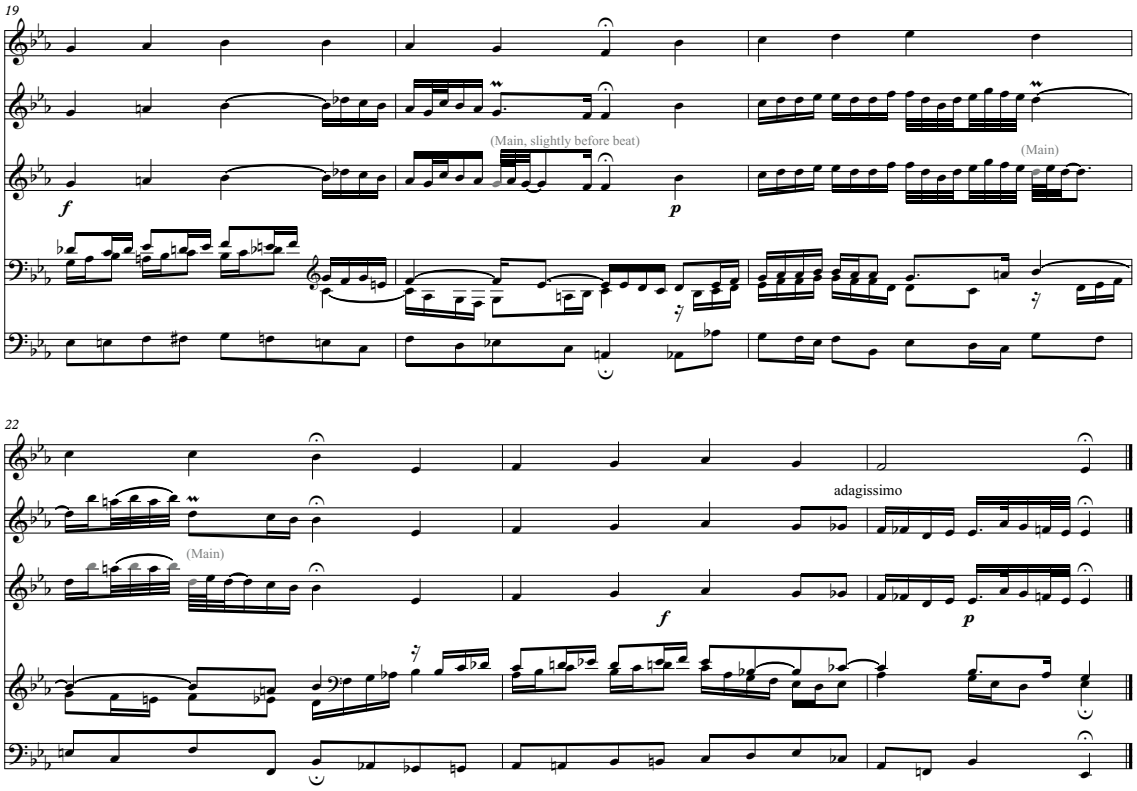


Figure 3. J.S. Bach: *O Mensch, bewein dein Sünde groß*, BWV 622, bars 7–24. See the caption of Figure 2 for an explanation of the meaning of each line.

Gigout then almost entirely abandons upper-note ornaments for the rest of the piece, apart from bar 18, beat 2, where the upper note serves to create a more conjunct melody. Whereas in bars 1–6, Gigout seems to be more interested in using the upper notes to create a more conjunct melody and avoid repeated notes at the beginning of a trill, in bars 7–24 he seems to be perfectly content to allow the repetition of two of the same notes at the beginning of a trill, evidenced in bar 10. One possible explanation for his decisions on whether to play a main or upper note trill could be related to the chorale melody itself; with only two exceptions — bar 15, beat 2 and bar 17, beat 2 — all Gigout's ornaments begin on the same pitch as the chorale tune from the four-part harmonisation of *O Mensch, bewein*, BWV 402. And the two aforementioned exceptions are both accents, which he treats consistently as upper note appoggiaturas,

consistent with the W.F. Bach table. Some of Gigout's trills begin on the beat, but many are slightly before, with one instance (bar 12, beat 2) beginning after. There seems to be no consistent pattern to this. Further perplexing is why Gigout seems to prefer upper note trills in bars 1–6, but then reverts to primarily main note trills for the entire rest of the piece.

Gigout also ignores two ornaments: bar 7, beat 2 and bar 16, beat 1. This is similarly inexplicable, given that both the trill and mordent, respectively, appear in the Fauré, Peters, and Bach-Gesellschaft.[433] Only the Peters and Bach Gesellschaft editions would have been published by the time Gigout recorded; it seems most likely that Gigout was playing from one of them, and the inclusion of both ornaments in the two French editions prepared within the decade (Schweitzer's was not published until 1967, but was mostly prepared before his departure to Africa in 1913[434]) indicate they were known in the French organ scene.

Dynamics

As noted previously, the design and use of the swell box is significantly different from organs in eighteenth-century Saxony and Thuringia. The older German organs almost never had swell boxes, and no surviving instruments from baroque era with swell boxes are controlled using the same mechanism as Welte or French Romantic organs (either a balanced pedal in the centre of the console/keydesk aligned centrally just above the pedalboard, or a hitchdown pedal to the side).[435] Therefore,

[433] Fauré Edition 2, 32–33. Peters Edition 5 (1846), 48–49. *BGS* 25, 33–34.
[434] Near, *Widor: A Life Beyond the Toccata*, 314.
[435] For examples of stoplists of a variety of eighteenth century Central German organs and early designs of swell boxes, see Peter Williams, *The European Organ, 1450–1850* (Bloomington: Indiana University Press, 1978).

Gigout's use of the swell pedal in this piece is entirely a product of the French Romantic Organ School. The decisions seem to be at the discretion of the performer, as none of the four major Bach editions from around this period which include BWV 622 suggest any dynamics at all (including Fauré, which is the most liberal of those in suggestions of dynamics).[436] The later Bonnet edition, which is compared in Table 4, gives an entirely different interpretation of dynamics in this piece.

Examining the switching signals for the swell box on the Welte roll, Gigout only leaves the box completely open or closed, never anything in between. Gigout changes the swell box nearly every bar; on the surface there is nothing happening in the composition harmonically or otherwise to consistently inspire such a drastic dynamic shift.

Looking at specific instances, the opening of the box at the end of the first phrase in bar 2 could correspond to the introduction of the D-flat in the soprano line, and keeping it open until the end of the third phrase in bar 6 could be a way to mark the end of the first section of the chorale. Other changes of the swell box take place at the endings of phrases: closing the box in bar 8, beat 3, and the same in bar 10, beat 3. The quickest change takes place in bar 10, where over the course of one beat the box completely shuts then opens again; this likely is tied to the introduction of a major harmonic shift in the tenor line; the preceding phrase (bars 8, beat 4 until bar 10, beat 3) cadences in B-flat major, but Bach immediately shifts the tonality by changing the third of B-flat major, D, to minor with an A-flat. This extremely sharp contrast in harmony was most likely the impetus for a quick swell shade movement.

[436] Widor-Schweitzer Edition 7, English. Johann Sebastian Bach, *2me Cahier de Chorals variés*, ed. Gabriel Fauré (Paris: Durand, 1920).

Similarly, the sudden harmonic shift in bar 13, beat 4 into bar 14, beat 1 — moving from the general tonal area of B-flat major to F minor — was a reason for Gigout to move the box. At the end of the same phrase (bar 12, beat 4 until bar 14, beat 3) Gigout opens the swell box, possibly to emphasise the striking harmony in bar 14, beat 3: a natural 4-2 chord over F, which eventually leads into C minor in bar 15. The greatest build-up in the entire piece takes place over the ascending chromatic scale in the bass line in bars 18, beat 4 until bar 19, beat 3 — here Gigout opens the swell box. Then in a move that seems counterintuitive, he closes the box in bar 20, beat 4, despite the soprano line being the most ornamented and highest in pitch of the entire piece; yet he was saving the dynamic change for a similar build-up to that of bars 18, beat 4 until bar 19, beat 3 — here he opens the box again, finally to close it after the highly striking harmonies in bar 23, beat 4 and bar 24, beat 1.

The swell box is used extensively in this performance — 17 swell box movements in a piece which is 24 bars in length. Table 4 is a list of the box positions Gigout employed in his performance.

Bars	Gigout Box Position
Bar 1 – bar 2, beat 4	Closed
Bar 2, beat 4 – bar 6, beat 4	Open
Bar 6, beat 4 – bar 7, beat 1	Closed
Bar 7, beat 1 – bar 8, beat 3	Open
Bar 8, beat 3 – bar 10, beat 1	Closed
Bar 10, beat 1 – bar 10, beat 3	Open
Bar 10, beat 3 – bar 10, beat 4	Closed
Bar 10, beat 4 – bar 11, beat 3	Open
Bar 11, beat 3 – bar 12, beat 4	Closed
Bar 12, beat 4 – bar 13, beat 4	Open
Bar 13, beat 4 – bar 14, beat 3	Closed
Bar 14, beat 3 – bar 16, beat 3	Open
Bar 16, beat 3 – bar 19, beat 1	Closed
Bar 19, beat 1 – bar 20, beat 4	Open
Bar 20, beat 4 – bar 23, beat 2	Closed
Bar 21, beat 1 – bar 22, beat 1	
Bar 22, beat 1 – bar 22, beat 2	
Bar 22, beat 2 – bar 22, beat 4	
Bar 22, beat 4 – bar 23, beat 3	
Bar 23, beat 3 – bar 24, beat 2	Open
Bar 24, beat 1 – end	
Bar 24, beat 2 – end	Closed

Table 4. List of dynamic changes achieved by the swell pedal in Eugène Gigout's Welte organ roll performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*, BWV 622.

Tempo and Rubato

Since the recording speed was always the same and the roll was digitised at the same speed, the tempo of the performance in Seewen is identical to what Gigout recorded in 1912. Using the method described in Chapter 6, with the pulse set at the quaver/eighth note, Gigout's average tempo in this roll is quaver/eighth note equals 35 beats per minute.[437] The data set which shows the length between beats is given in

[437] Omitting the adagissimo section from bar 23, beat 4 until the end does not significantly affect the overall average tempo (with those bars is 34.740 BPM versus without is 35.398 BPM).

Appendix A. Since the pneumatic organ's pitches and rhythms are a binary system, every aspect of rhythm and timing is indeed a "faithful" reproduction.

Based on the analysis, the average amount of time between every quaver/eighth note is 1.727 seconds (the greatest being 3.361 seconds between the last two beats of the piece and the smallest being 1.084 seconds at the very beginning of the piece). Table 5 shows the moments of the greatest ritardando (excluding the "adagissimo" section, discussed below), in which there are two seconds or more between every quaver/eighth note.

Bars	**Context**
Bar 4, beat 2	Precedes a fermata
Bar 5, beat 3, first half	First note of a descending accent ornament
Bar 6, beat 1, first half	Downbeat of the last bar of the first two chorale phrases
Bar 8, beat 3, second half	Middle of a fermata
Bar 10, beats 2.5–3.5	Precedes a fermata
Bar 11, beat 2, second half	First note of an appoggiatura (4–3 suspension)
Bar 12, beats 2–3.5	Precedes and includes the first half of a fermata
Bar 13, beat 4, second half	Precedes an important chromatic alteration
Bar 14, beat 2, second half	Precedes a fermata
Bar 16, beat 1	Downbeat of a phrase that precedes a fermata
Bar 16, beat 2.5–4	Fermata and beginning of a new phrase
Bar 18, beats 2.5–3.5	Precedes and includes a fermata
Bar 20, beat 2.5	Precedes a fermata
Bar 21, beat 3.5	Final set of demisemiquavers/32nd notes in run
Bar 22, beats 2.5–4.5	Precedes and includes a fermata

Table 5. List of the most extreme instances of rubato taken by Eugène Gigout in his organ roll performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*, BWV 622.

Gigout reserves his greatest rubato for moments that are significant to the structure of the work, mostly preceding and/or including fermatas, or for significant moments in the ornamented melody, such as the appoggiatura in bar 11, beat 2. In this recording, he is consistent with the French Romantic Organ School's aesthetics that all performance decisions, especially regarding rubato, need to have some relevance to highlighting the musical structure of the score.

At the last crotchet in the penultimate bar, Bach marks "adagissimo" in the score.[438] Here Gigout makes only a very small tempo shift, from an average tempo of about 33 bpm in bars 22–23 to around crotchet/quarter note = 20 bpm for the "adagissimo" section, then resuming around 33 bpm at the end (though this is slightly slower due to a ritardando). No major edition contemporary to this recording — Peters or Bach Gesellschaft — gives any metronome marking, and therefore there was nothing in Germanic editions at least which would have influenced the interpretation of Gigout or his Francophone colleagues.

Ultimately, this performance demonstrates that flexibility of tempo and rubato were an important part of Gigout's conception of this performance.

Conclusion

This roll's particular value to understanding French Romantic performance practice in Bach's organ works is in Gigout's ornamentation. His approach of playing main note and upper note trills without any visible pattern simply shows that, at least in the moment the recording took place, the question of how to interpret ornaments was purely a matter of taste, despite likely having access to J.S. Bach's ornament table. Additionally, Gigout's approach to registration and dynamic changes was entirely of the Romantic aesthetic, specifically due to his inclusion of decidedly nineteenth century soundscapes such as the Voix celeste; and the sheer amount of opening and closing of the swell box throughout the piece indicates that such dynamic manipulations were commonplace in chorale preludes such as these. Gigout's dynamic changes and use of

[438] In the Fauré edition — volume 2, no. 2, page 33 — the tempo here is marked "adagioissimo," likely an error.

tempo rubato are notably never at a whim — they always begin at moments which are significant to the musical structures, which is consistent with the teaching of Lemmens and Widor. While Gigout is ultimately faithful to Bach's musical text in this sense, his performance of *O Mensch, bewein* is also a brief but rich glance into the aesthetics of the French Romantic Organ School: an intentionally contemporary use of the instrument at hand, while also striving to maintain some faithfulness to the musical text.

Chapter 8: Roll 1585 — Gigout Plays *In dir ist Freude*, BWV 615

Editions

J.S. Bach's chorale *In dir ist Freude*, BWV 615, is another chorale prelude from *Das Orgelbüchlein*, the chorale itself normally being sung during the celebration of the New Year. The autograph shows the piece on two staves with the bass line marked for pedal.[439]

The *Neue Bach-Ausgabe* transcribes *In dir ist Freude* in three staves, as do the Fauré, Peters, and *Bach-Gesellschaft* editions.[440] However, there are some subtle differences between the three, which have to do with ornamentation and the notation of the repeat signs. The manuscript shows a repeat sign between bars 39–end, which is shown in the same way in the Fauré and Peters editions. In the *Bach-Gesellschaft* edition, the section after bar 39 is written out in its entirety, without a repeat sign. The *Neue Bach-Ausgabe* writes this out as first ending and final ending, to clarify that the final note in the alto line, C, is tied in the first ending, but not in the second.[441]

The other differences surround ornaments. In the *Bach-Gesellschaft* edition, the trill in the alto line in bar 45 and 48 (in both repeats) are marked in parentheses, whereas they are obligatory in all the other editions. Gigout plays every notated trill. In keeping consistent with his performance of *O Mensch, bewein*, though, Gigout is slightly inconsistent with his ornamentation practice — in the first repeat he always plays from the upper note, and for the most part continues trilling into the following note. In the second repeat he basically does the same thing, except he uses a main note trill in bar 45; this trill, beginning on a G-sharp following a G, is rather striking to the

[439] D-B Mus.ms. Bach P 283.
[440] *NBA* IV/1, 27–29. Fauré Edition 2, no. 2, 20. *BGS* 25, 20. Peters Edition 5, 36–37.
[441] *NBA* IV/1, 27.

ear. Additionally, in the second repeat, Gigout terminates his trills about a quaver/eighth note early.[442]

This piece also appears in Joseph Bonnet's edition of some Bach organ works in his *Historical Organ-Recitals* series, published in 1918, around six years following Gigout's recording.[443] As the by far most heavily edited of any produced by a member of the French Romantic Organ School, Bonnet's ideas about this piece clarify that some of Gigout's performance decisions were in fact intentional. Gigout's articulation could generally be described as legato except in a few specific instances. Primarily there is a consistent separation between repeated notes in the cantus firmus, especially in the soprano line; Bonnet's edition asks for this every time the cantus firmus appears by marking a tenuto and staccato on the note. This separation between repeated notes is a consistent and crucial part of the French Romantic Organ School's Bach performance practice, as established in Chapter 3. In Gigout's roll, the specific value of the separation varies slightly depending on where it appears, but until the registration change Gigout intentionally separates consecutive pitches more than his default articulation. After the registration change, there is only one note in the soprano cantus firmus which is repeated, bar 45; here Gigout does not apply the same level of articulation as before. On the Seewen organ, which is in a very dry acoustic, it almost sounds as if there is no articulation at all; in a large reverberant church it would be indistinguishable. Further, in Bonnet's edition, instances of repeated notes in the alto, tenor, and bass voices are always articulated; in Gigout's performance he rarely does this.

[442] With so much extra sound, perhaps this was an attempt to be extremely clear.
[443] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 22–25.

Registration

During the digitisation process at Seewen, this roll was scanned without difficulty. In his performance of *In dir ist Freude*, Table 1 shows the stops that Gigout selected on the recording organ:

Manual I		Manual II	
Bordun	16'	**Wienerflöte**	**8'**
Principal	**8'**	Bordun	8'
Traversflöte	**8'**	**Viola**	**8'**
Gambe	**8'**	**Aeoline**	**8'**
Viol. d'orch.	**8'**	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	4'	Clarinette	16'
Piccolo	2'	**Trompette**	**8'**
Sesquialter	II	**Horn**	**8'**
Fagott	**8'**	**Oboe**	**8'**
Harfe		Vox Humana	8'
Glocken		Tremolo	
Manual II to I			
		Pedal	
		Violonbass	16'
		Subbass	**16'**
		Cello	**8'**
		Gedackt	8'
		Posaune	16'
		I to Pedal	
		II to Pedal	

Table 1: Gigout's registration in his Welte organ roll performance of J.S. Bach: *In dir ist Freude*, BWV 615. The stops selected are shown in bold.

Gigout selects all the 8' flue stops in the organ, plus the swell reeds, which corresponds most closely to the suggestion for "mezzo forte" in the Fauré Bach edition (though the registration scheme is not given in any of the volumes of chorale preludes, only the free works).[444] This raises the question as to the relevance of the chorale's text when choosing a registration for members of the French Romantic Organ School.

[444] Fauré Edition, 1, no. 1, ii. For the registration to correspond exactly to Fauré, Gigout would have to close the swell box completely.

The Roman Catholic liturgy in France did not allow for congregational singing, and it seems the nature of Bach's chorale preludes as organ works based on a melody with a text particular to a Lutheran congregation was a completely foreign concept to Francophone organists; Widor particularly struggled with the meaning behind the many compositional tools Bach uses to highlight the chorale's text — rhythmic changes, chromaticism, textural alterations, etc.; he describes how Albert Schweitzer helped him understand the nature of the chorale prelude during their first meetings:

> "Several years ago, I quite often received visits from a young Strasbourgian... As he knew the old Lutheran texts very well, I informed him of my uneasiness with certain chorales [of Bach] that passed abruptly from one order of ideas to another, from chromaticism to diatonicism, from the solemn to the pointed, without apparent reason or logical deduction... What can be the thought of the composer here, what has he wanted to say?... how do we know this idea?
>
> ""Quite simply by the words of the hymn," replied Schweitzer; and then he recited to me the verses of the chorale in question, which fully justified the musician, and showed the descriptive genus at grips with the text, word by word; I came to ascertain that it was impossible to appreciate the work when ignoring the sense of the implied words." [445]

Schweitzer had brought Widor a new revelation regarding the organ chorales, and in turn Widor encouraged Schweitzer to write about the theological symbolism in Bach's music; this eventually resulted in Schweitzer's book *J. S. Bach: Le musicien-poète*, published in 1905, which discusses Bach's understanding of theology and music, and how he used both to create organ works which reflect the text.[446] Given Gigout's close relationship with Widor (who wrote the preface to Schweitzer's new book), Gigout surely would have had access to the book. However, there was never a publication translating the texts of Bach's chorale preludes into French, and the only Bach organ

[445] Widor, Preface to *J. S. Bach*, 1, vi. Translated in Near, *Widor: A Life Beyond the Toccata*, 313.
[446] Near, *Widor: A Life Beyond the Toccata*, 314. Schweitzer, *J. S. Bach: Le musicien-poète*.

works edition with French titles was that of Fauré, which was published after Gigout's recording session in 1912.[447]

It is also entirely possible that Gigout was aware of the text and wanted the piece to grow in volume. In the *Neue-Bach Ausgabe* edition's bar 40 during the second repeat, he adds the tutti. The swell box remains open for the entirety of the piece, which makes this jump in sound highly noticeable, even jarring. The signal to add all the loud stops at once comes on the second crotchet/quarter note of bar 40; see Figure 1 for the moment when the signal comes.

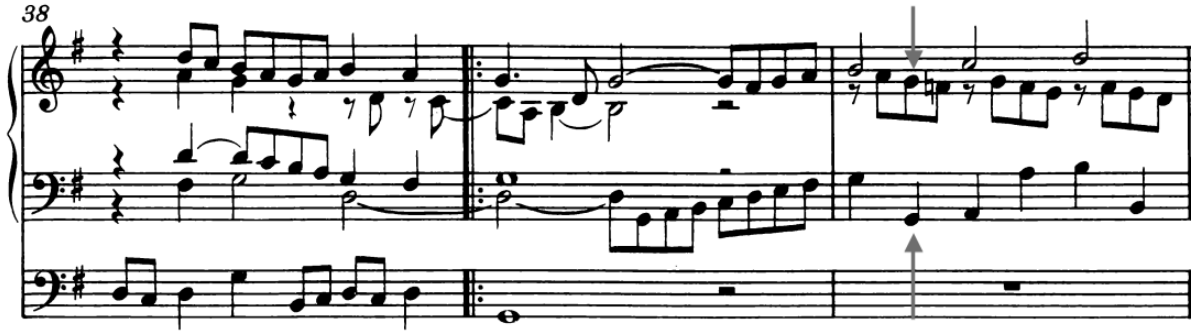


Figure 1: J.S. Bach: *In dir ist Freude*, BWV 615, bars 38–40, with the moment of Gigout's registration change (second repeat only) marked by arrows.[448]

The change of registration occurs in the middle of the minim/half note B in the soprano line.[449] Gigout's sudden increase of volume toward the end may have been intentional, and related to the text of the chorale, given here:

[447] Fauré Edition 2.
[448] NBA IV/1, 27.
[449] It is entirely possible that Gigout intended the change to happen on beat 1 but was not able to make the change happen at the right moment and Welte never edited it out.

In dir ist Freude in allem Leide,	In you there is joy in all suffering,
o du süßer Jesu Christ!	O you sweet Jesus Christ!
Durch dich wir haben himmlische	Through you we have heavenly
Gaben, du der wahre Heiland bist;	gifts; you are the true Saviour;
hilfest von Schanden,	save [us] from shame,
rettest von Banden.	save [us] from bondage.
Wer dir vertrauet,	Whoever trusts in you
hat wohl gebauet,	has built well,
wird ewig bleiben. Halleluja.	will remain forever. Hallelujah.
Zu deiner Güte steht unser G'müte,	By your goodness stands our heart,
an dir wir kleben im Tod und Leben;	to you we cling in death and life;
nichts kann uns scheiden. Halleluja.	nothing can separate us. Hallelujah.

Gigout's crescendo begins at the last three lines ("Zu deiner Güte"), where the text shifts from a litany of praise to the consequence of the speaker's trust in Jesus Christ, reflecting especially on both death and life.

Tempo

Gigout's average tempo in this recording is minim/half note = 53 beats per minute, with the longest beat lasting 2.686 seconds, and the shortest 0.891 seconds. In contrast with Gigout's performance of *O Mensch, bewein*, his *In dir ist Freude* stays more steady for the larger minim/half note beats, though fluctuates considerably more in quavers/eighth notes. Instances of beats lasting longer than 1.2 seconds are given in Table 2.

Bars	**Context/Remarks**
Bar 17, beat 1	A significant cadence in E Minor.
Bar 18, beat 1	Re-entry of the pedal on the characterising theme.
Bar 30, beat 3	The alto quavers/eighth notes are much slower
Bar 42, beat 1	Beginning of a phrase
Bar 50, beat 1	Significant cadence at the end of the first repeat.
Bar 43, beat 2	Middle of a phrase
Bar 46, beat 1	Entry of all four voices.
Bar 47–end	Gradual ritardando

Table 2. List of the most extreme instances of rubato taken by Gigout in his organ roll performance of J.S. Bach: *In dir ist Freude*, BWV 615.

Unlike the *O Mensch, bewein* roll, Gigout's additions of time are largely unrelated to the larger structure of the piece. There are even instances where the performance in the area around the tempo expansions are sloppy. In bar 41, beat 3, there is a significant issue between the pedal and tenor lines, shown in Figure 2.

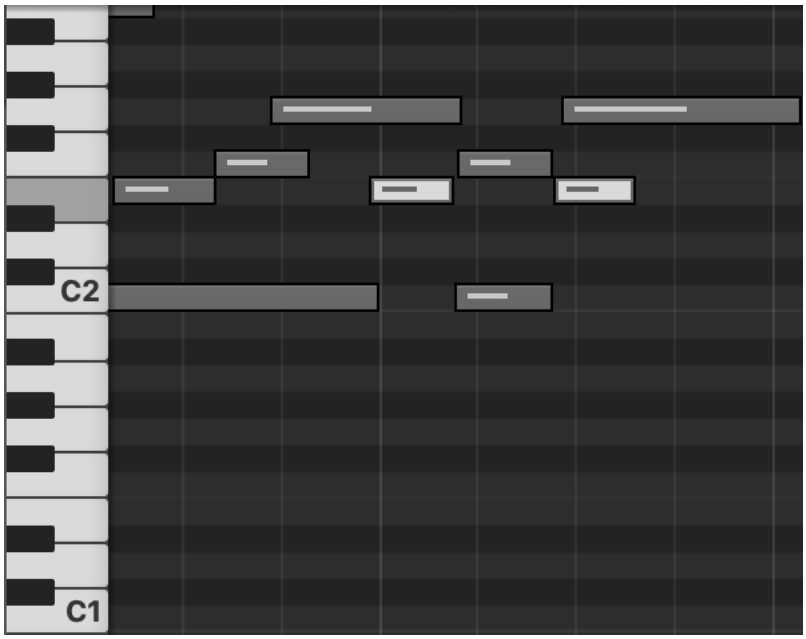


Figure 2. Screenshot of a MIDI digitisation of Eugène Gigout's organ roll performance of J.S. Bach: *In dir ist Freude*, BWV 615, bar 41, beat 3.

The two highlighted notes (E2) are extra pitch errors.

Gigout's performance of the trills in bars 44 and 45, beat three is inconsistent, despite being rhythmically identical. The score is shown in Figure 3.

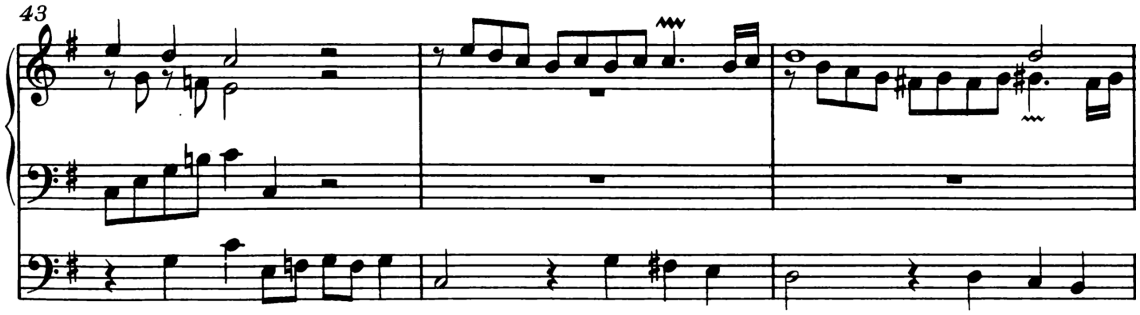


Figure 3. J.S. Bach: *In dir ist Freude*, BWV 615, bars 43–45.

In bar 44, beat 3, Gigout begins the trill on beat three before the pedal's beat three (F-sharp), whereas in bar 45 he begins the trill and the pedal on beat three together. Figure 4 is a screenshot of the digitised organ roll of bar 44, beat 3, with the white line showing where beat 3 begins:

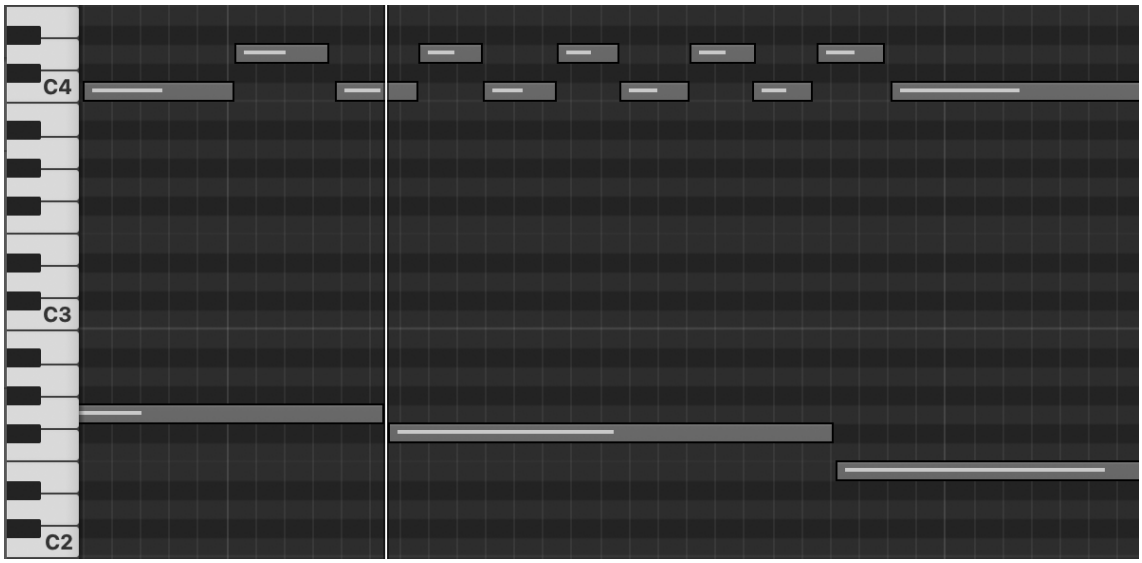


Figure 4. Screenshot of a MIDI digitisation of Eugène Gigout's organ roll performance of J.S. Bach: *In dir ist Freude*, BWV 615, bar 44, beat 3.

And Figure 5 shows bar 45, beat 3, where Gigout begins the trill and pedal almost exactly together (aurally, the tiny gap between when the pedal and trill begins is imperceptible):

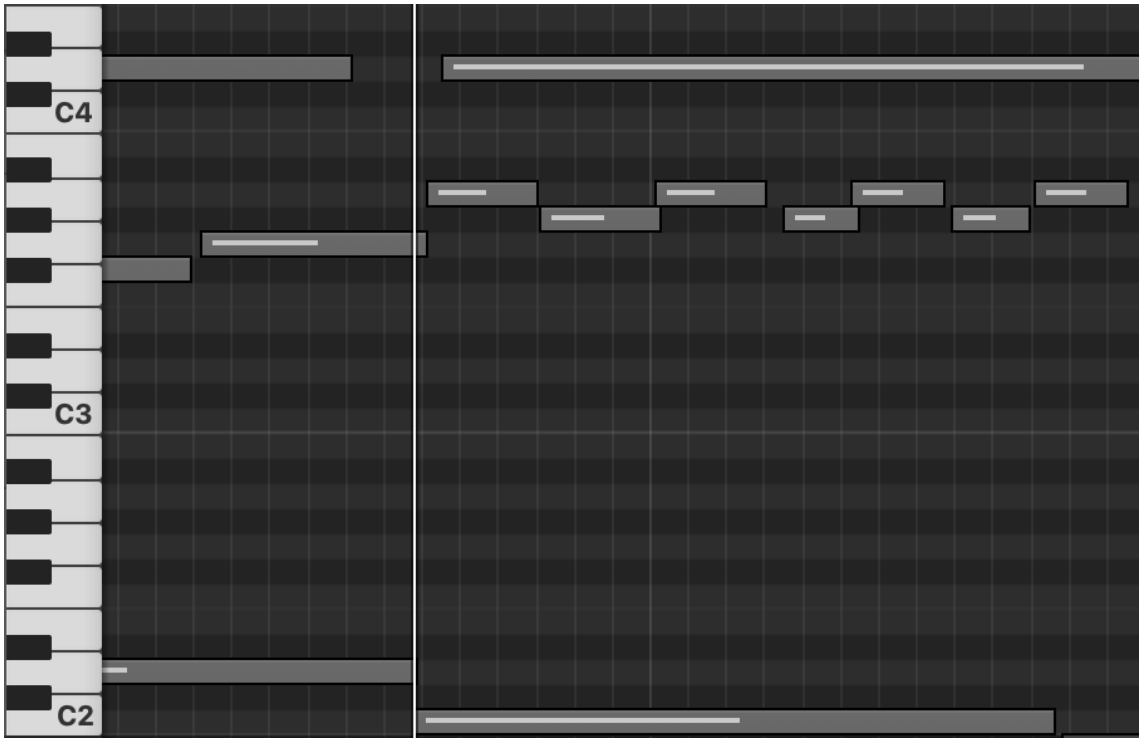


Figure 5. Screenshot of a MIDI digitisation of Eugène Gigout's organ roll performance of J.S. Bach: *In dir ist Freude*, BWV 615, bar 45, beat 3.

As Welte's master roll is no longer extant, the amount of editing decisions which resulted in this recording's final commercial copy are lost. However, it is clear that, even with several audible and noticeable errors in Gigout's performance, Welte did not wish to perfect them.

Summary

In this performance, Gigout keeps the tempo of the minim/half note largely consistent throughout, and ritardandi seem largely to be related to performance issues, rather than showing a larger structure.

Chapter 9: Roll 1079 — Gigout Plays *Toccata in F Major*, BWV 540

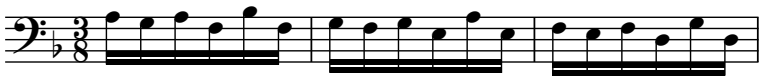
The Roll

Welte Roll 1079 is Gigout's performance of J.S. Bach's *Toccata in F Major*, BWV 540. It was erroneously labelled as "Toccata in E Major" in the Welte catalogue. The only surviving roll was not released commercially, as it has several problems. The performance begins normally, but as it goes on, clear note mistakes become more and more common, until after the first beat of bar 334 (of 438), the recording starts skipping between several short segments of the piece. These may have been intended for splicing later on, though the details of how exactly they did this are lost.

Editions

In the preface to the 1845 Peters edition, editor Friedrich Konrad Griepenkerl describes the source history and the most significant performance practice problem of the piece at the time:

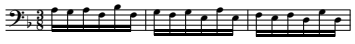
> "Since for this magnificent work, which originates from the time of the highest artistic education of its master, the autograph could not be found, we were therefore limited to the comparison of seven manuscripts, in which we certainly all had the essential divergences. — The greatest difference is shown by the *solo* passages for the pedal in the *Toccata*. They can be found most consistently and most completely in two manuscripts from my collection, one of which is from J.P. [Johann Peter] Kellner. They are abbreviated in an old book by J.L. [Johann Ludwig] Krebs, owned by the court organist [Johann Friedrich?] Reichardt in Altenburg, and in a copy that we owe to the kindness of Mr. [Siegfried Wilhelm von] Dehn in Berlin, and which is probably closely related to the aforementioned. — The reason for the change in these places is easy to see. The pedal of the organs go up at the highest to D4, the Altenburg [organ] only to C4, and J. S. Bach wrote in these passages up to F4, which is not found on the pedal of any old organ. Therefore when performing, he had to either take the notes exceeding the range of the pedal an octave lower, which to some extent disrupted the melodic coherence, or play them on the manual, the latter of which was only possible without any noticeable disturbance, if the sound of the notes in the manuals and pedals could be made approximately the same, which can be achieved by registering on many organs. To avoid these more artificial aids, which are impossible on some organs, and to keep the same tone colour, Krebs

> probably changed these parts first and made them applicable for his pedal in Altenburg. But since we consider the richer and more flowing form of the same to be the original, we have included it in the text and add here the change from Krebs for comparison and any use. In the first solo on page 17, Krebs leaves out the fourth and fifth bars without changing anything else. In the second solo on page 19 he keeps the first 18 bars, then inserts the following three for ten bars
>
> 
>
> and leaves the last four bars of the solo unchanged. He has made all other pedal passages applicable by taking the notes which exceed the range of the pedal one octave lower and, as far as the melodic coherence extends, remains in this lower octave. Those who have the old edition in the Bureau de Musique[450] by C.F. Peters can see it for themselves.[451]

The question of how to handle these octaves is one of the most significant differences in how to approach the pedal lines. Dietrich Kilian, in his notes to the *Neue Bach Ausgabe*,

---

[450] The Bureau de Musique refers to the engraving and printing shop which would eventually become C.F. Peters, opened by Franz Anton Hoffmeister and Ambrosius Kühnel in 1800; following the latter's death, it was sold to Carl Friedrich Peters. For further information on the founding of the Bureau de Musique, see Karen Lehmann, *Die Anfänge einer Bach-Gesamtausgabe* (Hildesheim: Georg Olms Verlag, 2004), 61–67.

[451] Peters Edition 3, i–ii.: "Da für dieses prachtvolle Werk, welches aus der Zeit der höchsten Kunstbildung seines Meisters herrührt, das Autographum nicht aufgefunden werden konnte, so waren wir auf die Vergleichung von sieben Handschriften beschränkt, in denen wir aber die wesentlichen Abweichungen gewiss alle beisammen hatten. — Die grösste Verschiedenheit zeigen die *solo* Stellen für das Pedal in der *Toccata*. Am konsequentesten und vollständigsten finden sie sich in zwei Handschriften aus meiner Sammlung, deren eine von J. P. Kellner herrührt. Abgekürzt stehen sie in einem alten Buche von J. L. Krebs, im Besitz des Herrn Hoforganisten Reichardt in Altenburg, und in einer Abschrift, die wir der Güte des Herrn Dehn in Berlin verdanken, und welche wahrscheinlich mit der vorher genannten in naher Verbindung steht. — Der Grund der Veränderung dieser Stellen ist leicht einzusehen. Die Pedal der Orgeln gehen höchstens bis zum eingestrichenen d, das Altenburger nur bis zum c, und J. S. Bach schrieb in diesen Stellen bis zum eingestrichenen f, was sich auf dem Pedale keiner einzigen alten Orgel findet. Er musste also die [ii] den Umfang des Pedals überschreitenden Töne bei der Ausführung entweder eine Octav tiefer nehmen, wodurch der melodische Zusammenhang einigermassen zerrissen wird, oder sie auf dem Manuale spielen, welches letztere ohne auffallende Störung nur dann möglich war, wenn der Klang der Töne im Manuale und Pedale ungefähr gleich gemacht werden konnte, was sich durchs Registrieren auf vielen Orgeln erreichen lässt. Um nun dies künstlicheren und auf manchen Orgeln unmöglichen Hilfsmittel zu vermeiden und die gleiche Tonfarbe zu behalten, veränderte wahrscheinlich Krebs sonst zuerst diese Stellen und machte sie für sein Pedal in Altenburg applicabel. Da wir aber die reichere und fliessendere Form derselben für die ursprüngliche halten, so haben wir diese in den Text aufgenommen und tragen hier die Veränderung von Krebs zum Vergleich und zu beliebigem Gebrauche nach. Im ersten *Solo* S. 17. lässt Krebs den vierten und fünften Tact weg, ohne sonst etwas zu ändern. Im zweiten *Solo* S. 19 behält er die ersten achtzehn Tacte bei, schiebt dann für zehn Tacte folgende drei ein  und lässt die vier letzten Tacte des Solos wieder unverändert. Alle übrigen Pedalstellen hat er dadurch applicable gemacht, dass er die Töne, welche den Umfang des Pedals überschreiten, eine Octav tiefer nimmt und, so weit der melodische Zusammenhang reicht, in dieser tieferen Octav bleibt. Diejenigen, welche die alte Ausgabe im *Bureau de Musique* von C. F. Peters besitzen, können sich davon genauer überzeugen."

argues that at the time of Bach, the organ for which this piece with such an extreme range was composed was the organ at Neu-Augustusburg in Weißenfels.[452] For many organists in at least the early days of the French Romantic Organ School, many important instruments, such as St-Clotilde (whose compass was C2–D4, as noted in Chapter 2), would have had to rely on the alternate version in the Peters edition. Griepenkerl concludes that, "In the end, many other inconveniences would be avoided if one on newly made organs increased the pedal to F4 and the manual to F6."[453]

By the time of Gigout's recording, however, Griepenkerl's wish had largely come through, as the compasses of many pedalboards had increased significantly, perhaps in part due to the popularity of BWV 540. The Welte recording organ's compass could play the entire piece without compromise.

Registration and Dynamics

This performance contains the most stop changes of all Welte's Francophone Bach recordings which comprise this study. The opening registration is shown in Table 3:

[452] *NBA* IV/5, notes, 404. The organ was built between 1667 and 1673, but is today significantly different from the time of its building due to rebuilds by Johann Friedrich Schulze in 1839, and after significant damage during the Second World War, the organ was finally partially reconstructed in 1985 by Arno Voigt.

[453] Peters Edition 3, ii.: "Übrigens würden doch manche anderen Unbequemlichkeiten vermieden werden, wenn man auf neu zu erbauenden Orgeln das Pedal bis zum eingestrichenen und die Claviere bis zum dreigestrichenen F ausdehnte."

Abb.	Manual I		Abb.	Manual II	
	Bordun	16'	Fl.	**Wienerflöte**	**8'**
Pr.	**Principal**	**8'**	B.	**Bordun**	**8'**
Fl. 8	**Traversflöte**	**8'**	V.	**Viola**	**8'**
Vs.	**Gambe**	**8'**	E.	**Aeoline**	**8'**
Or.	**Viol. d'orch.**	**8'**		Dolce	4'
	Vox coelestis	8'		Quinte	2 ⅔'
	Flöte	4'	Cl.	Clarinette	16'
	Piccolo	2'		Trompette	8'
	Sesquialter	II	H.	**Horn**	**8'**
Fg.	**Fagott**	**8'**	Ob.	Oboe	8'
	Harfe			Vox Humana	8'
	Glocken			Tremolo	
	Manual II to I				
				Pedal	
			Vb. 16	Violonbass	16'
			S. 16	**Subbass**	**16'**
			C.	**Cello**	**8'**
				Gedackt	8'
				Posaune	16'
				I to Pedal	
				II to Pedal	

Table 3: Gigout's registration in his Welte organ roll performance of J.S. Bach: *Toccata in F Major*, BWV 540, bars 1–54. The selected stops are shown in bold.

Here Gigout pulls every 8' stop, which gives the organ a fullness, despite Bach's sparse texture. For the duration of the first pedal solo, bars 55–82, Gigout adds the couplers from both manuals to pedal. He notably does not remove these couplers until bar 83, making the pedal's low G and C in bars 81–82 slightly overbalanced; however, on the Seewen organ this does not disturb the listener. For bars 83–136, Gigout returns to the same registration as the opening. At 137, at the entrance of the pedal solo in the dominant key, he adds the Violonbass 16' in the pedal and couples both manuals to the pedal. This registration, which carries on until bar 176, is shown in Table 4:

Abb.	Manual I		Abb.	Manual II	
	Bordun	16'	Fl.	**Wienerflöte**	**8'**
Pr.	**Principal**	**8'**	B.	**Bordun**	**8'**
Fl. 8	**Traversflöte**	**8'**	V.	**Viola**	**8'**
Vs.	**Gambe**	**8'**	E.	**Aeoline**	**8'**
Or.	**Viol. d'orch.**	**8'**		Dolce	4'
	Vox coelestis	8'		Quinte	2 ⅔'
	Flöte	4'	Cl.	Clarinette	16'
	Piccolo	2'		Trompette	8'
	Sesquialter	II	H.	**Horn**	**8'**
Fg.	**Fagott**	**8'**	Ob.	Oboe	8'
	Harfe			Vox Humana	8'
	Glocken			Tremolo	
	Manual II to I				
				Pedal	
			Vb. 16	**Violonbass**	**16'**
			S. 16	**Subbass**	**16'**
			C.	**Cello**	**8'**
				Gedackt	8'
				Posaune	16'
				I to Pedal	
				II to Pedal	

Table 4: Gigout's registration in his Welte organ roll performance of J.S. Bach: *Toccata in F Major*, BWV 540, bars 137–176. The selected stops are shown in bold.

At bar 178, the pedal Violonbass 16' is taken off. This change in the middle of the phrase beginning in bars 176–179 is hidden extremely well and is shown in Figure 8.

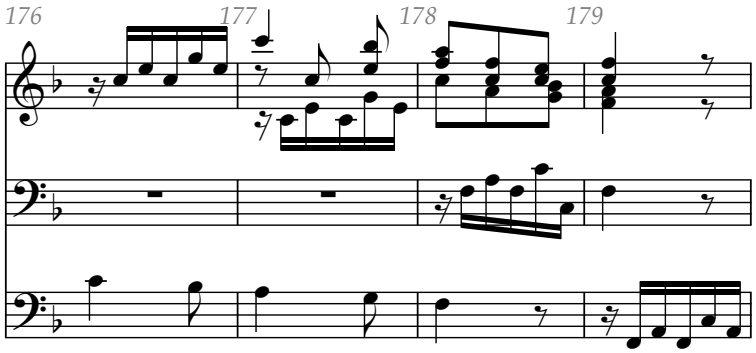


Figure 8: J.S. Bach: *Toccata in F Major*, BWV 540, bars 176–179.

By removing the strongest pedal stop after the pedal division has done its most active work, Gigout creates a mild decrescendo in the descending pedal line.

