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**ORGAN IMPROVISATION IN GERMAN *FUNDAMENTA*
OF THE 15TH CENTURY¹**

Abstract: The earliest instructions for organ playing reveal a close relationship between organ playing and improvisation. Instruction books bearing the title *Fundamentum* seem to be almost exclusively a German phenomenon. From these books it is clear that improvisation on the keyboard was done according to certain rules for consonances and typical playing figures idiomatic to the instrument. This article investigates the relationship between organ playing and improvisation as is evident from the *fundamenta*, in particular the *Munich Treatise*², the *Breslau-Fragment*³, the *Fundamentum* by Conrad Paumann⁴ and selected 15th century organ pieces.

Key words: Organ improvisation, *Fundamentum*, *Ars organisandi*, Conrad Paumann, *Buxheimer Orgelbuch*

During the Middle Ages and the Renaissance the terms *ex improviso* and *ex tempore* were frequently used to indicate that the musician created the music at the spur of the moment, thus establishing the connection between the playing of an instrument and the art of improvisation. However, with regard to organ playing, another term surfaced: *in arte organisandi*. As early as the 9th century it was used by a monk of Angoulême and it also occurs in a manuscript by Eberhard of Freisingen (11th century) and the *Milan Treatise* (around 1100). In the tractate of Freisingen the connection between the *organisandi* and organ playing is mentioned: *In qua simplici quaestione ne quis etiam simplex haereat, sciendum est, quod mensura consequenter de tot fistulis loquitur, quot chorus fistularum musici solent ipsi organico instrumento apponere, ad organisandi artem habendam.*⁵ It can therefore be assumed that the conventional manner in which organ playing was learned, was ‘at the instrument’, suggesting that this was achieved by means of improvisation.

¹ This article is based on an extract from a Masters thesis by the author, Daleen Kruger, *Die Orgel improvisation in Deutschland und Italien bis zum Anfang des 17. Jahrhunderts – unter besonderer Berücksichtigung der Deutschen Fundamentumbücher*, Potchefstroom, Potchefstroom University for Christian Higher Education, 1984.

² Munich, Bavarian State Library, Cod. lat. 7755 fol 276-280.

³ Breslau Staatsbibliothek, I Qu 42.

⁴ Mus ms 40613 Berlin Staatsbibliothek der Stiftung Preußischer Kulturbesitz.

⁵ As quoted by: A. Schering, *Studien zur Musikgeschichte der Frührenaissance*, Leipzig, 1914, 20. Free translation: ‘It must be known that, in such a straightforward investigation [into the art of the organ], no-one, however, has a straightforward answer, because the measurement consequently talks about many pipes and the choruses of pipes ... the musicians usually attach themselves to the organ, in order to master the art of organ playing’. The author wishes to thank Prof Marianne and Me Willemien Froneman of the Northwest University, Potchefstroom (South Africa) for their assistance with the translation.

It would seem that in the early 15th century one would also have distinguished between organ playing from a tablature and improvised playing. By the middle of the 15th-century command of the rules of counterpoint was most likely a pre-requisite for outstanding professional players of keyboard, wind and brass instruments alike.⁶ Good musicians played ‘without music’ (i.e., a written score). These performances emphasized the spontaneous creation of the music, either as contrapuntal invention or elegant elaborations of a melodic line.⁷ Teaching the *ars organisandi* was most likely an oral tradition, strengthening the argument that organ playing was first and foremost a matter of improvisation. However, accomplished organists were naturally more concerned with playing *ex improviso* and there could well have been an increasing need for methods to study the art of organ playing.⁸ These methods were referred to as the *fundamenta*.