This registration continues until bar 239, when Gigout adds the Violonbass 16' back to the pedal. One possible explanation for this is that bar 239 begins a new larger section following the trio which concludes the preceding section beginning at bar 176.

Dynamics

The registration remains the same for the rest of the piece until just 11 bars before the end, which Gigout begins a large-scale crescendo. Table 5 shows the change at bar 428:

Abb.	Manual I		Abb.	Manual II	
	Bordun	16'	Fl.	**Wienerflöte**	**8'**
Pr.	**Principal**	**8'**	B.	**Bordun**	**8'**
Fl. 8	**Traversflöte**	**8'**	V.	**Viola**	**8'**
Vs.	**Gambe**	**8'**	E.	**Aeoline**	**8'**
Or.	**Viol. d'orch.**	**8'**		Dolce	4'
	Vox coelestis	8'		Quinte	2 ⅔'
	Flöte	4'	Cl.	**Clarinette**	**16'**
	Piccolo	2'		Trompette	8'
	Sesquialter	II	H.	**Horn**	**8'**
Fg.	**Fagott**	**8'**	Ob.	**Oboe**	**8'**
	Harfe			Vox Humana	8'
	Glocken			Tremolo	
	Manual II to I				
				Pedal	
			Vb. 16	**Violonbass**	**16'**
			S. 16	**Subbass**	**16'**
			C.	**Cello**	**8'**
				Gedackt	8'
				Posaune	16'
				I to Pedal	
				II to Pedal	

Table 5: Gigout's registration in his Welte organ roll performance of J.S. Bach: *Toccata in F Major*, BWV 540, bar 428. The selected stops are shown in bold.

In summary, Gigout adds the Oboe 8' and Clarinette 16' to the manual.

At bar 428, Gigout begins a large crescendo. The swell box begins closed; he begins to open it around the beginning of bar 427, and then brings on the swell reeds

one bar later. He adds these on the downbeat while holding down the tied C-natural from the previous bar (see Figure 9).

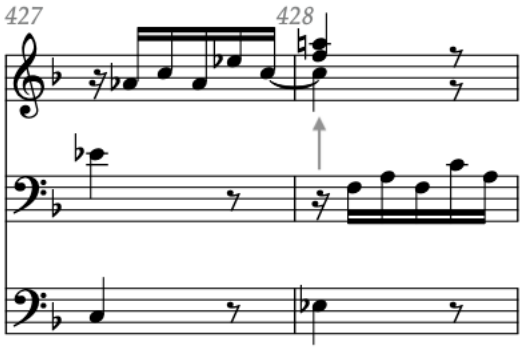


Figure 9: J.S. Bach: *Toccata in F Major*, BWV 540, bars 427–428.
The arrow marks where the swell reeds begin.

In the final semiquaver/sixteenth note of bar 428 (see Figure 10), Gigout moves to the "tutti" registration.

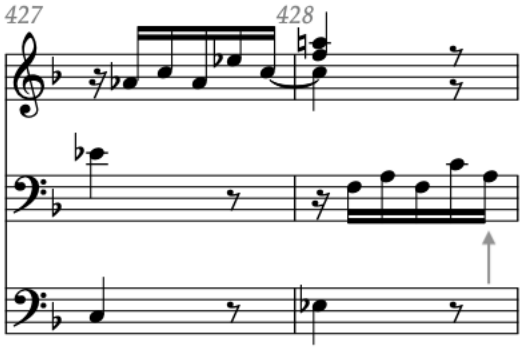


Figure 10: J.S. Bach: *Toccata in F Major*, BWV 540, bars 427–428.
The arrow marks where the tutti begins.

The Swell Box

Gigout keeps the swell box shut throughout the entire piece, except bar 426 until the end, where he introduces a crescendo from the relatively soft registration to full organ.

The Pedal

The *Toccata in F Major* is constructed in two large sections, opening first with an extremely long canon at the unison in the manuals over a pedal point. Gigout immediately begins, as in many of his Welte recordings, with the pedal beginning slightly ahead of the manuals, shown in Figure 11.

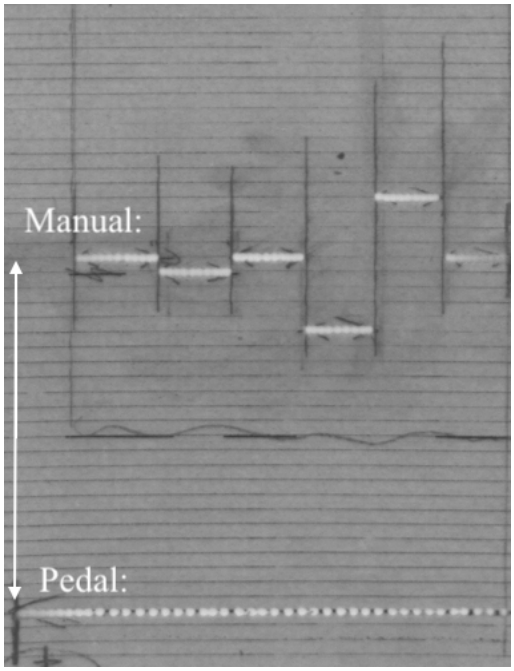


Figure 11: Section of Welte Roll 1079, master roll: Eugène
Gigout's performance of J.S. Bach: *Toccata in F Major*, BWV 540, bar 1.
Image courtesy the Museum für Musikautomaten.

The top series of white perforations are for the manual, and the lowest is the pedal. The vertical arrow shows at the bottom where the pedal begins; if the pedal and manual began together, the manual perforations would begin at the tip of the top of the arrow. However, Figure 11 clearly shows that the first sound is the pedal; though the digitisation shows it only begins 0.176 seconds before the entry of the manual, even this is audible to the listener when played back on the Seewen organ. The same thing happens in bar 82 when the canon begins anew in the dominant key, shown in Figure 12.

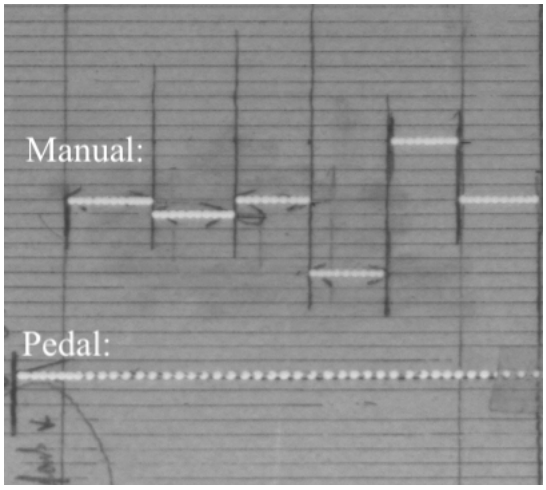
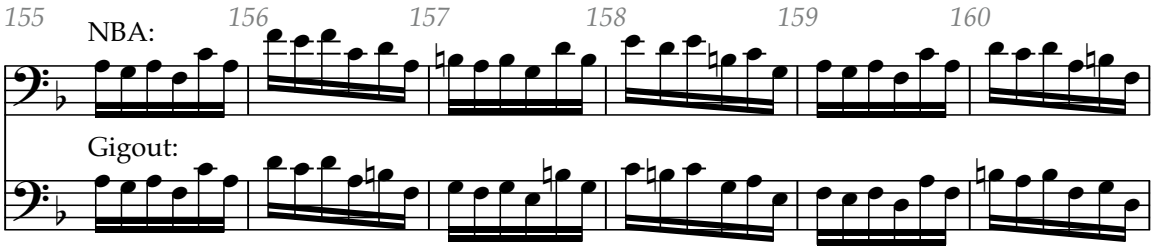


Figure 12: Section of Welte Roll 1079, master roll: Eugène
Gigout's performance of J.S. Bach: *Toccata in F Major*, BWV 540, bar 82.
Image courtesy the Museum für Musikautomaten.

Here Gigout begins 0.156 seconds before the manual, which is extremely close to his approach in bar 1, indicating that beginning the pedal ahead of the manuals was not only an intentional choice, but one precisely considered. In the long pedal solo following the canon in the dominant, beginning at bar 137, Gigout plays an alternate version of the pedal solo which does not include the high F in the autograph copy. This is a somewhat curious choice, given the organ did have a pedalboard capable of playing the entire work's large range, and Welte Philharmonic Organs with substantial independent pedal divisions were all equipped to play the high F version found in the Peters, Fauré, Widor-Schweitzer, and Bach-Gesellschaft editions.[454] A transcription of what Gigout plays is shown in Figure 13.



[454] Hänggi, "Die Seewener Welte-Philharmonie-Orgel," 205.

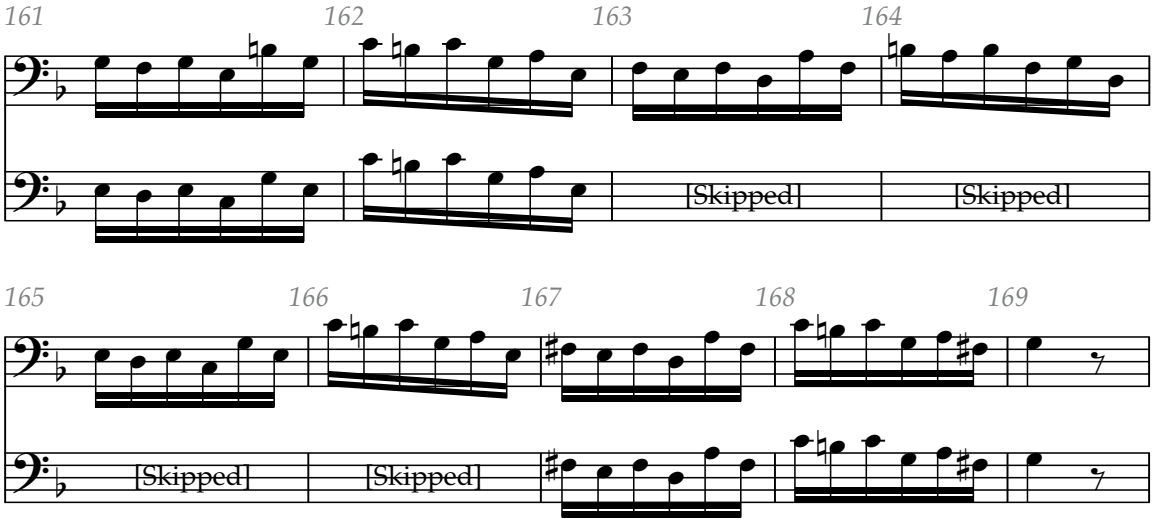


Figure 13: Comparison of J.S. Bach: *Toccata in F Major*, BWV 540, bars 155–169; the top line is from the *NBA*, and the bottom is a transcription of the pedal line from Gigout's organ roll performance.

Gigout adapts Bach's sequence from bars 156–161, plays 162 as Bach wrote it, then removes bars 163–166, returning to Bach at 167.

Articulation

The default articulation in the manuals is absolute legato, though Gigout is not as precise in these moments as in his other organ roll performances. An example of this can be seen in Figure 14.

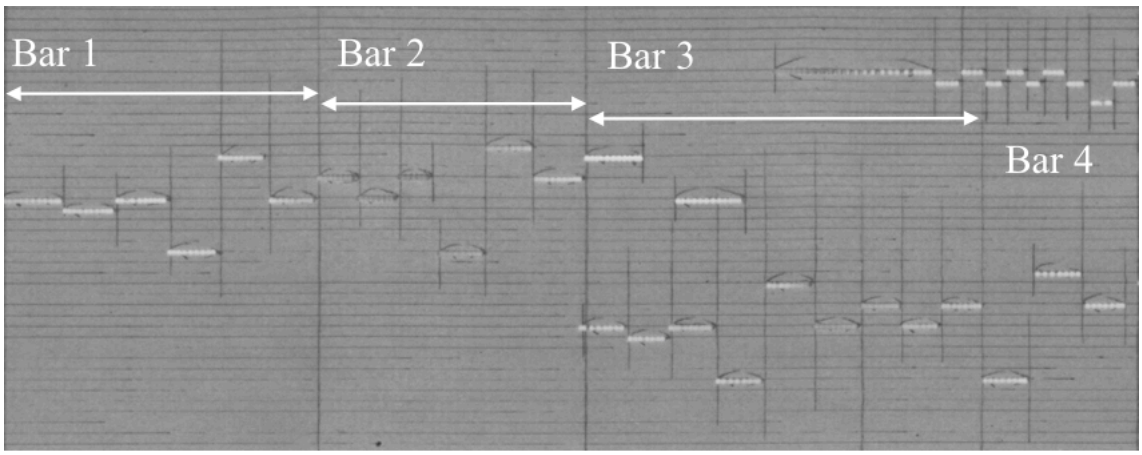


Figure 14: Section of Welte Roll 1079, master roll: Eugène
Gigout's performance of J.S. Bach: *Toccata in F Major*, BWV 540, bars 1–4.
Image courtesy the Museum für Musikautomaten.

In an organ roll where the articulation is absolute legato, there should be no gaps between each of the white dashes above, which represent pitches. The beginning of one note should immediately follow the end of the preceding note. In this case, there are small gaps between the individual notes, but they are not consistently on any one beat.

Gigout's lack of consistency continues. The manual chords beginning in bar 169 are marked in the autograph as staccatissimo (the marking is also sometimes called a 'wedge'). The score is reproduced in Figure 15.

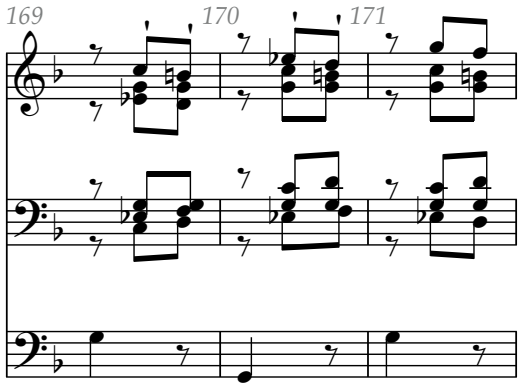


Figure 15: J.S. Bach: *Toccata in F Major*, BWV 540, bars 169–171.

Gigout plays these manual chords with considerable separation between them. In the soprano line, the values of each chord in bars 169–173 are shown in Table 6.

Bar	**Pitch**	**Pitch duration, in seconds**	**Silence duration, in seconds**	**Ratio of sound to silence, reduced**
169	1	0.267	0.186	1.44:1
169	2	0.403	N/A	N/A
170	1	0.160	0.257	1:1.61
170	2	0.228	N/A	N/A
171	1	0.188	0.249	1:1.32
171	2	0.216	N/A	N/A
172	1	0.188	0.284	1:1.51
172	2	0.220	N/A	N/A

Table 6: Summary of the durations of quavers/eighth notes in the soprano line of bars 169–172 in Gigout's performance of J.S. Bach: *Toccata in F Major*, BWV 540.

With a sound to silence ratio varying from 1.44 to 1 (the first chord) and 1 to 1.51 (the final chord), Gigout clearly desired an audible silence between these chords. Further, Bach only writes the wedge markings on bars 169 and 170, leaving 171–175 without any articulation markings; yet Gigout's approach remains the same. This same performance practice of having audible silence between large chords in this recurring musical figure — pedal crotchet/quarter note on beat one followed by two quaver/eighth note chords on beats two and three in the right hand — continues throughout the entire piece. From this, it appears Gigout assumed that this figure should always be performed in the way Bach marked the first two bars of this type.

This same articulation continues in the right-hand chords in bars 179, 183, 187, 191, 195, and their corresponding sections later in the piece.

Ornamentation

Throughout his performance of the *Toccata in F Major*, Gigout begins all ornaments from the written note. The question as to how long to trill, that is how many iterations between two pitch to play on a longer note, is inconsistent. Figure 17 shows an approximate transcription of bars 220–225 as Gigout plays the piece, along with the scan of the roll.

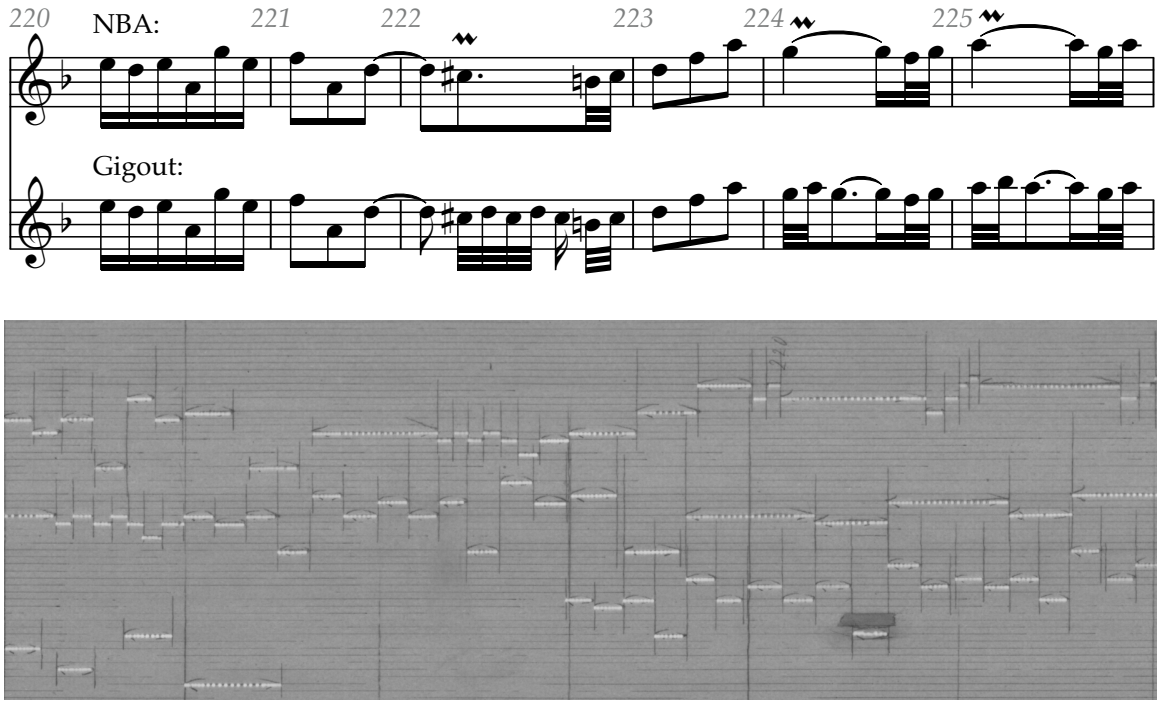


Figure 17: Above: Score of the soprano line of J.S. Bach: *Toccata in F Major*, BWV 540, bars 220–225, with an approximate transcription of Gigout's interpretation of the ornaments. Below: The master roll recording of Gigout's performance of the same.

In bars 220 and 222, Gigout trills back and forth between the C-sharp and D for the entire duration of the dotted quaver/eighth note, but in 224 and 225, he plays the trill once, then holds the main note for the rest of the notated value. One possible reason for the more restrained performance of the trills in bars 224 and 225 could be a desire for clarity; both these trills occur on top of some of the densest texture in the piece, with the pedal in semiquavers/sixteenth notes and the left hand in constant syncopation against the right hand and pedal. Leaving out most of the trill is one method to simplify the texture. However, a similar texture happens in bar 220, where Gigout trilled back and forth at length; while the pedal line is only moving at quavers/eighth notes, the texture is still complex. Another possible explanation is that these trio-textured sections in this piece, especially at moments like bar 223–238, are the most technically demanding in the work; playing the trills as Gigout does makes bars 224 and 225 considerably less

technically challenging. However, given the high quality of playing on Gigout's other organ roll recordings, a technical deficiency on his part seems unlikely.

Welte's Editing

There are two instances in this roll in which Welte editors noticeably changed Gigout's articulation to remove his application of *notes communes*. The first is in bar 238. Figure 18 shows three versions of the score: the first is from Bach's autograph, the second a transcription of what Gigout played in his recording, and the third is what the audience hears upon playback following Welte's editing.

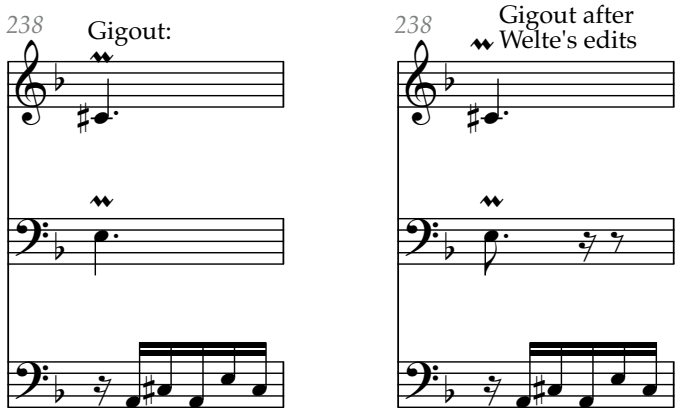


Figure 18: Three versions of J.S. Bach: *Toccata in F Major*, BWV 540, bar 238.
Left: transcription of what Gigout played in his organ roll recording.
Right: what an audience member would hear when playing back the roll as edited by Welte.

In the works of Bach for the French Romantic Organ School, there is no instance — written or in a Welte organ roll recording — where the principle of *notes communes* applies to the pedal and manual together; in other words, if there is a common note between the pedal and manual, *notes communes* does not apply. However, when coupling the manuals to the pedals, as Gigout does in this recording, any pipes which are already sounding will not be rearticulated when played on another division. Gigout

plays the piece by holding down the tenor E the entire written duration of the dotted crotchet/quarter note. Figure 19 shows this moment in the master copy of the organ roll:

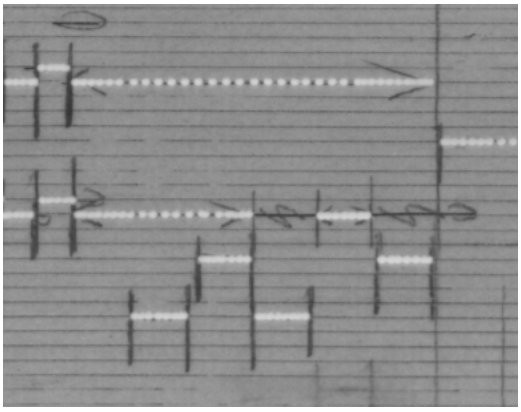


Figure 19: Section of Welte Roll 1079, master roll: Eugène
Gigout's performance of J.S. Bach: *Toccata in F Major*, BWV 540, bar 238.
Image courtesy the Museum für Musikautomaten.

As discussed in Part II, organ rolls were recorded by each key, stop, combination action (when present), and swell box being connected electrically to an inking machine; when the player presses a note, the corresponding inked disc is lowered onto the roll, leaving a line. There are three kinds of horizontal lines in Figure 19: the thinnest are ruled lines on the roll, the thicker black lines (which in this example are marked out) are what Gigout's playing left after recording — a sort of raw footage, and the white lines are the perforations added by Welte editors which makes these rolls able to be copied for commercial sale. In nearly all Welte master rolls, the thicker black lines are almost never present because they have been perforated over. In this instance, though, a Welte editor's interference can be clearly seen. The track with the thick black lines that are not perforated (the 14th from the bottom) were played by Gigout, but not perforated into the master roll, and therefore cannot be heard in playback. This shows that Widor's principles of articulation — re-articulating a common note between two voices — did not apply when the common note was between the pedal and manual, and more

importantly, shows that Welte's taste for *notes communes* differed from the French Romantic Organ School's.

A similar instance of Welte editor interference occurs in bar 280; instead of tying the tenor B at bar 280, Welte declined to perforate the paper, leading to a lack of any suspension at bar 280. This is shown in Figure 20.

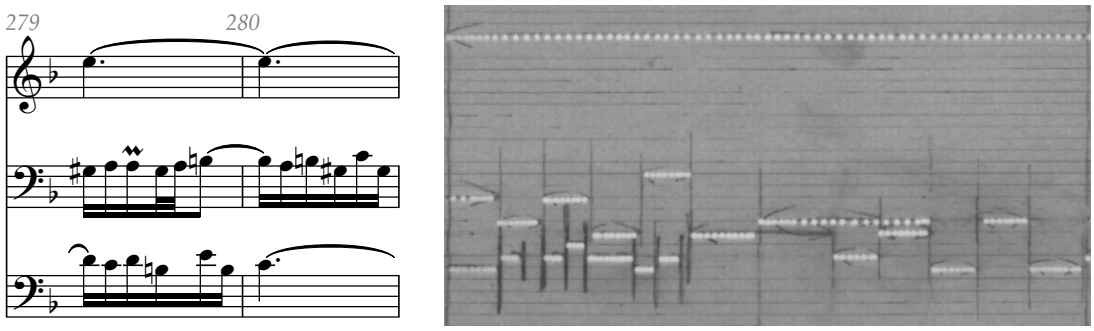


Figure 20: Left: J.S. Bach: *Toccata in F Major*, BWV 540, bars 279–280.
Right: The master roll recording of Gigout's performance of the same.

Here, like Figure 19, the dark black line represents what Gigout played but what was not perforated by Welte editors. Curiously, the same rhythmic texture in bar 227 was perforated correctly, indicating that the lack of perforation at the corresponding moment in bar 280 was probably a mistake.

The final chords of the piece follow the typical practice of the French Romantic School. Figure 21 shows that the pedal is played absolute legato while the manuals are detached.

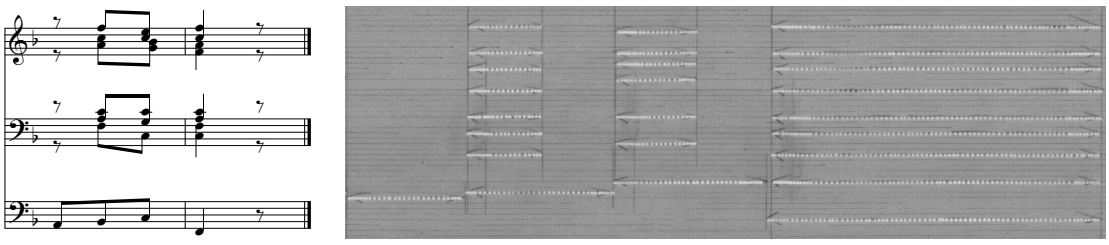


Figure 21: Left: J.S. Bach: *Toccata in F Major*, BWV 540, final two bars.
Right: The master roll recording of Gigout's performance of the same.

Here the chords are played nearly half value, but this is also in the midst of an extended decrescendo.

Tempo

The Museum für Musikautomaten's digitisation of the organ roll was reliably scanned until bar 348, at which point the rest of the file begins to skip to different sections. Analysis of the tempo from the beginning of the roll until this point shows that the average tempo is dotted crotchet/quarter note equals 50 beats per minute. This converted to quaver/eighth note is 150 BPM, is nearly twice the tempo suggested in Peters edition preface, quaver/eighth note equals 76 BPM.[455]

Within these first 348 (of 448 bars), the larger beats stay largely consistent; the greatest ritardandi in the opening canons (bars 1–168) both come at points in the piece which are structurally significant: the first is at end of the tonic canon and pedal solo, bar 82. The tempo at bars 80–82 slows from 50 BPM to 27, a substantial and, aurally, extremely obvious ritardando. Gigout's decision here is completely in line with the French Romantic Organ School's general approach to marking architecturally significant moments in a piece with a ritardando.

The second ritardando comes at the end of the dominant canon and pedal solo that leads into the long series of episodes, bar 168. Here the tempo slows only to 46 BPM, a significantly lesser ritardando than at bar 82, yet still clearly audible. Gigout's performance decision here also is relevant to the structure of the piece; while at bar 82 the material comes to a complete halt, here the end of the pedal solo leads directly into a long series of episodes which largely go around the circle of fifths.

[455] Peters Edition 3, iv.

Within these opening canons, the most significant tempo fluctuations are not at the bar, but at the semiquaver/sixteenth notes. Using the same technique to determine the average tempo, but with placing markers at the semiquaver/sixteenth note level from bars 1–54 demonstrates the degree to which Gigout deviates from a completely metronomic tempo. This can be most clearly seen in Figure 21, a line chart comparison in which the horizontal axis shows each semiquaver/sixteenth note in succession, and the vertical axis shows the duration of each semiquaver/sixteenth note, and only for the portions that were accurately scanned. The light grey line shows the tempo when the canon is played with no deviation in the tempo; the darker line shows the degree to which Gigout increases or decreases his performance of the semiquavers/sixteenth notes.

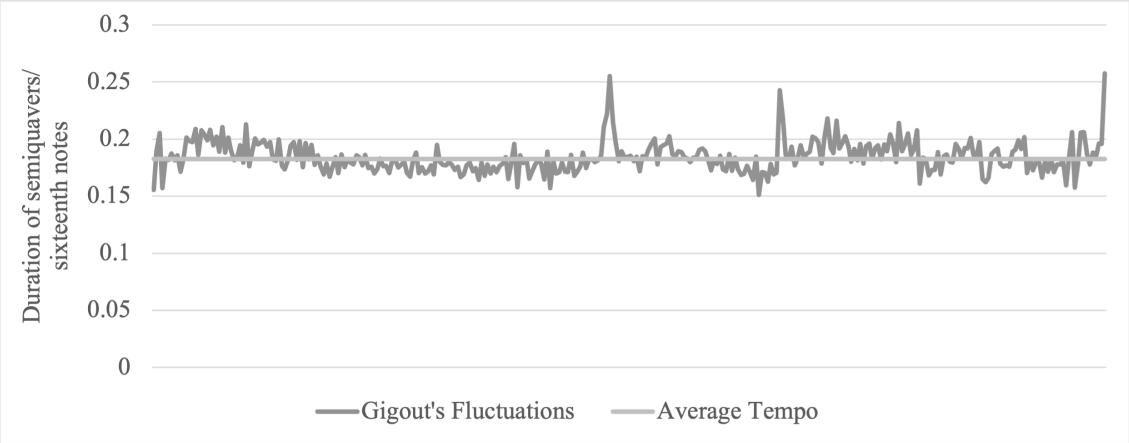


Figure 21: Tempo chart of Gigout's performance of J.S. Bach:
Toccata in F Major, BWV 540, at the semiquaver/sixteenth note level.

The dark line, "Gigout's Fluctuations", in Figure 21 demonstrates that the performer's tempo deviated significantly from the average tempo, to the point that it comes across very obviously to the listener.

The same analysis of bars 1–54 only, but using the larger dotted crotchet/quarter note beats, results in Figure 22, a similar line graph to Figure 21: the horizontal axis

shows each dotted crotchet/quarter note in succession, and the vertical axis shows the duration of each dotted crotchet/quarter note. The light grey line shows the tempo when the canon is played with no deviation in the tempo; the darker line shows the degree to which Gigout increases or decreases his performance of the dotted crotchet/quarter notes.

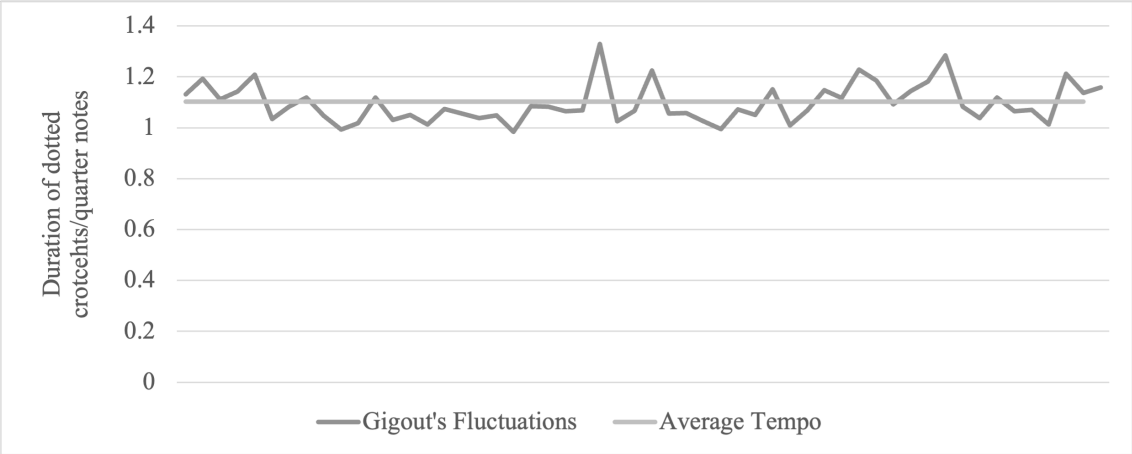


Figure 22: Tempo chart of Gigout's performance of J.S. Bach:
Toccata in F Major, BWV 540, bars 1–54, at the dotted crotchet/quarter note level.

Figure 22 shows that at the larger dotted crotchet/quarter note, Gigout's tempo was far more consistent than at the semiquaver/sixteenth note value.

In the contrapuntally dense trio sections between bars 169 and 348 (the last bar that was digitised correctly) — bars 216–238 and 270–290 — the tempo slows, which may result from a desire for clarity.[456] Analysis of the average tempo shows 45 BPM for bars 216–238 and 49 BPM for bars 270–290. However, the smaller semiquaver/sixteenth note values in the latter trio particularly deviate from a completely metronomic performance, as shown in Table 23, which is set up the same way as Table 22.

[456] Widor often discusses clarity in his teaching. See Near, *Widor on Organ Performance*, 53–58.

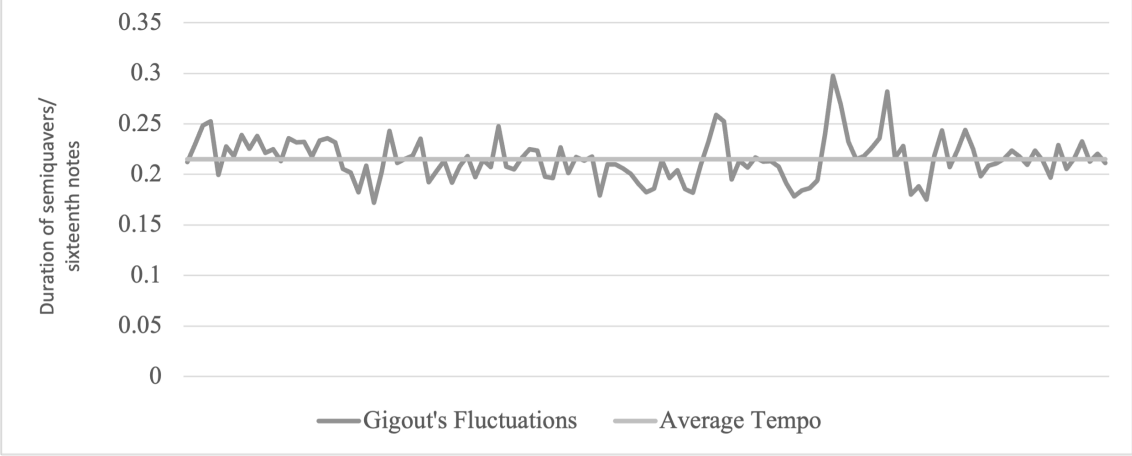


Figure 23: Tempo chart of Gigout's performance of J.S. Bach:
Toccata in F Major, BWV 540, bars 1–54, at the semiquaver/sixteenth note level.

These three charts, Figures 21, 22, and 23, demonstrate that one method of expression for Gigout was tempo deviation — not at the larger level, which stays largely consistent, but at the smaller note values between the beginnings of each bar.

Conclusion

The performance of this toccata can be summarised in a few points:

1. Gigout continues his general practice of playing the pedal slightly ahead of the manuals.

2. The pedal registration in the canons is characterised by a very soft pedal so that the listener can concentrate on the canon, not the pedal tones.

3. Gigout's articulation of series of chords is generally detached, and in those instances, he does not follow the rules of *notes communes*.

4. The crescendo at the end of the movement follows the general principles of Widor, except Gigout opens the swell box before adding the reeds.

5. Gigout's primary means of rhythmic expression comes from modifying the smaller semiquavers/sixteenth notes, while keeping the larger dotted crotchets/quarter notes largely metronomic.

Chapter 10: Roll 1080 — Gigout Plays *Prelude in E-flat Major*, BWV 552

Introduction

J.S. Bach's *Prelude in E-flat Major* is the opening of the third part of the *Clavier-Übung*, which was first published in 1739.[457] The collection contains chorales which would have been sung as part of the Lutheran mass ordinary, as well as several Catechism hymns; the set is sandwiched by BWV 552: at the end with the fugue, and the beginning the prelude. The audience for the collection was for the musically educated, as evidenced by the title page:

> "Third Part of the Keyboard Practice, consisting of various preludes on the Catechism and other hymns for the organ. Prepared for music-lovers and particularly for connoisseurs of such work, for the recreation of the spirit, by Johann Sebastian Bach, Royal Polish and Electoral Saxon Court Composer, Capellmeister and Director of the *chorus musicus*, Leipzig. Published by the Author." [458]

While Bach's first edition shows the piece written in two staves, all the editions in use at the time of Gigout's recording, plus those published shortly thereafter by members of the French Romantic School, show the work in three staves.[459] The exception is the Fauré edition, which does not include BWV 552 at all, despite dedicating an entire volume to the chorales in the *Clavier-Übung III*.[460] Bach's layout of the work in the published version suggests that, while the *Prelude* and *Fugue* were conceived together as part of the set, the inclusion of so many more pieces between them indicates that these two movements were not intended to be performed back-to-back. Rather, they are

---

[457] Johann Sebastian Bach, *Dritter Theil der Clavier Übung* (Leipzig: Johann Sebastian Bach, 1739).
[458] Title page of D-B Mus.ms. Bach P 283, translated in Williams, *The Organ Music of J.S. Bach*, 387: "Dritter Theil der Clavier Übung bestehend in verschiedenen Vorspielen über die Catechismus- und andere Gesaenge, vor die Orgel: Denen Liebhabern, und besonders denen Kennern von dergleichen Arbeit, zur Gemüths Ergezung verfertiget von Johann Sebastian Bach, Koenigl. Pohlnischen, und Churfürstl. Saechss. Hoff-Compositeur, Capellmeister, und Directore Chori Musici in Leipzig. In Verlegung des Authoris."
[459] *BGS* 3, 173–183. Peters Edition 3, 2–15. Widor-Schweitzer Edition 3.
[460] Fauré Edition 2, no. 3.

both some of the most extensive of Bach's compositions in the prelude and fugue form, and were intended as a particularly grand opening and triumphant ending to a magnum opus, or at least a monumental collection of major compositions. The Peters edition was the first in the Francophone world to include the *Prelude* and *Fugue* together in this way, and all editions thereafter followed suit; Griepenkerl justifies this decision in the preface:

> "Not arbitrarily, but following an old tradition that Forkel communicated to me forty years ago, we have put the two of them [the *Prelude in E-flat Major* and *Fugue in E-flat Major*] together here also according to space, since they are closely enough related in spirit and form to be recognised by any connoisseur, even without that tradition, to be immediately recognised for a whole."[461]

Based on this, it seems Griepenkerl and Forkel determined that both these works should be performed back-to-back without any evidence from Johann Sebastian himself or those in his circle. After a brief discussion of the publication of the *Clavier-Übung* as a whole, Griepenkerl continues, with performance practice suggestions:

> "Bach himself wrote '*Organo pleno*' on the prelude (as on the fugue), and one learns the meaning of this expression from another angle, as it was discussed in the preface to the first volume.[462] One should use the organ with its three keyboards and the pedal as presented; but not all voices that sound at the same time. [It is the writer's] opinion, if this had been meant, [this] would be nullified by the specifying of *forte* and *piano* on pages 3 and 6. The intermediate interplay between the prelude and the three parts of the fugue suggest this still more closely, because they differ sufficiently in form and spirit to justify the use of alternate pianos and different registers. How often J.S. Bach himself made use of this alternation also on suitable occasions for the presentation of his organ compositions, can be found in Prelude No. 3 of this volume [*Toccata and Fugue in D Minor 'Dorian'*, BWV 538], where, following old manuscripts, phrase by phrase [the alternation of manuals] are shown.[463] Now, although we do not want

[461] Peters Edition 3, i: "Nicht willkührlich, sondern einer alten Überlieferung folgend, die mir Forkel schon vor vierzig Jahren mittheilte, haben wir beiden hier auch dem Raume nach zusammen gestellt, da sie in Geist und Form nahe genug verwandt sind, um von jedem Kenner, auch ohne jene Überlieferung, sogleich für ein Ganzes anerkannt zu werden."
[462] For commentary on the discussion of "Organo pleno" according to Griepenkerl's preface in the first volume, see Chapter 1.
[463] In the Peters Edition 3, 31, Griepenkerl indicates manual changes between Positiv and Oberwerk, and also marks which hand to use with the abbreviations "sin." and "dest." (Italian: sinistra, destra — "right, left").

> to pre-empt the organ virtuosos in determining the choice of registers and of manuals for the presentation of this magnificent work, an unimportant proposal should not be unwelcome to friends of the organ who are less familiar with the organ compositions of Bach. To proceed in the simplest way, one can use the narrow scale 8' and 4' voices on the *Oberwerk*; on the Rückpositiv more and stronger 8' and 4' voices; and on the Hauptwerk all the strong 16', 8', and 4' large scale registers, but without the reeds and mixtures. In addition, the pedal can handle all 32', 16' and 8' voices, including the 16' Posaune, indeed also the 32', if it is good, but no 8' trumpet and no mixtures."[464]

Griepenkerl here is advocating for a performance on a three-manual organ, and two of which with only 8' and 4' stops selected. As a wider scale stop is typically louder than a narrower scale, Griepenkerl's suggestion of manuals with these registrations, in order from loudest to softest, would be Oberwerk, Rückpositiv, then Hauptwerk. According to this registration, his interpretation would therefore presumably result in a performance in which the sections marked *piano* would be played on either the Oberwerk or Rückpositiv, according to the player's taste; due to his suggestion for very loud pedal reeds (the Posaune and 32' reed), those sections marked *forte* would only reasonably balance against the Hauptwerk. Griepenkerl then goes on to suggest specific instances of which sections to assign to which manual:

---

[464] Peters Edition 3, i: "Bach selbst hat über das Präludium (wie über die Fuge) „*Organo pleno*" geschrieben, und man lernt die Bedeutung dieses Ausdrucks hier noch von einer anderen Seite kennen, als sie in der Vorrede zum ersten Bande besprochen wurde. Man soll hier nämlich das Orgelwerk mit seinen drei Clavieren und dem Pedal zur Darstellung gebrauchen; nicht aber gleichzeitig alle klingenden Stimmen, welche Meinung, wenn sie sich gebildet hätte, schon durch die Angabe von *forte* und *piano* Seite 3 und 6 aufgehoben würde. Noch näher deuten die Zwischensätze des Präludiums und die drei Theile der Fuge darauf hin, weil sie in Form und Geist weit genug von einander abweichen, um den Gebrauch abwechselnder Claviere und verschiedener Register zu rechtfertigen. Wie häufig J.S. Bach selbst auch dieser Abwechslung bei passenden Gelegenheiten zur Darstellung seiner Orgelcompositionen bediente, wird man aus dem Präludium Nr. 3 dieses Bandes abnehmen können, wo sie, alten Handschriften folgend, Satz für Satz beigedruckt sind. Nun wollen wir zwar den Orgelvirtosen in Bestimmung der Wahl der Register und der Claviere zur Darstellung dieses prachtvollen Werkes nicht vorgreifen, doch möchte ein unmassgeblicher Vorschlag den Orgelfreunden, die mit den Orgelcompositionen von J.S. Bach weniger bekannt sind, nicht unwillkommen sein. Man könnte das *Oberwerk*, um auf die einfachste Weise zu verfahren, mit 8 und 4 füssigen Stimmen von enger Mensur versehen, das Rückpositiv mit mehreren und kräftigeren 8 und 4 füssigen Stimmen und das Hauptwerk mit allen 16, 8, und 4 füssigen starken Stimmen von grosser Mensur, doch ohne die Schnarrwerke und Mixturen. Dazu verträgt das Pedal alle 32, 16 und 8 füssigen Stimmen, auch die 16 fussige Posaune, ja die 32 füssige, wenn sie gut ist, doch keine 8 füssige Trompete und keine Mixturen."

> "The longer movements of the prelude in punctuated notes[465] are then played on the main work, the *piano* pages 3 and 6 on the Oberwerk, and the *forte* on the Rückpositive.[466] The intermediate phrases, mostly in sixteenth [notes/semiquavers] and without a pedal, are taken on the Rückpositive; only on page 7 from the last bar of the first system, where the pedal is added, does one play the main keyboard [Hauptwerk] until the end... We hope, moreover, that no one will accept these suggestions without comparing them with the special peculiarity of their organ, which admittedly may make them unsuitable. On the organ which I had in mind, this excellent work would be heard in all the splendour and magnificence by using the above information, as the master probably thought."[467]

Griepenkerl clearly has a three-manual instrument in mind; however, the Welte recording organ only had two manuals. The preface directly before the musical text of the *Prelude and Fugue in E-flat* in Louis Vierne's edition similarly gives registration suggestions for a three-manual organ. However, the third keyboard only adds sound, and the performer only plays on two keyboards; he begins, "One should begin this piece on the three keyboards [coupled] together and with a full sound."[468] This "full sound" is clarified further in the preface "Manuals: foundations 8', 4' and mixtures; Pedal: foundations 16, 8. Keyboards and pedals coupled..."[469] Vierne's registration looks similar to Griepenkerl's, but adding the mixtures fundamentally changes the sound

---

[465] Griepenkerl presumably is referring to the main body of the work (i.e., everything but the echoes).
[466] Griepenkerl is referring to bars 34–36, 38–40, etc.
[467] Peters Edition 3, i: "Die längeren Sätze des Präludiums in punctirten Noten spielt man alsdann auf dem Hauptwerke, das *piano* S. 3 und 6 auf dem Oberweke und das *forte* auf dem Rückpositive. Die Zwischensätze, grossentheils in Sechzehnteln und ohne Pedal, nimmt man auf dem Rückpositive; nur Seite 7 vom letzten Tacte des ersten Systems an, wo das Pedal hinzu tritt, spielt man bis zum Schlusse auf dem Hauptclaviere... — Wir hoffen übrigens, dass niemand diese Vorschläge annehmen werde, ohne sie mit der besonderen Eigenthümlichkeit seiner Orgel zu vergleichen, durch welche sie allerdings unpassend werden können. Auf der Orgel, welche ich dabei im Sinne hatte, würde dies treffliche Werk durch die Benutzung der obigen Angaben in all der Pracht und Herrlichkeit zu Gehör kommen, wie es der Meister wahrscheinlich dachte."
[468] Vierne Edition 2, 1: "Il faut commencer cette pièce sur les trois claviers réunis et à plein son."
[469] Vierne Edition 2, 2: "Claviers manuels : fonds 8, 4 et mixtures; Pédale : fonds 16, 8. Claviers accouplés; tirasses..."

quality to become more brilliant and loud.[470] For the *piano* sections, Vierne says the following:

> "The *piano* and *forte* indications beginning at bar 34 are for the harpsichord version; on the organ, *piano* will be played on the Positif and *forte* on the Grand-Orgue. It will be useful to remove the Grand-Orgue to Pedalé coupler each time the pedal punctuates the phrase played by the hands on the Positif with its detached crotchet/quarter note."[471]

In this way, Vierne eschews Griepenkerl's suggestion of playing the *piano* sections on two manuals, in effect reducing the range of dynamics and colours of the performance. However, Vierne then goes on to offer an additional registration possibility, specifically for adding more dynamics to the performance:

> "N.B. Many organists register this prelude by saving a crescendo for the second entry of the second subject; here is, for curiosity's sake, the way in which they proceed, and which is not without producing, on a large instrument, a beautiful decorative effect:
>
> Manuals: G[rand Orgue]. Foundations, mixtures, and reeds 8', 4'.
> P[ositif]. Foundations 8', 4', and plein jeu.
> R[écit]. Foundations, reeds 8' and 4' and mixtures.
> Pedal. Foundations 16', 8'; reeds prepared.
> G[rand orgue]. and R[écit]. coupled; G[rand orgue]. and R[écit]. to pedal."[472]

Gigout's Registration

[470] On Francophone nineteenth and early twentieth century organs, pulling a single stop such as Montre 8' would result in one pipe playing per note; the mixture, such as Fourniture or Cymbale would result in multiple pipes playing per note at different high pitches, typically related to the overtone series.
[471] Vierne Edition 2, 2: "Les indications *piano* et *forte* commençant à la mesure 34 sont celles de la version de clavecin; à l'orgue, *piano* se jouera au Positif et *forte* au Grand-Orgue. Il sera utile de supprimer la tirasse Grand-Orgue chaque fois que la Pédale ponctuera de sa noire détachée la phrase jouée par les mains au Positif."
[472] Vierne Edition 2, 2: "N.B. Beaucoup d'organistes registrent ce prélude en ménageant un crescendo pour la seconde entré du second sujet ; voici, par curiosité, la manière dont ils procèdent et qui n'est pas sans produire, sur us grand instrument, un bel effet décoratif :
"Claviers manuels : G. fonds mixtures et anches 8, 4. P. fonds 8, 4 et plein jeu. R. fonds anches 8, 4 et mixtures. Péd. fonds 16, 8; anches préparées. G. et R. accouplés; Tirasses G. et R."

Gigout's choice to record BWVs 540 and 552 shows his willingness to engage in the most virtuosic and longest of Bach's free works. While his performance of the *Toccata* had very few registration changes, the *Prelude in E-flat* changes several times.

During the digitisation process at Seewen, this roll was scanned without difficulty. Gigout basically follows the principles described by Vierne and Griepenkerl — the main manual as the primary, with the sections marked *forte* and *piano* for the other two manuals — but makes use of the tutti to essentially simulate a third manual. The Seewen roll is a commercial copy, rather than a master roll; without a Welte editor's handwritten notes on the registration, an analysis must rely on what the Britannic Organ plays. Table 1 shows the stops that appear on the Britannic Organ in this roll:

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	**Violonbass**	**16'**
Principal	**8'**	**Bordun**	**8'**	**Subbass**	**16'**
Traversflöte	**8'**	**Viola**	**8'**	Gedackt	16'
Gedeckt	8'	**Aeoline**	**8'**	**Cello**	**8'**
Gambe	**8'**	**Blockflöte**	**4'**	Gedackt	8'
Viol. d'orch.	**8'**	Quinte	2 ⅔'	**Posaune**	**16'**
Vox coelestis	**8'**	Terz	1 ⅗'	**Trompete**	**8'**
Rohrflöte	**4'**	Sesquialter	II	**Clairon**	**4'**
Octave	4'	**Quintzimbel**	**1'**	**Sing. Cornett**	**2'**
Nachthorn	**2'**	Clarinette	16'		
Fagott	**8'**	**Trompette**	**8'**		
Mixtur	**III**	**Horn**	**8'**		
Trompete	8'	Oboe	8'		
Harfe		Vox Humana	8'		
Glocken		Tremolo			

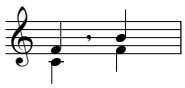
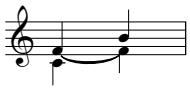
Table 1: Gigout's registration in his performance of J.S. Bach: *Prelude in E-flat*, BWV 552; the stops selected are in bold.

In every instance of the ritornello, he plays on Manual I using the tutti. For every contrapuntal episode, he removes the tutti, which causes the organ to remove all the

stops except those Gigout had selected in Table 1; he then plays the *forte* sections on Manual I with the box open and the *piano* sections on Manual II with the box closed (the only exception is bar 32, where Gigout closes the box until bar 35, beat 4). This allows him to simulate the effect of a grand three-manual organ while only having two manuals at his disposal.

Gigout's Use of *Notes communes*

Gigout's performance of the work in general could be largely characterised by a great deal of variety. In a piece with so many related sections, Gigout's approach is generally uniform. The default articulation in the tutti sections is absolute legato, and he follows Widor's rules of *notes communes* from the first bar. According to Widor,

> "Where some other part takes the [held] note... we have, not a repetition, but a taking-over. The note is then not lifted, for that would give the listener a wrong impression of the part-leading, as if a repetition had taken place in the same part. The note must be bound by keeping the key down.
>
> Do not play this way:  but thus: 
>
> It will not sound to the listener as if a key were held down, but as if one part had taken over the tone from the other."[473]

In the case of BWV 552/I, the opening bar is notated as shown in Figure 1:

[473] Widor-Schweitzer Edition 1, English, viii.

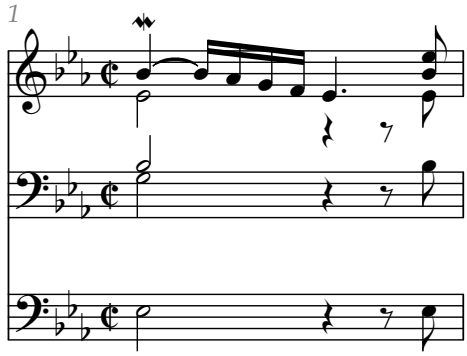


Figure 1: J.S. Bach: *Prelude in E-flat Major*, BWV 552, bar 1.

Gigout, following the principles of *notes communes*, performs the piece as shown in Figure 2:

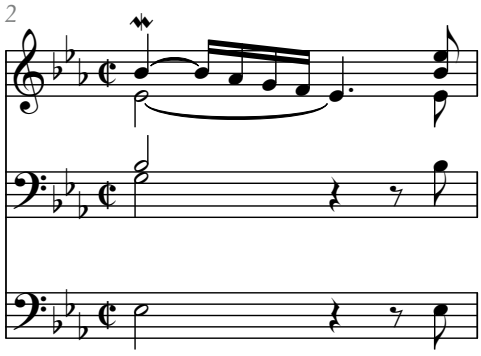


Figure 2: J.S. Bach: *Prelude in E-flat Major*, BWV 552, bar 1,
if performed strictly according to the principles of *notes communes*.

Here, the alto E-flat from the first beat is tied to the soprano E-flat. The representation of this in the organ roll performance is shown in Figure 3:

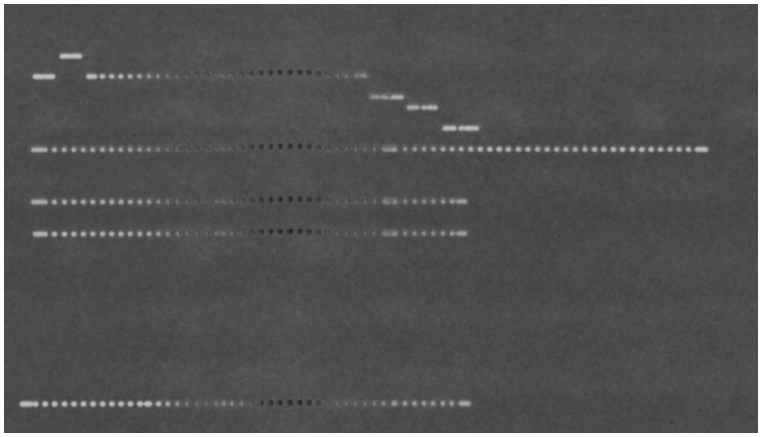


Figure 3: Section of Welte Roll 1080: Eugène Gigout's performance of the opening of J.S. Bach: *Prelude in E-flat Major*, BWV 552, bar 1. Image courtesy the Museum für Musikautomaten.

Here the longest line is the E-flat, which is shown here as being held, without lifting the key, for the entire bar. Gigout generally follows this principle throughout the piece

A moment of interest in articulation comes at the final chord of bar 110 leading into 111; here Bach writes two five-voice chords which consist of the same pitches except for the pedal and soprano voices, shown in Figure 4.

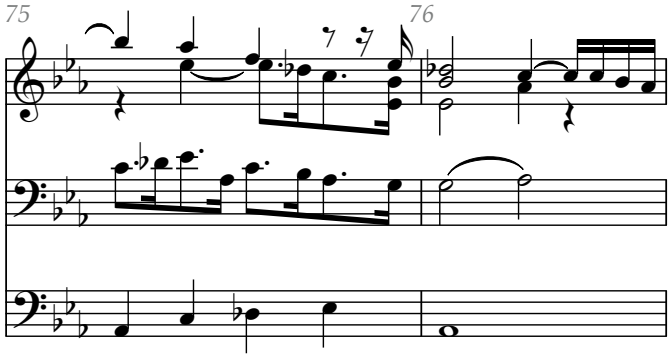


Figure 4: J.S. Bach: *Prelude in E-flat Major*, BWV 552, bars 110–111.

Following the theoretical rules of articulation, two outer voices should remain absolute legato while the three inner voices should be performed demi-staccato. Gigout's performance is reproduced in Figure 5.

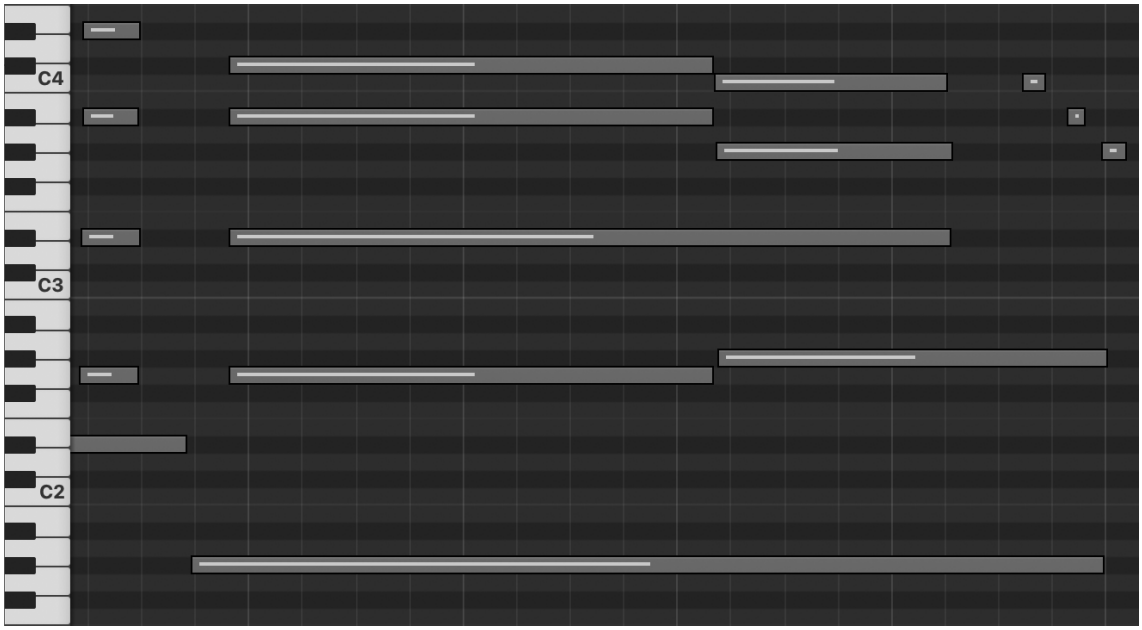


Figure 5: Screenshot of the Sonic Visualiser program's representation of an audio recording of the Seewen organ playing Gigout's performance of J.S. Bach: *Prelude in E-flat Major*, BWV 552, final chord of bar 110 and first chord of 111.

As seen in Figure 5, Gigout plays the pedal (the lowest two bars in the figure) without silence between them as absolute legato; however, the soprano line (the highest two bars in the figure) is articulated the same way as the other voices. This indicates that Gigout conceived the upper four voices, in their homophonic texture, as one texture which went against the pedal texture.

Articulation in the Episodes

In this Prelude, Bach generally employs two main ideas in the second contrapruntal episode, bars 71–98 and 130–175: the primary theme beginning with syncopations followed by descending semiquavers/sixteenth notes. In the soprano line in bar 73, the two repeated notes follow Widor's general principle of "demi-staccato" articulation — the first notated pitch lasts 0.768 seconds, with 0.524 seconds of sound followed by 0.244 seconds of silence, at a ratio of approximately 2:1, meeting the theoretical ideal.

The following notes, however, according to the aesthetics of the French Romantic Organ School, should be played absolute legato. In Gigout's performance, he plays this theme considerably shorter in nearly every entrance throughout the work. The gaps between pitches can be seen most clearly in the digitisation of the roll, reproduced in Figure 6.

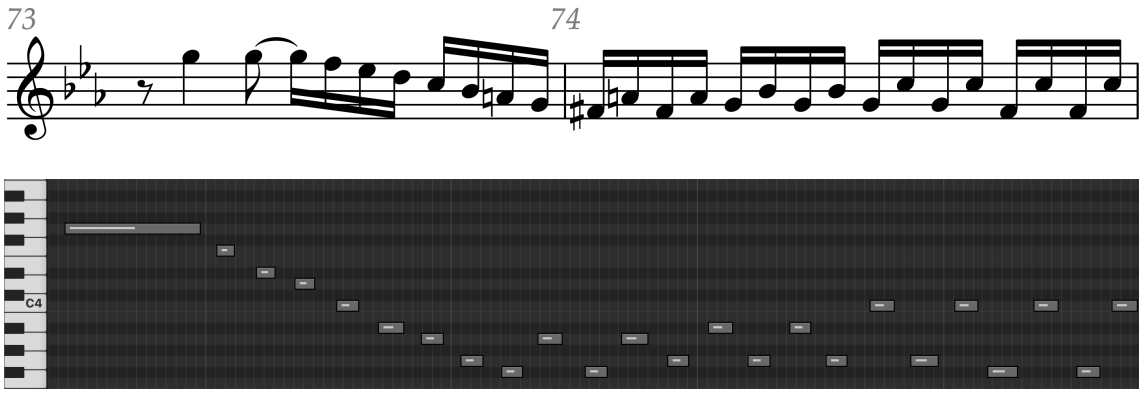


Figure 6: Above: Score of the soprano line of J.S. Bach: *Prelude in E-flat Major*, BWV 552, bars 73–74. Below: The Seewen digitisation of the organ roll recording of Gigout's performance of the same work.

If this piece were performed absolute legato, there would be no gap between the notes. The average values of each of these semiquavers/sixteenth notes in bar 73 are shown in Table 2.

Pitch	**Pitch duration, in seconds**	**Silence duration, in seconds**	**Ratio of sound to silence, reduced**
F	0.076	0.085	0.89:1
E-flat	0.084	0.076	1.11:1
D	0.084	0.084	1:1
C	0.091	0.077	1.18:1
B-flat	0.108	0.068	1.59:1
A	0.092	0.069	1.33:1
G	0.096	0.072	1:33:1

Table 2: Summary of the durations of semiquavers/sixteenth notes in the soprano line of J.S. Bach: *Prelude in E-flat Major*, BWV 552, bar 73, as performed by Gigout.

In this Table, the average length of sound to silence is 1.2 to 1, which indicates that for this articulation at such a quick speed, Gigout was going for a nearly equal value of

sound to silence, with a slight preference to making the duration of the pitches slightly longer than silence.

Beginnings of Chords and Ornamentation

Throughout this performance, Gigout generally plays the bass line — be it in the pedal or left hand — slightly ahead of the right. In listening to this recording carefully when played back on the Seewen organ with its tutti registration, the listener can only observe this in a few places. Looking at the organ roll, however, reveals that playing the upper voices slightly behind the lower was the norm. Even the first chord is performed this way, seen most clearly in the digitisation, reproduced in Figure 7.

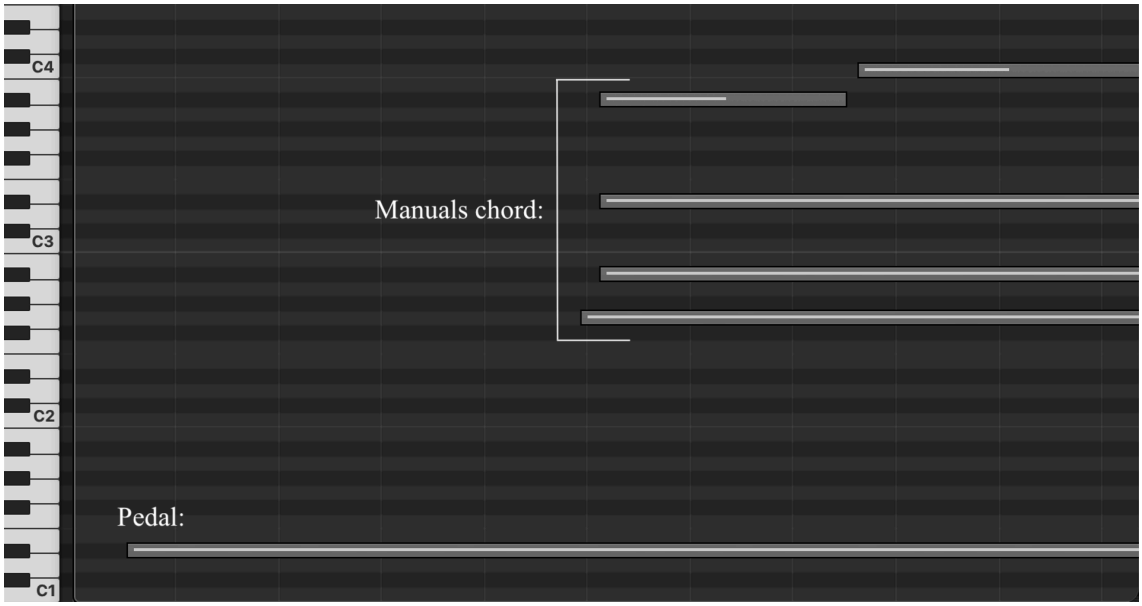


Figure 7: The Seewen digitisation (with annotations) of the organ roll recording of Gigout's performance of J.S. Bach: *Prelude in E-flat Major*, BWV 552, first chord.

Here the low E-flat in the pedal begins only 0.176 seconds earlier than the tenor G. This performance practice is consistent throughout the rest of the piece, regardless of the texture. Throughout the entire piece, Gigout also performs ornaments from the written note, which goes against J.S. Bach's ornament table in the *Clavier-Büchlein vor*

Wilhelm Friedemann Bach.[474] Gigout also performs many of these ornaments slightly before the written beat. This can most clearly be seen in the *forte — piano* sections, such as bars 35–36, the digitisation is reproduced in Figure 8.

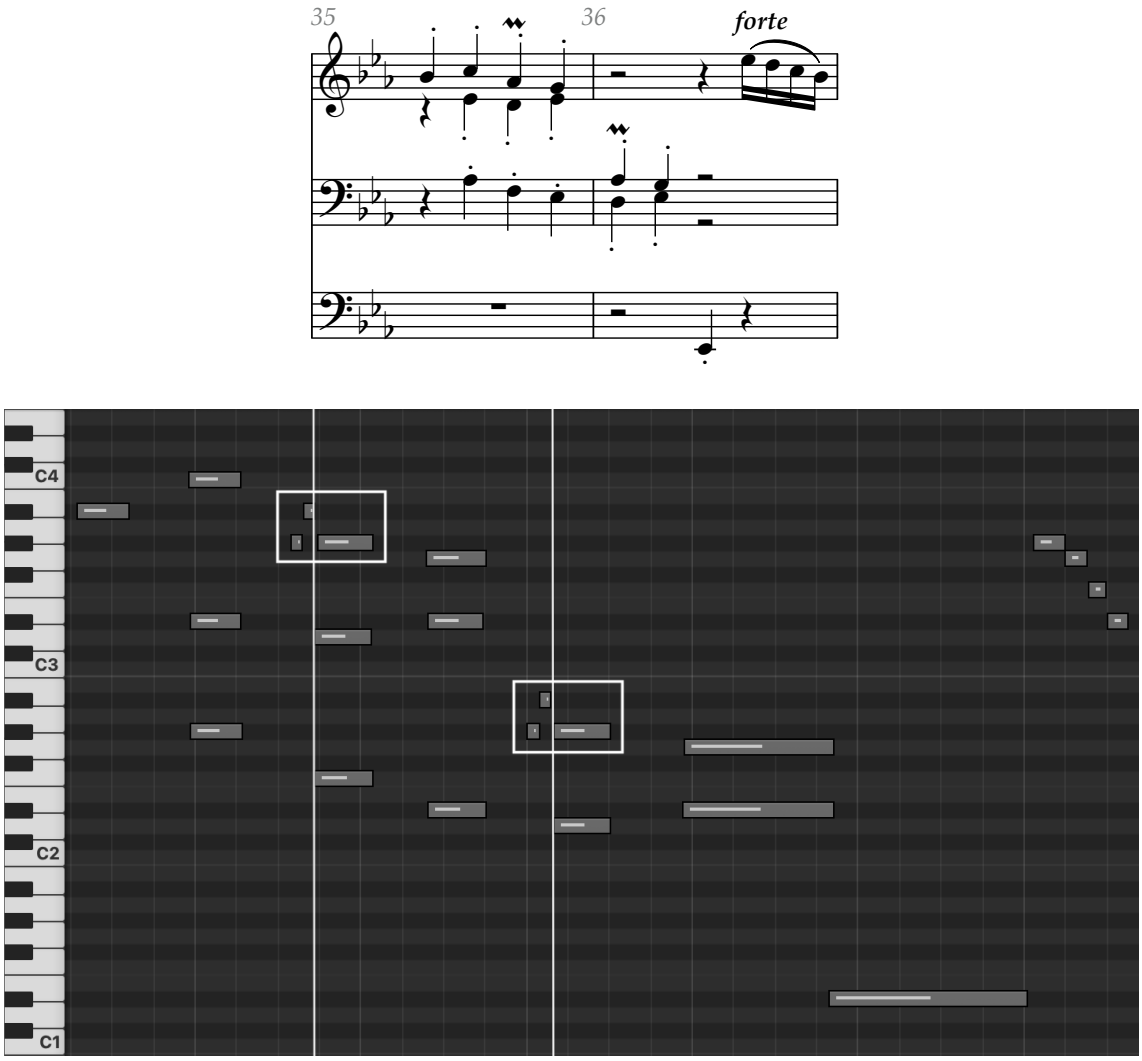


Figure 8: Above: J.S. Bach: *Prelude in E-flat Major*, BWV 552, bars 35–36.
Below: Digital representation of Gigout's organ roll performance of the same.

In this Figure, the white boxes show the ornamented crotchets/quarter notes in the right hand, and the long white lines show the beginning of each chord (the onset of all the pitches is not completely precise, but was not noticeable when the roll was played on the Seewen organ). The two trilled notes, beginning from the written pitch, begin before

[474] J.S. Bach, *Clavier-Büchlein vor Wilhelm Friedemann Bach*, fol. 3r.

each chord. These crotchets/quarter notes are also marked with staccato — one of the few such markings in all Bach's organ output articulation of autograph manuscripts — and the ratio of sound to silence of each crotchet in the soprano line (excluding ornaments) is shown in Table 3.

Beat	**Pitch duration, in seconds**	**Silence duration, in seconds**	**Ratio of sound to silence, reduced**
1	0.532	0.157	3.39:1
2	0.436	0.356	1.22:1
3	0.392	0.304	1.29:1
4	0.372	0.328	1.13:1

Table 3: Summary of the durations of semiquavers/sixteenth notes in the soprano line of bar 73 in J.S. Bach: *Prelude in E-flat Major, BWV 552*, as performed by Gigout.

The average ratio of sound to silence here is 1.76 to 1, which is close to Widor's theoretical definition of "demi-staccato."

However, when excluding the extremely long first crotchet/quarter note, the average ratio becomes 1.21 to 1 which is identical to Gigout's performance of the more "staccato" theme from bar 73. All this indicates that, for Gigout at the time of recording, there was indeed a significant difference between Widor's "demi-staccato" and a true "staccato."

Bach's other articulation markings, slurs, are completely ignored in this performance, and are generally either performed absolute legato regardless where the slur terminates, or staccato, such as the semiquavers in bar 113, reproduced in Figure 9.

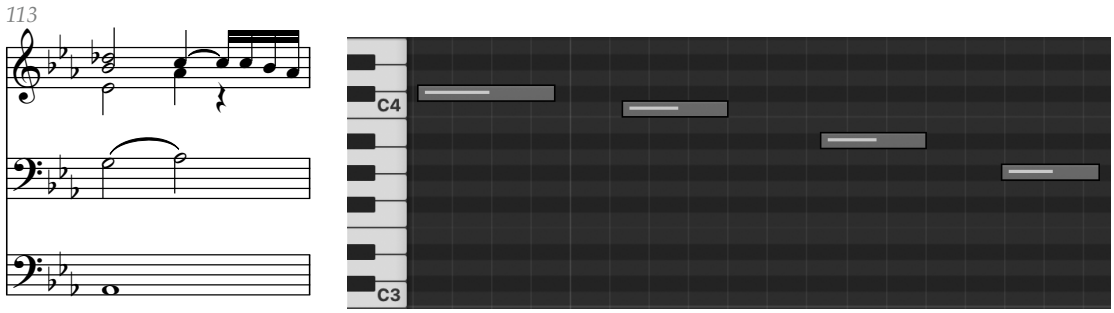


Figure 9: Above: J.S. Bach: *Prelude in E-flat Major*, BWV 552, bar 113.
Below: Digital representation of Gigout's organ roll performance bar 133, beat 4, soprano line.

Here there is considerable silence between each of these four pitches, resulting in a performance that is far from absolute legato or reflecting Bach's slur in the score.

Tempo

Only two editions of the BWV 552 prelude in this study include tempo markings for the *Prelude*; the Vierne edition suggests crotchet/quarter note equals 96 beats per minute.[475] The Peters edition preface, in contrast, suggests a tempo of crotchet/quarter note equals 76 beats per minute.[476] Analysis of the organ roll recording shows Gigout's average tempo is exactly crotchet/quarter note equals 76 beats per minute. The Vierne edition was published between 1916 and 1920, making it likely that Gigout did not have access to it at the time of recording; as has been established earlier in this paper, Gigout was most likely reading from the Peters or *Bach-Gesellschaft Edition*, and his playing was influenced by Griepenkerl's writings from the Peters Edition prefaces.

[475] Vierne Edition 2, 1.
[476] Peters Edition 3, iv.

Conclusion

The performance of this prelude can be summarised in a few points:

1. Gigout's adaptation of this piece to a two-manual organ in terms of registration is based on the principles described by his contemporaries in both Francophone and Germanic regions, and makes use of the technology available to him on the instrument at hand.

2. Gigout's articulation practice generally follows those of Widor. However he breaks these norms based on the function of each voice in the context of the piece: either as a unique voice in polyphony or just part of a chord where the majority articulation rules.

3. In such articulation, there is a distinct difference between Bach's written staccato and Widor's "demi-staccato" for repeated notes.

4. Main subjects of contrapuntal sections can be articulated according to the player's taste.

5. The lowest voice, be it in the pedal or manual, is generally played slightly ahead of the upper voices.

6. Bach's articulation markings may be observed or ignored according to the player's taste.

7. Gigout likely took his tempo marking from the Peters Edition's suggestion.

Chapter 11: Roll 1587 — Gigout Plays *Trio Sonata 5: II. Largo*, BWV 529

Introduction

J.S. Bach's *Trio Sonata in C Major* is the fifth of six trio sonatas, works for solo organ which mimic the chamber ensemble: two treble instruments, covered in the organ part by one hand each, and a bass instrument, covered by the pedals. Two sources survive: an autograph, P 271, and a copy by Wilhelm Friedemann Bach, P 272; Peter Williams speculates the former was intended as a fair copy for publication, and the latter was owned by Anna Magdalena Bach with some involvement from Johann Sebastian.[477] Both copies contain all six sonatas, indicating that they may have been conceived as a set, or at least were consistently grouped together.

Unlike all the previous Bach works in this study, this *Sonata* is the first in which the pedal is notated on its own line, giving a total of three staves; both the copies by J.S. and W.F. Bach are formatted the same way.[478] This practice is echoed in editions by members of the French Romantic Organ School.[479]

Registration

Griepenkerl's preface to the Peters edition immediately attributes the *Trio Sonatas* (and the *Passacaglia*, BWV 582) to the pedal clavichord.[480] He then recognises that for the practical reason of lacking such instruments, these works were going to be performed on organs; he suggests the following about registration:

---

[477] Williams, *The Organ Music of J.S. Bach*, 2.
[478] D-B Mus.ms. Bach P 271, Faszikel 1 and D-B Mus.ms. Bach P 272
[479] *BGS* 15, 50–65. Fauré Edition 3, 46–62. Peters Edition 1, 54–57. Widor-Schweitzer Edition 5.
[480] Peters Edition 1, iv–v. Griepenkerl also suggests that the Trio Sonatas can be played on fortepiano with a third hand taking the bass, and the highest part played an octave higher than written, and that this has great advantages in teaching.

> "It would be very instructive if the composer himself had indicated the stops with which these trios should be played on the organ. Since it did not happen, we can only speculate as to what possibly was meant by him regarding the spirit and form of the pieces. Strong voices or many stops combined together will not be suitable anywhere; much more one will be able to orientate oneself according to how trios are usually registered with a chorale melody. Most of the time the last movement of a sonata will be stronger than the first, and the second will have to be the weakest. The strength of the manuals should probably not be allowed to increase anywhere above Principal 8' with Octave 4'. Hohlflöte or Rohrflöte 8' and 4' will be very good for some pieces in the manuals. In the first case, take Principal 16' and Octave 8' in the pedal, and in the second Subbass 16' with Hohlflöte 8'. Most of the difficulty will be in weighing the strength and evenness of both manuals, because the organs seldom have the same voices in two keyboards. But complete equality is only necessary with regard to strength, not tone colour, which, just as a duet of singers can [have] different [voices]. Organ friends may practise all sorts of combinations here, [and] they will not miss the meaning of the master if they do not lose sight of the spirit and the form of the pieces to be performed."[481]

According to Griepenkerl, the primary consideration for registration is an equal balance between all manuals and pedals — even if there are strikingly different stops in each voice, as long as the volume of each is the same, they still fit the aesthetic. Notably, Griepenkerl does not mention the use of reeds as a tone colour in trio sonatas. The Fauré and Widor-Schweitzer editions give no indication as to registration in trios, but Bonnet's edition of Trio Sonata 3, BWV 527, suggests the following for this piece:

> "Récit : Basson-Hautbois et Cor de nuit 8
> Posit. ou G. O. : Flûtes 8 et 4
> Pédale : Bourdon 8 et Flûte douce 8." [482]

---

[481] Peters Edition 1, v: "Sehr belehrend würde es seine, wenn der Componist selbst die Register angegeben hätte, womit dies Trio's auf der Orgel gespeilt werden sollten. Da es nicht geschehen ist, so können wir nur Vermuthungen hegen, wie es nach Geist und Form der Stücke wahrscheinlich von ihm gemeint sei. Starke Stimmen, oder vielfach combinirte Register, werden nirgends passend sein, viel mehr wird man sich einigermassen danach richten können, wie Trio's über eine Choralmelodie registrirt zu werden pflegen. Meistens wird man das letzte Stücke einer Sonata stärker als das erste, und das zweite am schwächsten nehmen müssen. Über Principal 8 Fuss mit Octave 4 Fuss hinaus wird man wohl die Stärke der Manuale nirgends steigern dürfen. Hohl- oder Rohr-flöte 8 und 4 Fuss wird für manche Stücke in den Manualen sich sehr gut ausnehmen. Im ersten Fallen nehme man zum Pedale Principal 16 Fuss mit Octava 8 Fuss, im zweiten Subbass 16 Fuss mit Hohlflöte 8 Fuss. Die meister Schwierigkeit wird das Abwiegen der Stärke und Gleichmässigkeit beider Manuale machen, weil die Orgeln selten in zwei Clavieren gleiche Stimmen haben. Aber völlige Gleichheit ist nur erforderlich in Rücksicht der Stärke, nicht der Tonfarbe, die, wie bei den Sängern eines Duetts, verschieden sein kann. Mögen sich die Orgelfreunde hier in allerlei Combinationen üben, sie werden den Sinn des Meisters nicht verfehlen, wenn sie dabei den Geist und die Form der vorzutragenden Stücke nicht aus dem Auge verlieren."
[482] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 68.

This registration is notable in that it asks for a reed in one manual with only flutes in the other; on many Germanic or Anglophone organs from the period, the oboe would be overpowering unless the box were partially closed. Further, the Récit is assigned to the right hand, and the Positif to the left hand, placing the 4' pitch of the Positif above the 8' pitch of the right. However, if on the organ Bonnet had in mind these two distinct sound combinations still balanced, they would be following Griepenkerl's aesthetics, even if one combination was largely based on a reed.

The lack of 16' pitch in the pedal indicates that Bonnet's aesthetic preferred lightness and clarity. Given the texture and three-movement structure — fast, slower, fast — are identical in each sonata, a performer could apply the same general principles of registration and style to each sonata. Therefore, Bonnet's registration in the second movement of BWV 527 could work in the corresponding movement of BWV 529.

During the digitisation process at Seewen, this roll was scanned without difficulty. Table 1 shows the stops that Gigout selected on the recording organ:

Abb.	Manual I		Abb.	Manual II	
	Bordun	16'		Wienerflöte	8'
	Principal	8'		Bordun	8'
Ft. tr.	**Traversflöte**	**8'**		Viola	8'
	Gambe	8'		Aeoline	8'
	Viol. d'orch.	8'		Dolce	4'
	Vox coelestis	8'		Quinte	2 ⅔'
Ft. 4	**Flöte**	**4'**		Clarinette	16'
	Piccolo	2'		Trompette	8'
	Sesquialter	II		Horn	8'
	Fagott	8'	Ob.	**Oboe**	**8'**
	Harfe			Vox Humana	8'
	Glocken			Tremolo	
	Manual II to I				
				Pedal	
				Violonbass	16'
			S. 16	**Subbass**	**16'**
			Cello	**Cello**	**8'**
				Gedackt	8'
				Posaune	16'
				I to Pedal	
				II to Pedal	

Table 1: Gigout's registration in his performance of J.S. Bach:
Trio Sonata V: II. Largo, BWV 529; the stops selected are in bold.

Articulation of Repeated Notes

Unusually in comparison to so many of his other organ works, Bach includes some articulation markings in this movement in his autographs; the slurs in bars 1 and 3 appear in the two sources: D-B Mus.ms. Bach P 271, Fascicle 1 and D-B Mus.ms. Bach P 272 (though in P 271, the slur over bar 1, beats 1–3 is missing).[483] Given the inclusion of all the slurs in the Bach-Gesellschaft and Fauré editions, they seem to use P 272 as both their sources.[484] In terms of articulation, Gigout follows these slurs in bar 1, which

[483] D-B Mus.ms. Bach P 271, Fascicle 1, 39 and D-B Mus.ms. Bach P 272, 68.
[484] *BGS* 15, 57. Fauré Edition 3, 54.

can be seen in the following figures. Bar 1 of the right hand of Gigout's performance of BWV 529/II is shown in Figure 1.

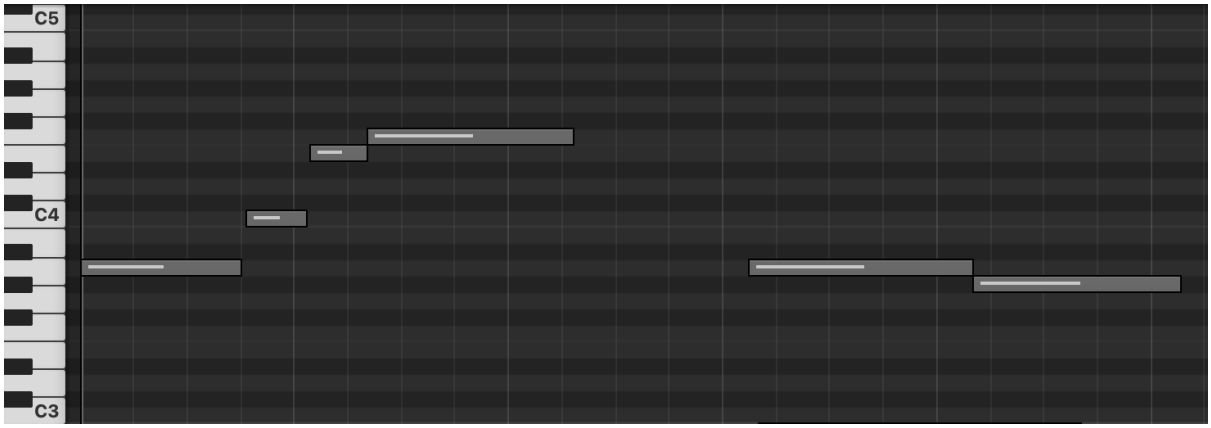


Figure 1: Digitisation of Gigout's performance of
J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, right hand part, bar 1.

As seen in Figure 2, there is a slight gap between the first and second pitches, but in every other instance (except the quaver/eighth note rest on beat 3) as soon as one pitch ends, another begins. In the case of listening to the first note on the Seewen organ, the gap between the first two pitches is so small and the voicing of the Seewen organ so smooth that it is inaudible to the naked ear. For reference, Figure 2 shows the same excerpt as seen in Figure 1, but as it appears on the scan of the paper organ roll.

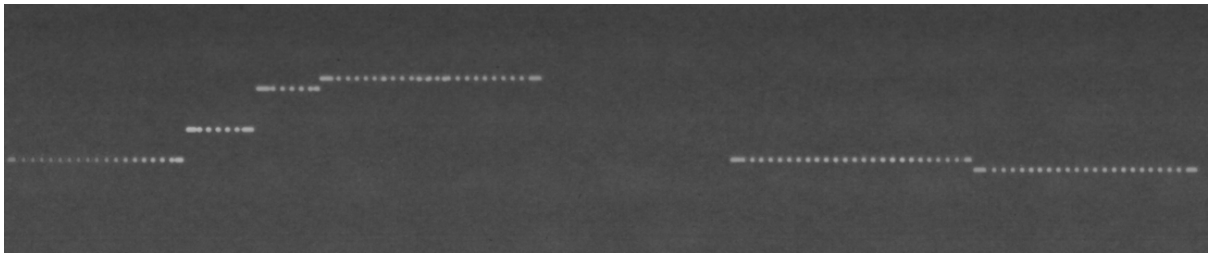
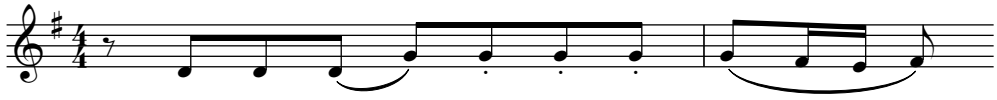


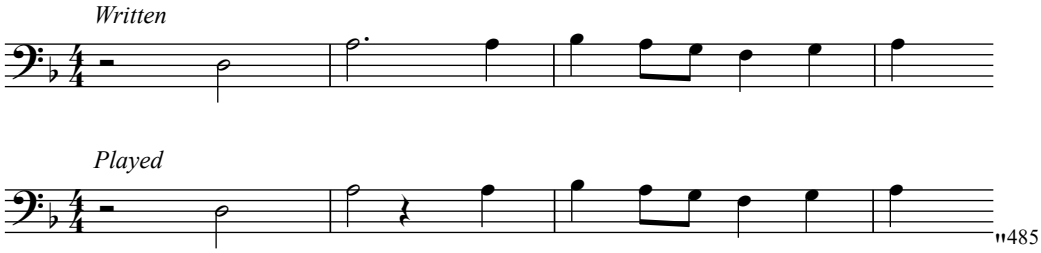
Figure 2: Scan of the organ roll recording of Gigout's performance of
J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, right hand part, bar 1.

The repeated semiquavers/sixteenth notes in bar 2 present a question of interpretation; as seen in Part I, two of Widor's rules of performance practice, from the recollection of his student A.M. Henderson, state:

"I. In *Allegro*, or *Moderato* tempos, repeated notes in the same voice should be played demi-staccato, the last note in the group being phrased to the following note:



II. A dotted note, when repeated, loses the value of the dot.



"[485]

Point II above is also echoed by Vierne in the preface to his Bach edition.[486] In terms of the exact amount of silence to follow any given note before the next pitch, comparing both examples below Point II in bar 2 indicate that the ideal ratio of sound versus silence is two parts sound (minim/half note) to one part silence (crotchet/quarter rest) — in other words 2:1. However, in the case of a Largo movement, such as BWV 529/II, this should theoretically not be followed literally, as Largo is not an Allegro or Moderato tempo. However, there must be some sort of silence between notes, since performing the same note repeatedly with no separation — as done in absolute legato — is impossible, as there must be some gap between the pitches if the listener would be able to differentiate the beginning and ending of each note. Gigout's solution to this question — found on his Welte organ roll recording of this piece — is shown in its Seewen MIDI visualisation in Figure 3.

[485] Henderson, "Widor and His Organ Class," 343.
[486] Vierne Edition 1, vi.

Figure 3: Digitisation of Gigout's performance of J.S. Bach:
Trio Sonata V: II. Largo, BWV 529, right hand part, bar 2.

In terms of articulation, each of the three repeated A semiquavers/sixteenth notes in question can be divided into some ratio of sound versus silence — that is, the ratio of the amount of sound versus the amount of silence prior to the beginning of the next note. In this example of the three repeated semiquaver/sixteenth notes, the MIDI sequencer shows that the length of the first pitch, rounded to two decimal places, is 0.26 seconds followed by a silence of 0.17 seconds; the second pitch lasts 0.28 seconds followed by 0.15 seconds of silence; and the third pitch lasts 0.28 seconds followed by 0.13 seconds of silence. In terms of the ratio of the length of pitch to the length of silence of each note, the first note is 26:17, which cannot be reduced; however, these durations are so small, that if we add a mere 0.0033 seconds to the second part, the ratio becomes 26:17.33, which can be reduced to 3:2, which makes the pitch itself slightly longer than Widor's ideal ratio of 2:1 in the works of Bach.

However, in the second note, the ratio of sound to silence is 28:15. Shortening the second portion of silence by a mere 0.01 seconds would make the ratio 28:14, or 2:1. Similarly, in the third note, the ratio of sound to silence is 28:13, and by adding 0.01 seconds to the silence results in a ratio of 28:14, again 2:1. These results are summarised in Table 2.

Pitch number	**Duration of semiquaver**	**Duration of pitch**	**Duration of silence**	**Approximate ratio of pitch to silence**
1	0.43 sec	0.26 sec	0.17 sec	3:2
2	0.43 sec	0.28 sec	0.15 sec	2:1
3	0.41 sec	0.28 sec	0.13 sec	2:1

Table 2: Summary of the three repeated A pitches in the right hand of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 2, as performed by Gigout.

This analysis of the organ roll shows that, for these three repeated semiquavers/sixteenth notes, Gigout's approach to articulation hovers between either three parts pitch and two parts silence the ratio of 3:2, or two parts pitch and one part silence, 2:1. This is entirely in line with Widor's and Vierne's suggestions for a fast movement, even though this is a slower movement. Of course, the duration of silence in these examples has been modified by 0.01 seconds; it seems highly unlikely that Gigout would have thought in such precise terms around 1912 when he recorded this piece. Yet the general proportion of sound to silence when considering articulation seems to have been largely engrained, and the tempo itself was not relevant.

For the rest of the piece, there is some fluctuation in these exact ratios between sound and silence in repeated notes. Table 3 shows the same repeated notes of the main theme the first time it appears in the left hand in bar 6.

Pitch number	Duration of semiquaver	Duration of pitch	Duration of silence	Approximate ratio of pitch to silence
1	0.44 sec	0.30 sec	0.14 sec	2:1
2	0.45 sec	0.31 sec	0.14 sec	2:1
3	0.44 sec	0.32 sec	0.12 sec	3:8

Table 3: Summary of the three repeated E pitches in the left hand of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 6, as performed by Gigout.

Similarly, the ratio of sound to silence in the first note is 15:7; reducing the duration of the pitch by even 0.01 seconds makes the ratio 2:1. In the second pitch, the ratio is 31:14, and reducing the duration of the pitch by 0.01 seconds and lengthening the silence by 0.01 seconds results in a ratio of 2:1. The third pitch is the least regular of those seen so far, but in all, Gigout's preferred articulation is nearly perfectly in line with the written theoretical ideals of performance practice as described by the members of the French Romantic Organ School.

Other Matters of Articulation

For all the remarkable precision of articulation shown in the previous section regarding repeated notes, the release of pedal notes followed by rests longer than a quaver/eighth note seems to have been unimportant to Gigout. In bar 13, the pedal should release at the end of beat 2, but the release is well into beat three. Figure 4 shows the visualisation of this moment from the Seewen digitisation; the long bar on A1 is the pedal note, while the shorter bars are the left-hand voice alone. The white cursor is placed where the pedal note should end, if performed exactly as notated in Bach's score.