The *fundamenta*

Instructions for the *arte organisandi* are found in several organ methods from the middle of the 15th century onwards. Some of these instruction books bear the title *Fundamentum*. Apart from the Polish *Tablature* (1537-1548) of Johannes von Lublin,⁹ the 15th-century *Fundamenta* seem to be almost exclusively a German phenomenon, wide spread throughout the German speaking regions.¹⁰

Derived from the Latin *fundare* the *fundamentum* can be understood as a method of laying the foundation for the *arte organisandi* – the foundation of organ playing. The *fundamenta* were therefore not composition methods per se¹¹ but rather methods for improvisation on a given melody.¹² Most material in the *fundamenta* can be regarded as ‘notated exercises designed specifically to cultivate improvisation and dexterity at the organ’.¹³

Several *Fundamenta* from the 15th and the first half of the 16th century are known to us. The oldest is the so-called *Munich Treatise* (*M Tr*) wherein the author states that the best way of playing the organ

⁶ J. Kmetz, *Music in the German Renaissance. Sources, Styles and Contexts*, Cambridge, Cambridge University Press, 1994, 210.

⁷ *Ibid.*, 1994, 211.

⁸ F. Feldmann, ‘Musik und Musikpflege im mittelalterlichen Schlesien’, *Darstellung und Quellen zur schlesischen Geschichte, Band 37*, Hildesheim, Olms Verlag, 1973, 118-119.

⁹ Krakow, Polska Akademia Nauk, Ms. 1716.

¹⁰ It must be noted that the term *Fundamentum* also appears in methods for other instruments like the clavichord in Kotter’s *Fundamentum totius artis musicae* (1513) and the lute in Judenkönig’s *Utilus et compendiarium introductio, qua ut fundamentum* (1515/1523?) and Neusiedler’s *Ein neugeordnet künstlich Lautenbuch* (1536).

¹¹ W. Apel, *Geschichte der Orgel- und Klaviermusik bis 1700*, Kassel, Bärenreiter, 1967, 42-44.

¹² See: E. T. Ferand, *Die Improvisation in der Musik*, Zurich, Rhein Verlag, 1938, 305; M. Kugler, *Die Musik für Tasteninstrumente im 15. und 16. Jahrhundert*, Wilhelmshafen, Heinrichshofen Verlag, 1975, 62.

¹³ J. Butt, ‘Germany and the Netherlands’, in: A. Silbiger (ed), *Keyboard music before 1700*, New York, Schirmer Books, 1995, 147.

relies on the progression of good consonances: *iis modus organizandi perfectus*.¹⁴ Other works¹⁵ bearing the title *fundamentum* include the *Fundamentum* by Wolfgang von Neuhaus¹⁶ and the two fragments from the Dominican monastery in Breslau.¹⁷ The most well-known of the 15th-century sources are the *Fundamentum organisandi* by Conrad Paumann¹⁸ and the 4 *Fundamenta* in the *Buxheimer Orgelbuch*.¹⁹ As the most comprehensive collection of keyboard music before 1600, it is significant that almost one third of the manuscript (45 out of 166 written folios) is dedicated to *fundamenta*.²⁰ It could be indicative of the importance given to the craftsmanship and improvisation abilities of the organist.²¹

From the 16th century the *fundamenta* of Hans Kotter (1513)²² and Hans Buchner (1515)²³ stand out amongst all the organ tablatures. Buchner actually defines exactly what the purpose of the *fundamentum* is: *Fundamentum* is a term used by organists to indicate a short but accurate instruction to organize a second, third or more parts against a well-known melody.²⁴ The instruction includes rules for comfortable fingering, the ability to transcribe vocal pieces into tablature (*cantiones transferendae in tabulaturum*), the treatment of a *cantus firmus*, the *ars inveniendi* and canonic imitation. The mentioning of canonic imitation should be linked to the fact that Buchner's *Fundamentum* is almost 100 years younger than the *M Tr* and Paumann's work and that he takes into account the contrapuntal developments of his time and incorporates these into the keyboard techniques. Buchner's work reflects the state of German organ playing at the beginning of the 16th century.

The method of the *fundamenta*

The *fundamenta* are mainly concerned with four aspects of organist skills:

¹⁴ Munich, Bavarian State Library, Cod. lat. 7755 fol 276-280. Discovered and described by T. Göllner, 'Formen früher Mehrstimmigkeit in deutschen Handschriften des späten Mittelalters'. *Münchener Veröffentlichungen zur Musikgeschichte*, Band 6, Tutzing, Schneider, 1961.

¹⁵ D. Kruger, op. cit., 1984.