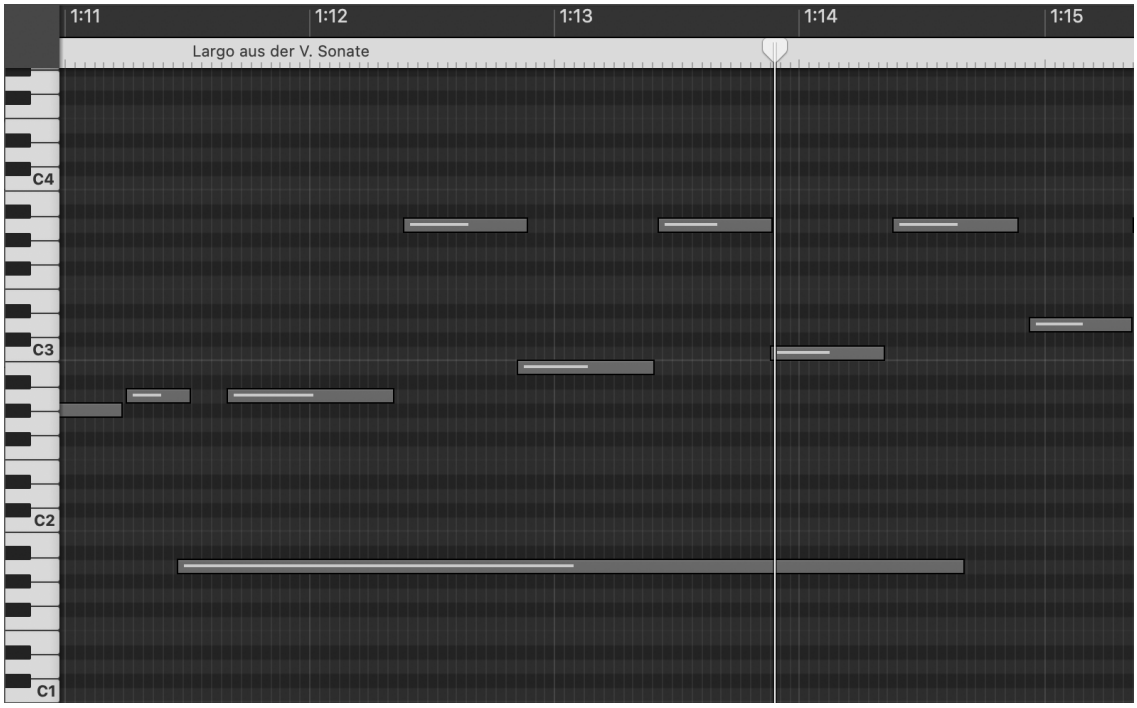


Figure 4: Top: Score of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 13. Below: Digitisation of Gigout's performance of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, left hand part and pedal, bar 13.

Similarly, in bar 14, the pedal should release at the end of beat 1 with the end of the fourth demisemiquaver/thirty-second note, but Gigout holds it slightly too long. Figure 5 shows this moment in the same way as Figure 4.

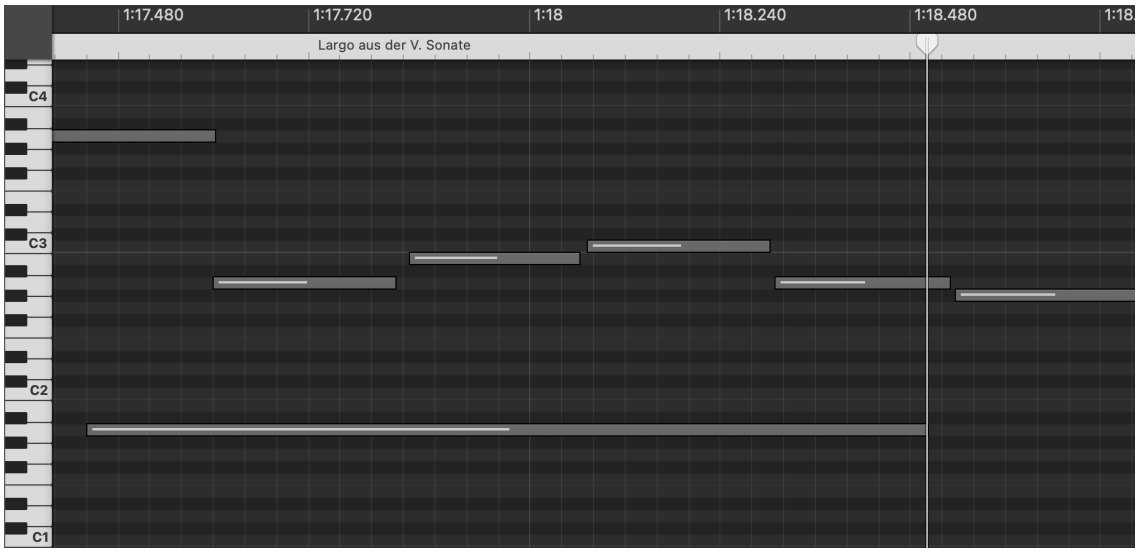


Figure 5: Top: Score of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 14. Digitisation of Gigout's performance of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, left hand part and pedal, bar 14.

Gigout holds the pedal too long in bar 15 as well, with the low D in the pedal overhanging by nearly a semiquaver/sixteenth note. This is shown in Figure 6.

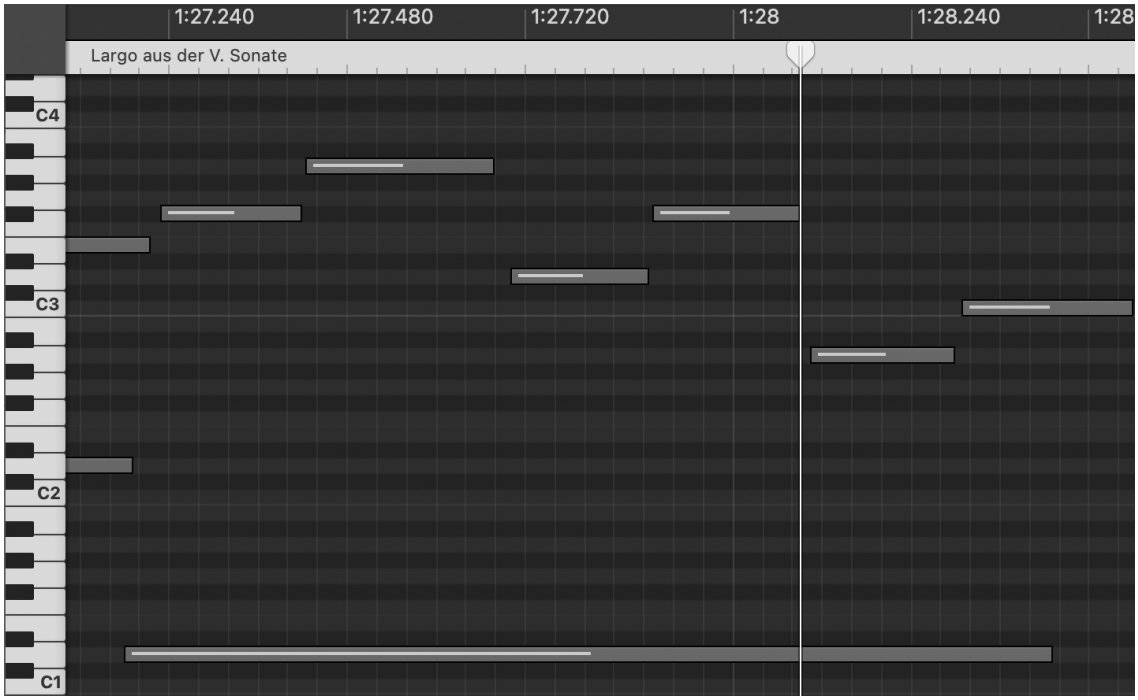


Figure 6: Top: Score of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 16. Digitisation of Gigout's performance of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, left hand part and pedal, end of bar 16.

These, combined with similar instances throughout this roll, indicate that in this piece, Gigout was not concerned with the exact length of pedal notes when followed by a long rest as in bars 13 and 14, or the end of a phrase such as bar 15.

Tempo

Using the method previous established, the average tempo of this movement is dotted crotchet/quarter note equals 18.4 beats per minute. However, there are a few instances where Gigout notably rushes, which are consistently in moments like bars 33–34 (shown in Figure 7), where the pedal plays only at the beginning of the bar and drops out.

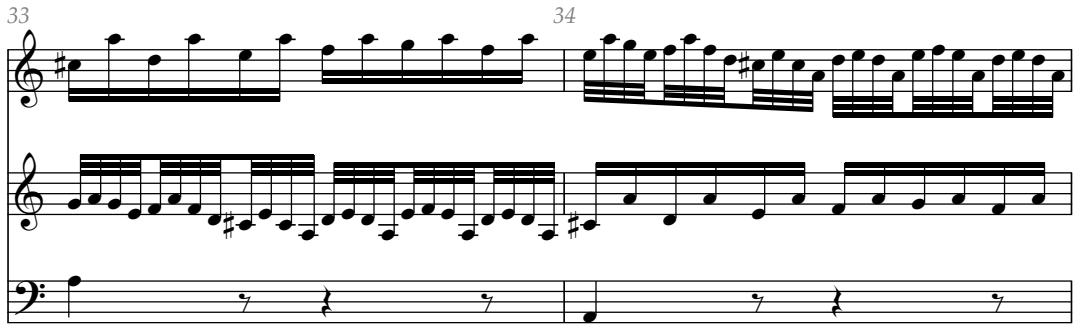


Figure 7: Score of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bars 33–34.

The average duration of each dotted crotchet/quarter note was 3.26 seconds, meaning each bar on average should last 6.52 seconds. Here, though, Gigout's speed increases, with bar 33 lasting 5.94 seconds, and 34 only 5.6 seconds. This is not consistent in the piece, though; a similar moment in bars 13–14, shown in Figure 8, last 5.94 and 5.58 seconds, respectively.

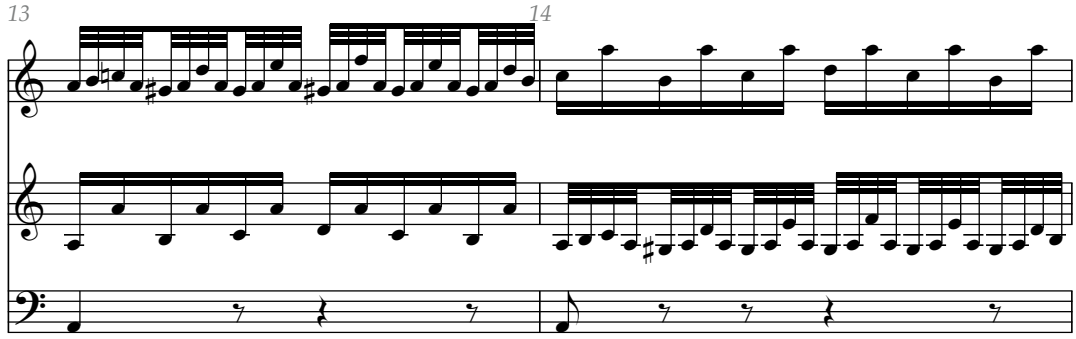


Figure 8: Score of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bars 13–14.

This consistency indicates at least one of three possibilities: he wished to move the tempo forward in both instances (bars 13–14 and 33–34), he simply rushed both instances, or there was some distortion in the roll both times.

The timings given in the previous paragraph were all the length of the entire bar; the measurements of time when dividing each of the bars in half is shown in Table 4.

Bar	Duration: full bar	Duration: first half	Duration: second half
13	5.94	3.27	2.67
14	5.60	2.84	2.76
33	5.94	3.06	2.88
34	5.58	2.79	2.81

Table 4: Summary of the durations of bars 13–14 and 34–35 in
J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*, bar 2, as performed by Gigout.

While the lengths of the entire bars are nearly identical, the half bar measurements tell a slightly different story. Comparing the first half of each bar to the second (i.e. the values in columns 3 and 4 in Table 4), there is a slight accelerando toward the end of the entire bar; the exception of bar 34, where both halves are basically equal.

Gigout adds a significant ritardando four times in the piece, all of which take place at the major changes to the form. The overall structure of the movement, as analysed by Peter Williams (with some abbreviation by this author), is as follows:[487]

A	1–13	subject, chromatic countersubject
B	13–21	second subject group
A	21–33	subject answered
B	33–41	altered, in dominant of D minor, modulating to:
A	41–54	1–12 repeated, plus countersubject; phrygian cadence

Gigout, in contrast, places his major ritardandi at the end of bar 12, the end of the exposition with the subject and countersubject. If he had played the piece completely in time, the bar should last 5.94 seconds; Gigout's performance lasts 9.36 seconds, a reduction of 158 percent. The most significant ritard takes place at bar 38, the major transition point back into the recapitulation of the subject in bar 41; Gigout's performance of bar 38 lasts 8.96 seconds. According to these ritardandi, assuming they were intentional and indicative of the form (as was the case in his performance of *O*

[487] Williams, *The Organ Music of J.S. Bach*, second edition, 30–31.

Mensch bewein), therefore, Gigout's understanding of the form of this piece could be summarised as follows:

A	1–12	exposition
B	13–24	development
A	25–38	exposition in G major
A	39–54	transition to the recapitulation, recapitulation

Compared to Peter Williams, Gigout takes a simpler understanding of the form, and emphasises different areas. Ultimately, these judgements are somewhat subjective, but Gigout's emphasis in bar 25 on the main theme in a major key, and emphasis on the chromaticism of bar 38, indicate the moments which were most important to him were those which the audience could easily hear.

Deviations from the Score

In this recording, Gigout makes several deviations from the score, which are accurate in the organ roll itself. However, the master roll of this performance is lost, and therefore so are the details of how Welte's editors may (or may not have) interfered from the raw recording take. The deviations from the score are listed below:

Bar 23	Right hand, final note: trill added above the B
Bar 25	Left hand, final note: plays F-sharp
Bar 30	Right hand, beat 2, final demisemiquaver/thirty-second note: plays B-flat Left hand, beat 3, second demisemiquaver/thirty-second note: plays B
Bar 37	Right hand: plays trill on beat 4, ignores written trill on beat 5
Bar 38	Pedal: first note changed to C natural. Second note changed to B-natural Manuals: final D of both hands played together as demisemiquaver/thirty-second note
Bar 52	Manuals: final A of both hands played together as demisemiquaver/thirty-second note
Bar 53	Ends the piece on the first note of this bar

Gigout's finishing the piece early to avoid the phrygian cadence indicates that, when a movement is performed out of its original context, the favoured approach is to simply end on the tonic.

Dynamics

Gigout manipulates the swell box between either fully closed or fully open; the instances are shown in Table 5.

Bar	Box Position
Bar 1–bar 13, beat 2	Closed
Bar 13, beat 2.5–bar 40, beat 2.5	Open
Bar 40, beat 2.5–bar 51, beat 1	Closed
Bar 51, beat 1–bar 52, beat 6	Open
Bar 52, beat 6–end	Closed

Table 5. List of dynamic changes achieved by the swell pedal in Eugène Gigout's organ roll performance of J.S. Bach: *Trio Sonata V: II. Largo, BWV 529*.

For the most part, these dynamic changes, like Gigout's other performances and as noted earlier in this recording regarding tempo, correspond to some aspect of the piece's form or harmony. The first swell box movement takes place in bar 13, the beginning of an entirely new section with new melodic material. Bar 40, the next change, is the site of the highest of the long arc of demisemiquavers/thirty-second notes in the piece, with the top note (C) being the highest pitch on many Saxon eighteenth century organs. The beginning of bar 51 is the middle of a sequence which begins in bar 49, beat 5; there does not seem to be a particularly significant harmonic or structural reason to change the box's position there, unless Gigout wanted to ensure the piece ended softly, in which case the box was already closed and would need to be opened in order to make a decrescendo possible. The final motion of the box to the closed position takes place on the final beat of the penultimate bar.

Conclusion

The performance of this trio sonata movement can be summarised into a few key points:

1. The articulation of repeated notes, even in a slow tempo, was treated the same as Widor and Vierne's recommendations for fast tempos: repeated notes are played approximately two thirds value.

2. Pedal notes, when followed by a long rest, or a short rest at the end of a phrase, do not need to be held to exactly the written value.

3. As in *O Mensch bewein*, Gigout used ritardando to clarify the form, though favouring different moments in the piece than Peter Williams's modern analysis, that is, those moments which will be clearly audible to the listener.

4. A cadential figure where one voice ends on the tonic and the other voice approaches the tonic from the semitone below at half the rhythmic value can — but do not have to — be assimilated to avoid the semitone dissonance.

5. Trills are performed from the main note.

6. Phrygian cadences at the end of a piece can be removed if the piece is performed out of its larger context.

7. A large movement of the swell reflects the harmony or structure of the piece.

Chapter 12: Roll 1588 — Gigout Plays *Trio Sonata 1:*

I. Allegro moderato, BWV 525

Registration

The Museum in Seewen holds two copies of this roll: a master and a green roll. The master copy is the roll upon which Gigout himself recorded and Welte editors made their annotations, and a "green roll" refers to a copy made from a more robust paper stock.[488]

The master was scanned twice, with problems both times; a green roll was scanned once and was largely correct.[489] The Museum's database notes from the scanners say that both scans of the Master resulted in issues regarding transposition; in the Debrunner digitisation process, sometimes entire lines can be transposed up or down if there has been any distortion in the paper. According to the notes, which were written in English, the second digitisation was corrected. However, there were still problems with accuracy, which they hoped a scan of the green roll might fix. That resulted in a copy which was mostly correct, but skips several groups of bars upon playback. Therefore the tempo analysis used in the present study discounts any variations in the bars which are missing; however, based on study of the paper roll itself, any tempo variation in those bars would have minimal effect on the overall average tempo of the roll.

Given this, the digitisation used in this study is the green roll. Though Welte Roll 1588 was recorded in 1912, a note on the green copy says "completed 1.12.1915 K.

[488] Rumsey, "The Big Picture," 76, 79.
[489] Museum für Musikautomaten, Seewen, Switzerland: Roll 8141 is the green roll, and Roll 37 is the master roll.

Bröckel", presumably one of the Welte technicians who either did or supervised the copying work.[490] Table 1 shows which stops Gigout selected on the recording organ:

Manual I		Manual II	
Bordun	16'	Wienerflöte	8'
Principal	8'	Bordun	8'
Traversflöte	**8'**	Viola	8'
Gambe	8'	Aeoline	8'
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	**4'**	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	**Oboe**	**8'**
Harfe		Vox Humana	8'
Glocken		Tremolo	
Manual II to I			
		Pedal	
		Violonbass	16'
		Subbass	**16'**
		Cello	**8'**
		Gedackt	8'
		Posaune	16'
		I to Pedal	
		II to Pedal	

Table 1: Gigout's registration in his performance of J.S. Bach:
Trio Sonata 1: I. Allegro moderato, BWV 525; the stops selected are in bold.

Tempo and Ritardando

Due to the issues in digitization, the following bars were omitted from the scan: bar 7, beat 4 until bar 9, beat 2; bar 12, beat 1 until bar 13, beat 4; and bar 15, beat 4 until 17, beat 4. Determining the average tempo of the entire piece with complete precision, therefore, is not possible, of the remaining material that was digitized correctly, the crotchet/quarter note equals 50 beats per minute.

[490] Museum für Musikautomaten, Seewen, Switzerland: Roll 8141: "fertig 1.XII.1915 K. Bröckel." This same text also appears on Seewen Roll 37, the master copy.

Gigout makes a number of ritardandi throughout the piece, each of which have a direct correlation to some aspect of the piece. In bar 4, beat 3, Bach writes the first cadence to the dominant key; here Gigout decreases the average tempo slightly to 46 BPM. In bar 10, beat 4, Gigout slows even more into the end of the first main idea in the tonic key; here the ritardando tempo averages at 33 BPM. Gigout's ritardando at bar 21, beats 3 and 4 leads into the main motive of the piece, this time in the dominant key, with an average tempo of 40 BPM. Bar 25, beat 2 is another cadence leading into secondary material, this time with an average tempo of 40 BPM. In bar 29, beat 1, Gigout expands the tempo slightly as the pedal takes over the main melody in F minor, decreasing the tempo to 40 BPM. The ritardando beginning at bar 35, beat 2, lasting until bar 36, beat 1, is a significant cadence into F minor, with an average tempo of 38 BPM. Bar 50, beat 2 until 51, beat 1 is a ritardando into the entrance of the main theme in the pedal in E-flat major again, with an average tempo of 38 BPM. In bar 55, beats 2–3, Gigout plays a slight ritardando into the deceptive cadence in bar 56, with an average tempo of 39 BPM. The final ritardando begins at bar 57, beat 2, and extends to the end of the piece.

This analysis demonstrates several key points. Gigout's total change of tempo, in other words, the degree to which he adds ritardando, slows the tempo from the average 50 BPM to, excluding two outliers, a highly consistent 38–40 BPM. Further, his use of ritardando throughout the piece is always related to the structure of the work.

Figure 2 is a line chart comparison in which the horizontal axis shows each crotchet/quarter note in succession, and the vertical axis shows the duration of each note. The light grey line shows the tempo when the piece is played with no deviation in

the tempo; the darker line shows the degree to which Gigout increases or decreases his performance of the crotchets/quarter notes.

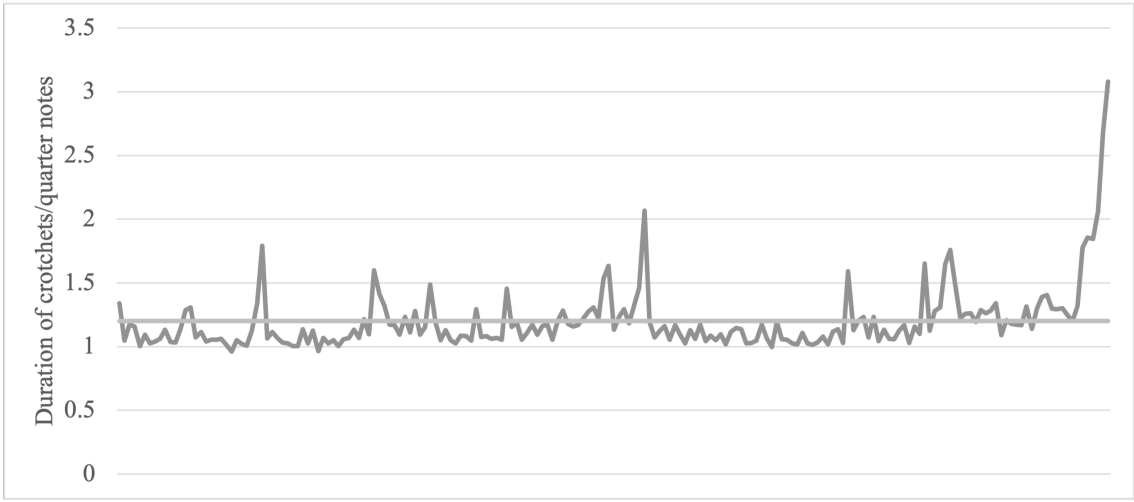


Figure 2: Tempo chart of Gigout's performance of *Trio Sonata 1: I. Allegro moderato*, BWV 525, at the crotchet/quarter note level.

Each of the spikes are instances of the greatest amount of ritardando; the higher the spike, the greater the decrease in tempo.

Ornamentation

Throughout this movement, the trills are consistently played from the main note. There is also a consistent rhythmic interpretation in this movement which Gigout does not use in any of his other Bach organ rolls: except for bar 4, he always begins the trills slightly before the beat.

Gigout's articulation follows similar trends to his performance of BWV 529/II Figure 3 shows the score on top, with a scan of the master roll below:

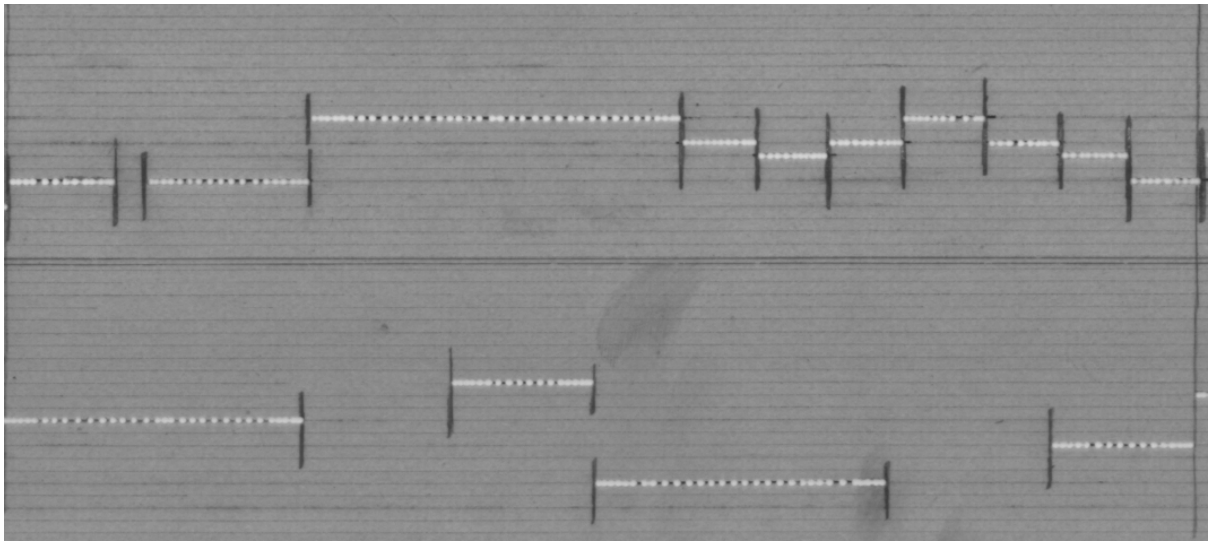


Figure 3: Top: Score of J.S. Bach: *Trio Sonata 1: I. Allegro moderato*, BWV 525, bar 4.
Scan of Gigout's organ roll performance of J.S. Bach: *Trio Sonata 1: I. Allegro moderato*, BWV 525, right hand part and pedal, bar 4.

This scan demonstrates the general trend in Gigout's performance of this piece: for the vast majority, the ending of one note and beginning of the next occur with no space whatsoever between them — in other words, absolute legato. The exception are repeated notes, which show a similar trend to that of the previous chapter; in bar 5, the right hand plays two consecutive quaver/eight note Cs. The digitised MIDI file shows that the entirety of beat one (a crotchet/quarter note) lasts 1.07 seconds — the first quaver/eighth note lasts 0.38 seconds followed by 0.11 seconds of silence. If this were performed absolute legato, the first quaver/eighth note would last 0.49 seconds, followed by a second quaver/eighth note of 0.58 seconds.[491] However, there is 0.11 seconds of silence following the first note; if one adds a mere 0.04 seconds to this, the ratio of sound to silence becomes 4:1.

[491] A mathematically perfect performance would mean each quaver/eighth note lasts an equal length of time, which indicates that Gigout did in fact rush these two pitches.

In bar 6, the same thing happens in beat one; the first note lasts 0.3 seconds followed by silence of 0.15 seconds of silence, then the second note is 0.57 seconds long. The ratio of sound to silence in the first quaver/eight note is 2:1, which matches the theoretical ratio of Widor and Vierne.

Similar instances of this pattern take place in bars 26 and 27. The timings of each of these are shown in Table 2.

Bar, Hand	**Note 1 duration**	**Silence duration**	**Ratio of sound to silence**
26, LH	0.39	0.13	3:1
26, RH	0.34	0.14	5:2
27, LH	0.39	0.13	3:1

Table 2: Summary of the durations of consecutive repeated quavers/eighth notes in bars 26 and 27 in J.S. Bach: *Trio Sonata 2: I. Allegro moderato, BWV 525*, as performed by Gigout.

From this table, Gigout's left hand follows an exact ratio twice in a row of 3:1. The right hand is not quite as clean, but the ratio can most simply be expressed as 5:2. In this performance, Gigout uses varying amounts of articulation for repeated notes. While the amount varies considerably more than his other Bach Trio Sonata performance from Chapter 11, he still only adds silence between notes at these moments, and the default articulation for the rest of the piece remains absolute legato.

Gigout's Edits to the Form

As discussed above, Gigout adds a significant ritardando nine times in this performance; similar to his interpretation of BWV 529/II, these all take place at significant changes to the form. The overall structure of the movement, as analysed by Peter Williams (with some abbreviation by this author), is as follows:[492]

[492] Williams, *The Organ Music of J.S. Bach*, second edition, 30–31.

A	1–11	tonic, left hand opens
B	11–22	to dominant, right hand opens
A	22–36	to F minor, right hand opens
B	36–51	to tonic, left hand opens
A	51–58	pedal opens

Gigout adds significant rubato in these exact same places, and the amount of ritardando between each is basically the same, except for leading into bars 22 and 36. Based on this, Gigout intended to highlight only the largest structural changes, shown below:

A	1–11	exposition
B	11–51	development, with small punctuations at bars 22 and 36
A	51–58	recapitulation

Unlike in his performance of BWV 529/II, Gigout's interpretation here agrees with Peter Williams's analysis. However, while significant moments in the piece's structure are punctuated with ritardandi, there is little deviation in the amount of ritardando. This is not in line with the aesthetics of Griepenkerl, editor of the mid-nineteenth century Peters edition, who writes:

> "...the responsibility lies on the player to carefully analyse the organ piece that he wants to perform beforehand, and to break it down into its main and subordinate clauses, which of course is not there [in the musical text], so that he can play it like a speech, with correct observation of the punctuation, [and] can declaim [the piece]."[493]

This idea in particular — whether it came through reading Griepenkerl himself or through the general aesthetic ideas of the time — seems not to have resonated with Gigout. If one equates a large ritardando as a period, and a smaller one as a comma, the sentence of performing this piece would be performed as:

> Exposition. Development, along with some elaboration, then an interesting harmonic turn. Recapitulation.

[493] Peters Edition 1, ii: "...so legt es dem Spieler die Verpflichtung auf, sich das Orgelstück, welches er vortragen will, vorher sorgfältig zu analysieren und in seine Haupt- und Nebensätze zu zerlegen, so dass er es, wie eine Rede, mit richtiger Beobachtung der Interpunction, die freilich nicht dasteht, declamieren kann."

While Griepenkerl may well have been referring to smaller phrases within the larger musical form, members of French Romantic Organ School were clearly interested in punctuating the larger structures, as evidenced in several of the rolls analysed thus far, even if they ignored the idea of using varying degrees of ritardando to create a hierarchy to highlight the form.

Edits on the Master Roll

The master roll of this performance includes only a few edits. Welte's editors used their normal abbreviations for the registrations at the beginning, and vertical lines in pencil across nearly the entire roll mark the beginnings and endings of each bar. In bar 12, the final pedal note appears to have been played at the same time as the following E-flat crotchet/quarter note in bar 13; however, the pedal note itself is played slightly before the downbeat, as seen in Figure 4.

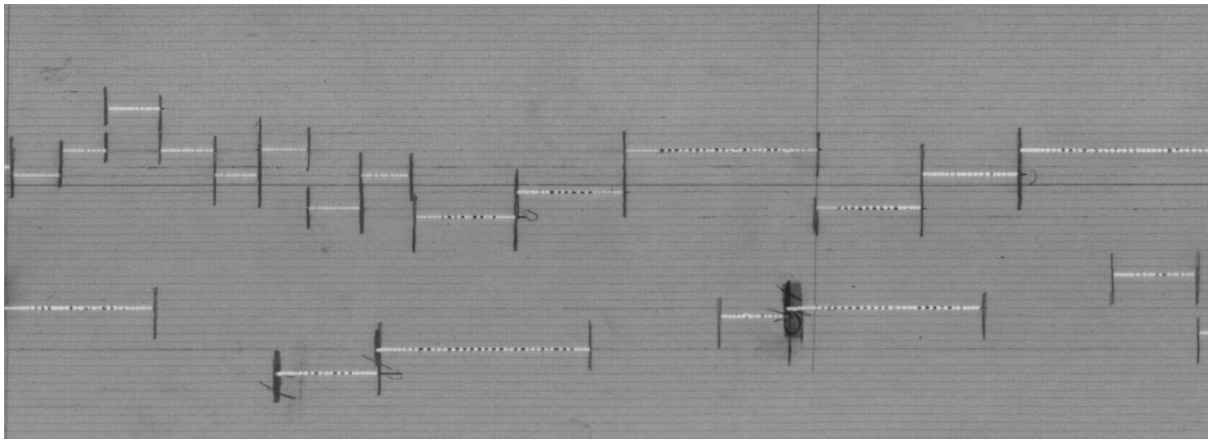


Figure 4: Top: Score of J.S. Bach: *Trio Sonata 1: I. Allegro moderato*, BWV 525, bars 13–14.
Scan of Gigout's organ roll performance of J.S. Bach: *Trio Sonata 1: I. Allegro moderato*, BWV 525, right hand part and pedal, bars 13–14.

The moment in question occurs at the longest vertical line in Figure 4 above. In this, the lower line of perforations are the pedal, and the upper the right hand. If Gigout were following the score exactly, the pedal E-flat should begin when the right hand plays the

note beginning at the longest vertical line. The fact that this pedal note begins slightly but noticeably before the beat, and that there was a correction leading into that moment, indicates that at this moment, Gigout was not perfectly precise, and more importantly, that Welte's editors did not seek for a perfectly aligned performance. Based on the Seewen digitisation, the pedal comes in 0.015 seconds early, which is nearly imperceptible anyway. In the MIDI digitisation, this can be heard if a percussive instrument with a sharp decay like piano or xylophone is selected. When played back on the Museum's Welte organ, the problem is not audible.

The same thing happens shortly thereafter in the pedal, with bar 14 into 15, which is rhythmically identical in Bach's score. In bar 16, there seems to be some rhythmic overlapping when Gigout played the pedal B-flat and A which Welte editors corrected.

Conclusion

Analysis of Gigout's performance of this trio sonata movement shows a number of key points:

1. The default articulation in this work is absolute legato. However, the articulation of repeated notes is not as consistent as Gigout's other trio sonata recording.

2. Gigout's registration of this piece is largely consistent with trio sonata registrations suggestions by Bonnet and Guilmant, and notably the pedal lacks 16' pitch.

3. As in several other recordings, Gigout used ritardando to clarify the form, but in this case mostly uses the same tempo reduction. However, he ignores Griepenkerl's advice to use multiple degrees of ritardando to create a hierarchy of important moments.

4. Welte editors corrected wrong notes.

Chapter 13: Roll 1199 — Bonnet Plays *In dulci jubilo*, BWV 751

Introduction

In dulci jubilo, BWV 751 exists in two sources: a copy by Johann Gottlieb Preller from c. 1743–1749 in the Leipzig Stadtbibliothek, and the *Neumeister Collection*, in the hand of Johann Gottfried Neumeister, compiled no earlier than 1790.[494] In 1991, scholar Christoph Wolff argued that the *Neumeister Collection* (LM 4708) definitively shows that the authorship of the chorale does not belong to Johann Sebastian Bach, and rather to Johann Michael.[495] It seems members of the French Romantic Organ School were suspicious of the work as well, as the piece does not exist in the Fauré Bach edition. In the preface to the second collection of volumes, the chorales, Fauré notes: "We have removed from this collection works collected by the students of the Grand Cantor and whose authenticity remains really too doubtful."[496] However, for other members of the French Romantic School, clearly none of this mattered — Bonnet includes BWV 751 in his own Bach edition.[497] The preface of this collection contains a number of notes about each of the pieces, which in the case of the chorales tend to focus on the nature of the text and sometimes how that relates to theology. However, Bonnet's description of BWV 751 is easily the shortest in the entire book: "Melody of a sacred Christmas berceuse of the Middle Ages."[498] While Bonnet may have been short on prose, his edition contains extensive markings. He first suggests the following registration:

---

[494] Preller copy: D-LEb Peters Ms. 7, Faszikel 7. Neumeister copy: US-NH LM 4708 [Ma21.Y11.A30]
[495] Christoph Wolff, *Bach: Essays on His Life and Music* (Cambridge, Massachusetts: Harvard University Press, 1991) 117.
[496] Fauré Edition: 2, vol. 1, iii: "Nous avons supprimé de cette collection des œuvres recueillies par les élèves du Grand Cantor et dont l'authenticité reste véritablement trop douteuse."
[497] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 3–6.
[498] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, iv.

"Récit : Gambe et Bourdon de 8
Posit. : Cromorne 8 (ou Clarinette 8)
et Flûtes 8 et 4 (boîte ouverte)
G.O. : Flûte 8
Pédale : Soubasse 16 seule"[499]

From the outset, Bonnet's use of a reed stop with the instruction "boîte ouverte" ("[swell] box open") indicates that the loudest registration would be on the positif. The request for a 16' stop by itself is also an unusual choice, as very few pieces from the French Romantic Organ School ask for only a 16' pitch in the pedal (normally in terms of pitch level priority in standard organ literature, 8' is the most important, then 16', then 4'). Bonnet's edition, like the setting of *In dir ist Freude*, indicates the end of phrase markings by breath marks. There are extensive instructions for registration and manual changes throughout. It is worth noting that Bonnet's edition was published in 1918, nearly five years after his recording session with Welte. However, there are many similarities between the edition and organ roll.

[499] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 3. It is worth noting that Bonnet's registration instructions in French produce a considerably different sound than those in English. In the case of this registration, Bonnet's suggestion for an Anglophone organ is:

Swell : Vox celeste and Aeoline 8' (box closed)
Great : Flute 8'
Choir : Clarinet 8', Flutes 8', 4' (box open)
Pedal : Soft 16' only

Fundamentally, the balance and sounds would be approximately the same: a solo reed on the Choir, strings on the Swell, and a single Flute on the Great. However, the individual timbres would sound quite different, as an Aeoline on a Casavant or E.M. Skinner organ from this period is typically much softer than its equivalent on a Francophone organ; similarly, a Cavaillé-Coll-style flute on the main manual would be considerably louder than a stop of the same name on a USA or Canadian organ. Also, the order of manuals is switched to the Anglophone order, from closest to the player to furthest away: choir, great, swell; on most French organs the order is great, choir, swell.

Registration

During the digitisation process at Seewen, this roll was scanned without difficulty, however the data regarding which stops were used is incomplete. Based on comparative analysis of the other Seewen digitisations, Table 2 shows the stops that Bonnet selected on the recording organ (in bold), with everything played on Manual II, except the portions of the score marked "piano," which were played on Manual I. The stops which are the author's best guess, based on the registrations given in Bonnet's edition, are marked in italics. As a result, a full registration analysis and comparison to Bonnet's edition will not be given.

Manual I		Manual II	
Bordun	16'	Wienerflöte	8'
Principal	8'	Bordun	8'
Traversflöte	**8'**	**Viola**	**8'**
Gambe	8'	Aeoline	8'
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	4'	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	**Oboe**	**8'**
Harfe		Vox Humana	8'
Glocken		Tremolo	
Manual II to I			
		Pedal	
		Violonbass	16'
		Subbass	**16'**
		Cello	8'
		Gedackt	8'
		Posaune	16'
		I to Pedal	
		II to Pedal	

Table 2: Bonnet's registration in his performance of J.M. Bach: *In dulci jubilo* (formerly BWV 751); the stops selected are in bold.

Tempo

Bonnet's performance of this piece is characterised by an unequivocally unsteady tempo. The baseline from the tempo analysis of the piece is minim/half note equals 104, which is very close to the tempo marking in Bonnet's own edition: minim/half note equals 100.[500]

Figure 1 is a line chart comparison in which the horizontal axis shows each minim/half note in succession, and the vertical axis shows the duration of each note. The light grey line shows the tempo when the piece is played with no deviation in the tempo; the darker line shows the degree to which Bonnet increases or decreases his performance of the minims/half notes.

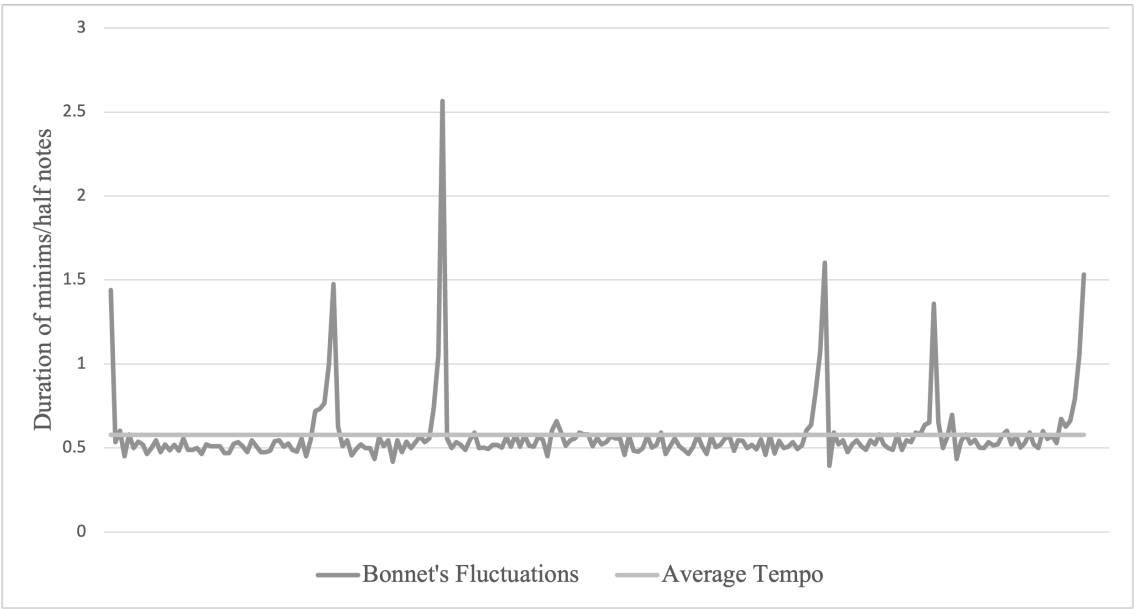


Figure 1: Tempo chart of Bonnet's performance of *In dulci jubilo*, BWV 751, at the minim/half note level.

[500] The only activity in bar 1, beats 1–2 is a beginning pedal point on beat 1 that is held until bar 25. As such, it is impossible to tell where exactly Bonnet felt the second beat occurring, and therefore the first two beats have been omitted from the overall tempo analysis.

Throughout, the darker line of Figure 1, Bonnet's performance, shows considerable variation in the amounts of time between each beat. There is almost no point at which Bonnet's tempo is completely steady. The spikes throughout are areas in which Bonnet adds extreme amounts of rubato. As this chorale does not appear in any of the other French Romantic Organ School's major Bach editions, the following analysis of this roll recording will reference Bonnet's edition. Each ritardando/rallentando corresponds exactly to the moments in Bonnet's edition in which he suggests adding tempo fluctuation: bars 16, 25, 34, 52, 61 and 72. Each of these instances are basically the same amount of tempo decrease, with the exception of bar 25, in which Bonnet takes an entire 2.5 seconds of silence before beginning bar 26. This could possibly be a reflection of the chorale's form, as the portion of the *cantus firmus* from bars 62–68 is the only time in which the same phrase of text (in the first verse "Alpha es et O") is repeated.[501]

Articulation

The first two notes of the manuals are repeated. Staying true to the teachings of Widor and Guilmant, Bonnet breaks the default articulation of absolute legato, with a ratio of sound to silence summarised in Table 2.

Duration of minim/ half note	**Duration of pitch**	**Duration of silence**	**Approximate ratio of pitch to silence**
0.564 sec	0.38 sec	0.184 sec	2:1

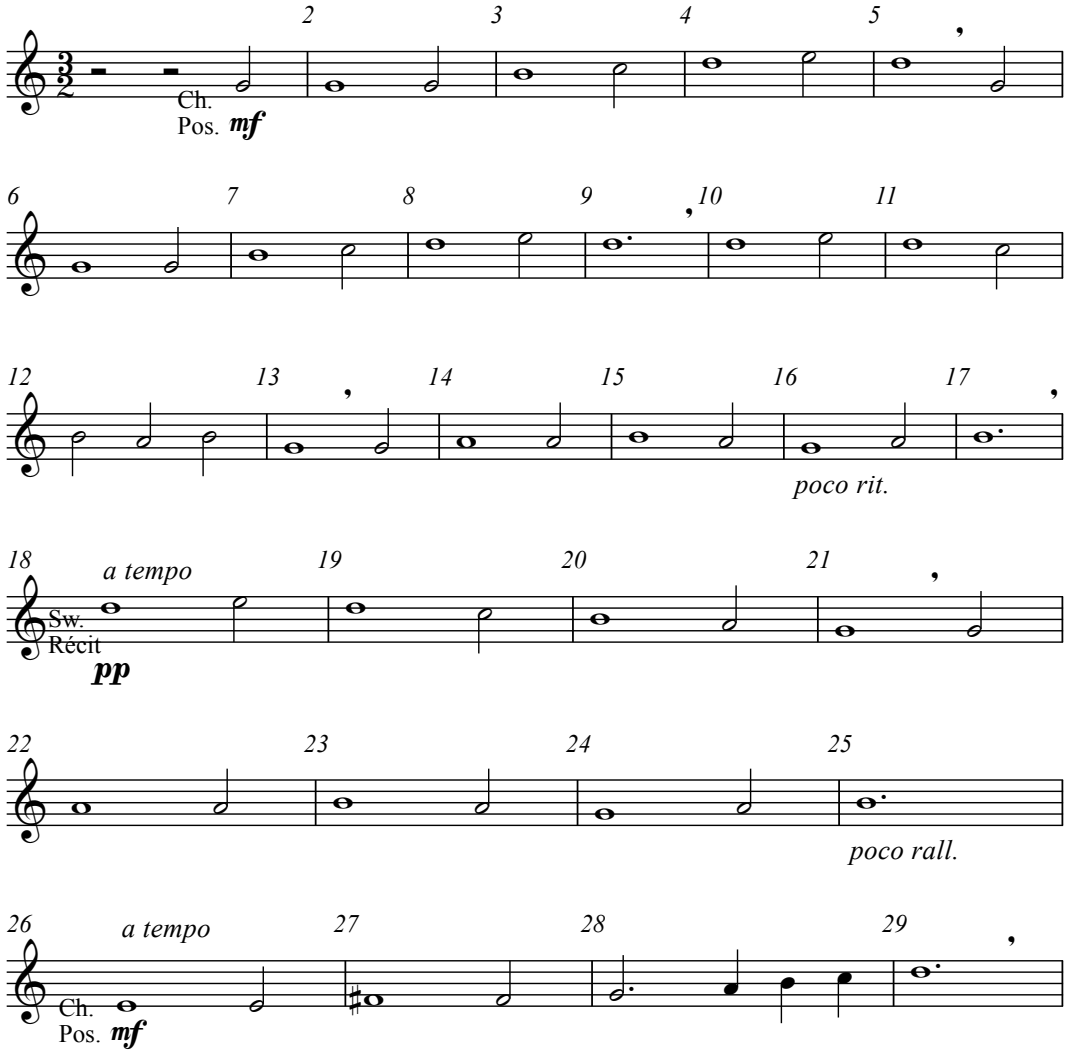
Table 2: Summary of the repeated alto line B pitches in the right hand of J.M. Bach: *In dulci jubilo* (formerly BWV 751), as performed by Bonnet.

[501] The text presumably most used by Bach himself can be seen in his four-part harmonisation of the chorale, BWV 368.

In this single minim/half note, ratio of sound to silence in the first note is almost exactly 2:1, which matches the theoretical ratio of Widor and Vierne.

Breath Markings in the Cantus Firmus

The soprano line of this piece is almost entirely the chorale melody *In dulci jubilo*, and the Bonnet edition includes breath marks throughout at the ends of each phrase. This can be seen in Figure 3.[502]



[502] The soprano line only from the Bonnet Edition 3–6.

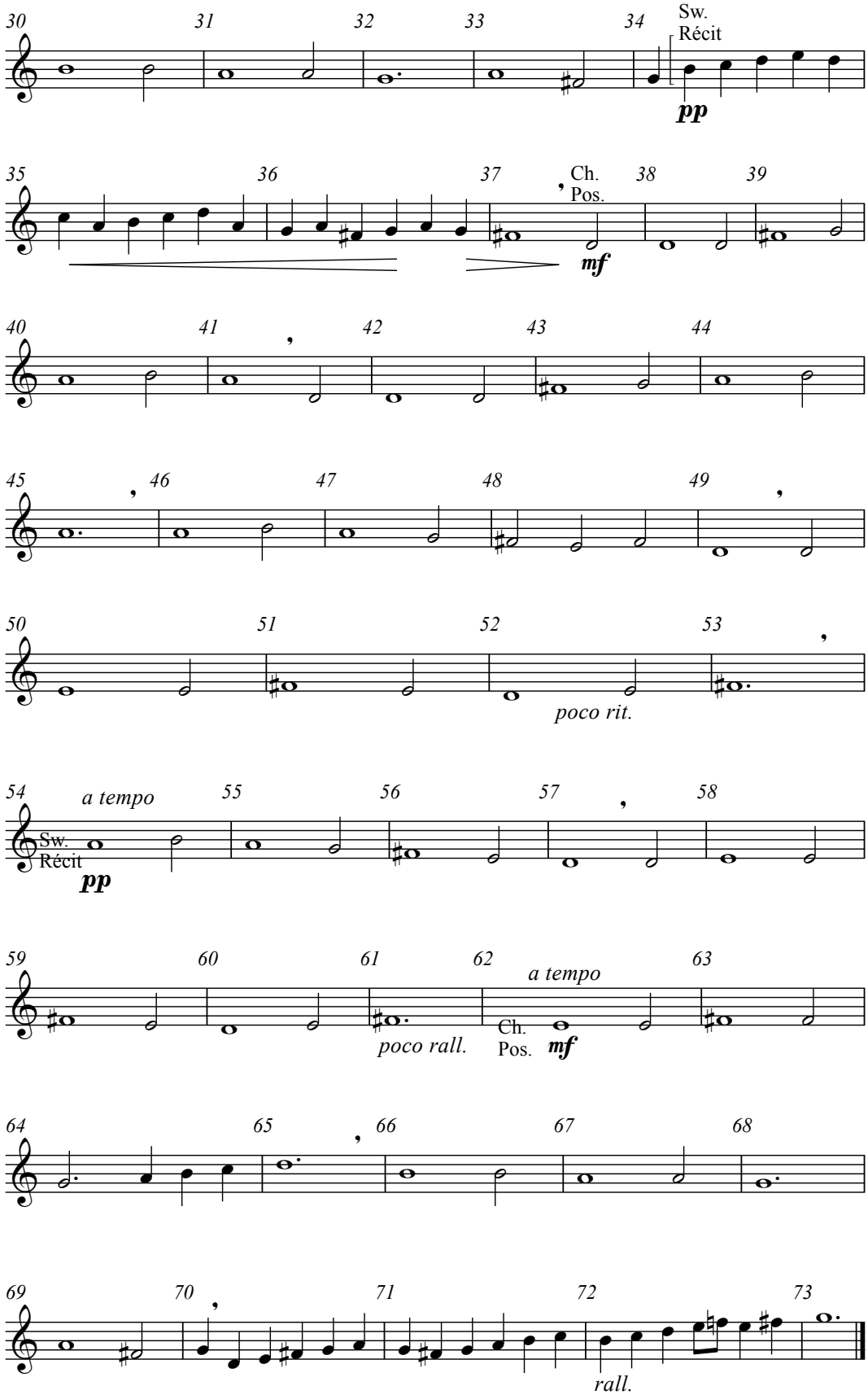


Figure 3: The soprano line of J.M. Bach: *In dulci jubilo* (formerly BWV 751) in the Bonnet edition.

The degree to which Bonnet adds breath markings is not consistent; in the chorale, one would think there should be breaths after bars 26 and 61, as indeed the corresponding moments are marked with breaths in Bach's four-part harmonisation of *In dulci jubilo* (BWV 368). In performing the chorale prelude, the degree to which Bonnet follows his breath markings is variable. In many cases, because the note before and after the breath marking are identical, there would inevitably be some separation and therefore breaking of the principle of absolute legato, no matter who was playing. The ratios of sound to silence at each instance of a breath mark is shown in Table 3; the note in question is always the note which precedes the breath marking.

Bar	**Note duration**	**Pitch duration**	**Silence duration**	**Ratio of sound to silence, rounded**
5	0.996	0.996	0.000	N/A
9	1.460	1.360	0.100	13.6:1
13	1.027	0.879	0.148	6:1
21	1.036	0.872	0.164	5:1
29	1.524	1.491	0.033	45:1
37	1.080	0.732	0.348	2:1
41	0.984	0.888	0.096	9.25:1
45	1.523	1.407	0.116	12:1
49	1.005	0.900	0.105	8.5:1
57	1.060	0.871	0.189	4.6:1
65	1.640	1.616	0.024	67.33:1
70	0.287	0.272	0.015	18:1

Table 3: Summary of the value of each pitch preceding a breath marking in J.M. Bach: *In dulci jubilo* (formerly BWV 751), as performed by Bonnet.[503]

Table 3 shows that there is no consistency in the amount of space Bonnet places after notes. In the case of bar 65, for example, the ratio of 67.33:1 is nearly completely inaudible to the ear when listening to this played back on the Seewen organ.

[503] The breath markings at bars 17 and 53 are ignored, as they are approached by a ritardando with a tutti breath after the note in all the manual parts, which is not representative of typical articulation within a phrase.

Conclusion

This organ roll shows a multitude of ways in which Bonnet's approach to Bach (or a work that he thought was by Johann Sebastian) differs from that of Gigout.

1. The default articulation in this work is absolute legato, yet repeated notes and breath marks in Bonnet's own edition of this work are approached without a strong methodical approach.

2. In the case of tempo, Bonnet follows his edition's recommendations to within 4 BPM of his metronome marking. Further, he observes all the rallentando and ritardando suggestions in his edition.

Chapter 14: Roll 1200 — Bonnet Plays *Prelude and Fugue in E Minor*, BWV 533

Introduction

The *Prelude and Fugue in E Minor*, BWV 533[504] exists only in copies, of which the only contemporary version is by Johannes Ringk, a student of Johann Peter Kellner, a member of the Bach circle. Peter Williams notes that the most other important copies were from Johann Caspar Vogler (which contains only the fugue), an eighteenth-century copy, and another from the early nineteenth century of the prelude by itself.[505] The Ringk source most likely comes via C.P.E. Bach or Johann Christian Kittel, making it the most reliable. In this source, the piece is entitled "Praeludium con Fuga E Moll. Pedaliter," and is copied in two staves.

Registration

Bonnet's Bach edition includes four free works; the registrations of the first movements are shown in Table 1:

[504] Bonnet's choice to record BWV 533 would seem to potentially clarify the question as to which Bach e-minor prelude and fugue was popular among the French Romantic Organ School. As noted previously, Gigout played an e-minor prelude and fugue on several occasions throughout his career, as did César Franck. Whether that was BWV 533, 548, or 555 (which in the French Romantic Organ School is only mentioned as being a piece which Franck's students played at conservatoire exams) is unclear (Smith, *Toward an authentic interpretation*, 107). However, BWV 533 was not included in the Fauré edition, whereas BWV 548 was, indicating perhaps the piece was not so popular among Fauré's audience at least. Yet Bonnet considered the piece worthy enough to warrant a recording. In the end, which e-minor prelude and fugue was the most popular is unclear.

[505] Williams, *The Organ Music of J.S. Bach*, 45. Vogler copy: D-LEb Breitkopf Mus. ms. 2, Ringk: D-B Mus.ms. Bach P 425; copy via C.P.E. Bach (scribe: Johann Heinrich Michel): D-B Mus.ms. Bach P 287; copy via Kittel (scribe: Johann Nikolaus Gebhardi): D-B Mus.ms. Bach P 320; unknown scribe, eighteenth century: D-B Mus.ms. Bach P 804; another unknown scribe, first half of the nineteenth century, prelude only: D-B Mus.ms. Bach P 301.

Prelude in D Major, BWV 532

Récit	:	Fonds, anches, mixtures 8, 4, 2
Posit.	:	Fonds, anches, mixtures 8, 4 Récit accouplé
G.O.	:	Fonds, anches, mixtures 16, 8, 4 Récit et Pos. accouplés
Pédale	:	Fonds et anches 16, 8 tirasses G.P.R.

Prelude in G Major, BWV 541

Récit	:	Fonds, Anches, Mixtures 8, 4, 2
Posit.	:	Fonds, Anches, Mixtures 8, 4, 2
G.O.	:	Fonds, Anches, Mixtures 8, 4, 2, Claviers accouplés
Pédale	:	Fonds et Anches 16, 8, 4, Tirasses, G.O., Pos. Récit

Fantasie in G Minor, BWV 542

Récit	:	Fonds 8, Flûte 4, Anches 8, 4 et plein jeu
Posit.	:	Bourdon 8, Flûte 8, Salicional 8, Montre 8, Anches Mixtures
G.O.	:	Bourdon 8, Flûte 8, Montre 8, Anches, Mixtures
Pédale	:	Soubasse 16, Flûte 16, Bourdon 8, Flûte 8, Violoncelle 8, Anches 16, 8, 4

Toccata in D Minor, BWV 565

Récit	:	Grand chœur sans 16
Posit.	:	Grand chœur sans 16. Récit accouplé
G.O.	:	Grand chœur avec fonds 16. Claviers réunis
Pédale	:	Fonds 32, 16, 8, 4, Anches 16, 8, 4, Tirasses

Table 1: Bonnet's suggested registrations in four Bach free works.[506]

In short, all these registrations are variations on using the full organ, all of which call for Anches (reeds), mixtures, and fonds (foundations, i.e. flue stops). It is noteworthy that, for Bonnet, it seems that the fonds did not include string stops; while

[506] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2: 82, 102, 116, 136.

he simply asks for "fonds" in his registrations for BWV 532 and 541, he does not in BWV 542, rather specifying the Francophone bourdon, harmonic flute, and principal.

Bonnet collaborated on Fauré's Bach edition in the third volume on the Concertos, writing a brief preface on the differences between modern organs and his ideas on the kind of organ Bach would have known. This will be discussed further in Chapter 15, but he concludes his discussion with the following about performing the preludes and fugues.

> "Depending on the character of the pieces and the degree of intensity that one wishes to obtain, one sometimes employs the foundation stops, sometimes a mixture of foundations and mutations to which one can sometimes add reed stops.
>
> "One should use these last stops with great discretion, as should the same 16' [foundation stops] on the manuals. These are excellent in some Preludes and in certain [chorale preludes], but will be strictly excluded from the registration of Fugues.
>
> "The Récit will preferably be entrusted to the Cornet, the Nazard, the Cromorne, and accompanied by jeux doux.
>
> "Bach performed the main parts of his Preludes and Fugues on the keyboard of the Grand Orgue, and the episodes without pedals usually on the Rückpositiv."[507]

Bonnet plays the entire *Prelude* using the Tutti, which on the Welte recording organ included all the foundation stops, mutations (Sesquialtera II), and reed stops, as Bonnet suggested above. In the case of Bonnet's suggestion for the Récit, the Cornet and

---

[507] Joseph Bonnet in Fauré Edition 3, ii: "Suivant le caractère des pièces et le degré d'intensité que l'on désirera obtenir, on emploiera tantôt les jeux de fonds, tantôt un mélange de fonds et de mutations auxquels on pourra parfois ajouter quelques jeux d'anches.
"On observera une grande discrétion vis à vis de ces derniers jeux ainsi que des 16 pieds des claviers manuels. Ceux-ci excellents dans quelques Préludes et dans certains Chorals seront rigoureusement exclus de la registration des Fugues.
"Les Récits seront confiés de préférence au Cornet, au Nazard, au Cromorne, et accompagnés par des jeux doux.
"Bach exécutait les parties principales de ses Préludes et Fugues sur le Clavier du Grand Orgue, et les épisodes sans pédales généralement sur le Rückpositiv."

Cromorne are rarely included on the swell of a Germanic Romantic organ like Welte's recording instrument; however, the closest thing to a cornet would be the Sesquialtera on Manual I, and the Oboe 8' on Manual II would be the equivalent to a cromorne (the timbre of the Clarinette 16' is slightly closer to a cromorne, but on the Welte recording organ this is at the wrong octave). The jeux doux refers to foundation stops, as discussed in Chapter 2. Finally, the tutti on a Welte organ includes the Glocken, a stop whereby sound is produced not by pipes, but small pitched bells, similar to a modern orchestral Glockenspiel. With these combinations of stops, the Welte organ comes close to what Bonnet envisioned on a Francophone organ in this *Prelude*, plus the little bells.

The Roll

During the digitisation process at Seewen, this roll was scanned without difficulty, but the conversion of the roll data to MIDI caused several problems. The most obvious to the listener upon hearing the roll played back in Seewen is that the Posaune 16' is always on in the pedal, despite the rest of the registration being some of the softest 8' foundations in the manuals. The listener also will hear what appears to be one of the 4' flute stops pulled on around bar 10, beat 2, but there is no registration change in the original roll. There is a note on the master roll at the entrance of the pedal in bar 19 just before the entrance of the subject in the tenor: "? Gt to Ped".[508] This may have been a question the editors meant to ask Bonnet, or a decision that would have been made internally at the Welte factory; in the end, the Manual I to Pedal coupler was activated from the outset of the piece.

[508] "Gt" refers to the great, which is the dominant manual on any organ in English terminology. In the case of the Seewen organ, this is Manual I.

Analysis of the Prelude

Bonnet's performance of the opening 10 bars of the *Prelude* show several different approaches to the same rhythmic figure. The movement opens with a single line in bars 1–5; Bonnet's default articulation here is absolute legato, typical of the French Romantic Organ School's performance practice. The score to bars 6–10 are shown in Figure 1.

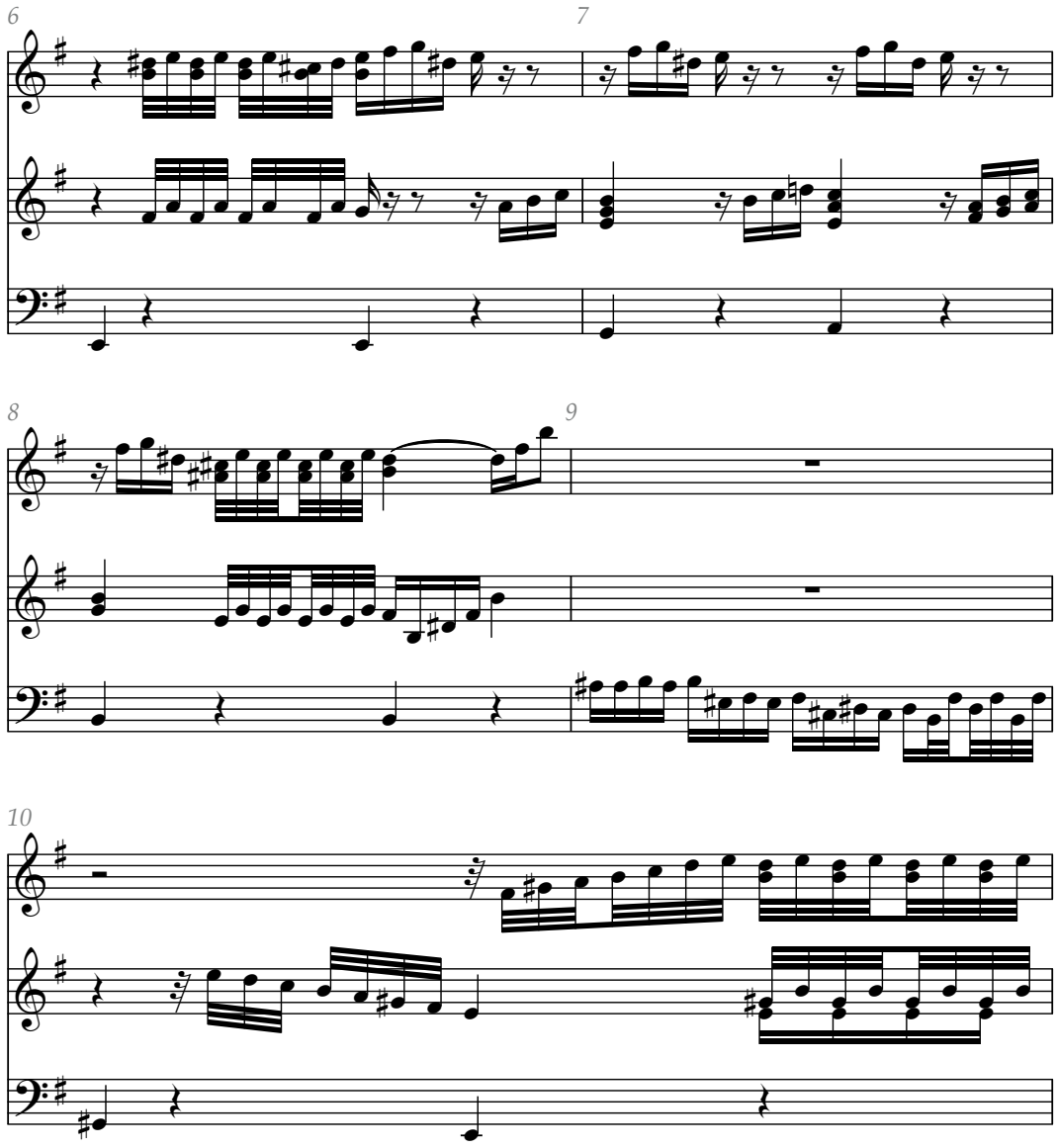


Figure 1: Score of J.S. Bach: *Prelude in E Minor, BWV 533*, bars 6–10.

On beats one and three of bars 6–8, there is a strong accent, which takes the form of either a single pedal note or a large chord in the manuals along with a pedal note; in bars 6 and 8, Bonnet performs a slight accelerando on both groups of repeated demisemiquavers/thirty-second notes. He does the same in the last beat of bar 9. However, in bar 10, the identical passage rhythmically is performed metronomically, without accelerando. Figure 2 shows these moments in the score, and Figure 3 compares the accelerando demisemiquavers/thirty-second notes in bar 6 to the same rhythmic figure in bar 10 without the accelerando.

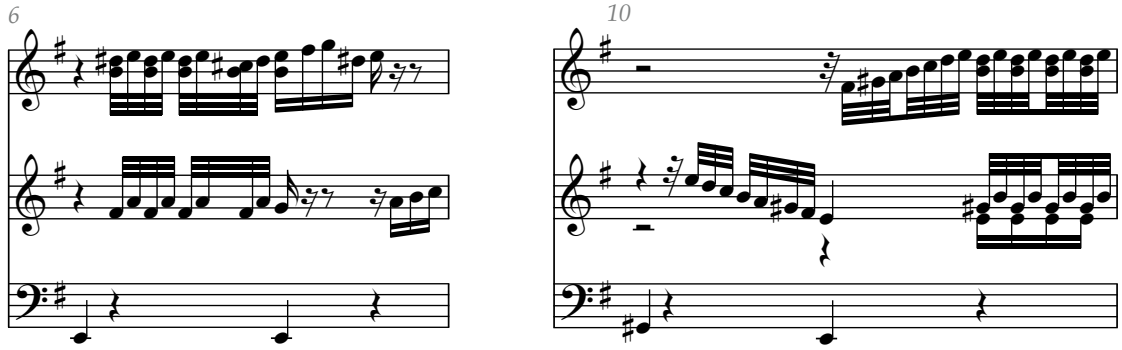
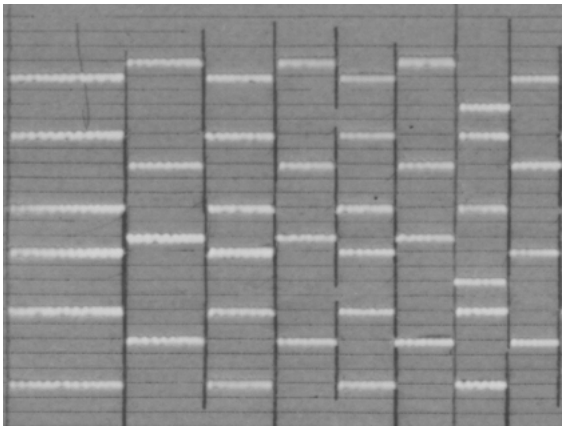


Figure 2: J.S. Bach: *Prelude in E Minor*, BWV 533, bar 6 (left) and bar 10 (right).

Bar 6, beat 2, manuals:



Bar 10, beat 4, manuals:

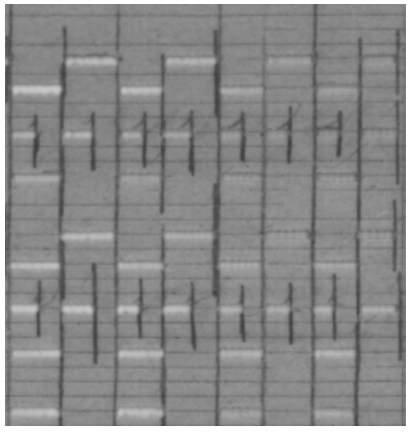


Figure 3: Scan of Bonnet's organ roll performance of J.S. Bach: *Prelude in E Minor*, BWV 533. The image on the left shows the demisemiquavers/thirty-second notes in bar 6, while the right shows the same rhythmic figure in bar 10.

In Figure 3, each demisemiquaver/thirty-second note chord is represented as a vertical column separated by long vertical pencil marking; between each of these pencil markings is a chord. Based on this, the upper image shows a clear acceleration in terms of rhythm; each chord gets shorter. Conversely, the second image shows a nearly identical length of each chord. This indicates that, for Bonnet, an adherence to strict metronomic playing was not important, and there could be flexibility in the performer's approach to this kind of figure.

It is also worth noting that in bar 8 beat four, instead of lifting as Bach marks, Bonnet simply holds every note of the previous chord, along with the new pitches in bar 8, beat 4. This is shown in Figure 4.

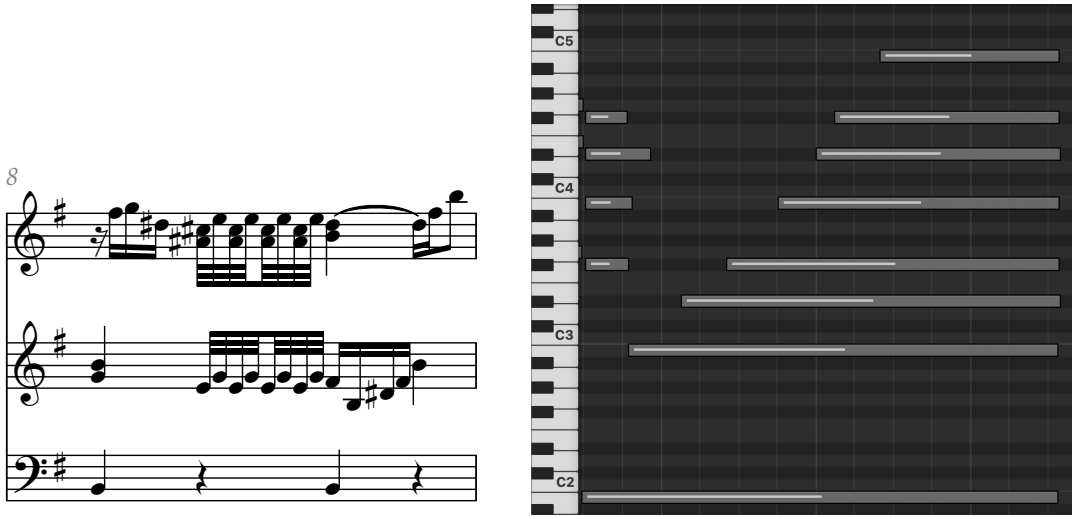


Figure 4: Left: Score of J.S. Bach: *Prelude in E Minor*, BWV 533, bar 8.
Right: Digital representation of Bonnet's organ roll performance of
J.S. Bach: *Prelude in E Minor*, BWV 533, bar 8, beats 3–4.

Instead of releasing the chords indicated, Bonnet holds them; on the organ the addition of notes like this creates a natural crescendo, without the manipulation of the swell pedal or adding of stops.

One part of Bonnet's performance that defies any written source on Bach performance practice in the French Romantic Organ School is his placement of each pedal note in bars 14–17. In this section, the texture comprises the soprano melody juxtaposed against chords the lower four voices, which move almost entirely in homophony. Here, instead of articulating these chords together as Bach marks in the score, he consistently plays the pedal slightly early. This can be seen in Figure 6.

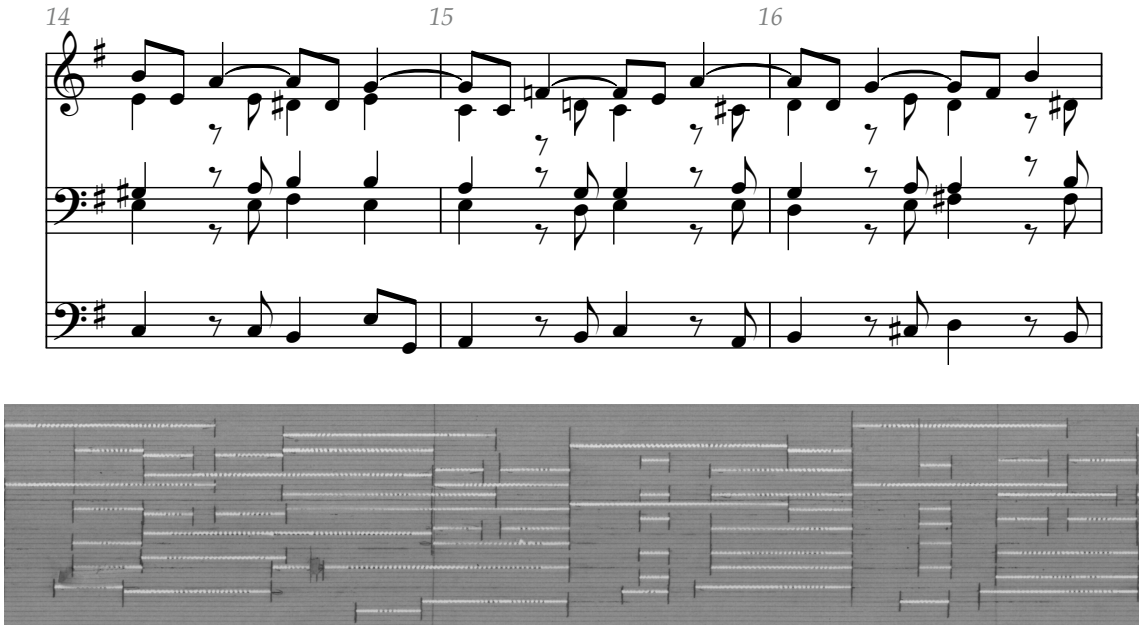


Figure 6: Above: Score of J.S. Bach: *Prelude in E Minor*, BWV 533, bars 14–16.
Below: Scan of Bonnet's organ roll performance of J.S. Bach:
Prelude in E Minor, BWV 533, bars 14, beat 2–bar 16, beat 1.

In the scan of the roll, the lowest set of lines represent the pedal, and each horizontal line represents the beginning and ending of a note. Each of the pedal notes begins slightly earlier (i.e. it begins slightly to the left) of each manual note. This performance practice then continues until bar 20, beat 1. Thereafter, Bonnet continues playing the pedal slightly early, but only before beat 1 of each bar. This was clearly intentional, as the Welte editors did not correct these instances, but did correct other small errors throughout. In some cases, it appears they even shortened the amount that Bonnet

played the pedal note ahead of the rest of the chord, but still did not line everything up completely. This can be seen in Figure 7.

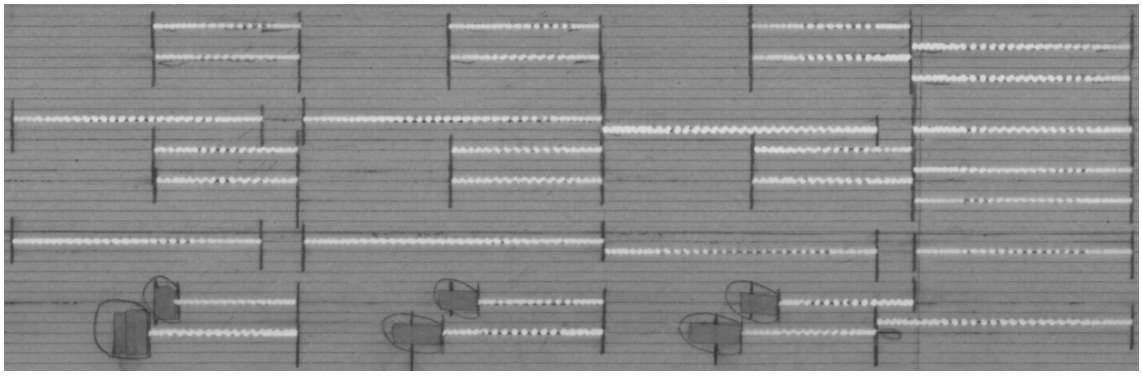


Figure 7: Scan of Bonnet's organ roll performance of
J.S. Bach: *Prelude in E Minor*, BWV 533, bar 21, beats 2–4.

In general, Welte editors changed the length of a note in their master copies by marking over the note that is too long with red tape, and then adding a line in pencil exactly when the pitch should have begun or ended. In this case, not only did they allow Bonnet's rolling to continue, but they even shortened the lowest tenor voice slightly to create an even greater arpeggiation effect.

Analysis of the Fugue

The subject of the *Fugue* begins with two repeated B notes: a quaver/eighth note followed by a crotchet/quarter note, the latter with a mordent. As such, theoretically, Bonnet should play the first note as "demi-staccato", as per Widor's suggestion. Figure 8 shows the fugue subject, and Table 2 shows the duration of sound to silence in Bonnet's performance.

Note	Note duration	Pitch duration	Silence duration	Ratio of sound to silence, rounded
1	0.740	0.339	0.401	1 : 1.18
3	0.685	0.424	0.261	3.25 : 2

Table 2: Summary of the value of some of the first pitches in
J.S. Bach: *Fugue in E Minor*, BWV 533/II, as performed by Bonnet.

According to Table 2, Bonnet performs the first repeated note at a nearly equal ratio of sound to silence, and the second at a ratio that is very close to Widor's ideal ratio. In reality, the specificity of such tiny amounts of time makes little difference — the larger picture is that Bonnet was indeed placing some articulation between repeated notes.

Which Edition?

The question as to which edition Bonnet used can be largely narrowed down by examining ornaments and editions. The performance of ornaments in this fugue is highly consistent: Bonnet begins mordents and trills from the written note. However, he leaves out a number of ornaments that appear in the *Neue Bach-Ausgabe* (*NBA*). It is possible, to guess the edition from which Bonnet was playing based on the ornamentation in each, or lack thereof. In bar 22 in the soprano line, the *NBA* suggests a mordent on beat 2, and a trill on beat 4; similarly in bar 23 in the alto line, there is a trill on beat 4.5. Likewise, in bar 27 in the soprano on beat 1 and bar 35 in beat 2 there are turns. Bonnet ignores all of these. He does, however, play several ornaments when they are not notated in *NBA*: he adds mordents on the crotchets/quarter notes of the theme in the pedal in bars 12–13, as well as 33–34. These are consistent with the ornaments suggested in the Bach-Gesellschaft, Fauré, and Peters Editions. However, the Bach-Gesellschaft Edition only shows three voices in bar 34, whereas Bonnet played the four-note version in the Fauré and Peters. The other clue is that in bar 32, Bonnet plays the

first D in the alto voice on beat 2 as a crotchet/quarter note, whereas *NBA* shows it as a quaver/eighth note following a dotted crotchet/quarter note. Both Fauré and Peters agree with this. However, since the Fauré Edition was not published until 1916, Bonnet was probably playing from the Peters Edition or one based directly on it.

Registration

Unlike the *Prelude*, the *Fugue* opens with a very soft registration. This can be seen on the master roll directly following the conclusion of the *Prelude*. Bonnet employs the registration shown in Table 3.

Abb.	Manual I		Abb.	Manual II	
	Bordun	16'	Fl.	**Wienerflöte**	**8'**
Pr.	**Principal**	**8'**		Bordun	8'
Ft. 8	**Traversflöte**	**8'**		Viola	8'
	Gambe	8'	E.	**Aeoline**	**8'**
Or.	**Viol. d'orch.**	**8'**		Dolce	4'
	Vox coelestis	8'		Quinte	2 ⅔'
	Flöte	4'		Clarinette	16'
	Piccolo	2'		Trompette	8'
	Sesquialter	II		Horn	8'
	Fagott	8'		Oboe	8'
	Harfe			Vox Humana	8'
	Glocken			Tremolo	
	Manual II to I				
				Pedal	
				Violonbass	16'
			S. 16	**Subbass**	**16'**
				Cello	8'
				Gedackt	8'
				Posaune	16'
				I to Pedal	
				II to Pedal	

Table 3: Bonnet's registration in his performance of J.S. Bach: *Fugue in E Minor*, BWV 533/II; the stops selected are in bold.

Bonnet here employs most of the 8' foundation stops, but curiously, not all of them; the Manual I Gambe 8' and Manual II Bordun 8' and Viola 8' are all missing. This appears to be yet another deviation from the typical practice of the French Romantic Organ School; according to most theoretical writings, as discussed in Chapter 3, the foundations at 8' should include all principal, flute, and string stops. Bonnet's only using part of this is likely a way to increase the dynamic contrast between the tutti of the *Prelude* and the gentle disposition he wanted to convey in the *Fugue*.

Bonnet manipulates the swell box in several places throughout the piece; these instances are shown in Table 4.

Bar	**Box Position**
Bars 1, beat 1 – bar 4, beat 3	Closed
Bar 4, beat 4 – bar 16, beat 2.5	Open
Bar 16, beat 2.5 – bar 28, beat 4	Closed
Bar 29, beat 1 – bar 30, beat 1	Open
Bar 30, beat 2 – end	Closed

Table 4. List of dynamic changes achieved by the swell pedal in Joseph Bonnet's organ roll performance of J.S. Bach: *Fugue in E Minor*, BWV 533.

These movements of the swell shades have nothing to do with the overall architecture of the piece, as Widor suggested and Gigout followed in several of his organ roll recordings. The opening of the box at bar 4, beat 3 could reflect the increase of rhythmic motion generated by the addition of semiquavers/sixteenth notes. Closing it at a nearly equivalent place musically at bar 16 is a way to show contrast. The opening of the box at bars 29–30 could be more related to trying to highlight the descending sequence toward the end of bar 30.

However, it is worth noting that Bonnet highly consistent in terms of articulation in moments when there should be, according to Widor's teaching, multiple articulations in one hand based on voice leading, as seen in Bonnet's approach to bar 20.

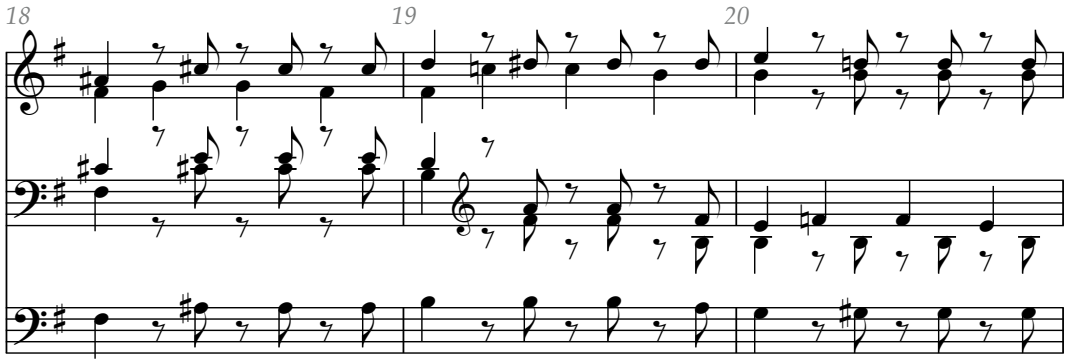


Figure 11: Score of J.S. Bach: *Prelude in E Minor*, BWV 533, bars 18–20.

In this case, the soprano voice, being two repeated B notes, should be performed with separation, while the two lower voices remain absolute legato. Bonnet does exactly this, as shown in Figure 8.

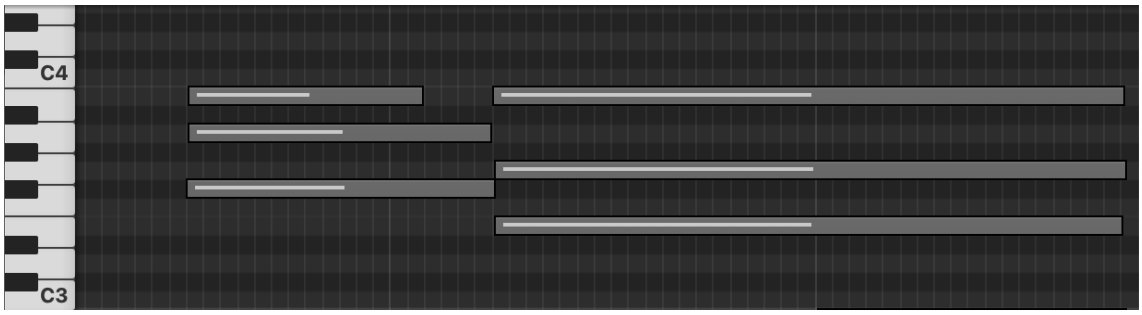


Figure 8: Digital representation of Bonnet's organ roll performance of J.S. Bach: *Fugue in E Minor*, BWV 533, bar 20, second and third chords in the upper three voices.

The top voice is indeed separated, while the lower two voices play absolute legato.

Conclusions

This performance of the *Prelude and Fugue in E Minor* shows several important divergences from the traditional theoretical teachings of members of the French Romantic Organ School:

1. Chords can be arpeggiated, with the lowest note coming slightly before the beat.

2. Multiple chords in a row are usually separated unless there is a structural reason.
3. Dynamic changes in a fugue do not have to conform to the larger architecture of the piece.
4. Notes in a given edition can be changed according to the player's taste.

Many aspects of Bonnet's articulation follow that of the generation before him, particularly there being some separation between repeated notes. However, he is not as rigid about the exact amount of space as Gigout.

Chapter 15: Roll 761 — Erb Plays *Concerto in A Minor: II. Adagio*, BWV 593

Introduction

The basis of BWV 593 is Antonio Vivaldi's *Concerto in A Minor for Two Violins*, Op. 3, No. 8, composed between 1700 and 1710 and published by Estienne Roger in Amsterdam in 1711.[509] Peter Williams points out that while Roger's print most likely was the source of J.S. Bach's transcription into BWV 593, there is some uncertainty, in part due to the lack of an autograph.[510] The earliest copy is by Johann Friedrich Agricola, with the following inscription on the title page: "Concerto of Mr Ant. Vivaldi arranged for the organ for two keyboards and pedals by Mr Giovanni Sebastiano Bach."[511] The two earliest copies after this are by Leonhard Scholz of Nuremberg, from the second half of the eighteenth century, and an unknown scribe from 1780.[512]

Editions

It is in these Concerti that the Fauré edition adapts Bach's manual instructions to the modern Francophone organ; this was likely because Joseph Bonnet joined as the co-editor for the volume.[513] Both editors, like Schweitzer and Widor, were in favour of modernisation and have several thoughts on this topic; Fauré offers the following:

> "From the fact that the resources of the organ in the time of J.S. Bach were very limited, does it follow that in order to perform works he wrote for this instrument in our days, one must do without the advantages with which so many successive improvements have enriched modern organs? It would be as childish to refrain from performing the *Preludes and Fugues*, the *Suites*, the *Inventions*, the *Concertos* by the same author on the piano, on the pretext that these pieces

[509] Antonio Vivaldi, *L'estro armonico, Op. 3*, Book 2 (Amsterdam: Estienne Roger, n.d. [1711]).
[510] Williams, *The Organ Music of J.S. Bach*, 209.
[511] D-B Mus.ms. Bach P 400b: "Concerto del Sig[re] Ant. Vivaldi accommodato per l'Organo a 2. Clav. e Ped. dal Sig[re] Giovanni Sebastiano Bach."
[512] Scholz: D-LEb Rara Ib, 134, Unknown scribe, 1780: D-B Mus.ms. Bach P 288.
[513] Fauré Edition 3.

> were composed for the harpsichord. Some organists consider that, on the contrary, current means of expression cannot be applied to the performance of Bach's works without the risk of altering their character. Relying on the fact that his manuscripts (like most of the manuscripts of this period) are devoid of indications of nuances, they hold to alternating the *forte* and the *piano*, the *piano* and the *forte*, which already constitutes arbitrariness; so why not do everything one can to revive the interest of these works, instead of exaggerating what [style] they sometimes present as being a little antiquated? The evil from which masterpieces suffer is the excessive respect with which they are surrounded, and which ends up making them boring.
>
> "Nevertheless, when playing certain pieces of Bach, it will be necessary to consider that such or such a sound which is very particular to old organs is no longer found on modern organs. A performer gifted with ingenuity and *taste* will know how to obtain, by combinations of stops, equivalent sounds."[514]

Fauré here establishes several important considerations. First, he is in favour of applying expression achieved through modern organ technology to the works of Bach; however, that was already clear from the prefaces to his earlier volumes. Second, he disparages old manuscripts, saying they are "devoid of indications of nuances." He never goes near the level of editorial markings as Bonnet's edition, but there are more liberties added to this Fauré Edition volume than any of the others, possibly due to Bonnet's influence. Fauré then notes that there were significant differences between the

[514] Fauré Edition 3, i. It is worth noting that there are some differences between the French and English translation in the edition; the English reproduced above is a new translation, which endeavours to capture the more direct language of Fauré's original French: "De ce que les ressources de l'orgue, au temps de J.-S. Bach, étaient fort limitées, s'en suit-il que pour exécuter de nos jours les œuvres qu'il écrivit pour cet instrument, on doive se priver des avantages dont tant de successifs perfectionnements ont enrichi les orgues modernes? Ce serait aussi puéril que de s'abstenir d'exécuter sur le piano les *Préludes et Fugues*, les *Suites*, les *Inventions*, les *Concertos* du même auteur, sous prétexte que ces pièces furent composées pour le clavecin. Quelques organistes estiment qu contraire qu'on ne saurait appliquer les moyens d'expression actuels à l'exécution des œuvres de Bach sans risquer d'en altérer la caractère. S'appuyant sur ce que ses manuscrits (comme la plupart des manuscrits de cette époque) sont dépourvus d'indications de nuances, ils s'en tiennent à faire alterner le *forte* et le *piano*, le *piano* et le *forte*, ce qui constitue déjà de l'arbitraire; alors pourquoi ne pas l'étendre à tout ce qui peut revivifier l'intérêt de ces œuvres, au lieu d'exagérer ce qu'elles présentent parfois d'un peu suranné? Le mal dont souffrent les chefs-d'œuvre, c'est le respect excessif dont on les entoure et qui finit par les rendre ennuyeux.

"Néanmois, en faisant entendre certains pièces de Bach, il y aura lieu de tenir compte de ce que telle ou telle sonorité très particulière aux anciennes orgues ne se retrouve plus dans les orgues modernes. Un exécutant doué d'ingéniosité et *goût* saura obtenir, par des combinaisons de jeux, des sonorités équivalentes."

organs a composer like Bach would have known, and the modern instruments of Cavaillé-Coll and his competitors. Most importantly, though, he acknowledges that, at least around the time of publication (1920), there was a significant debate between those who wanted to use the advancements of the modern organ, versus those who felt a more restrained approach using only the means of expression Bach knew. It is unclear, though, as to who fell into the more "purist" camp; as we have seen, the major figures — Bonnet, Fauré, Gigout, Guilmant, Schweitzer, Vierne, and Widor — were in favour of using registration changes and the swell box in Bach's works. At this stage in the French Romantic Organ School's development, its members increasingly speak of the differences between new and old organs. Bonnet's portion of the preface expands on this:

> "May we be permitted to add that the organ, even the most modern, cannot do without a sufficient variety of sets of simple and compound mutations: quintes, nazards, tierces, septièmes, cornets, fournitures, plein-jeux, and that the organ clarinet cuts a poor figure compared to the cromorne, so full of grace and character, by turns grave and collected, spiritual and sly."[515]

Consistent with his Registration Instruction A for a fast movement of a trio sonata, Bonnet advocates for an organ which is ultimately French Baroque in nature, rather than from eighteenth century Saxony or Thuringia. While quintes, nazards, septièmes, and cromornes appear on organs by builders like Gottfried Silbermann or Hildebrandt, the fourniture and plein-jeux were unique to Francophone instruments (see Chapter 2). Bonnet then reflects on recent developments in organbuilding:

> "But the errors of the Romantic era did not spare organ building, and we can still see 19th century instruments lacking traditional timbres, without which, however, there is no complete organ.