¹⁶ Hamburg, State Library ND VI 5225. See also: L. Schrade, *Die handschriftliche Überlieferung der ältesten Instrumentalmusik*, Baden, Lahr, 1931.

¹⁷ Breslau Staatsbibliothek, I Qu 42 and IF 687a. See also: Feldman, op cit., 244-245 and T. Göllner, op. cit., 88.

¹⁸ Mus ms 40613 Staatsbibliothek der Stiftung Preußischer Kulturbesitz.

¹⁹ Bavarian State Library Cim 352b. Faksimilee edition: B. A. Wallner, *Das Buxheimer Orgelbuch*, Kassel, Bärenreiter, 1955. Modern edition: B. A. Wallner (ed), *Erbe deutsche Musik*, Vol 37-39, Kassel, Bärenreiter, 1958/59.

²⁰ W. Apel, *Geschichte der Orgel*, op. cit., 52; M. Kugler, op. cit., 69.

²¹ D. Kruger, op. cit., 73.

²² Hs Basel F. IX. 22.

²³ 2 copies: Zurich State Library S. Mscr. 284 and Basel University Library F. I. 8^a.

²⁴ *Fundamentum vocant organistae brevem certissimamque rationem quemvis cantum planum redigendi in iustas duarum, trium pluriumve vocum symphonias*. Folio 16 of F. I. 8^a.

- treatment of ascending and descending melodic lines in a tenor (*ascensus* and *descensus*),
- the art of filling out a *tactus*, i.e., the playing figures to ornament voices in general,
- the elaboration on the final closing interval (*pausas regulas*), and
- pieces with repeated notes (*redeuntes*) or preludes.

It will now be established how these aspects are treated in the *M Tr* and the *Fundamentum Organisandi* by Conrad Paumann and what traces of these teachings can be found in the organ pieces in manuscripts of the time.

The *Munich Treatise*

The *Munich Treatise* (*M Tr*) bears the inscription *Nota regulas supra tactus*. Apart from informing the organist as to the proper use of consonances, the *M Tr* also introduces several basic playing figures (Figure 1) which can be used to fill out the *tactus* or connect the consonances. These figures can be viewed in the same light as the diminutions of the 16th century which formed the basis of improvisation for singers and instrumentalists.²⁵

²⁵ Among the earliest of these methods for the *diminution* are Sylverstro Ganassi's *Opera intitulata Fontegara* (1535) and Diedo Ortiz's *Tratado de glosas* (1553).

²⁶ As quoted by T. Göllner, op. cit., 174 (f. 278 of the manuscript).

of these figures in combination with the proper consonances are described as the normal way of playing (*ars organica usualis*).

Example 1: The playing figures from the *M Tr*

1 2 3
Ascendens:

4 5 6
Descendens:

7 8 9
Indifferens:

10 11
Ascendens:

12
Descendens:

13 14
Indifferens:

This is then followed by detailed examples illustrating different ways in which the figures can be combined to the taste of the player. According to the author of the *M Tr* the mastering of the application of these figures in combination with knowledge of the consonances would bring the aspiring organist closer to proper organ playing (*quibus satis et ars organica, que proprie artificialis nuncupatur et non usualis*).²⁷ The examples given demonstrate that the player was free to combine the playing figures in any order and experiment with different rhythms as well:

Example 2: Combinations of the basic figures with new rhythmic patterns, *M Tr*

Ascendens:

Descendens:

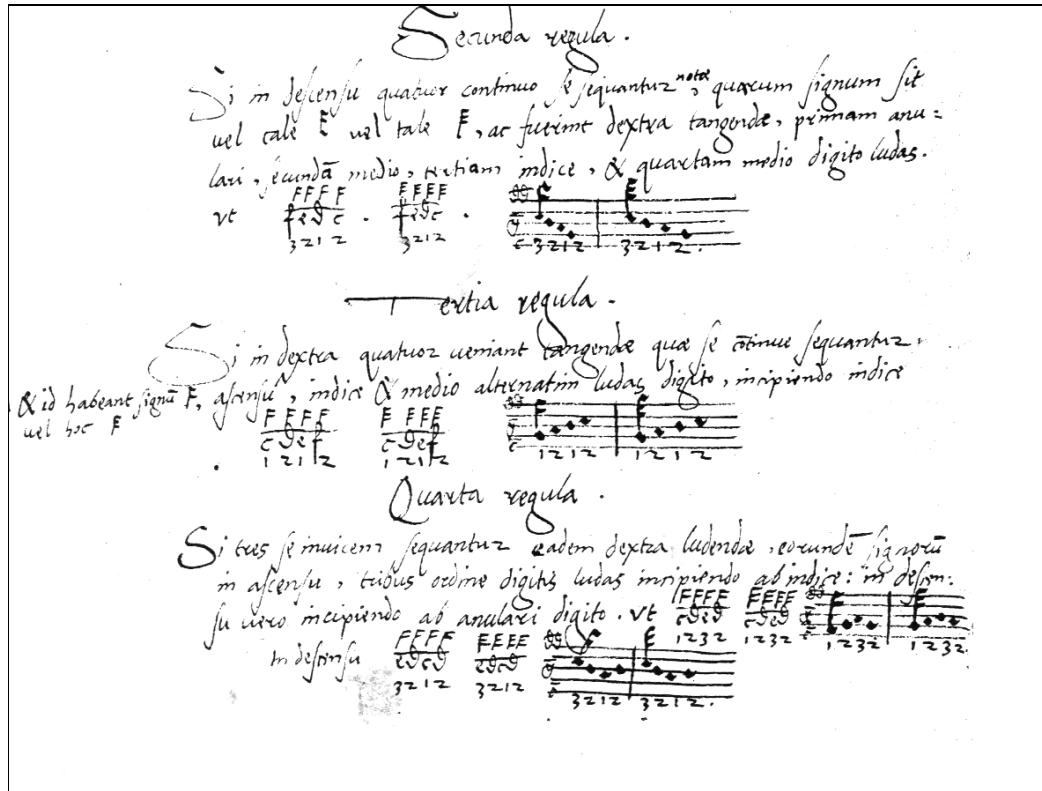
Indifferens:

The playing figures of the *M Tr* reveal a direct link to the known playing techniques of the time. None of the figures exceed the interval of the fourth and could thus be played naturally according to conventional fingering principles. One could also argue that these figures were the natural result of the fingering used

²⁷ Ibid.

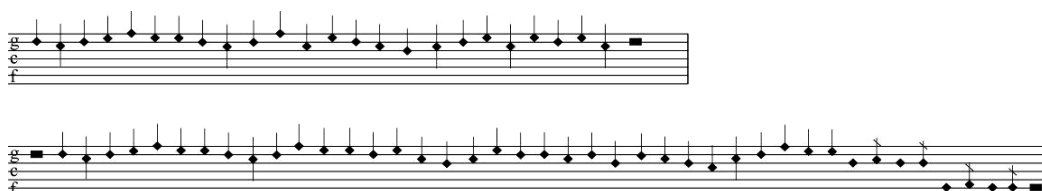
by the keyboard players of the time – the manner of playing (fingering) determined what could be improvised. It is noteworthy that the examples for *de comoda digitorum* (comfortable fingering), as described in the 2nd, 3rd and 4th rules of the Buchner *Fundamentum*, correspond to the basic figures 5, 2 and 9 respectively of the *M Tr* (see also Example 1).

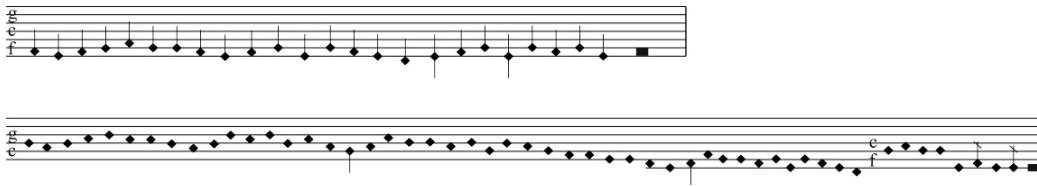
Figure 2: The second, third and fourth rules from Buchner’s *Fundamentum*



The combination of the playing figures in the *M Tr* are also given in examples for both the right and the left hand, thus emphasizing the aspect of developing the finger dexterity as well as the fluency in the combination of the various figures.