[515] Joseph Bonnet, Fauré Edition 3, ii. The English translation given in the preface has some considerable differences to Bonnet's original: "On nous permittra d'ajouter que l'orgue, même le plus moderne, ne peut se passer d'une variété suffisante de jeux de mutations simples et composées: quintes, nazards, tierces, septièmes, cornets, fournitures, plein-jeux, et que la clarinette d'orgue fait une piètre figure au lieu et place du cromorne si plein de [g]race et de caractère, tour à tour grave et recueilli, spirituel et narquois.

> "Organists and organists have now come back from these mistakes, and many modern organs have the sounds from the time of Bach and Couperin, essential for the performance of the music of these Masters..."[516]

Here Bonnet disparages instruments like Sainte-Clotilde, which lacks the "traditional timbre" of a cromorne, instead replacing it with a clarinet. He instead praises the newer Francophone organs of the early twentieth century which contain more of the stops one would associate with eighteenth-century music. Yet there are still no specific guidelines given for registrations in the Fauré edition.

The Fauré Edition of this *Concerto* takes a few liberties with that of the Agricola copy and the Peters edition. It is likely that the Peters edition was the basis of Fauré's edition for this piece, as the spacing between pages is identical — i.e. the first page of both Peters and Fauré are bars 1–18, the second 19–40, and so on except for the last page of Peters, which Fauré divides over two pages.

Bach gives two dynamic markings in this piece: piano at the beginning, and piano again five bars from the end. This implies that the final bars should be played softer than the general registration. Following Fauré's registration suggestion for *piano* from the preface to his Preludes and Fugues volume, this piece should be played on the "Jeux de fonds de 8 p."[517]

---

[516] Joseph Bonnet, Fauré Edition 3, ii: "Mais les erreures de l'époque romantique n'ont pas épargné le facture d'orgues, et l'on peut encore voir des instruments du XIX^{e} siècle démunis des timbres traditionnels, sans lesquels il n'est cependant pas d'orgue complet.
"Les organistes et les organiers, sont aujourd'hui revenus de ces erreurs, et beaucoup d'orgues modernes possèdent les sonorités du temps de Bach et de Couperin, indispensables à l'exécution de la musique de ces Maîtres...

[517] Fauré Edition 1, no. 1, ii.

Registration

During the digitisation process at Seewen, this roll was scanned without difficulty. Table 2 shows the stops as they are rendered on the Seewen organ:

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	Violonbass	16'
Principal	8'	Bordun	8'	**Subbass**	**16'**
Traversflöte	8'	Viola	8'	Gedackt	16'
Gedeckt	8'	Aeoline	8'	Cello	8'
Gambe	8'	Blockflöte	4'	Gedackt	8'
Viol. d'orch.	8'	Quinte	2 ⅔'	Posaune	16'
Vox coelestis	**8'**	Terz	1 ⅗'	Trompete	8'
Rohrflöte	4'	Sesquialter	II	Clairon	4'
Octave	4'	Quintzimbel	1'	Sing. Cornett	2'
Nachthorn	2'	Clarinette	16'		
Sesquialter	II	Trompette	8'		
Fagott	8'	Horn	8'		
Mixtur	III	Oboe	8'		
Trompete	8'	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 2: Erb's registration in his performance of J.S. Bach:
Concerto in A Minor, BWV 593: II. Adagio; the stops selected are in bold.

Here Erb employs a string in one manual/hand and a harmonic flute for the other, with the box beginning closed, which corresponds to the Fauré Edition's description of pianissimo ("soft foundations"), and also reflects Vivaldi's own marking of "Pianissimo Sempre" at bar 5 in most of the parts of the first edition.[518] There is one registration change: throughout the piece the box opens gradually until at bar 31, beat 2 through bar 33, beat 2 the box is fully open, and Erb adds the following stops for this portion only:

[518] Fauré Bach Edition 1, no. 1, ii. Vivaldi: L'estra armonico. Amsterdam: Estienne Roger, n.d.[1711], Violino Secondo 5, Violino Terzo 5, Violino Quatro 5, Alto Primo 4, Alto Secondo 4, (this instruction is missing in the Violino Primo part due to the soloist entering at bar 5, and in the *Violoncello* and *Violone e Cembalo* parts, as these instruments are not playing at that moment).

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	Violonbass	16'
Principal	**8'**	**Bordun**	**8'**	**Subbass**	**16'**
Traversflöte	**8'**	**Viola**	**8'**	Gedackt	16'
Gedeckt	8'	**Aeoline**	**8'**	Cello	8'
Gambe	**8'**	Blockflöte	4'	Gedackt	8'
Viol. d'orch.	**8'**	Quinte	2 ⅔'	Posaune	16'
Vox coelestis	**8'**	Terz	1 ⅗'	Trompete	8'
Rohrflöte	4'	Sesquialter	II	Clairon	4'
Octave	4'	Quintzimbel	1'	Sing. Cornett	2'
Nachthorn	2'	Clarinette	16'		
Sesquialter	II	Trompette	8'		
Fagott	8'	Horn	8'		
Mixtur	III	Oboe	8'		
Trompete	8'	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 3: Erb's registration in his performance of J.S. Bach:
Concerto in A Minor, BWV 593: II. Adagio; the stops selected are in bold.

In short, Erb adds all the 8' foundation stops on the manuals, which corresponds to the Fauré Edition's description of piano ("foundations").[519] To the listener the effect is somewhat jarring, yet the choice clearly shows that Erb felt this moment was the climax of the piece. Erb's choice to highlight this moment is strange, given that Vivaldi's orchestral parts' only loud dynamic marking, "Forte e Spiritoso," comes five bars from the end, at the same place the organ arrangement's Bach-Gesellschaft Edition shows "piano."[520]

The only note Erb plays in the pedal is the very last note.

[519] Fauré Bach Edition 1, ii.
[520] *BGS* 38. Vivalid: L'estra armonico. Amsterdam: Estienne Roger, n.d.[1711], Violino Primo 5, Violino Secondo 5, Violino Terzo 5, Violino Quatro 5, Alto Primo 4, Alto Secondo 4, Violoncello 5, Violone e Cembalo 5.

Ornamentation

There are only two minor ornaments written in the score, both quaver/eighth note appogiature, in beat 1 of bars 21 and 31. Erb ignores both.

Tempo

Analysis of the tempo of this roll showed that the crotchet/quarter note beat equals an average of 38 BPM. A graphic representation of Erb's tempo variants placed upon a background of a completely metronomic performance, Figure 1, shows that Erb modified tempo in a comparable way to Gigout and Bonnet.

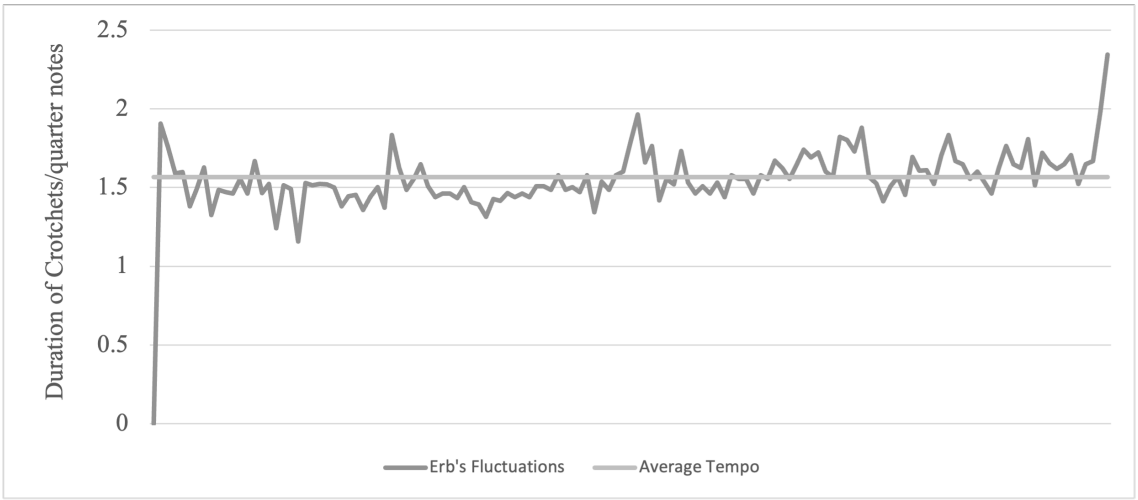


Figure 1: Tempo graph of Marie-Joseph Erb's performance of J.S. Bach: *Concerto in A Minor*, BWV 593.

As in the other organ roll recordings, the greatest fluctuations take place at structurally significant moments in the piece. The first ritardando, bar 12, beats 1–2, marks the end of the presentation of the major themes in the piece. The next tempo fluctuation is in bar 24, at a significant cadence to the dominant key and the end of an episode; the average tempo decreases to 33 BPM here, and resumes back to the original tempo at the beginning of bar 25. Bars 32, beat 3 until beat 35, beat 1 demonstrate an accelerando

that is a reaction to ritardando; Figure 2 shows these eight beats compared to the average tempo:

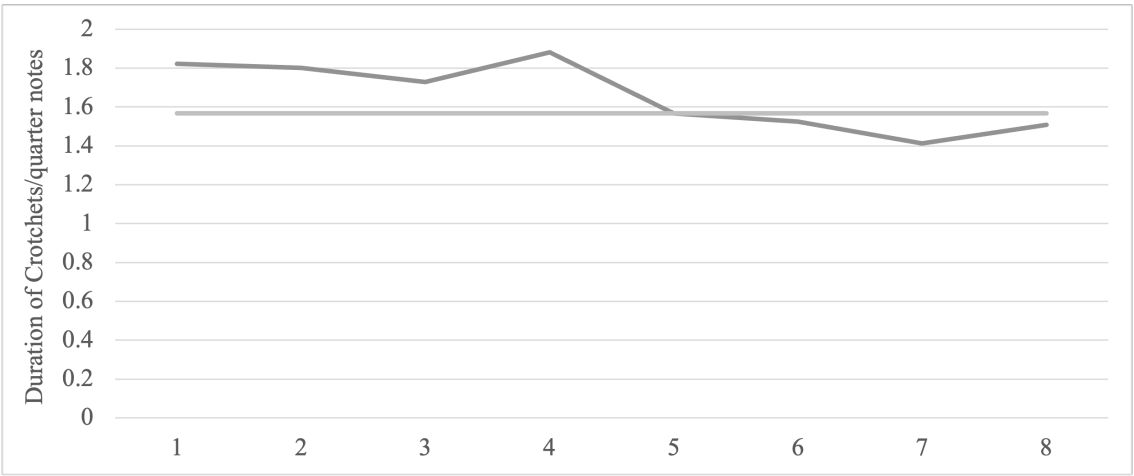


Figure 1: Tempo graph of Marie-Joseph Erb's performance of J.S. Bach: *Concerto in A Minor*, BWV 593, bars 1–8.

Figure shows that beats 1–4 (which correspond to bar 32, beat 3–bar 33, beat 3) are greater than the average duration of a beat, a ritardando. Beats 5–8, corresponding to bar 34–35, beat 1 are faster than the average, an accelerando. The average tempo of these eight beats is 36 BPM, versus 33 for the average of the entire piece. With these two values so close, Erb was employing rubato, which is not discussed as a concept in the writings of French Romantic Organists with relation to Bach. However, most of Erb's colleagues were Parisians, while he was Alsatian; is entirely possible that this brief moment in the piece was reflecting the Germanic side of the region of his musical heritage.

Articulation and Rushing

The first four bars form the main theme of this movement. Within this performance there are two key questions of interpretation: what is the articulation of the

repeated quavers/eighth notes in beats 2.5 and 3? Also audible to the listener is a significant amount of rushing in the quaver/eighth note rest on beats 2 of each bar. An analysis of the data file from Debrunner's scan and conversion of the roll into MIDI answers these questions most clearly.

Tables 4–6 respectively show the precise lengths of each note in beats 1–3 of each of the first three bars, looking at the soprano line only.

Quaver number	**Duration of quaver**	**Duration of pitch**	**Duration of silence**	**Approximate ratio of pitch to silence**
1 (D4)	1.000 sec	0.976 sec	0.249 sec	4:1
2 (D3)	1.132 sec	1.132 sec	N/A	N/A
3 (rest)	0.654 sec	N/A	0.654 sec	N/A
4 (D4)	0.821 sec	0.640 sec	0.181 sec	3.5:1
5 (D4)	0.804 sec	0.796 sec	0.008 sec	99.5:1

Table 4: Duration of each pitch of the soprano line in bar 1 of J.S. Bach: *Concerto in A Minor: II. Adagio, BWV 593*, as performed by Erb.

Table 4 shows the exact durations of each pitch and silence in bar 1. The average duration of each quaver/eighth note that has a pitch (i.e. every quaver/eighth note except for the rest, Quaver 3) is 0.939 seconds. The quaver rest's duration is 0.654 seconds, which is significantly smaller than that average; in practical terms, this means the amount of time Erb rested was considerably shorter than when he actually played a note. This definitively shows that Erb rushed the quaver/eighth note rest. Regarding articulation of the two repeated notes, Quavers 4 and 5, the ratio of sound to silence between them is 3.5 to 1, which means Erb holds the pitch slightly longer than Widor's ideal articulation of repeated notes, approximately 3 to 1.

Table 5 shows the same thing in bar 2:

Quaver number	Duration of quaver	Duration of pitch	Duration of silence	Approximate ratio of pitch to silence
1 (C4)	0.792 sec	0.772 sec	0.020 sec	38.6:1
2 (C3)	1.043 sec	1.043 sec	N/A	N/A
3 (rest)	0.365 sec	N/A	0.365 sec	N/A
4 (C4)	0.780 sec	0.640 sec	0.14 sec	4.5:1
5 (C4)	0.748 sec	0.732 sec	0.016 sec	45.75:1

Table 5: Duration of each pitch of the soprano line in bar 2 of *Concerto in A Minor: II. Adagio, BWV 593*, as performed by Erb.

The average duration of each quaver/eighth note that has a pitch (i.e. every quaver/eighth note except for the rest, Quaver 3) is 0.841 seconds. The quaver rest's duration is 0.365 seconds, which is, again, significantly smaller than that average, showing again that Erb rushed that quaver/eighth note rest. Regarding articulation of the two repeated notes, Quavers 4 and 5, the ratio of sound to silence between them is 4.5 to 1, which means Erb holds the pitch even longer than the same place in bar 1.

Table 6 shows the same thing in bar 3:

Quaver number	Duration of quaver	Duration of pitch	Duration of silence	Approximate ratio of pitch to silence
1 (B-flat 4)	0.763 sec	0.748 sec	0.015 sec	50:1
2 (B-flat 3)	1.000 sec	1.000 sec	N/A	N/A
3 (rest)	0.408 sec	N/A	0.408 sec	N/A
4 (B-flat 4)	0.736 sec	0.600 sec	0.136 sec	4.4:1
5 (B-flat 4)	0.753 sec	0.744 sec	0.009 sec	83:1

Table 6: Duration of each pitch of the soprano line in bar 3 of *Concerto in A Minor: II. Adagio, BWV 593*, as performed by Erb.

The average duration of each quaver/eighth note that has a pitch (i.e. every quaver/eighth note except for the rest, Quaver 3) is 0.813 seconds. The quaver rest's duration is 0.408 seconds, which is, again, significantly smaller than that average, showing again that Erb rushed that quaver/eighth note rest. Regarding articulation of the two repeated notes, Quavers 4 and 5, the ratio of sound to silence between them is 4.4 to

1, which means Erb holds the pitch longer than bar 1, and nearly the same amount as bar 2.

Conclusion

This performance of the *Adagio from the Concerto in A Minor* shows several important themes that are consistent and somewhat divergent from the theoretical teachings of members of the French Romantic Organ School:

1. Erb's attention to rhythm, namely rests, is not as developed as Gigout or Bonnet; he rushes them consistently.
2. Erb largely follows Widor's suggestions for adding more silence to repeated notes, though errs less silence than his colleagues.
3. Large scale tempo fluctuations, like the other recordings so far, always are made at significant moments in the piece.

Chapter 16: Roll 768 — Erb Plays *Concerto in G Major*, BWV 592

Introduction

The *Concerto in G Major* is based on a concerto based on a work of Prince Johann Ernst of Sachsen-Weimar, whom J.S. Bach knew from his time as organist at the court of Weimar.[521] The Johann Ernst piece is scored for "Concerto a 6 Violini e Violoncello col Basso per l'organo," which is almost literally for six violins: principal, two obbligato, two ripieno, then a viola and cello.[522] There is no Bach autograph of his organ transcription of the work, but several copies of this work are the same as the *Concerto in A Minor* which Erb also recorded. Unlike the Vivaldi concerto transcriptions, Bach's own compositional voice is more present; he changes figuration and melodies more frequently.[523]

Movement 1: [No tempo indication]

Registration

During the digitisation process at Seewen, this roll was scanned without difficulty. Table 1 shows the stops selected when the roll is played on the Britannic Organ:

[521] Werner Breig, "Composition as Arrangement and Adaptation," in *The Cambridge Companion to Bach*, ed. John Butt, this article trans. Stewart Spencer (Cambridge, UK: Cambridge University Press, 1997), 160–162.
[522] Williams, *The Organ Music of J.S. Bach*, 206.
[523] Williams, *The Organ Music of J.S. Bach*, 206. Breig, "Composition as Arrangement and Adaptation," 160–170.

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	**Violonbass**	**16'**
Principal	**8'**	Bordun	8'	**Subbass**	**16'**
Traversflöte	**8'**	**Viola**	**8'**	Gedackt	16'
Gedeckt	8'	**Aeoline**	**8'**	**Cello**	**8'**
Gambe	**8'**	Blockflöte	4'	Gedackt	8'
Viol. d'orch.	**8'**	Quinte	2 ⅔'	Posaune	16'
Vox coelestis	**8'**	Terz	1 ⅗'	Trompete	8'
Rohrflöte	**4'**	Sesquialter	II	Clairon	4'
Octave	4'	Quintzimbel	1'	Sing. Cornett	2'
Nachthorn	2'	Clarinette	16'		
Sesquialter	II	Trompette	8'		
Fagott	**8'**	Horn	8'		
Mixtur	III	**Oboe**	**8'**		
Trompete	8'	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 1: Erb's registration in his performance of J.S. Bach:
Concerto in G Major, BWV 592: I. [No tempo indication]; the stops selected are in bold.

Tempo

Throughout the piece, the most audible characteristic of Erb's playing is the extreme variations of tempo. The average throughout the piece is crotchet/quarter note equals 62 BPM, or 0.96 seconds per beat. Within that, Erb's extremes of tempo fluctuation mean the crotchet/quarter note can last anywhere between 0.51 and 2.38 seconds. A graphic representation of Erb's tempo variants placed upon a background of a completely metronomic performance, Figure 1, shows the extremes to which Erb modified the tempo.

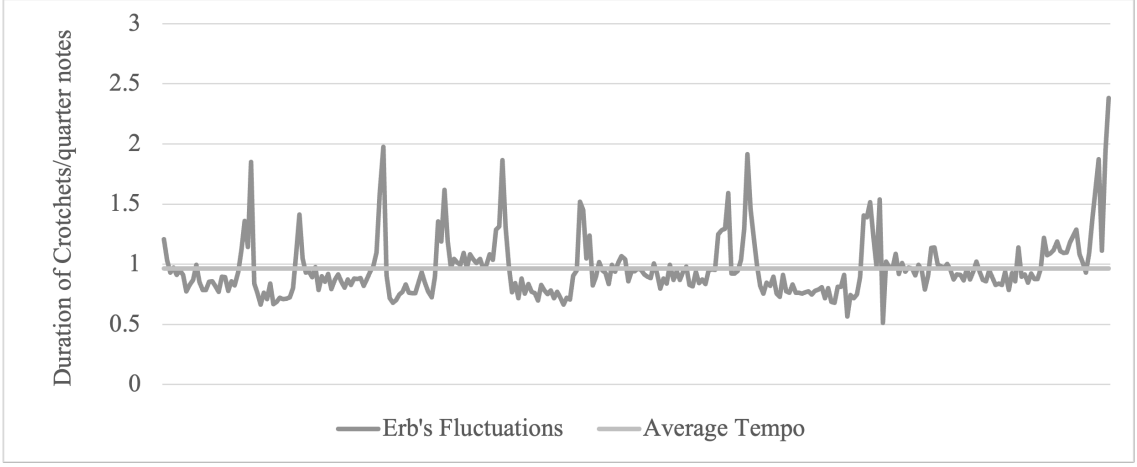


Figure 1: Tempo chart of J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, as performed by Erb.

Even at a quick glance, the amount of variation in this chart is clearly significantly greater than any of the other French Romantic Organ School recordings in this study. Yet within this significant variation, the peaks of Erb's ritardandi all happen at moments of transition between every ripieno and concertino section.

Rubato

The first two bars are an excellent example of the kind of rubato Erb used in his recording of the second movement of the A Minor Concerto, and a test as to how strictly Erb followed the French Romantic Organ School's principles of articulating repeated notes. Table 2 shows the duration of the first seven quavers/eighth notes of the piece in the soprano line (Erb ignores the trill on the seventh note).

Quaver number	Duration of quaver	Duration of pitch	Duration of silence	Approximate ratio of pitch to silence
1 (G4)	0.593 sec	0.464 sec	0.129 sec	3.5:1
2 (G4)	0.504 sec	0.336 sec	0.168 sec	2:1 (exactly)
3 (G4)	0.483 sec	0.320 sec	0.163 sec	2:1
4 (G4)	0.504 sec	0.343 sec	0.161 sec	2:1
5 (A4)	0.488 sec	0.324 sec	0.164 sec	2:1
6 (A4)	0.411	0.296 sec	0.115 sec	2.5:1
7 (A4)	0.388	0.388 sec	0 sec	N/A

Table 2: Duration of each pitch of the soprano line in J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, bars 1–2, as performed by Erb.

The ratio of sound to silence here is largely 2:1, which is in line with Widor's suggestions. The full duration of each quaver/eighth note, sound and silence, however, is highly variable. Figure 2 shows these durations versus the average tempo for those seven quavers.

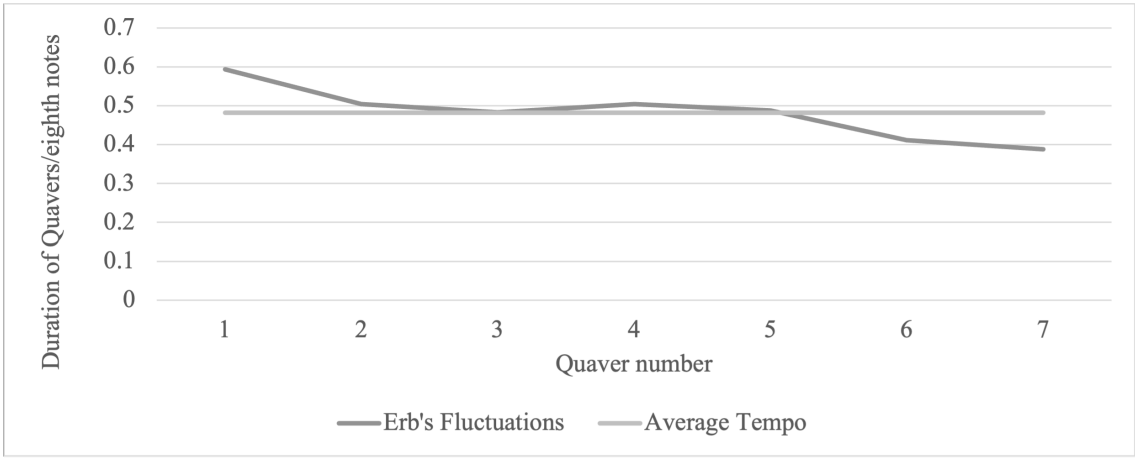


Figure 2: Tempo chart of J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, bars 1–2, as performed by Erb.

The average tempo of these seven notes is still 62 BPM, yet the chart shows how Erb begins slowly, hits the average tempo by the third quaver/eighth note, and then speeds back up for notes 5–7. In summary, this is mathematically a nearly perfect demonstration of using rubato: taking tempo from one portion of a piece, then speeding up to make up for lost time.

Another highly noticeable aspect of the performance is that the pedal frequently is played slightly earlier than the manuals. This is particularly noticeable in bars 5–6. Figure 3 is a screenshot of this moment in the digitised organ roll:

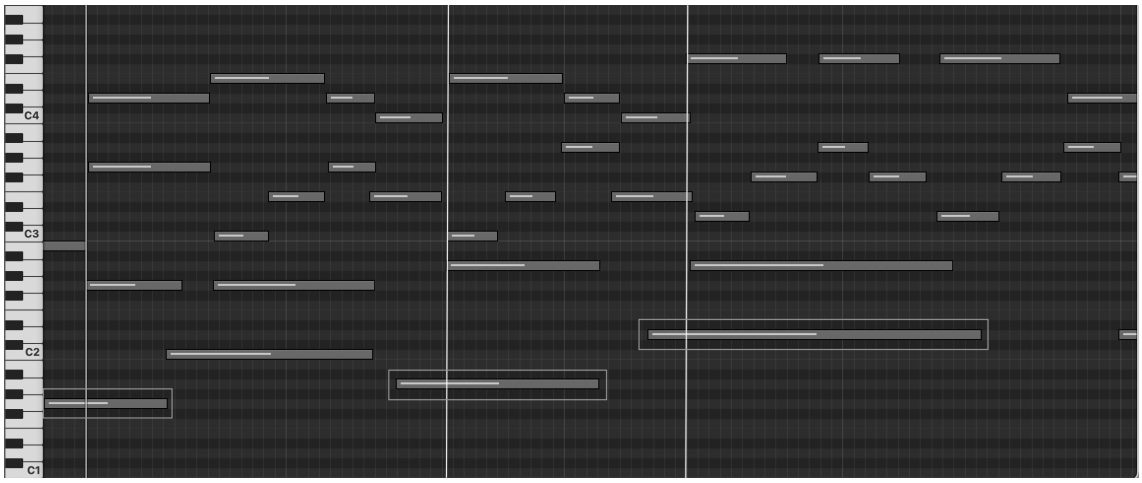


Figure 3. Screenshot of a MIDI digitisation of Marie-Joseph Erb's organ roll performance of J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, bars 5–6

In Figure 3, the beginnings of each of the manual beats are marked with a vertical white line, and each of the lowest pedal notes are boxed. While the lowest pedal notes begin significantly before each chord, the upper pedal notes are played exactly with the manuals. This indicates that playing the lowest pedal note earlier was a deliberate aesthetic choice by Erb.

The question of how Erb approaches staccato articulation can be seen by comparing the soprano quavers/eighth notes in bars 6, 8, and 10, which are marked staccato in the Bach-Gesellschaft edition.[524] Table 3 shows the duration of each:

[524] *BGS* 38, 149.

Bar and quaver	Duration of quaver	Duration of pitch	Duration of silence	Approximate ratio of pitch to silence
6-1 (F-sharp 4)	0.480 sec	0.364 sec	0.116 sec	3:1
6-1 (F-sharp 4)	0.432 sec	0.292 sec	0.140 sec	2:1
6-1 (F-sharp 4)	0.459 sec	0.436 sec	0.023 sec	19:1
6-1 (D4)	0.388 sec	0.384 sec	0.004 sec	96:1
8-1 (G4)	0.397 sec	0.300 sec	0.097 sec	3:1
8-2 (G4)	0.456 sec	0.356 sec	0.100 sec	3.5:1
8-3 (G4)	0.404 sec	0.396 sec	0.008 sec	49.5:1
8-4 (E4)	0.428 sec	0.412 sec	0.016 sec	26:1
10-1 (A4)	0.431 sec	0.308 sec	0.123 sec	2.5:1
10-1 (A4)	0.440 sec	0.320 sec	0.120 sec	2.6:1
10-1 (A4)	0.380 sec	0.380 sec	0 sec	0
10-1 (F-sharp 4)	0.424 sec	0.412 sec	0.012 sec	34.3:1

Table 3: Duration of each pitch of the soprano line in bars 1–2 of J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, as performed by Erb.

The clear pattern is that the first two staccato quavers/eighth notes of each of these bars are performed with a sound to silence ratio of between 3:1 and 2:1, and that there is almost no audible silence between the latter pair. Erb's performance, therefore, is essentially not taking the staccati into account; the first two notes are separated in the typical French Romantic Organ School fashion, while the last two are played nearly absolute legato. The staccati are included in the Bach-Gesellschaft Edition and the Widor-Schweitzer, but they are not in the Fauré Edition.[525] However, as this recording was made one year before Widor-Schweitzer and two years before the Fauré Edition, Erb simply ignored the staccati that was in the Bach-Gesellschaft Edition.

Ornamentation

Throughout this movement, Erb plays trills only from the main note, and, looking at the Bach-Gesellschaft Edition, ignores all the ornaments, suggested or

[525] *BGS* 38, 149, Widor-Schweitzer Edition 5, English, 2. Fauré Edition 3, vol. 2, 1.

otherwise, except for those in bars 4, 16, 21, 22 (first one only), 25, 44 (both), 90, and 145. This omits nearly two thirds of the trills in the piece; furthermore, at parallel cadences, such as bar 53, beat 2 and bar 90, beat 2, Erb plays the trill in 90, but not 53. For Erb, it seems that ornamentation was a mere suggestion which could be followed to the performer's taste.

Miscellaneous Notes

At bar 58, the right hand has triplet quavers/eighth notes, while the left hand has quaver-semiquaver/eighth note-sixteenth note pairs; here Erb consistently assimilates the left-hand semiquavers/sixteenth notes into the third triplet of each right hand group of three quavers/eighth notes.

In bar 50, Erb's right hand line, deviates from Bach's composition; Figure 4 is a transcription of the notated part versus what Erb plays.

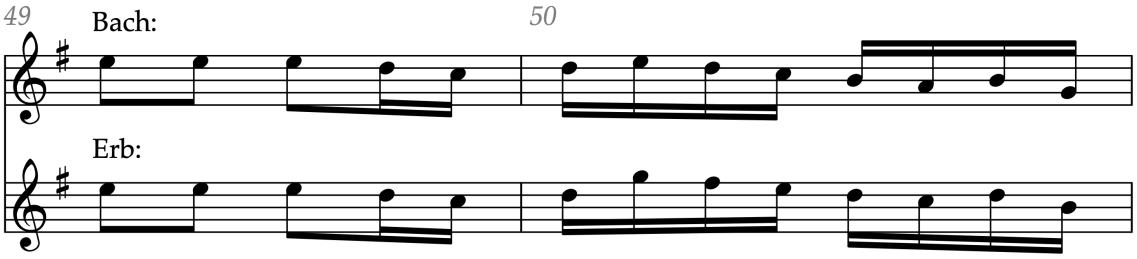


Figure 4: Soprano line of J.S. Bach: *Concerto in G Major: I. [No tempo indication]*, BWV 592, bars 49–50, comparing Bach's score to Erb's Welte organ roll performance.

Instances such as bar 35 in which the right hand and pedal release on a crotchet/quarter note and the left hand releases early to move to a different manual, are performed by Erb as a single chord, in which everything is released together, there is a small pause, and then the episode begins.

Movement 2: Grave

Registration

Table 4 shows the stops that are employed on the Seewen Organ at the outset:

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	Violonbass	16'
Principal	**8'**	Bordun	8'	**Subbass**	**16'**
Traversflöte	**8'**	**Viola**	**8'**	Gedackt	16'
Gedeckt	8'	Aeoline	8'	**Cello**	**8'**
Gambe	8'	Blockflöte	4'	Gedackt	8'
Viol. d'orch.	**8'**	Quinte	2 ⅔'	Posaune	16'
Vox coelestis	**8'**	Terz	1 ⅗'	Trompete	8'
Rohrflöte	**4'**	Sesquialter	II	Clairon	4'
Octave	4'	Quintzimbel	1'	Sing. Cornett	2'
Nachthorn	**2'**	Clarinette	16'		
Sesquialter	II	Trompette	8'		
Fagott	8'	**Horn**	**8'**		
Mixtur	III	Oboe	8'		
Trompete	8'	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 4: Erb's registration in his performance of J.S. Bach:
Concerto in G Major: II. Grave, BWV 592; the stops selected are in bold.

Tempo

Again, throughout the piece, the average throughout the piece is crotchet/quarter note equals 52 BPM. Figure 5 shows the extremes to which Erb modified the tempo.

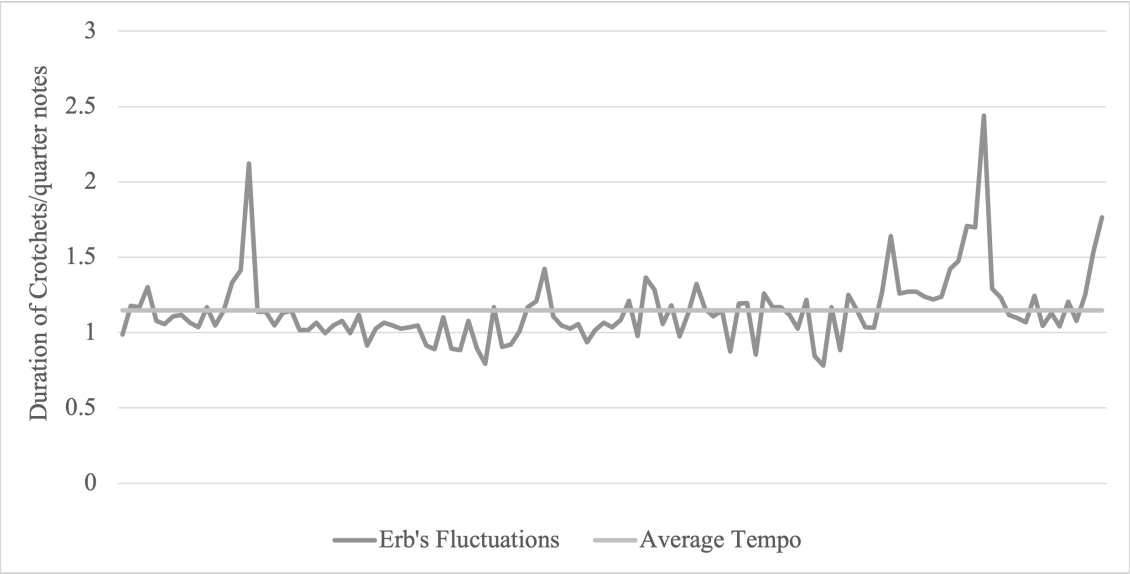


Figure 5: Tempo chart of Marie-Joseph Erb's Welte organ roll performance of J.S. Bach: *Concerto in G Major: II. Grave*, BWV 592.

Like the first movement, Erb's fluctuation with tempo throughout the *Grave* is highly variable. The three peaks on Figure 5 are the downbeats to bars 6 and 35, plus beat bar 21, beat 2. In the case of the instances at bars 6 and 35, Erb treats the downbeats as fermati before moving to another manual. The peak at bar 21, beat 2 is the greatest point of harmonic tension in that phrase (A minor 6-3/first inversion resolving to the dominant, B major), and marks the halfway point in the piece.

Ornamentation

Throughout the piece, Erb always begins trills on the main note. Erb's ornaments terminate either by evenly leading into the next note, or usually in conjunction with a change of another voice (as Gigout does in his *O Mensch bewein* organ roll recording). Typical examples are bars 8 and 10; Figure 6 shows the score of this moment, along with a screenshot of the scanned master roll at the same moment.

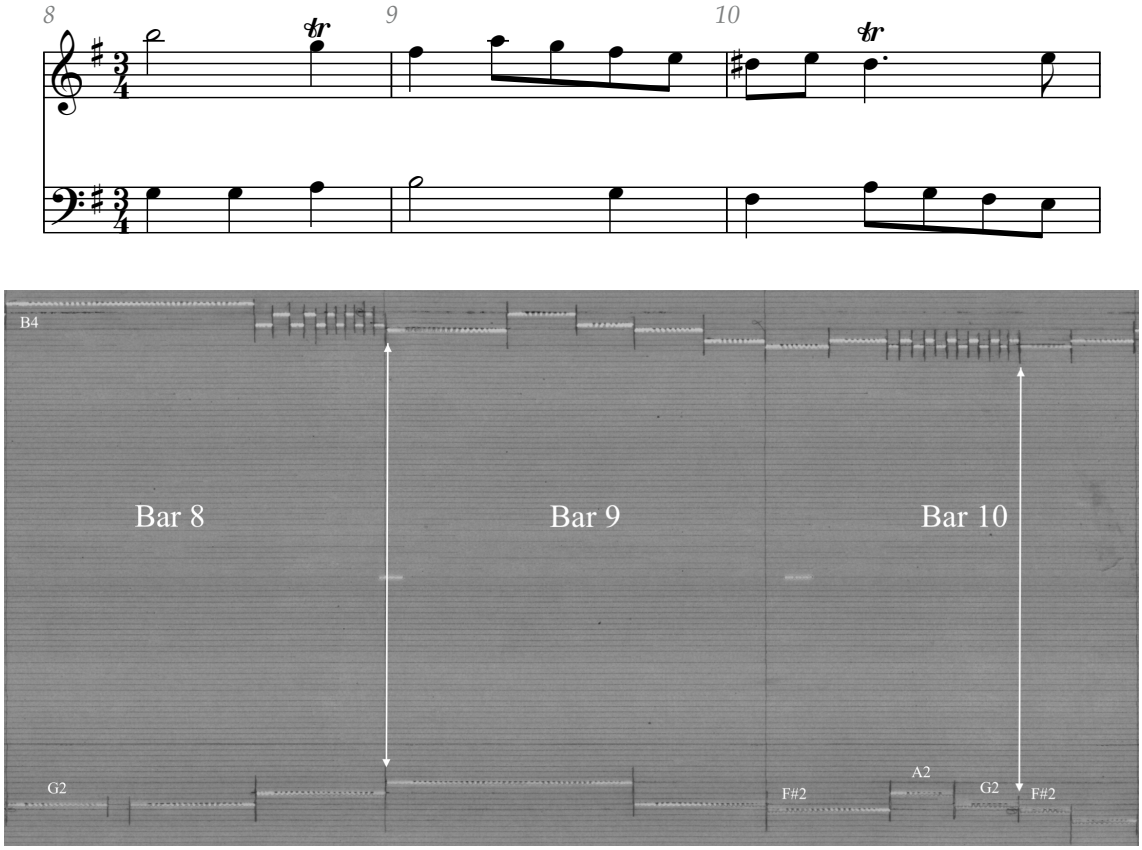


Figure 5: Score and section of Welte roll 0768, master roll: Marie-Joseph Erb's Welte organ roll performance of J.S. Bach: *Concerto in G Major: II. Grave*, BWV 592, bars 8–10.
Image courtesy the Museum für Musikautomaten.

The annotations show the bars, the most relevant pitches, and the arrows show the termination point between the right and left hands; in bar 8 Erb trills until the downbeat of bar 9, while in 10 he ends the trill at the beginning of beat 3.

Articulation

Erb's articulation throughout this movement is absolute legato, with the exception of repeated notes. Figure 6 shows bar 9, in which two successive G2 crotchets/quarter notes are performed with a space in between. The duration of the first beat is 1.008 seconds (0.828 seconds of sound followed by 0.180 seconds of silence), a sound of silence ratio in Beat 1 is 4.6 to 1, which is more legato than Widor's

suggestions. Similarly one bar earlier in the right hand, the first note is played for 0.927 seconds followed by 0.133 seconds of silence, a ratio of nearly 7:1. For Erb, at least in this slow movement, playing repeated notes with some separation between was less important than what Widor suggested.

Pedal Ensemble

The pedal entrance at bar 23, like the first movement, is consistently played noticeably earlier than the manuals, despite being the same rhythm. Figure 7 shows the left hand and pedal here, with the vertical white lines showing where the left-hand chords begin:

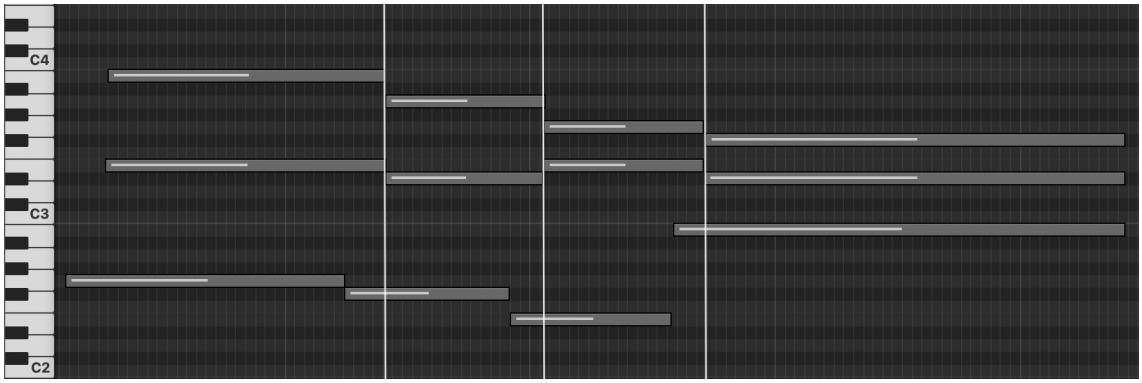


Figure 2. Screenshot of a MIDI digitisation of Marie Joseph Erb's organ roll performance of J.S. Bach: *Concerto in G Major: II. Grave*, BWV 592, bar 23.

Notice that the lowest notes (pedal) all begin significantly earlier than the left hand. The possibility of a digitisation inaccuracy was considered; if all three pedal notes began the exact same length early, it would suggest a possible error. However, in this case the first two pitches begin 0.164 seconds early, and the last one begins 0.136 seconds early, suggesting that not only was this not an error, but the preciseness of the first two notes especially, being exactly identical to a thousandth of a second, was a fully intentional choice by Erb.

Movement 3: Presto

Registration

Table 5 shows the stops selected on the Seewen organ:

Manual I		Manual II		Pedal	
Bordun	16'	**Harmonieflöte**	**8'**	**Violonbass**	**16'**
Principal	**8'**	**Bordun**	**8'**	**Subbass**	**16'**
Traversflöte	**8'**	**Viola**	**8'**	Gedackt	16'
Gedeckt	8'	**Aeoline**	**8'**	**Cello**	**8'**
Gambe	**8'**	Blockflöte	4'	Gedackt	8'
Viol. d'orch.	**8'**	Quinte	2 ⅔'	**Posaune**	**16'**
Vox coelestis	8'	Terz	1 ⅗'	**Trompete**	**8'**
Rohrflöte	**4'**	Sesquialter	II	**Clairon**	**4'**
Octave	4'	**Quintzimbel**	**1'**	**Sing. Cornett**	**2'**
Nachthorn	**2'**	**Clarinette**	**16'**		
Sesquialter	II	**Trompette**	**8'**		
Fagott	**8'**	**Horn**	**8'**		
Mixtur	**III**	**Oboe**	**8'**		
Trompete	**8'**	Vox Humana	8'		
Harfe		Tremolo			
Glocken					

Table 5: Gigout's registration in his performance of J.S. Bach:
Concerto in G Major: III. Presto, BWV 592; the stops selected are in bold.

Tempo

Like the other two pieces, Erb's inconsistency of tempo is highly noticeable to the listener. The average throughout the piece is crotchet/quarter note equals 83 BPM. A graphic representation of Erb's tempo variants placed upon a background of a completely metronomic performance, Figure 9, shows the extremes to which Erb modified the tempo.

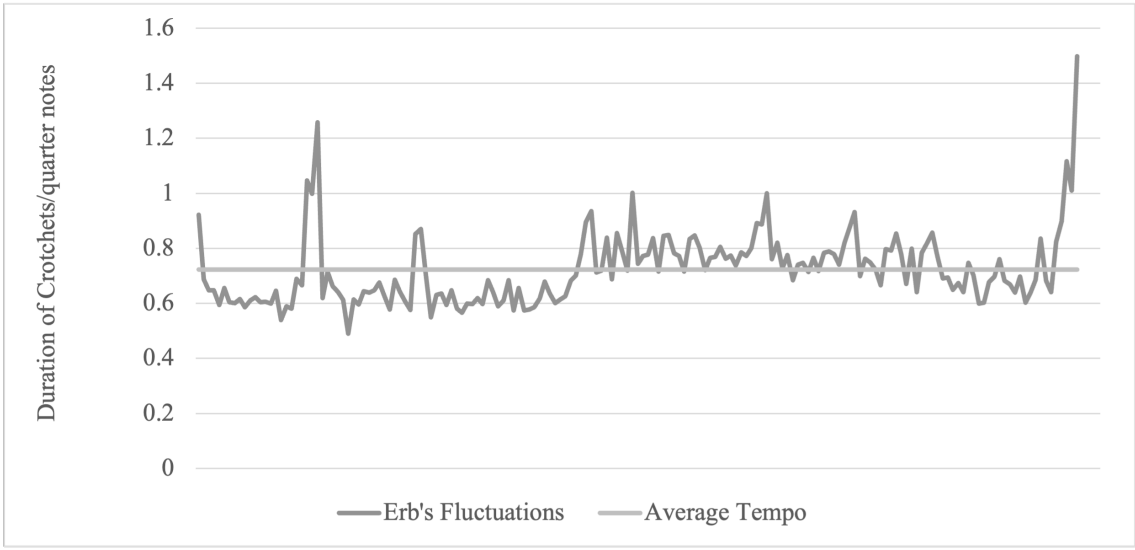


Figure 9: Tempo chart of Marie-Joseph Erb's Welte organ roll performance of J.S. Bach: *Concerto in G Major: III. Presto*, BWV 592.

Even glancing at Figure 9, Erb basically played the piece at two different tempi: the first values (left half of the chart) which put "Erb's Fluctuations" above the average tempo, and those below (right half). The largely slower tempo section runs from bars 1–38, with an average tempo of 91 BPM; from 39–end, the average tempo slows to 78 BPM.

Manual Changes

Erb plays the majority of the movement on Manual I, but changes to Manual II for short ripieno sections: bars 39–40, 43–44, 47–54, 65–66, and 68–71. Notably, bars 57–64 remain on Manual I, despite having the same motivic material as the sections Erb had always played previously on Manual II. Perhaps he wanted to highlight that this episode, unlike the others, was based on a descending stepwise sequence (bars 60–63). It is also entirely possible he simply forgot to change manuals.

A Special Finale

The only significant note deviance from Bach's scores in all ten of the Welte recordings in this study comes at the very end of the concerto. Instead of ending on the lowest G of the manual as Bach writes, Erb adds a big G-major chord with manuals and pedals. Ultimately, this was a matter of taste.

Conclusion

Throughout this *Concerto*, Erb's playing reflects the following deviations from the written aesthetics of French Romantic Organ School performance practices:

1. Rubato — the practice of increasing tempo in one section and then decreasing it in another such that the overall net tempo change is zero — is possible in Bach's organ works.
2. Manual changes can be accomplished by slowing the tempo or adding as much time as the performer wants, rather than remaining any sense of a metronomic performance.
3. In slow movements, repeated notes can be less articulate than Widor's ideal ratio of sound to silence (2:1 or 3:1).
4. The tempo of a piece can be highly variable (though this may not have been an ideal aesthetic).

Written versus Reality: Overarching Findings

The overarching findings of Part III are grouped into the following categories: articulation; registration and dynamics; ornamentation; rhythm and tempo; use of tempo modification; and adaptation for recordings and intervention of editors. As the most detailed of any type of recording in the early twentieth century, organ rolls can provide insights into the tiniest detail, clarifying written ideals of performance practice.

Articulation

Introduction

The articulation between any two notes in organ rolls is determined by measuring the distance between the end of one note and the beginning of the next. Detailed analysis of the ten organ rolls by three performers shows extraordinary consistency. Most of the time, the articulation is always absolute legato. Generally, the exceptions almost always come when the same pitch is repeated. According to Widor, the ideal ratio of sound to silence here is between two parts silence and one part sound, 2:1, or three parts silence and one part sound, 3:1.

Gigout's Articulation

Gigout's articulation in all his organ rolls is nearly always absolute legato. As discussed in Chapter 9, significant deviations from this are found in the *Toccata in F Major*, with gaps in bars 1–4 in the manuals. Chords are usually played using the principles of *notes communes*; this can be seen clearly Chapter 10 on the *Prelude in E-flat Major*, yet in the *Toccata in F Major* Gigout observes the staccatissimo/wedge markings on the manual chords in bars 169–170, instead of tying any common notes.

In the *Toccata*, the right-hand chords in bars 179, 183, 187, 191, 195, and their corresponding sections later in the piece — according to the theory of *notes communes* — should not be played with separation, but rather in the manner shown in Figure 16:

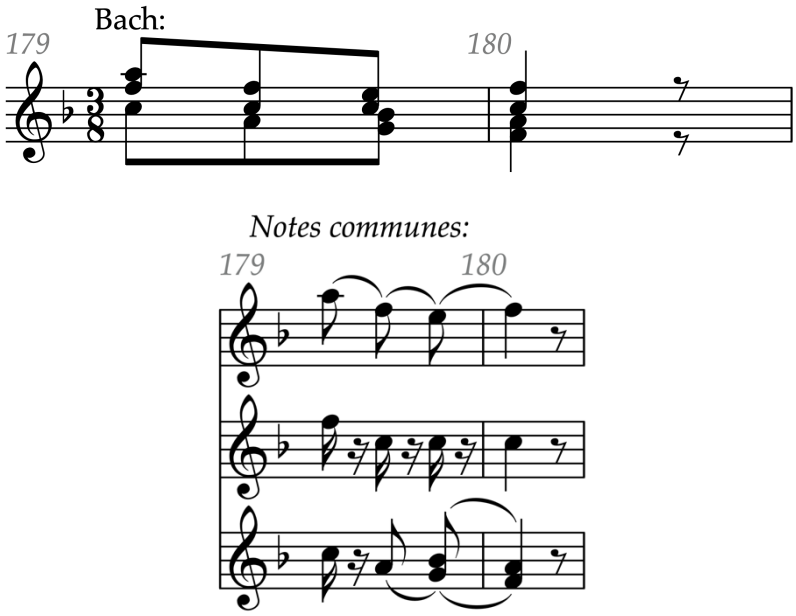


Figure 16: J.S. Bach: *Toccata in F Major*, BWV 540, bar 179, edited by the author to show the theoretical practice of *notes communes*. The semiquavers/sixteenth note rests are not necessarily literal — they simply show a shortening of the preceding note, while the slurs show absolute legato.

Figure 16 recreates how a performer would play bars 179 strictly according to the theory of *notes communes*; here, common chords are tied together in the same way Widor describes in his preface to the Widor-Schweitzer Edition. Gigout's deviation from the default absolute legato articulation and leaving behind the principles of *notes communes* is highly unusual, given how strictly he otherwise follows the articulation principles of the French Romantic Organ School. One possible explanation is that this was an unwritten performance tradition that developed among Lemmens and his pupils, but it is entirely possible Gigout's interpretation was original.

As noted in Chapter 10, Gigout in the *Prelude and Fugue in E-flat Major* plays the pedal slightly ahead of the manuals throughout.

In the *Trio Sonata V: II. Largo*, BWV 529, Gigout's default articulation remains absolute legato, but analysis of his articulation of repeated notes shows he is nearly perfectly in line with the written theoretical ideals of Widor. While in the *Trio Sonata 1: I. Allegro moderato*, BWV 525, the amount of articulation between the same pitches played multiple times varies considerably more than BWV 529/II; he still only adds silence between notes at these moments, and the default articulation for the rest of the piece remains absolute legato.

Summarised, Gigout follows the French Romantic Organ School's theoretical ideals of articulation nearly exactly unless Bach marks articulation in the score. He deviates in playing the pedal slightly ahead of the manuals in some cases, and that *notes communes* can be observed according to the player's taste.

Bonnet's Articulation

Bonnet's default articulation is also usually absolute legato. In the case of repeated notes seen in Chapter 13 on *In dulci jubilo*, bar 37 follows Widor and Vierne's recommendations for the amount of sound to silence almost perfectly. A significant deviation, however, is that Bonnet did not take Widor's suggestion of removing the dot when playing repeated notes, and in general he was not nearly as rigid about the durations of repeated notes as Gigout.

In this piece, Bonnet also does not follow the breath markings in the *cantus firmus* in his own edition. However, this was published in 1918, nearly six years after his recording the same piece for Welte. While this could explain why he did not follow the breath markings and diverged from his edition in terms of ritardando, the issue of his not following the theoretical principles for repeated notes indicates that the entire

French Romantic Organ School was not so indoctrinated with Widor's and Lemmens's principles of articulation as the sources led readers to believe.

In Chapter 14 on the *Prelude and Fugue in E Minor*, Bonnet plays the pedal significantly earlier than the manuals. Neal Peres da Costa's extensive investigation on arpeggiation in late nineteenth and early twentieth century piano recordings discusses this kind of performance in detail; he summarises:

> "In early piano recordings pianists arpeggiated chords to achieve the following:
> - Emphasize melody notes by delaying and setting them apart from the harmonic accompaniment
> - Provide a cushion of sound supporting the melody note
> - Enhance the effect of poignant harmonies by strengthening or softening them
> - Give particular effect to special accents such as *sforzando*
> - Enliven the momentum of the music, propelling it forward
> - Enrich the sound and or texture of the musical material
> - Delineate the boundaries of phrases
> - Give separation to overlapping melody lines played in one hand"[526]

In the case of Bonnet, his effective arpeggiation of the pedal and lower-voice chords in this prelude likely serve to highlight the strong beats for the listener, possibly to clarify the generally syncopated nature of the rhythm throughout this section, and to build tension.

The lack of written discussion of organ arpeggiation in French Romantic music is a familiar phenomenon in keyboard playing contemporary to Bonnet's recording; da Costa notes that, "Although early recordings reveal a widespread employment of unnotated arpeggiation, contemporaneous written texts fail to document clearly its importance and characteristics."[527] Bonnet's recording of this work does indeed indicate that the same is true of organ playing, and invites further research into the performing

[526] Neal Peres da Costa, *Off the Record: Performing Practices in Piano Playing* (Cambridge, UK: Cambridge University Press, 2012), 102.
[527] da Costa, *Off the Record*, 187.

practices preserved on organ rolls beyond the works of Bach, and even those of the French Romantic Organ School.

Erb's Articulation

Overall, Erb's detail to articulation and adherence to the ideals of the French Romantic Organ School are not as precise as Gigout and Bonnet. Detailed analysis of repeated notes in the *Concerto in A Minor: II. Adagio* demonstrated two key points: Erb did add separation before repeated notes, but not as much as Widor suggested, and that he definitively and noticeably rushed every quaver/eighth note rest in these first few bars. The same trends continue throughout the piece.

Similar to Bonnet's *Prelude and Fugue in E Minor*, Erb's *Concerto in G Major*, BWV 592 begins in the first three bars with the pedal of each chord played significantly earlier than the manuals

***O Mensch, bewein*: Comparing Articulation in Gigout's Organ Roll and Bonnet's Edition**

In Gigout's *O Mensch, bewein* recording, his default articulation is legato throughout with some exceptions, which are reflected in Bonnet's edition. Instead of marking the ends of each phrase of the chorale by a fermata as in the *Neue Bach-Ausgabe*, Bonnet's edition shows breath markings, which Gigout universally observes in the soprano voice with one exception: bar 16, between beats 3 and 4, reproduced in Figure 4.

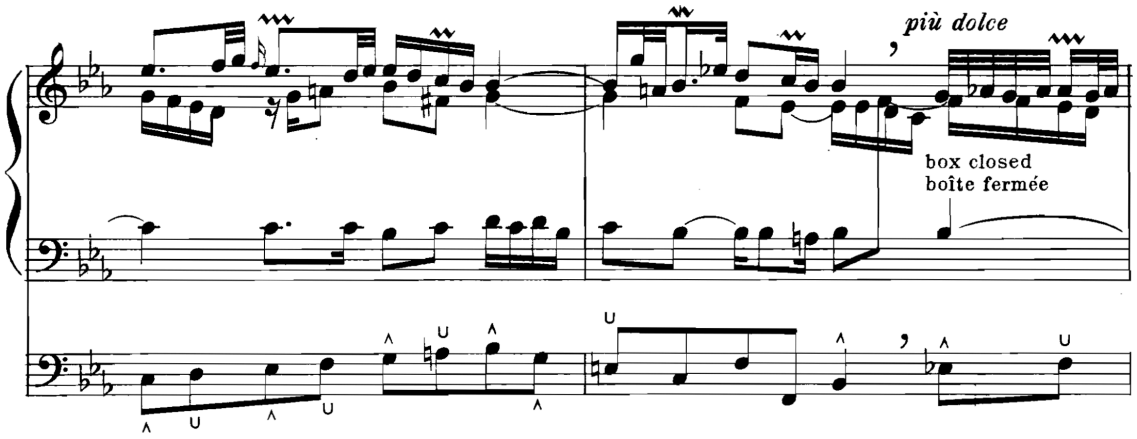


Figure 4. J.S. Bach: *O Mensch, bewein dein Sünde groß*, bars 15–16 as shown in the Bonnet edition.

In this moment, Gigout does lift in the soprano line as Bonnet suggests, but connects in the pedal. Bonnet's suggested pedalling of using right toe to right toe between the crotchet/quarter note B-flat on beat 3 and quaver/eighth note on beat 4 is physically impossible to play completely legato. This indicates that Gigout was certainly using a different pedalling at this point, and more importantly, that at the ends of chorale phrases like this, it was more important to Gigout that the chorale melody be clear, and for him, the accompaniment was distinct.

Summary

Analysis of these instances show that Gigout and Bonnet followed these guidelines to within mere thousandths of a second with only a few exceptions. Erb also follows these principles, but not as precisely. In practice, members of the French Romantic Organ School played repeated notes in a ratio of sound to silence that was very close to Widor's theoretical ideal of "demi-staccato." In Gigout's *Prelude in E-flat Major*, he seems to be aiming for a true "staccato", though not nearly as severe as

Widor's pupil and successor at St-Sulpice Marcel Dupré, who advocated for staccato as a ratio in sound to silence of 1:1.[528] The exceptions to these overarching practices are:

1. Subjects of entire pieces, which can be articulated according to the player's taste.[529]

2. When playing two chords that share some or all notes; in these instances, the player articulates every note of each chord,[530] and can also ignore the rules of *notes communes*.[531]

3. Following markings of articulation in all Bach editions is optional.[532]

4. Pedal notes, especially when followed by a long rest, do not need to be played to the exact notated value.[533]

5. The lowest notes, especially the pedal when it functions as the bass line of homophonic textures, are often played slightly before the beat.[534]

The main point of contention between performers is the degree of articulation required for repeated notes in slow movements.[535]

Registration and Dynamics

Rather than registering the organ in the ways an eighteenth-century Saxon organist might, members of the French Romantic Organ School universally registered the instrument at hand as if it were a nineteenth century organ. Any changes of registration in the middle of the piece were usually related to highlight the form, though

[528] See the prefaces to Johann Sebastian Bach, "Œuvres complètes pour orgue," ed. Marcel Dupré (Paris: S. Bornemann, 1938).
[529] This is consistent in both organ roll recordings and in French Romantic Bach editions.
[530] Gigout in the *Toccata in F Major* and *Prelude in E-flat Major*, Bonnet in the *Prelude and Fugue in E Minor*.
[531] Gigout in the *Toccata in F Major*.
[532] Gigout in the *Prelude in E-flat Major* makes a distinction between repeated-note-style separation and actual staccato. Bonnet in *In dulci jubilo* approaches the breath markings of the *cantus firmus* which are in his own edition inconsistently. Erb in the
[533] Gigout in *Trio Sonata 5/II*.
[534] Gigout in *Toccata in F Major* and *Prelude and Fugue in E-flat Major*, Bonnet in *Prelude and Fugue in E Minor*, Erb in *Concerto in G Major*.
[535] Gigout in in *Trio Sonata 5/II* plays them the same ratio as fast movements. Erb in *Concerto in G Major: II. Grave* plays repeated notes with considerably less space between each.

adding a crescendo or decrescendo could also be at the performer's discretion. They often followed suggestions in the various Francophone editions (especially Widor-Schweitzer, Fauré, and Bonnet). A noteworthy exception to this is in Trio Sonatas, which may be played with or without 16' pitch in the pedal.[536]

When registering a crescendo or decrescendo, all three organists generally followed the basic principles outlined by Widor in his preface to the Widor-Schweitzer Edition. However, while Widor complains about registration changes taking place in the middle of a chord, it was not uncommon.[537] Also in contradiction to Widor, Gigout also demonstrates that the swell box can be opened before adding the reeds.[538]

Finally, time may be added if necessary to accommodate a manual change.[539]

Gigout's Registration and Dynamics

Chapter 3 summarised Widor's method of effecting a crescendo; below is a brief reminder:

1. Close the swell box and add first the mixtures, then the reeds.
2. Open the swell.
3. Add the mixtures and reeds of the choir, then great.[540]

In the *Toccata in F Major*, Gigout follows these rules to the best of his ability. At bar 428, the swell box begins closed; adding mixtures is not possible on the Welte recording organ because there are none, but instead of adding the reeds, he begins to open the box around the beginning of bar 427, and then brings on the swell reeds one

[536] Gigout playing *Sonata 1/I*.
[537] Gigout in *In dir ist Freude*.
[538] *Toccata in F Major*.
[539] Erb in the *Concerto in G Major*.
[540] Widor-Schweitzer Edition 1, English, xv.

bar later. Notably, he adds these stops on the downbeat while holding down the tied C-natural from the previous bar (see Figure 9).

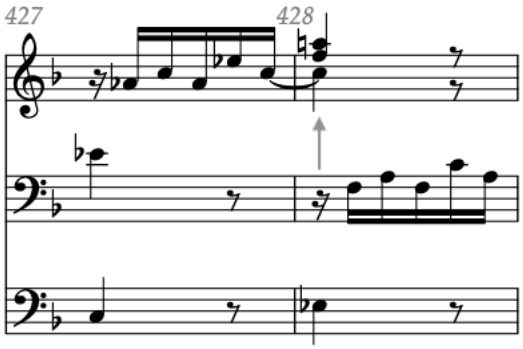


Figure 9: J.S. Bach: *Toccata in F Major*, BWV 540, bars 427–428.
The arrow marks where the swell reeds begin.

This could be constituted as the "shredding" of the chord Widor so despised.[541] Yet to the listener, because the chord is not yet established, the shredding effect never really occurs. However, in the final semiquaver/sixteenth note of bar 428 (see Figure 10), Gigout moves to the "tutti" registration.

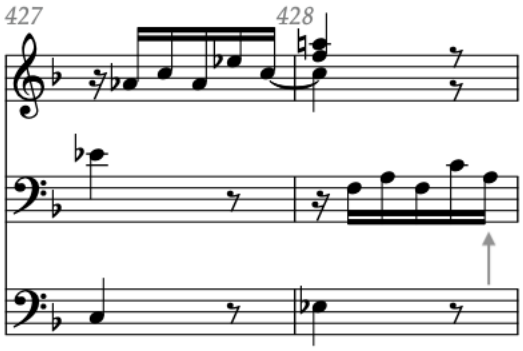


Figure 10: J.S. Bach: *Toccata in F Major*, BWV 540, bars 427–428.
The arrow marks where the tutti begins.

While the rhythmic figure is the same, a possible reason Gigout adds stops on the tied note rather than the downbeat is because the string of semiquavers/sixteenth notes is

[541] Widor-Schweitzer Edition 1, English, xv.

descending to a bass note, which he generally plays slightly early. Another argument in this favour is that the pedal in bar 429 functions as a melody rather than the basis of harmony.

In the *Toccata in F Major*, Gigout keeps the swell box shut throughout the entire piece, except bar 426 until the end, where he introduces a crescendo from the relatively soft registration to full organ. This is the only instance in the 1912 recording session where Gigout modifies registration within a piece. Making some kind of stop change at the end of a Bach free work in the French Romantic period was not unheard of; Henderson recalls that Alexandre Guilmant, another important member of the French Romantic Organ School and Widor's successor at the Conservatoire de Paris, once closed a masterclass by playing the *Toccata and Fugue in C* with "a well-graded diminuendo to pianissimo... it was very effective."[542] Perhaps Gigout was going for a similar effect, but with a crescendo. Whatever the intent, such a crescendo would have been very difficult to achieve on organs in eighteenth-century Saxony and Thuringia; as previously noted, they rarely had swell boxes. Also, while it would be possible to add stops manually on such an organ, sometimes the keydesk was designed in such a way that many of the register controls were located at the limit or beyond the reach of the organist sitting at the keyboard, and many times pulling the stops themselves would require some strength. To make a crescendo similar to what Gigout does on an instrument that Bach knew, the organist would require assistance in most cases.

Bonnet's and Erb's Registration and Dynamics

[542] Henderson, "Memories of Some Distinguished French Organists: Guilmant," 978.

In their two organ roll recordings, Bonnet follows the ideas in his own editions, and Erb follows the principles of registration of the French Romantic Organ School.

Registering *O Mensch, bewein*: Comparing Gigout's Roll with Bonnet's Edition

O Mensch, bewein also appears in Joseph Bonnet's edition of some Bach organ works in his *Historical Organ-Recitals* series, published in 1918, around six years following Gigout's recording.[543] Bonnet suggests the following registration:

"Récit : Fonds 8, Flûte 4
Posit[if] : Bourdon 8, Flûte 8, Salicional 8
Récit accouplé au Pos.
G. O. : Flûte 8, Bourdon 8. Récit et Pos.
accouplés au G.O.
Pédale : Fonds 16 et 8" [544]

Table 3 shows a comparison between Gigout's registration and which stops on the recording organ would have sounded closest to what Bonnet knew; the selected stops marked in bold:

[543] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 26–29.
[544] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 26.

Gigout		Bonnet		Bonnet		Gigout	
Manual I		Manual I		Manual II		Manual II	
Bordun	16'	Bordun	16'	**Wienerflöte**	**8'**	**Wienerflöte**	**8'**
Principal	**8'**	Principal	8'	**Bordun**	**8'**	Bordun	8'
Traversflöte	**8'**	**Traversflöte**	**8'**	**Viola**	**8'**	Viola	8'
Gambe	8'	Gambe	8'	Aeoline	8'	**Aeoline**	**8'**
Viol. d'orch.	8'	**Viol. d'orch.**	**8'**	**Dolce**	**4'**	Dolce	4'
Vox coelestis	**8'**	Vox coelestis	8'	Quinte	2 ⅔'	Quinte	2 ⅔'
Flöte	4'	Flöte	4'	Clarinette	16'	Clarinette	16'
Piccolo	2'	Piccolo	2'	Trompette	8'	Trompette	8'
Sesquialter	II	Sesquialter	II	Horn	8'	Horn	8'
Fagott	8'	Fagott	8'	Oboe	8'	Oboe	8'
Harfe		Harfe		Vox Humana	8'	Vox Humana	8'
Glocken		Glocken		Tremolo		Tremolo	
Man. II to I		**Man. II to I**					
				Pedal		Pedal	
				Violonbass	**16'**	Violonbass	16'
				Subbass	**16'**	**Subbass**	**16'**
				Cello	**8'**	Cello	8'
				Gedackt	**8'**	Gedackt	8'
				Posaune	16'	Posaune	16'
				I to Pedal		**I to Pedal**	
				II to Pedal		**II to Pedal**	

Table 3: Gigout's registration in his performance of *O Mensch, bewein* compared to suggestions by Joseph Bonnet adapted by the author to fit the Welte recording organ in Freiburg; the stops selected are in bold.

In this adaptation, Bonnet's Récit corresponds to the Freiburg recording organ's Manual II, where Bonnet's instructions can be realised perfectly. However, adapting the rest of Bonnet's registrations for a three-manual organ to the two-manual Freiburg recording instrument requires some compromises. Bonnet's G.O. (grand orgue) corresponds to the Freiburg organ's Manual I; here, Bonnet's indication for "Flûte" is a shorthand for the French Romantic "Flûte harmonique", which would most likely be closest in design to the Freiburg Traversflöte. However, there is no equivalent to Bonnet's Bourdon 8 on the Freiburg organ, and Bonnet's entire positif division cannot be realised literally on the Freiburg organ. Therefore, to fulfil Bonnet's request for a Salicional 8 on the positif, one

could add the Viol. d'orch. 8' on the Freiburg organ, since Bonnet couples the positif sounds to the grand orgue.

Gigout's approach differs from this proposed adaptation of Bonnet's instructions in several notable ways. Bonnet's registrations, read literally on an organ he would have known, would not feature any sort of principal sound. Gigout chooses a principal as the solo stop, and therefore Bonnet's solo would have sounded softer and a bit gentler. Second, Gigout uses only two stops in the accompaniment, while Bonnet calls for the entirety of the récit's foundation stops. However, he compensates for this by marking the récit line with piano, meaning the box would be mostly shut.[545] Further, Bonnet does not include any form of céleste sound, and he also calls for a much louder pedal division than what Gigout chose. In summary, Bonnet favours a gentler — yet because of the lack of céleste, clearer — sound from the organ, yet with a stronger bass.

The extensive use of the swell box in this performance — 17 swell box movements in a piece which is 24 bars in length — indicates that changing dynamics was an important part of performance practice. Gigout's particular use of the box confirms that, at least in this performance, the dynamic changes were tied to the structures, particularly harmonic, in the composition itself, as opposed to letting the contour of the line — opening the box when the melody is higher in pitch and closing when lower — dictate the swell shutters' position.

This is confirmed in Bonnet's edition. Table 4 shows a comparison between the various dynamics Gigout employed in his performance, and those indicated in Bonnet's edition.

[545] The box would not be entirely shut, as Bonnet instructs the player to "close the swell box" ("fermez boite Récit") at the end of bar 6; see Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 26.

Bars	Gigout Box Position	Bonnet Dynamics
Bar 1 – bar 2, beat 4	Closed	Piano
Bar 2, beat 4 – bar 6, beat 4	Open	
Bar 6, beat 4 – bar 7, beat 1	Closed	Close box
Bar 7, beat 1 – bar 8, beat 3	Open	
Bar 8, beat 3 – bar 10, beat 1	Closed	
Bar 10, beat 1 – bar 10, beat 3	Open	
Bar 10, beat 3 – bar 10, beat 4	Closed	Forte
Bar 10, beat 4 – bar 11, beat 3	Open	
Bar 11, beat 3 – bar 12, beat 4	Closed	
Bar 12, beat 4 – bar 13, beat 4	Open	Box open
Bar 13, beat 4 – bar 14, beat 3	Closed	
Bar 14, beat 3 – bar 16, beat 3	Open	
Bar 16, beat 3 – bar 19, beat 1	Closed	Box closed
Bar 19, beat 1 – bar 20, beat 4	Open	
Bar 20, beat 4 – bar 23, beat 2	Closed	
Bar 21, beat 1 – bar 22, beat 1		Crescendo
Bar 22, beat 1 – bar 22, beat 2		Forte
Bar 22, beat 2 – bar 22, beat 4		Decrescendo
Bar 22, beat 4 – bar 23, beat 3		Piano
Bar 23, beat 3 – bar 24, beat 2	Open	
Bar 24, beat 1 – end		Pianissimo
Bar 24, beat 2 – end	Closed	

Table 4. List of dynamic changes achieved by the swell pedal in Eugène Gigout's organ roll performance of J.S. Bach: *O Mensch, bewein dein Sünde groß*, BWV 622, as compared with the dynamic markings given in Bonnet's edition.

Bonnet's edition calls for more subtlety in dynamic changes than Gigout's opening and closing the box completely. Because Bonnet's markings for piano are followed by an instruction to close the box and forte by an instruction to open the box, the three most extreme dynamic markings are "Box open," "Box closed," and "Pianissimo." This indicates that for the swell box, a marking of piano means slightly open, and Forte almost completely open.

Despite the greater subtleties in Bonnet's instructions, the general shape of the dynamics of Gigout's performance are for the most part identical to Bonnet's. The variants are in bar 10, beat 3, where Gigout closes the box but Bonnet instructs "forte" — but Gigout's box movements here are very quick, likely because he wanted to bring

out the trill on the A-natural. Bonnet's general crescendo and decrescendo in bars 21–23 while Gigout keeps the box closed may have been because Gigout preferred a more subtle melodic climax in bar 22. Gigout opens the box in bar 23, beat 3 while Bonnet remains at piano, because Gigout wanted a strong dynamic contrast at the adagissimo. Finally, there is a slight difference in what point in the final bar the two organists close the box; Gigout favours waiting to close the box until after the shocking harmonies in bar 24, beat 1 conclude, whereas Bonnet calls for a softer dynamic, even during some of the chromaticism.

A summary of Widor's instructions on how to move from foundation stops to full organ, as described in Chapter 3, are as follows:

1. Close the swell box and add first the mixtures, then the reeds.
2. Open the swell.
3. Add the mixtures and reeds of the choir, then great.[546]

Gigout clearly does not follow this in his recording session with Welte, as the box remains open the entire piece, and all the stops come on at once. The signal to add all the loud stops at once comes on the second crotchet/quarter note of bar 40; see Figure 1. for the moment when the signal comes.

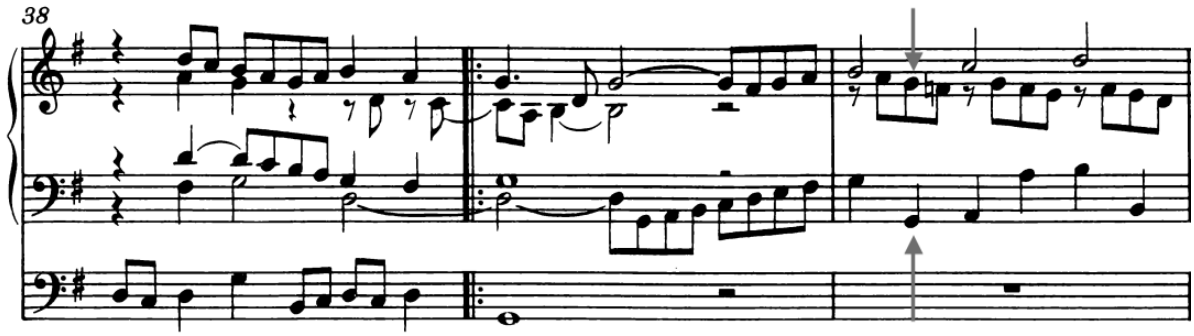


Figure 1: bars 38–40 of Bach *In dir ist Freude*, BWV 615, with the moment of Gigout's registration change (second repeat only) marked by arrows.[547]

[546] Widor-Schweitzer Edition 1, English xv.
[547] *NBA* IV/1, 27.

This change of registration occurs in the middle of the minim/half note B in the soprano line; Widor is completely against this, commenting, "to a sensitive ear this splitting-up and shredding of a chord... will always be a torture."[548] This entire registration change directly contradicts the aesthetics of Gigout's predecessor at the Paris Conservatoire. And yet, as will be demonstrated in Chapter 9, Gigout himself does not approach every crescendo on the organ in such a hasty manner. As to the seeming carelessness with which this piece was registered, it may have been an issue of Gigout not having enough time. Even so, Welte clearly was willing to edit the recordings, and in this roll a Welte editor already added the manual coupler at the registration change. Making the registration change earlier would have involved moving the perforations on the registration tracks only slightly ahead; if the change had happened at bar 40, beat 1, it would have avoided the "shredding" of the chord that Widor so vehemently disliked. The change at the point it appears in the final roll did not bother Gigout or Welte enough to make a modification, which indicates that Gigout was not as concerned about the precision of registration changes as his colleague.

Registering *In dir ist Freude*: Comparing Gigout's Roll with Bonnet's Edition

Bonnet's edition suggests the following registration for this piece:

"Claviers réunis : Fonds 8, 4, 2, Mixtures,
Anches 8, 4
Pédale : Fonds et Anches 16, 8, 4
Tirasses Récit et Pos." [549]

Bonnet's registration, albeit for a French Romantic organ, transfer easily here. The only exceptions are that there is no 4' reed in either manual, nor a mixture; additionally, the

[548] Widor-Schweitzer Edition 1, English, xv.
[549] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 22.

Horn 8' on the Freiburg recording organ, while a reed stop, did not typically appear on French Romantic organs.

Gigout also diverges from all the major Bach editions in bar 30 in the tenor line at the very last note, where he plays a D-sharp instead of D-natural, which is not marked in any of the editions from which he most likely was playing. If this was intentional, it does not particularly disturb the ear because the beginning of the next bar, 31, is in E minor. Welte clearly was willing to modify the roll, as he had already added the manual coupler at the registration change. It would have been simple to move the D-sharp Gigout had played one track over to D-natural. Yet the D-sharp remained; it is entirely possible that Gigout simply preferred this note, or this mistake simply was not noticed by anyone in the recording session.

Gigout's addition of stops in the middle of a note does not follow Widor's instructions for crescendo at all, and indicates not every member of the French Romantic Organ School shared his aesthetics about registration changes. It is also possible that the sudden addition of stops was a performer's issue, rather than a deliberate aesthetic choice; either way, this roll serves as a valuable and rare record of imperfection in early recordings.

Registering Trio Sonatas: Comparing Gigout's Rolls with Bonnet's Edition

For members of the French Romantic Organ School, the fast movement of a trio sonata required a different approach than a slow movement in terms of registration. Bonnet's edition of Trio Sonata 3, BWV 527, suggests three registrations for the outer, fast movements. For the first, two options are given:

"**A**

Récit	:	Cornet
Posit.	:	Cormorne 8 (ou Clarinette 8), Flûtes 8 et 4
Pédale	:	Bourdon 8, Flûte 8, Violoncelle 8

B

Récit	:	Basson, Hautbois 8, Bourdon 8
Posit. ou G. O.	:	Flûtes 8 et 4
Pédale	:	Bourdon 8, Flûte 8

...

Note. For this piece we propose two different registrations, **A** and **B**. The organist may choose either." [550]

Registration A is identical to French Baroque registration practice in the Trios à deux dessus texture; Fenner Douglass's chart, which summarises eight sources from 1676–1766, all suggest some form of a cornet on one manual with the cromorne in other.[551] However, all the sources except Boyvin (1689) say that the cornet should be in the left hand, with the cromorne in the right, the opposite of Bonnet's suggestion. It seems entirely likely that Bonnet would have known something about the French Baroque repertoire, given his teacher Alexandre Guilmant had edited an entire series of French Renaissance and Baroque repertoire entitled *Archives des Maîtres de l'orgue* (along with André Pirro). However, Guilmant's registrations for trios have nothing to do with any period sources; in Nicolas de Grigny's *Gloria in excelsis*, movement 8, marked "Trio," Guilmant suggests the following:

"Récit (main gauche)	:	Gambe et Bourdon de 8
Positif ou Gd. Orgue	:	Fl.harm. de 8"[552]

[550] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 58: "*Nota*. Pour cette pièce, nous proposons deux différentes régistrations **A** et **B**. L'organiste choisira entre l'une ou l'autre.
[551] Douglass, *The Language of the French Classical Organ*, 118.
[552] Nicolas de Grigny, "Livre d'orgue," *Archives des Maîtres de l'orgue* 5, ed. Alexandre Guilmant and André Pirro (Paris: A. Durand & Fils, 1904), 28.

However, in François Couperin's Agnus Dei, the fifth couplet (Domine Deus) from the *Messe*, Guilmant clearly ignores Couperin's instruction (which is reproduced in the edition), "Trio a deux dessus de chromhorne et la basse de tierce." The registration he gives is:

> "Positif, main droite : Cromorne (ou Clarinette) et Bourdon de 8 P.
> Récit, main gauche : Basson et Bourdon de 8 P."[553]

Guilmant's suggestion does not correspond to any typical French Baroque registration for a Trio, and ignores Couperin's' request for "la basse de tierce." Bonnet may have been aware of a source his teacher had missed, but even if that were the case, he still inverted the left and right hands, and his suggestion for the pedal would only balance on most French Romantic organs if the Grand orgue had a very soft cornet and a very loud Violoncello 8' in the pedal. Yet if Bonnet had wished to play Bach's trio on a registration of a Francophone eighteenth century organ, his Registration A clearly indicates a preference for a French organ registration, rather than attempting to make the piece sound as if it were played by a chamber ensemble on the organ.

As noted in Chapter 11 (Roll 1587), Registration B is problematic for several reasons, mainly having to do with pitch levels. In bar 32, the pedal line is higher in pitch than the second treble line. In this moment, the two treble lines are moving in parallel motion, indicating Bach considered them as a single unit texturally; with only an 8' pitch in the pedal, the final B-flat sounds as if it's part of the inner texture, and the audience may perceive the left-hand line functioning as the bass. However, with a 16' in the pedal, the B-flat, sounding an octave lower, clarifies that the harmonic motion at this

[553] François Couperin, "Pièces d'orgue," *Archives des Maîtres de l'orgue* 5, ed. Alexandre Guilmant (Paris: A. Durand & Fils, 1903), 125.

moment is V^{6-4}/ii, which is typical of eighteenth-century music. This indicates that Bach intended for a 16' pitch in the pedal, in order to keep the bass function of the lowest line.

However, there is no source from Bach himself which gives any indication of what registration he used when playing trio sonatas on the organ. If playing these pieces on the harpsichord or clavichord with a pedalboard, for instance, a 16' pitch in the pedal was rare but did exist in pre-nineteenth century instruments, depending on the design.[554] In the instances in which Bach transcribed these organ sonatas for an instrumental ensemble, a 16' pitch instrument may or may not have been present; in cantatas such as BWV 76/8, a near-direct transcription of BWV 528/2 for oboe d'amore and viola da gamba in the treble lines, he gives no indication as to the basso continuo composition; however, given the rest of the piece involves a large ensemble of strings, two oboes, and trumpet, one could reasonably assume a 16' instrument would have been present.[555] In other instances, such as the two trio sonatas for chamber ensemble, BWV 1039 and 1040, it would be outside of the usual practice of a trio group of the period to have an instrument of 16' pitch. Perhaps Bonnet was trying to mimic these instrumental practices of the time in his registration suggestions, or he simply did not mind voice crossings such as bar 32 of BWV 525/1. Whatever the reason, the use of 16' pitch in the pedal for trios was not in Bonnet's aesthetic.

In Gigout's recording of the *Trio Sonata 1: I. Allegro moderato*, BWV 525, Table 1 shows which stops Gigout selected on the recording organ:

---

[554] Karrin Ford, "The Pedal Clavichord and Pedal Harpsichord," *The Galpin Society Journal* 50 (March 1997), 161–179. Ford notes on page 171 that the only surviving pedal clavichord with two manuals, built in 1760 by Johann David Gerstenberg of Saxony, had both 8' and 16' pitch in the pedal. No original harpsichords with a pedalboard survive; Ford's examination of the various descriptions of these instruments indicate that, depending on the instrument, the harpsichord pedalboards were operated by pull-down mechanisms or could have their own independent case. Only in the latter could the instrument have 16' pitch.

[555] D-B: Mus.ms. Bach P 67.

Manual I		Manual II	
Bordun	16'	Wienerflöte	8'
Principal	8'	Bordun	8'
Traversflöte	**8'**	Viola	8'
Gambe	8'	Aeoline	8'
Viol. d'orch.	8'	Dolce	4'
Vox coelestis	8'	Quinte	2 ⅔'
Flöte	**4'**	Clarinette	16'
Piccolo	2'	Trompette	8'
Sesquialter	II	Horn	8'
Fagott	8'	**Oboe**	**8'**
Harfe		Vox Humana	8'
Glocken		Tremolo	
Manual II to I			
		Pedal	
		Violonbass	16'
		Subbass	**16'**
		Cello	**8'**
		Gedackt	8'
		Posaune	16'
		I to Pedal	
		II to Pedal	

Table 1: Gigout's registration in his performance of J.S. Bach:
Trio Sonata 1: I. Allegro moderato, BWV 525; the stops selected are in bold.

This basically conforms to the suggestions of Guilmant and Bonnet (especially the latter's suggestion B) above, with a few key differences. Bonnet and Guilmant both suggest using a reed stop plus a Bourdon for one of the manuals; in Gigout's case, he only uses the Oboe 8' alone, without any second flute at 8' pitch. He also adds a 16' Subbass to the pedal, whereas the suggestions of his contemporaries only allow for 8' pitch. This indicates that, while some members of the French Romantic Organ School liked 8' pitch in the pedal, there was clearly variation, and ultimately the nature of the organ at hand and aesthetics of the player were the most important considerations.

Summary

While there are differences of opinion between Gigout and Bonnet in the details of which stops to employ, all three organists followed the ideals of the French Romantic Organ School without exception. Swell box movements can be used to accentuate the large-scale form of a piece, but can also be general expressive devices.

Ornamentation

The vast majority of the time, Gigout, Bonnet, and Erb perform trills and mordents from the written note, despite having access to J.S. Bach's ornament chart in the *Clavier-Büchlein vor Wilhelm Friedemann Bach*. The exceptions to this are when playing from the upper note makes for a better melody in a slow movement.[556] Trills may continue to be repeated until the next note, or can be terminated early at the same time as there is motion in another voice.

Gigout's Ornamentation

The many variations, inconsistencies, and liberties Gigout takes in ornamentation practice, especially in the *O Mensch, bewein* roll (but also *In dir ist Freude*) indicates that in chorale preludes, decisions about the starting note of trills in the French Romantic Organ School were far more flexible than one dogmatic approach. While the simplest explanation might be to suggest that Gigout was uninformed of the W.F. Bach table, most of Gigout's decisions have a clear logic, and it seems unlikely that such an accomplished organist and organ teacher would have arrived at these

[556] Gigout in *O Mensch, bewein*.

choices without having carefully considered how to handle each of Bach's own markings in the score, especially in a piece designed as a pedagogical work for ornamentation.

All the trills in *Trio Sonata V: II. Largo*, BWV 529 are performed from the main note. The chromatic differences could simply have been mistakes, either on Gigout's part, or in the copying of the roll. The assimilation of the final notes of bars 38 and 52 into one demisemiquaver/thirty-second note avoids the dissonance between the tonic note (D and A, respectively) and the semitone below, which suggests that the French Romantic Organ School did not approve of such clashes. Curiously, the other instance where a similar motion occurs, the end of bar 12, Gigout does not assimilate the rhythmic values, but plays them in basically exact time, though with some ritardando into the next section. Given these three bars' similar function in the overall form, the variation between them indicates that some aspects of interpretation were left up to the performer's mood in the moment.

The change of pitches in bar 38 is not seen in either of the Bach autographs, P 271 and P 272; these show the musical text in the pedal as D, C, B-flat, etc., whereas Gigout plays C, B, B-flat, etc.[557] Harmonically the resulting 6-4 chord on beat one goes against the typical function of this chord in eighteenth century works, especially those of J.S. Bach. However, the change of these two notes does create a descending chromatic line starting at the last quaver/eighth note of bar 37, which perhaps Gigout found attractive to the right hand's contrary motion ascending chromatic scale. It does indicate that, if this was not an error, that there was some freedom to change the notes in Bach's organ works to fit the performer's taste. However, since there are no mentions of

[557] D-B Mus.ms. Bach P 271, Faszikel 1, 41. D-B Mus.ms. Bach P 272, 71.

this in any primary written sources from the time of the French Romantic Organ School, the choice to change these notes seems inexplicable unless it was an error on the part of the Welte technician who perforated the score.

Bonnet's Ornamentation

In both Bonnet's organ roll recordings, he only plays trills from the main note.

Erb's Ornamentation

In both Erb's organ roll recordings, he only plays trills from the main note. However, he also ignores many trills written into the score in the first movement of the *Concerto in A Minor* and the *Concerto in G Major*, and in the second movement of the latter he changes the length of his trills.

Ornamenting *O Mensch*: Comparing Gigout's Roll with Bonnet's Edition

Bonnet's edition simplifies several ornamentation markings from what Bach's manuscript shows. Instead of writing out the descending accents in the soprano in bars 5 and 6, Bonnet simplifies them, shown in Figure 5.

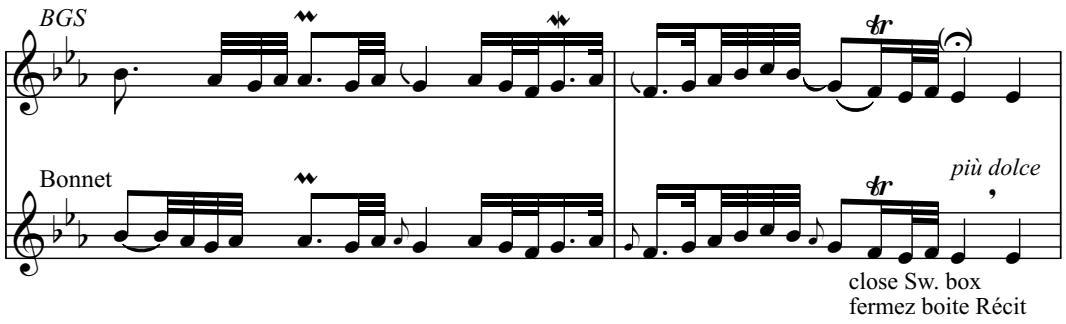


Figure 5. J.S. Bach: *O Mensch, bewein dein Sünde groß*, comparing bars 5–6 as shown in the *Neue Bach-Ausgabe* and the same in the Bonnet edition.

Bonnet's editorial decision goes against J.S. Bach's practice, and given he reproduces the Wilhelm Friedemann Bach ornament chart at the beginning of the edition, was clearly Bonnet's intentional decision.[558] This indicates that his priority was to replace arcane ornament signs with something he thought his potential audience — presumably non-professional organists — would find simpler. It also shows that the leading Francophone organists of this period knew about the ornament table and Bach's practices, and intentionally chose another solution according to their taste.

Summary

Bonnet and Erb played trills only from the main note, and Gigout in everything but his chorale preludes. In chorale preludes, Gigout employs a mix of main and upper note trills, which are based on either making a conjunct line or highlighting the melody of the chorale. All three leave ornaments out, but this could be a result of the edition.

Rhythm and Tempo

All three performers add some form of rubato at major structural points in the piece, clarifying form. The tempo and stability of tempo of each piece depends entirely on the performer. Gigout and Bonnet are largely very steady with keeping the larger beats consistent; any rhythmic variation for Gigout especially happens within the larger beats. Erb's rhythm fluctuates, often in the extreme, and he is the only organist of the three to employ a true rubato in his recordings.

[558] Bonnet, "Johann Sebastian Bach," *Historical Organ-Recitals* 2, 1.

If a tempo was marked in an edition, the performers (Bonnet and Erb) usually followed it very closely.

Gigout's Rhythm and Tempo

Gigout uses ritardando in every organ roll to accentuate the musical form of a piece. There are instances where he uses accelerando as well. His recording of the *Trio Sonata V: II. Largo*, BWV 529, especially bars 13–14 and 33–34, is an example of what to modern ears might sound like an uncontrolled accelerando and would seem to go against the French Romantic Organ School's general principles of strong rhythm. However, given that these two pairs of bars are nearly identical in duration — bars 13 and 33 both lasting exactly 5.94 seconds, and bars 14 and 34 lasting 5.60/5.58 seconds respectively, a difference of 0.02 seconds — indicates that these instances were not due to simply rushing, but were highly intentional.

Bonnet's Rhythm and Tempo

Bonnet's rhythm and tempo is the most consistent of the three, and he follows the metronome markings in his edition of *In dulci jubilo* nearly perfectly. He also uses ritardando to accentuate the musical form of the piece.

Erb's Rhythm and Tempo

Erb's rolls show by far the least consistent pulse in his playing. He is also the only of the three to use rubato according to the theoretical use (adding a ritardando to a few beats and then adding an accelerando immediately after to make up the lost time). He also uses ritardando to accentuate the musical form of the piece.

Summary

All three organists use ritardando to highlight significant moments in the piece's architecture. Accelerando is also used as a form of increasing tension and motion, but is done highly intentionally and for only short periods of time within a piece.