Example 3a: Combination of playing figures for the right hand, *M Tr*



Example 3b: Combination of playing figures for the left hand, *M Tr*

Several other characteristics of organ playing can be identified in the organ piece at the end of *M Tr* (fol. 279v and fol. 280). The piece can be viewed as a practical implementation of the techniques taught in the *M Tr*. The following aspects can be pointed out after studying the piece:

- The tenor is divided into 8 sections and the figures in the discant are all based on the figures in the treatise.
- The main concordance is still the octave and almost every consonance is approached from the lower second
- An interesting feature, not mentioned in the *M Tr*, is the short upbeat (2 semi-minima) at the beginning of each section. Similar upbeats occur regularly in other pieces of the time: *Magnificat* (Munich State Library Cod. Lat. 5963), *Wol up ghesellen* (Berlin State Library theol.lat.quart.290) and the *Incipit*-pieces from the Breslau Manuscript (Breslau State Library I F 687) etc.
- Although mentioned the *pausae* are not discussed further in the *M Tr*. It is only illustrated in the organ piece.

The following examples serve as illustration to this discussion:

Example 4a: Examples of *pausae* on C and E, *M Tr*

- It seems that one figure dominates in each of the sections, for example figure 8 in the *Pausae*.
- Sequence-like repetitions of patterns (as illustrated in Example 4b) can be observed in some of the *Pausae*. These could be regarded as natural forms of progression within an improvisational set-up on the keyboard. The ability to repeat and transpose motifs or figures is one of the basic skills in improvisation.

Example 4b: Examples of *pausae* with semi-sequences, *M Tr*

The freedom of the application of the figures, as suggested in the *M Tr*, is further evident in the organ piece when the 1st, 4th and 7th sections of the piece are compared. All three sections are based on the same tenor line but the discant proceeds in a different manner every time:

Example 5: Comparison of the application of playing figures to sections 1, 4 and 7 from the piece in *M Tr*

***Fundamentum* practices in other keyboard pieces**

The untitled piece in the *M Tr*²⁸ is a clear demonstration of how the skills obtained from the *fundamentum* can be applied to a given tenor. Organ music from other manuscripts of the time reveal distinct similarities to the techniques as instructed by means of the *M Tr*. The similarities are most evident in the

²⁸ M. Radulescu, *Organum Antiquum: früheste Orgelmusik um 1500*, Wien, Doblinger, 14-15.

application of the playing figures. Although notated organ pieces before 1450 are relatively few in number, it is possible to imagine the process of improvising such pieces according to the principles of the *fundamentum*. On the one hand these pieces indicate a unified manner of organ playing in general, but on the other hand they also point towards the individual application and interpretation of the fundamental principles.²⁹

The playing figures illustrated in the *M Tr* can be observed in almost all of the organ music of the time, whether delivered in the *fundamenta* or in other manuscripts and tablatures. The surviving pieces represent broadly the standard repertoire of the 15th-century organist: intavolations on the keyboard of popular secular songs and dances, preludes or redeuntes and liturgical pieces, including vocal compositions, intended for the *alternatim* practice between choir and organ during the celebration of the mass.³⁰

The general trends of the *M Tr* will now be traced in selected pieces from two manuscripts which can be placed in the same time frame as the treatise: A manuscript from the Berlin Staatsbibliothek³¹ (dated c.1431) and the *Tablature* of Adam Ileborgh von Standal (1448). The indication for the use of the pedal confirm that these are organ pieces in the first instance.³²

The Berlin manuscript³³ contains several pieces in the style of the *M Tr*. Apart from two settings of the *Sanctus*, two secular pieces are also included, *Frysicum* and *Wol up ghesellen*.³⁴ The *Summum Sanctus* serves as illustration. One notes the same inclination towards the up-beat in the upper voice, similar playing figures and treatment of the *pausa* as can be observed in the piece from *M Tr*:

Example 6: Beginning of *Summum sanctus* from the Berlin Manuscript



The intavolation of the song *Frowe al my[n] hoffe[n] an dyr lyed* from the *Igleborgh Tablature*³⁵ illustrates very clearly how the playing figures are applied in the figuration of the melody. That this is a keyboard rendering of a well-known song suggests strongly that the piece was improvised at first and

²⁹ D. Kruger, op. cit., 47-8.