Adaptation for Recordings and Intervention of Editors

There are two instances in these recordings in which the ending of a piece was modified for the purposes of the recording: Gigout cuts out the Phrygian cadence in *Trio Sonata 5/II*, and Erb adds a large G major chord at the end of the *Concerto in G Major*. These were intentional choices of the organists, as Welte editors typically corrected wrong notes.

Summary and Conclusion

The Origins of Bach in France

At the beginning of the nineteenth century, following the French Revolution, the organ works of Johann Sebastian Bach were basically unknown in the Francophone world. The first nearly half of the century was a time of rebuilding what had been destroyed, both in terms of instruments and the pedagogy of the organ. The heart of teaching was improvisation, and on the whole organ playing remained far behind that of the Germanic world, in part due to a lack of pedals in the instruments, and study of pedalling among players. The keyboard music of J.S. Bach had come to France as early as 1801, but was limited primarily to fugues, and only a few piano teachers, such as Louis Adam of the Paris Conservatoire, used it in their teaching. Among those early editions, they all largely only reproduced the notes as J.S. Bach had written — there was no distinctive editorial intervention, French or otherwise.

The Belgian musicologist and head of the Brussels Conservatoire François-Joseph Fétis sought to introduce Bach's organ works to try and raise the standard of Francophone organ performance. He invited Christian F.J. Girschner of Berlin to teach the organ class, and specifically to introduce the tradition of Johann Sebastian Bach's music. While the details of this pedagogy are lost, he almost certainly was teaching some form of legato as the default articulation in organ playing.

The turning point came when Fétis sent his prized pupil, Jacques-Nicolas Lemmens to Breslau to study with the Bach grand-pupil Adolph Hesse. Upon his return from Breslau, Lemmens bore a note from Hesse that said, "I have nothing more to teach

M. Lemmens."[559] The veracity of this note and reality of the claim was more complex, but in the end it made no difference: Fétis proclaimed far and wide that his prized pupil had studied with a Bach grand-pupil and had inherited a living tradition of Johann Sebastian's music and performance practice.

The heart of this, codified in the 1862 treatise and method book *École d'Orgue*, was a reliance on absolute legato as the default articulation in polyphony; in this, every note is connected, with no silence at all between any two pitches. Additionally, pedalling could use toes and heels equally to achieve this goal, as well as new extended techniques of fingering, such as the *glissé*.

With the help of the organbuilder Aristide Cavaillé-Coll, Lemmens's ideas about performance practice were introduced to the upper echelons of Parisian musical life and became influential, attracting the biggest talents of the day to study with him — especially Bach's organ works — in Brussels, and then return to Paris to take major church posts.

With the appointment of Lemmens's student Charles-Marie Widor as organ professor of the Paris Conservatoire, these ideas became the heart of multiple generations' study, and playing a major work of Bach was a prerequisite for serious organ study. As Lemmens's pupils began to take over literally every major church post, a new style of Francophone organ playing, improvisation, and composition emerged, all of which was centred around the works of Johann Sebastian Bach, with all the details of performance practice based on ideas from Lemmens and Fétis. Widor took these ideas further and, thanks to organbuilding innovations pioneered by Cavaillé-Coll (and also

[559] Fétis, "Revue critique," *Revue et gazette musicale de Paris* 18 (1851), 30: "Je n'ai plus rien à apprendre à M. Lemmens."

used by his Francophone competitors), introduced a clear method of using registration changes to create — for the first time in France — a seamless crescendo from pianissimo to fortissimo. He also espoused that rhythm was the most important aspect of organ playing, and valued clarity above all; he believed that while absolute legato was the ideal default articulation, there were specific instances in which there had to be exceptions. The most important of these was for repeated notes; according to Widor, the ratio of sound to silence should be between 2:1 — two parts sound and one part silence — or 3:1, three parts sound, one part silence.

The French Romantic Organ School's pedagogical writings are not found in prefaces to their own music, but to that of Johann Sebastian Bach. The Widor-Schweitzer Edition codified what various students and colleagues of Widor had said he had been teaching for years. Other Bach editions by Gabriel Fauré, Joseph Bonnet, and Louis Vierne further support not only Widor's ideas, but the serialisation of Bach and Francophone organ performance practice in general. In summary, there was no difference between the performance practice of French Romantic organ compositions and J.S. Bach — they were one and the same. What remained was to study these written ideals of performance practices and aesthetics, compare them with early recordings on organ rolls, determine how closely they were followed in real performances by leading organists of the time, and the implications of any deviations.

Organ Rolls

The Welte Company, based at its peak in Freiburg im Breisgau, Germany, built self-playing musical instruments, which from 1833 until the early twentieth century, became increasingly complex. While the early automatons played works that a

technician pinned into a barrel or punched into paper or another similar wood-based material, Welte's greatest contribution to organ art came around 1912 when they developed and released technology that, for the first time, would allow a live artist to record their playing onto a piece of paper, and then after perforation and the application of new pneumatic technology, would allow that performance to be replayed on demand.

The goal was commercial success, yet Michael Welte also saw the importance of his technology for capturing a live human's performance for generations to come. He invited leading organists and composers from all over Europe (and later further afar) to come to his studios in Freiburg and Poughkeepsie, New York to record their own compositions, transcriptions of others' pieces, and performances of organ works by other composers.

Among the members of the French Romantic Organ School, Eugène Gigout, Joseph Bonnet, and Marie-Joseph Erb made a combined total of ten recordings of Bach's organ works on paper organ rolls. Many of those original master rolls, from which the commercial copies were made, are in the possession of the Museum für Musikautomaten in Seewen, Switzerland. Under the joint leadership of Daniel Debrunner and David Rumsey, the Museum sponsored a major digitisation project whereby all their Welte organ rolls were scanned and, with the help of purpose-developed software, converted into specialised MIDI files that would allow Welte's recordings to be faithfully reproduced while ensuring the preservation of the original paper rolls.

In 2007, the Museum put one of the world's few surviving large-scale Welte organs on display. This Welte Philharmonie Organ was originally slated to be put on the HMHS *Britannic*, but instead had gone through several owners before the Museum

acquired it and sponsored its restoration. As part of this process, a computer was attached to the organ that is able to play the digitisations made by Debrunner and his team. These organ rolls and their digitisations objectively show the performer's exact articulation, registrations and methods of crescendo and decrescendo, ornamentation practices, and more, and can be analysed in extreme detail.

The Debrunner scans of French Romantic Organ School members playing Bach's works form the basis of this study, which aims to compare the written aesthetics from Lemmens, Widor, and those in their circles to performances on organ rolls to determine how faithfully the three members of the French Romantic Organ School — Gigout, Bonnet, and Erb — followed the highly serialised performance practice instructions from their teachers, and the implications of any variations.

Further Research

An important goal of this thesis is to make organ roll recordings more well-known among performers and scholars alike, and pave the way for future research on organ rolls using empirical methodology. The study of Bach's organ works in the French Romantic period is important to understanding the way those organist-composers thought about, performed, and composed their own music. The work ahead for researchers focusing on performance practice is the study of recordings of organist-composers playing their original compositions from that period.

The Museum für Musikautomaten in Seewen, Switzerland is the world's largest repository of Welte organ roll recordings, but it is by no means the only one, and studies of organ recordings by the Aeolian Company and other smaller organ automaton producers are basically completely unstudied. The major topics to be researched

thoroughly are performance practice, especially composers playing their own music (Max Reger, Gigout, Karl Straube), the transcription/adaptation of orchestral works to the organ (especially Edwin Lemare), methods by which non-Germanic organists adapted registrations to a German recording instrument, and other famous organists playing older music (Marcel Dupré and Karl Straube playing Bach). Study of organ rolls can also reveal questions about commercial interests of recording producers and their highly affluent customers, the kinds of music passengers of luxury ships like the RMS *Titanic*, HMHS *Britannic*, and many more might have heard when the orchestras were on break.[560]

Conclusion

This limited study of ten rolls alone definitively refutes the idea that written guides on performance practice were followed strictly, shows that even in highly standardised national schools of playing there was great room for individual flair, and most importantly, demonstrates that organ rolls are a basically completely unexplored wealth of knowledge about every aspect of organ art. However, from a practical perspective, the greatest value of organ rolls is that they captured an artist's performance — even if only at that one exact moment in time — and preserved it far better and in greater detail than any other recording medium until the invention of MIDI.

The most surprising thing about studying organ rolls, from the author's perspective as a performer, is how far from the performing practices modern musicians have strayed. Having studied, worked, and/or taught in major conservatoires in North

[560] Welte organs were built for both ships, but the *Titanic*'s was unfinished by the time of the maiden voyage, and as discussed previously, the *Britannic*'s never made it on board due to the ship being requisitioned as a hospital vessel.

America and Europe, so many conservatory music teachers are uninformed of the true performance practices of the late nineteenth and early twentieth century, and claim to rely on traditions passed down from their teachers. The author has never heard a performance of Reger's works that sound anything remotely close to Reger's organ rolls. These recordings were made barely over 100 years ago and refute countless assumptions by modern performers. While tremendous attention has been given in the last century to music of the first half of the nineteenth century and earlier (the "Early Music" movement), one of the final frontiers of truly understanding historically informed performance practice is examining the period during which these organ rolls were recorded. For organists, these rolls are the key to rediscovering unique and extraordinarily beautiful forms of musical expression that have not been heard since the days of Gigout, Bonnet, and Erb.

Appendix A: Dataset of Durations of Beats in Gigout's Organ Roll Recording of *O Mensch, bewein*, BWV 622

Below is the dataset for Gigout's Welte recording of *O Mensch, bewein*, BWV 622. The "Time" column indicates the precise timing of the beginning of each quaver/eighth note beat. The "Beat" column is in the format "Bar.Quaver" — for example, 2.7 refers to bar 2, quaver 7.

Time (seconds)	Beat
0.000	0.7
0.048	0.8
1.628	1.1
2.712	1.2
4.201	1.3
5.536	1.4
6.838	1.5
7.988	1.6
9.630	1.7
10.925	1.8
12.235	2.1
13.447	2.2
14.786	2.3
16.069	2.4
17.452	2.5
18.739	2.6
20.236	2.7
21.978	2.8
24.276	3.1
25.861	3.2
27.185	3.3
28.317	3.4
29.579	3.5
30.798	3.6
32.466	3.7
33.741	3.8
34.945	4.1
36.281	4.2
37.756	4.3
39.172	4.4
40.670	4.5
42.493	4.6
44.327	4.7

46.405	4.8
48.447	5.1
50.225	5.2
51.850	5.3
53.104	5.4
54.764	5.5
56.501	5.6
58.503	5.7
59.939	5.8
61.719	6.1
63.437	6.2
65.623	6.3
67.500	6.4
69.079	6.5
71.529	6.6
73.839	6.7
76.138	6.8
77.949	7.1
79.772	7.2
81.479	7.3
83.116	7.4
84.856	7.5
87.028	7.6
88.735	7.7
90.163	7.8
91.650	8.1
93.099	8.2
94.454	8.3
95.865	8.4
97.663	8.5
99.323	8.6
101.130	8.7
103.236	8.8
104.931	9.1
106.301	9.2
107.868	9.3
109.087	9.4
110.623	9.5
112.013	9.6
113.371	9.7

115.050	9.8
116.445	10.1
117.692	10.2
119.063	10.3
120.360	10.4
122.195	10.5
124.366	10.6
126.560	10.7
128.337	10.8
130.206	11.1
131.866	11.2
133.515	11.3
134.920	11.4
136.452	11.5
138.681	11.6
140.167	11.7
141.932	11.8
143.639	12.1
145.636	12.2
147.400	12.3
149.328	12.4
151.382	12.5
154.366	12.6
156.653	12.7
158.395	12.8
160.264	13.1
161.866	13.2
163.260	13.3
164.978	13.4
166.313	13.5
167.892	13.6
169.215	13.7
171.003	13.8
172.413	14.1
174.904	14.2
176.495	14.3
178.039	14.4
179.961	14.5
181.986	14.6
183.576	14.7

185.017	14.8
186.778	15.1
188.253	15.2
189.593	15.3
191.137	15.4
192.726	15.5
194.479	15.6
195.767	15.7
197.560	15.8
199.436	16.1
200.992	16.2
203.407	16.3
205.508	16.4
207.250	16.5
209.641	16.6
211.978	16.7
214.378	16.8
216.677	17.1
218.627	17.2
220.218	17.3
221.913	17.4
223.910	17.5
225.546	17.6
227.104	17.7
228.786	17.8
230.539	18.1
232.327	18.2
233.744	18.3
235.439	18.4
237.187	18.5
239.328	18.6
241.711	18.7
243.751	18.8
245.574	19.1
247.049	19.2
248.607	19.3
250.212	19.4
251.733	19.5
253.176	19.6
254.589	19.7

255.940	19.8
257.445	20.1
259.066	20.2
260.580	20.3
261.991	20.4
263.673	20.5
265.700	20.6
267.337	20.7
269.235	20.8
271.229	21.1
272.666	21.2
274.408	21.3
276.045	21.4
277.455	21.5
279.012	21.6
280.800	21.7
282.924	21.8
284.491	22.1
286.128	22.2
288.009	22.3
290.325	22.4
292.188	22.5
295.114	22.6
297.866	22.7
300.025	22.8
302.132	23.1
304.065	23.2
305.964	23.3
307.618	23.4
309.398	23.5
311.171	23.6
313.017	23.7
315.002	23.8
316.883	24.1
319.356	24.2
322.045	24.3
324.389	24.4
327.593	24.5
329.979	24.6
333.340	24.7

Appendix B: Lemmens's *École de la Pédale*

The following is a reproduction of the preface to the second part of Jacques-Nikolaus Lemmens's *École d'orgue*, entitled *École de la Pédale*. This section of the *École d'orgue* (to the author's knowledge) has not been reprinted since the first edition, and as it contains invaluable insights into the pedal performance practice and aesthetics of Lemmens and those of his pupils, this short but dense document is now available to those without access to the original. The French is reprinted from Jaak Nikolaas Lemmens, *École d'orgue: basée sur le plain-chant romain*, (Germany: B. Schotts Söhne, 1862), 68, and an English translation with annotations is given on the next pages.

ÉCOLE DE LA PÉDALE.

La pédale est une des parties les plus essentielles de l'orgue. Pour acquérir un certain degré d'habileté sur cet instrument, il faut mettre tous ses soins à en bien connaître l'emploi.

Un grand nombre d'organistes ne se servent, pour jouer de la pédale, que du pied gauche. Cette mauvaise méthode oblige l'exécutant de transporter à chaque instant la même pied d'un endroit à l'autre, ce qui rend impossible la liaison de jeu; quant aux passages vifs, dont la pédale est aussi susceptible que le clavier des mains, il ne faut pas songer à les exécuter de cette manière. Une bonne méthode pour l'emploi de la pédale est aussi nécessaire qu'un bon doigter pour le jeu de l'orgue proprement dit.

L'étendue de la pédale doit être de vingt-sept notes au moins; il est préférable de lui en donner trente, en montant jusqu'au *fa*.

Les jeux de la pédale doivent être plus bas d'une octave que ceux du grand orgue. Il arrive cependant que pour donner plus de force au manuel, on y met un bourdon de seize pieds, sans qu'il y ait des trente-deux pieds à la pédale. Dans ce cas, il faut éviter, en usant de ce jeu, de descendre plus bas de la main gauche que la partie de pédale. Le croisement de ces deux parties à l'unisson produirait un renversement de l'harmonie, et au lieu d'un accord parfait, on en aurait un de sixte ou de quarte et sixte.

On joue de la pédale deux pieds : 1º en *poussant* de la pointe ou du talon; 2º en *glissant* d'un même pied; 3º en *substituant* l'un des pieds à l'autre, ou en *substituant* la pointe au talon et *vice versâ*.

Nous désignerons la pointe par un P, le talon par un T. Lorsque ces lettres se trouvent au-dessus de la portée, elles indiquent le pied droit; en-dessous, elles signifient le pied gauche.

Les passages les plus faciles et les plus usités sont ceux qui permettent de jouer des deux pieds alternativement. (*Voir les exercices, page* 69).

Les pages 70 et 71 contiennent les gammes majeures et mineurs de tous les tons. Pour peu qu'on étudie ces gammes, on s'apercevra qu'on peut les exécuter dans un mouvement beaucoup plus vif avec notre nouvelle manière de placer les pieds qu'avec toute autre méthode; cela provient de ce que nous avons évité tout déplacement inutile.

On remarquera en jouant ces gammes, que toutes les fois qu'on rencontre trois noires [1] de suite, soit en montant soit en descendant, on est obligé de glisser de la pointe d'une de ces noires sur l'autre, ce que est d'une exécution très-difficile.

Le *glissé*, est représenté par un trait d'union, qui se trouve entre les deux lettres, comme P—P.

Le *glissé* se fait aussi d'une *noire* sur une *blanche*, en montant ou en descendant d'un demi ton, et par la pointe du pied. (*Voir l'exercice nº* 1*, page* 72).

Le *glissé* se fait encore sur une seule touche *blanche* et cela pour se prépare une bonne position. Par exemple : pour lier du même pied, *ré*, *mi*, *fa dièze*, on doit commencer par la pointe sur le *ré*, ensuite on met le talon sur le *mi*, mais pour arriver alors avec la pointe au *fa dièze*, il faut avancer le pied en glissant du talon sur le *mi*. En faisant le même passage en descendant, il faut reculer le pied, en glissant du talon sur le *mi*, afin de pouvoir atteindre par la pointe au *ré*. (*Voir l'exercise nº* 2*, page* 72), où nous avons placé, au-dessus de la lettre T indiquant le talon, deux autres petites lettres *a* et *r*, qui indiquent qu'il faut glisser sur la même touche en avancant (*a*) ou en reculant (*r*) le pied.

La *substitution* est également d'une grande ressource pour lier les passages difficiles de la pédale. Elle se fait de deux manières : 1º en substituant un pied à l'autre; 2º en substituant le talon à la pointe du même pied, ou la pointe au talon. (*Voir l'exercice nº* 3*, page* 72, dans lequel l'un des pieds est substitué à l'autre). On remarquera, dans cet exercice, la manière dont nous indiquons la substitution d'un pied à l'autre. On y verra aussi qu'il faut substituer au talon d'un pied la point de l'autre et à la pointe de l'un le talon de l'autre.

Dans l'exercice nº 4, on substitue le talon à la pointe du même pied et la pointe au talon.

Les arpèges sur la pédale ont été regardées, jusqu'à ce jour, comme impraticables. Cependant l'exécution en devient assez facile si l'on passe la pointe du pied gauche derrière le talon du pied droit. Par ce système les pieds ne se gênent pas l'un l'autre. (*Voir l'exercice nº* 5*, page* 72).

Les cadences se font de la même manière sur la pédale que sur le clavier des mains. Dans les mouvements vifs, on fait un peu moins de notes que dans les mouvements lents, pour éviter la confusion. (*Voir l'exercice nº* 6*, page* 72).

Les accords font rarement un bon effet sur la pédale ; aussi n'en faut-il user que sobrement. On peut faire, du même pied, tous les intervalles de seconds majeures et mineures, toutes les tierces majeures et mineures, excepté celles que sont composées de deux touches noires. (*Voir l'exercice nº* 7*, page* 72).

Pour donner une idée de tout ce que l'on peut faire sur la pédale, nous donnons, sous le nº 8, un solo de pédale à 4 parties.

A la page 73, se trouvent différents exercices à une partie.

Les pages 74 et 75 contiennent des exercices en octaves, très-difficiles.

Avant de terminer ces explications, nous ferons observer qu'il faut préférer, dans les mouvements vifs, le *glissé* à la substitution, parce que le *glissé* ne demande qu'un mouvement du pied et que la substitution en exige deux.

---

[1] Nous entendons par *noires* les touches supérieures de la pédale, qui sont *ut dièze, mi bémol, fa dièze, la bémol* et *si bémol*. Par *blanches*, nous entendons les touches inférieures, *ut*, *ré*, *mi*, *fa*, *sol*, *la*, *si*.

PEDAL SCHOOL.

The pedal is one of the most essential parts of the organ. To acquire a certain degree of ability on this instrument, it is necessary to take all care to know its use well.

A large number of organists only use the left foot to play the pedal. This dreadful method forces the performer to always move the same foot from one place to another, which rends it impossible to create a legato in playing; as for the lively passages, of which the pedal is as susceptible as the keyboard of the hands, one must not dream of playing in this manner. A good method for the use of the pedal is as necessary as a good fingering for the proper playing of the organ itself.

The range of the pedal must be at least twenty-seven notes; it is preferable to give it thirty, ascending to F.[561]

Pedal stops should be one octave lower than those of the great organ. It happens, however, that to give more force to the manual, we add a Bourdon 16' to it, without there being 32' at the pedal. In this case, it is necessary to avoid, by using this stop, to descend lower with the left hand than the pedal part. The crossing of these two parts in unison would produce a reversal of the harmony, and instead of a perfect chord, one would have a six chord or a four-six chord.[562]

One plays the pedal with two feet: first by *pushing* with the toe or the heel; second while *sliding* with the same foot; third by *substituting* one of the feet for the other, or by substituting the tip for the heel and vice versa.

We will designate the toe by a P, the heel by a T. When these letters are above the staff, they indicate the right foot; below, they signify the left foot.

The easiest and most used passages are those that allow you to play with both feet alternately. (*See the exercises on page* 69).

Pages 70 and 71 contain all the major and minor scales. If one studies these scales, one will find that one can execute them in a much livelier movement with one's new way of placing the feet than with any other method; this is because we have avoided any unnecessary travel.

One will notice while playing these scales, that every time one encounters three black keys (1) in a row, either ascending or descending, one is obliged to slide from the point of one of these black pedals onto the other, which is very difficult to execute.

The *glide* is represented by a hyphen, which is between the two letters, like P—P.

The *glide* is also done from a *black* [key] to a *white* [key], going up or down a semitone, and by the toes of the foot. (*See exercise no.* 1*, page* 72).

The *glide* is still done on a single *white* key in order to prepare a good position. For example: to tie with the same foot, *D*, *E*, *F sharp*, you must start with the toe on *D*, then you put your heel on *E*, but to arrive then with the toe at *F sharp*, you have to

[561] Based on this, Lemmens suggests the pedalboard should begin chromatically on C two octaves below middle C, with the highest note being the D above middle C. As discussed in Part 1 of this dissertation, Lemmens's suggestion that the pedalboard go until F is probably directly related to J.S. Bach's *Toccata in F Major*, BWV 540.

[562] This principle of pedal registration echoes philosophies espoused by Lemmens's various pupils and grand-pupils of the French Romantic Organ School. The "perfect chord" to which he refers is a root-position triad.

move the foot by sliding from the heel on the *E*. While making the same passage while descending, it is necessary to step back the foot, while sliding from the heel on the *E*, in order to be able to reach by the point with the *D*. (*See exercise no.* 2*, page* 72), where we have placed, above the letter T indicating the heel, two other small letters a and r, which indicate that you have to slide on the same key while moving forward (*a*) or stepping back (*r*) the foot.

Substitution is also a great resource for tying together difficult passages for the pedal. It is done in two ways: first by substituting one foot for the other; second by substituting the heel for the toe of the same foot, or the toe for the heel. (*See exercise no.* 3*, page* 72, in which one foot is substituted for the other). One will notice, in this exercise, the way in which we indicate the substitution of one foot for the other.[563] One will also see there that it is necessary to substitute for the heel of one foot the point of the other and for the toe of one the heel of the other.

In exercise no. 4, one substitutes the heel for the toe of the same foot and the toe for the heel.

The arpeggios on the pedal have been regarded, until now, as impracticable. However, the execution becomes quite easy if you pass the tip of the left foot behind the heel of the right foot. By this system the feet do not interfere with each other. (*See exercise no.* 5*, page* 72).

The cadences are done in the same way on the pedal as on the manual keyboard. In lively movements, one should play fewer notes than in the slow movements, to avoid confusion. (*See exercise no.* 6*, page* 72).

Chords rarely have a good effect on the pedal; therefore they should only be used sparingly. One can play, with the same foot, all the intervals of major and minor seconds, all the major and minor thirds, except those which are composed of two black keys. (*See exercise no.* 7*, page* 72).

To give an idea of all that can be done on the pedal, we give, under no. 8, a solo for pedal in four parts.

On page 73 there are various exercises for one [voice] part.

Pages 74 and 75 contain exercises in octaves, which are very difficult.

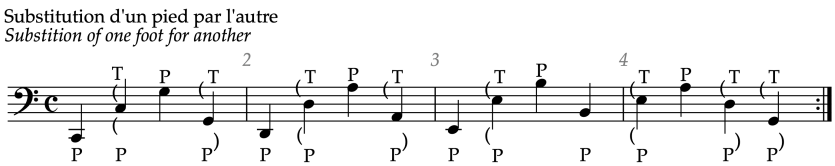
Before ending these explanations, we will observe that in livelier movements, the glide is preferred to substitution because the glide requires only one movement of the foot and the substitution requires two.

---

(1) [Lemmens's footnote] — By *black* we mean the upper keys of the pedal, which are *C sharp*, *E flat*, *F sharp*, *A flat* and *B flat*. By *white* we mean the lower keys, *C*, *D*, *E*, *F*, *G*, *A*, *B*.

---

563 This is indicated in the following way:



Bibliography

Publications by Many Authors

La france musicale 7.

La Presse, Paris edition, 19 December 1844.

La Revue musicale 6 (1829).

Le Ménestrel 11, no. 30.

Nouveau Manuel Complet de l'Organiste. Paris, 1905.

The Britannic Organ. Volumes 1–11: Munich: Oehms Records, 2011–2015. Volume 12: Hong Kong: Naxos of America.

Works by an Unknown Author

"Audition du nouvel orgue A Saint-Eustache." *Le Ménestrel* 11, no. 30 (1844), 2.

"En hommage à Marie-Joseph Erb," *Dernière nouvelles d'Alsace* (20 November 2019), 37.

"Joseph Bonnet," *The Musical Times* 85, no. 1221 (November 1944), 351.

"Joseph Bonnet," *The Diapason* 418, no. 10 (September 1944), 10.

"Mr. M. Welte's Orchestrion." *The Illustrated London News* 41, no. 1165 (20 September 1862), 323.

"Sonic Visualiser." Accessed 5 September 2020. www.sonicvisualiser.org.

Works by One or More Author

Anderson, Christopher. ""... wie ich es eingtlich meine...": In Pursuit of the Straube School via Recorded Evidence." In *The Organ in Recorded Sound: History, Sources, Performance, Practice*, edited by Kimberly Marshall. Göteborg: Göteborg Organ Art Center, 2012.

Armstrong, Agnes. *Organ Loft Whisperings: The Paris Correspondence of Fannie Edgar Thomas, 1893–1894*. Altamont, New York: Sicut tuum, 2003.

Bingham, Seth. "Joseph Bonnet as He Knew Him; Intimate Picture of the Man." *The Diapason* 418, no. 10 (September 1944), 4.

Bach, Carl Philipp Emanuel. *Versuch über die wahre Art das Clavier zu spielen*. Berlin: Christian Friedrich Henning, 1753.

Bach, Johann Sebastian. *Clavier-Büchlein vor Wilhelm Friedemann Bach*. Yale University Beinecke Library (US-NHub) Music Deposit 31, fol. 3r.

_____. *Dritter Theil der Clavier Übung*. Leipzig: Johann Sebastian Bach, 1739.

_____. *Goldberg Variations*. Edited by Carl Czerny. Leipzig: Peters, c. 1850.

_____. *Well-Tempered Clavier, Book 1*. Edited by Carl Czerny. Leipzig: Peters, 1863.

Bédos de Celles de Salelles, François Lamathe. *L'art du facteur d'orgues* (Paris: Dom Bédos, 1766).

Benton, Rita. "Pleyel as Music Publisher." *Journal of the American Musicological Society* 32, No. 1 (1979).

Binniger, Kurt. "Die Welte-Philharmonie-Orgel." *Acta organologica* 19 (1986).

Blanchard, Henri. "Audition de l'orgue Daublaine-Callinet a l'exposition des produits de l'industrie." *Revue et gazette musical de Paris* 11.

_____, "Auditions musicales." *Revue et Gazette Musicale de Paris* 33 (18 August 1850).

Bonnet, Joseph. "Forerunners of Bach (Maîtres primitifs et Précurseurs de Bach)." *Historical Organ-Recitals* 1. New York: G. Schirmer, 1917.

_____. "Handel, Mozart, and Masters of the Eighteenth and Early Nineteenth Centuries," *Historical Organ-Recitals* 3. New York: G. Schirmer, 1918.

_____. "Johann Sebastian Bach," *Historical Organ-Recitals* 2. New York: G. Schirmer, 1918.

_____. "Modern Composers: César Franck to Max Reger," *Historical Organ-Recitals* 5. New York: G. Schirmer, 1929.

_____. "Old Spanish Masters," *Historical Organ-Recitals* 6. New York: G. Schirmer, 1940.

_____. "Romantic Period: Schumann, Mendelssohn, Liszt," *Historical Organ-Recitals* 4. New York: G. Schirmer, 1919.

Bowen, José Antonio. "Who Plays the Tune in "Body and Soul"? A Performance History Using Recorded Sources." *Journal of the Society for American Music* 9, no. 3 (2015).

Breig, Werner. "Composition as Arrangement and Adaptation." In *The Cambridge Companion to Bach*, edited by John Butt and translated by Stewart Spencer. Cambridge, UK: Cambridge University Press, 1997.

Butler, Lynn and Christoph Wolff. *The Organs of J.S. Bach: A Handbook*. Urbana: University of Illinois Press, 2012.

Cittadin, Nicola. "L'Esposizione Internazionale di Torino nel 1911, Marco Enrico Bossi e la ditta Welte." In *Wie von der Geisterhand: Aus Seewen in die Welt*, edited by Christoph Hänggi. Seewen, Switzerland: Museum für Musikautomaten, 2011.

Clarke, Eric. "Empirical Methods in the Study of Performance." In *Empirical Musicology: Aims, Methods, Prospects*. Oxford: Oxford University Press, 2004.

Cook, Nicholas, Eric Clarke, Daniel Leech-Wilkinson, and John Rink. *The Cambridge Companion to Recorded Music*. Cambridge, UK: Cambridge University Press, 2009.

Couperin, François, *L'Art de toucher le clavecin*. Paris: Chés l'Auteur, le Sieur Foucaut, 1716.

_____. "Pièces d'orgue." A*rchives des Maîtres de l'orgue* 5. Edited by Alexandre Guilmant. Paris: A. Durand & Fils, 1903.

Couwenbergh, Hilaire Vital. *L'orgue ancien et moderne: traité historique, théorique et pratique de l'orgue et de son jeu*. Lierre: Joseph van In & Cie, 1891.

Crawford, Jack. ""Mes Souvenirs" by Louis Vierne: An Annotated Translation." PhD diss., University of Miami, 1973.

da Costa Neal Peres. *Off the Record: Performing Practices in Piano Playing*. Cambridge, UK: Cambridge University Press, 2012.

Dangel, Gerhard. "Archäologie eines Klangs." In *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, edited by Christoph Hänggi. Bern: Hochschule der Künste Bern, 2013.

Debrunner, Daniel. "Die Entwicklung des Musikrollenscanners der Bernerfachhochschule — Aus Musikrollenbildern wird Musik — Die Elektronische Steuerung der Welte-Philharmonie-Orgel." In *Wie von der Geisterhand: Aus Seewen in die Welt*, edited by Christoph Hänggi. Seewen, Switzerland: Museum für Musikautomaten, 2011.

_____. "Von der Welte-Rolle zur parametrisierbaren Wiedergabe auf synthetischen Instrumenten und MIDI-fähigen Selbstspielklavieren." In *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, edited by Christoph Hänggi. Bern: Hochschule der Künste Bern, 2013.

Dirst, Matthew. *Engaging Bach: The Keyboard Legacy from Marpurg from Mendelssohn*. Cambridge, UK: Cambridge University Press, 2021.

Douglass, Fenner. *Cavaillé-Coll and the French Romantic Tradition*. New Haven: Yale University Press, 1999.

_____. *The Language of the Classical French Organ: A Musical Tradition before 1800*. New Haven: Yale University Press, 1995.

Duvall, André Charles. "The Development and Application of Keyboard Fingering Principles in the Music of J.S. Bach and C.P.E. Bach: An Analysis in Comparison with Modern Approaches to Fingering, and the Utilization of the J. C. Bach-Ricci Method for Nurturing a Versatile Technique in the Early Stages of Study." DMA diss., University of North Carolina at Greensboro, 2014.

Ellis, Katharine. *Interpreting the Musical Past: Early Music in Nineteenth-Century France*. Oxford: Oxford University Press, 2005.

_____. *Music Criticism in Nineteenth-Century France: 'La Revue et Gazette musicale de Paris', 1834–1880*. Cambridge, UK: Cambridge University Press, 1995.

Erb, Marie-Joseph. "Mon entré à l'Ecole Niedermeyer." In *Marie-Joseph Erb: Sa vie et son œuvre*. Strasbourg: Éditions F.X. Le Roux et Cie., 1948.

Erb, Jane. "Marie-Joseph Erb, né à Strasbourg le 23 Octobre 1858, mort à Andlau le 9 Juillet 1944." In *Marie-Joseph Erb: Sa vie et son œuvre*. Strasbourg: Éditions F.X. Le Roux et Cie., 1948.

Eschbach, Jesse. *A Compendium of Known Stoplists by Aristide Cavaillé-Coll*. Paderborn: Verlag Peter Ewers, 2003.

_____. *Aristide Cavaillé-Coll: Aspects of His Life and Work*. Paderborn: Verlag Peter Ewers, 2012.

_____. "Aristide Cavaillé-Coll: Master of Masters." In *The Organ as a Mirror of its Time*, edited by Kerala J. Snyder. Oxford: Oxford University Press, 2002.

_____. *Cavaillé-Coll and the Musicians* (Raleigh: The Sunbury Press, 1980).

Faulkner, Quentin. "J.S. Bach's Keyboard Fingering: New Evidence." *The Diapason* 71, no. 4 (April 1980).

Fauré, Gabriel. "Souvenirs." *La Revue musicale* 22 (October 1922).

Ferrard, Jean. "François-Joseph Fétis et Joseph Merklin, unis pour le progrès de le facture d'orgues en Belgique." *Revue belge de Musicologie / Belgisch Tijdschrift voor Muziekwetenschap* 62 (2008).

Fétis, François-Joseph. *Biographie universelle*. Brussels, 1868.

_____. *Le parfait organiste, par F. J. Fétis. Deuxième partie. Style des organistes célèbres de toutes les époques et de toutes les écoles, ou Recueil de morceaux choisis dans leurs oeuvres*. Paris: Pleyel, c. 1830.

_____. " Revue critique / Nouveau Journal d'orgue, à l'usage des organistes du culte catholique, publié par M. Lemmens, professeur d'orgue au Conservatoire royal de musique de Bruxelles." *Revue et gazette musicale de Paris* 18 (1851).

Fétis, François-Joseph and Ignaz Moscheles. *Méthode des méthodes de piano ou Traité de l'art de jouer de cet instrument*. Paris: Maurice Schlesinger, 1840.

Ford, Karrin. "The Pedal Clavichord and Pedal Harpsichord." *The Galpin Society Journal* 50 (March 1997).

Forkel, Johann Nikolaus. *Über Johann Sebastian Bachs Leben, Kunst und Kunstwerke*. Leipzig: Hoffmeister und Kühnel, 1802.

Fulton, Mervin E. "How the Welte Pipe Organ Rolls were Made." In *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, edited by Christoph Hänggi. Bern: Hochschule der Künste Bern, 2013.

Grigny, Nicolas de. "Livre d'orgue." *Archives des Maîtres de l'orgue* 5. Edited by Alexandre Guilmant and André Pirro. Paris: A. Durand & Fils, 1904.

Hagmann, Peter. *Das Welte-Mignon-Klavier, die Welte-Philharmonie-Orgel und die Anfänge der Reproduktion von Musik*. Bern: Peter Lang, 1984.

Hänggi, Christoph. "Die Seewener Welte-Philharmonie-Orgel." In *Wie von der Geisterhand: Aus Seewen in die Welt*, edited by Christoph Hänggi. Seewen, Switzerland: Museum für Musikautomaten, 2011.

Heinsheimer, Hans W. "The Saga of Schweitzer's Bach Edition." *Music: The AGO and RCCO Magazine* 9, no. 1 (1975).

Henderson, Archibald Martin. "Memories of Some Distinguished French Organists: Dubois." *The Musical Times* 78, no. 1134 (1937).

_____. "Memories of Some Distinguished French Organists: Gigout." *The Musical Times* 78, no. 1133 (1937).

_____. "Memories of Some Distinguished French Organists: Guilmant." *The Musical Times* 78, no. 1137 (1937).

_____. "Memories of Some Distinguished French Organists: Saint-Saëns." *The Musical Times* 78, no. 1132 (1937).

_____. "Personal Memories of Vierne." *The Musical Times* 95, no. 1336 (1954).

_____. "Widor and His Organ Class." *The Musical Times* 78, no. 1130 (1937).

Hesse, Adolph. "Kleine Pedal-Schule." In *Nützliche Gabe für Orgelspieler* 1. Breslau: F.E.C. Leuckart, c. 1860.

_____. "Kleine Zeitung." *Neue Zeitschrift für Musik* 36 (1852).

Higginbottom, Edward. "The French Classical Organ School." In *The Cambridge Companion to the Organ*, ed. Nicholas Thistlethwaite and Geoffrey Webber. Cambridge, UK: University of Cambridge Press, 1999.

Jordan, Wesley D. "Manoel de S. Bento Gomes, *Magister aenigmaticus*: Notes about an Eighteenth Century Organbuilder from Valladolid, His Work and His Importance to Organography." *Revista de Musicología* 16, no. 6 (1993).

Joy, Charles R. *Music in the Life of Albert Schweitzer*. New York: Harper, 1951.

Jurine, Michel. "Joseph Merklin, facteur d'orgues: sa vie et son œuvre." PhD diss., Université Paris-Sorbonne, 1989.

Kooiman, Ewald. "Jacques Lemmens, Charles-Marie Widor, and the French Bach Tradition." *The American Organist* 29, No. 3 (March 1995).

Kounadi, Anna. "Scriabin Sonata-Fantasy op. 19 n. 2 on Record: A comparative Study of Sound Recordings and Piano Rolls." PhD diss., Goldsmiths, University of London, 2015.

Lecotart, Henri. "Quelques souvenirs." *L'Orgue* 36 (December 1938) and 37 (March 1939).

Lehmann, Karen. *Die Anfänge einer Bach-Gesamtausgabe*. Hildesheim: Georg Olms Verlag, 2004.

Lemmens, Jaak Nikolaas. *École d'orgue: basée sur le plain-chant romain*. Germany: B. Schotts Söhne, 1862.

Lemmens, Jacques-Nicolas. *École d'Orgue basée sur le Plain-chant Romain*. Brussels, 1862.

Liège Les Orgues. “Église Saint-Barthélemy (Grand Orgue).” Accessed 5 September 2020. https://liegelesorgues.eu/orgues/eglise-saint-barthelemy-grand-orgue/.

Locher, Carl. *An Explanation of the Organ Stops with Hints for Effective Combinations*. Translated by Agnes Schauenburg. London: Kegan, Paul, Trench and Co., 1888.

Loret, Clément. *Cours d'orgue et exercise journalier*. Paris: La Maîtrise, 1858–1859.

Lueders, Kurt. "Reflections on the Esthetic Evolution of the Cavaillé-Coll Organ." In *Charles Brenton Fisk, Organbuilder: Essays in His Honor* 1, edited by Fenner Douglass, Owen Jander, and Barbara Owen. Easthampton, Massachusetts: The Westfield Center for Early Keyboard Studies, 1986.

Marie-Joseph Erb's website. "Biographie." Accessed 5 September 2020. https://sites.google.com/site/mariejosepherb/biographie.

Marpurg, Friedrich Wilhelm. *Anleitung zum Clavierspielen*. Berlin: A. Haude & J. C. Spener, 1755.

Morelot, Stephen. "Inauguration de l'orgue de Saint-Eustache." *La France musicale* 7 (1844).

Musuem für Musikautomaten. "Museumsgeschichte." Accessed 5 September 2020. www.musikautomaten.ch/mma/de/home/museum/museumsgeschichte.html.

Near, John. *Widor: A Life Beyond the Tocca*ta. Rochester: University of Rochester Press, 2011.

_____. *Widor on Organ Performance Practice and Technique*. Rochester: University of Rochester Press, 2019.

Nectoux, Jean-Michel. *Gabriel Fauré: A Musical Life*. Cambridge, UK: Cambridge University Press, 2004.

Nivers, Guillaume-Gabriel. *Livre d'orgue contenant cent pièces de tous les tons de l'Église*. Paris: Ballard, 1665.

Ochse, Orpha. *Organists and Organ Playing in Nineteenth-Century France and Belgium*. Bloomington: Indiana University Press, 2000.

Owen, Barbara. "Technology and the Organ in the Nineteenth Century." In *The Organ as a Mirror of its Time*, edited by Kerala Snyder. Oxford: Oxford University Press, 2002.

Palm, Albert. "La connaissance de l'œuvre de J. S. Bach en France a l'époque préromantique." *Revue de Musicologie* 52, no. 1 (1966).

Pontecoulant, Ad. vicomte de [pseudonym]. "Exposition de l'industrie. Pianos: Gaërin. — Orgues: Daublaine et Callinet. — Réception de l'orgue de Saint-Eustache." *La France musicale* 7 (1844).

Peterson, William J. "Lemmens and Nineteenth-Century Organ Methods." In *French Organ Music from the Revolution to Franck and Widor*. Rochester, New York: University of Rochester Press, 1995.

Pirro, André. *Jean-Sébastien Bach*. Paris: F. Alcan, 1906.

_____. *L'esthétique de Jean-Sébastien Bach*. Paris: Librairie Fischbacher, 1907.

_____. *L'orgue de Jean-Sébastien Bach*. Paris: Librairie Fischbacher, 1895.

Povel, Dirk-Jan. "Temporal Structure of Performed Music: Some Preliminary Observations." *Acta Psychologica* 41 (1977).

Raugel, Félix. *Les grandes orgues des églises de Paris et du département de la Seine*. Paris: Librairie Fischbacher, 1927.

Rich, Kirk. "To Lift or Not to Lift: Slurs and Articulation in Mendelssohn's Organ Works." DMA diss., University of Houston, 2018.

Riemenschneider, Albert and Herman Keller, "A Short History of the Basic Griepenkerl edition of Bach's Organ Works." *Eight Music Book*. London: Hinrichsen, 1956.

Rinck, C.H. *Practische Orgelschule*. Berlin: Simrock, c. 1794.

Rumsey, David. "Afternoons with Eugène Gigout." *The Diapason* 1216 (March 2011).

_____. "The Big Picture — Welte's Instruments, Rolls, Recording, Digital Editing." In *Wie von der Geisterhand: Aus Seewen in die Wel*t, edited by Christoph Hänggi. Seewen, Switzerland: Museum für Musikautomaten, 2011.

_____. "The Speed of Welte's Organ Rolls." In *Wie von der Geisterhand: Aus Seewen in die Welt*, edited by Christoph Hänggi. Seewen, Switzerland: Museum für Musikautomaten, 2011.

Schmitz, Hans-W. "Untersuchungen am Aufnahmeapparat für die Welte-Philharmonie-Orgelrollen." In *'Recording the Soul of Music': Welte Künstlerrollen für Orgel und Klavier als authentische Interpretationsdokumente?*, edited by Christoph Hänggi. Bern: Hochschule der Künste Bern, 2013.

Schumacher, Guido and Monique Dehin. "La restauration du grand orgue Merklin de l'ancienne collégiale Saint-Barthélemy à Liège." *Festival d'Orgue de Liège* (2014).

Schweitzer, *Albert*. *J.S. Bach* 1. Leipzig: Breitkopf und Härtel, 1928. Preface by Charles-Marie Widor.

_____. *J. S. Bach: Le musicien-poète*. Leipzig: Breitkopf und Härtel, 1905.

_____. *Out of My Life and Thought*. Translated by C.T. Campion. New York: H. Holt, 1949.

_____. *Un Grand Musicien Français: Marie-Joseph Erb*. Strassburg-Paris: Editions F.-X. Le Roux & Cie., 1948.

Seashore, Carl E. *Psychology of Music*. New York: McGraw-Hill, 1938.

Seyfried, Hans Jürgen. *Adolph Friedrich Hesse als Orgelvirtuose und Orgelkomponist*. Regensburg: G. Bosse, 1965.

Smith, Rollin. *Louis Vierne: Organist of Notre-Dame Cathedral*. Hillsdale, New York: Pendragon Press, 1999.

_____. *Toward an Authentic Interpretation of the Organ Works of César Franck*. New York: Pendragon Press, 1983.

Stauffer, George. "Bach's Organ Registration Reconsidered." In *J.S. Bach as Organist*, edited by George Stauffer and Ernest May. Bloomington: Indiana University Press, 1986.

Steger, Carsten and Markus Ulrich. "A Camera Model for Line-Scan Cameras with Telecentric Lenses." *International Journal of Computer Vision* 129 (January 2021).

Stinson, Russell. *Bach: The Orgelbüchlein*. Oxford: Oxford University Press, 1999.

_____. *J.S. Bach at His Royal Instrument: Essays on His organ Works*. Oxford: Oxford University Press, 2012.

Tiffin, Joseph and Carl E. Seashore, "The Iowa Piano Camera." *Science*, New Series 72, no. 1858 (8 August 1930).

Vivaldi, Antonio. *L'estro armonico, Op. 3, Book 2*. Amsterdam: Estienne Roger, n.d. [1711].

Wolff, Christoph. *Bach: Essays on His Life and Music*. Cambridge, Massachusetts: Harvard University Press, 1991.

Werner, Johann Gottlob. *Orgelschule*. Penig: F. Dienemann und Compagnie, 1807.

Williams, Peter. *The European Organ, 1450–1850*. Bloomington: Indiana University Press, 1978.

_____. *The Organ Music of J.S. Bach*. Cambridge, UK: Cambridge University Press, 2003.

Yearsley, David. *Bach's Feet: The Organ Pedals in European Culture*. Cambridge, UK: Cambridge University Press, 2012.