³⁰ See also: M. Kugler, op. cit., 65.

³¹ Berlin State Library theol. lat. quart. 290. Modern edition: W. Apel (ed), *Keyboard music of the fourteenth and fifteenth centuries. Corpus of early keyboard music*, Vol 1, Hänssler-Verlag, Neuhausen-Stuttgart, American Institute of Musicology, 1963, 15-18.

³² Kugler, op. cit., 57.

³³ Berlin State Library theol. lat. quart. 290. Modern edition: W. Apel, *Keyboard music*, op. cit., 15-18.

³⁴ Published by W. Apel, *Ibid.*, 15-17.

³⁵ See: M. Radulescu, op. cit., 40-41, as well as W. Apel, *Keyboard music...*, op. cit., 29.

probably written down later. The style of the *M Tr* can be easily recognized, not only in the figurations, but also in the treatment of the *pausa*.

Example 7: First phrase from *Frowe al my[n] hoffe[n]* from the *Igleborgh Tablature*



The above mentioned pieces provide a general rendition of organ improvisation during the first half of the 15th century, but obvious changes characterize the art of organ playing after 1450. Several reports from the time enable us to form a better view of the developments. The large instruments built in cities like Breslau, Nördlingen and Nürnberg are a further testimony to the flourishing of the *ars organisandi*.³⁶ It can also be established from the fact that more organ tablatures from this period survived. By the middle of the 15th century, Tinctoris linked the development of polyphonic playing to ‘a German player’ and ‘opposed this manner of playing to the emphasis of embellished playing of a solo line’.³⁷ The German player whom Tinctoris referred to was in all probability Conrad Paumann.³⁸

Paumann’s *Fundamentum organisandi*

Conrad Paumann (c. 1410-1473/75) was the famous city organist of Nürnberg and since 1450 also the court organist in Munich. The essence of Paumann’s musical style is described by a contemporary, the Meistersinger Hans Rosenplüt, in a lengthy poem (1447) on the city of Nürnberg:

(257) *Noch ist ein mayster in disem gedichte*

*Der hat mangel an seynem gesicht
Der heist meyster Cunrat pawman...*

(265) *Er trug wolauf von golt ein kron*

*Mit contra tenor und mit faberdon
Mit primi tonus tenorirt er
Ayf elamy so sincopirt er
Mit resonanczen in accutis*

(270) *Ein trawrichs hercz würt freyes mutes*

³⁶ F. W. Arnold, ‘Das Fundamentum Organisandi von Paumann’, *Jahrbuch für Musikwissenschaft*, Vol II, Leipzig 1867, 70.

³⁷ J. Kmetz, op. cit., 209.

³⁸ Keith Polk presents a very convincing comparison between Tinctoris’ *Libre de arte contrapuncti* (1477) and Paumann’s treatment of the consonances. See: K. Polk, *German instrumental music of the late middle ages*, Cambridge, Cambridge University Press, 1992, 163-177.

³⁹ Complete citation by F. W. Arnold, op. cit., 71.

*Wen er auss ottaf discantirt
Vnd quint vnd vt zusammen resamirt ...*³⁹

The keywords in lines 267 (*tenorirt*), 268 (*sincopirt*) and 271 (*discantirt*) can be linked directly to the instrumental skills taught in Paumann's *Fundamentum*.⁴⁰ The *Fundamentum organisandi magistri Conradi Paumanns ceci de Nürnbergga anno 1452* survived in four copies in three sources, namely the *Erlangen Manuscript*,⁴¹ the second part of the *Lochamer Liederbuch*⁴² and two copies in the *Buxheim Orgelbuch*.⁴³ The *Fundamentum Organizandi (PFO)* was probably intended for use by his students and dictated by the blind Paumann to a student. It can be regarded as a 'progression of cantus firmus compositions for improvising, composing, and making ornamented variations of bass parts, progressing by seconds, thirds, fourths, fifths and sixths'.⁴⁴

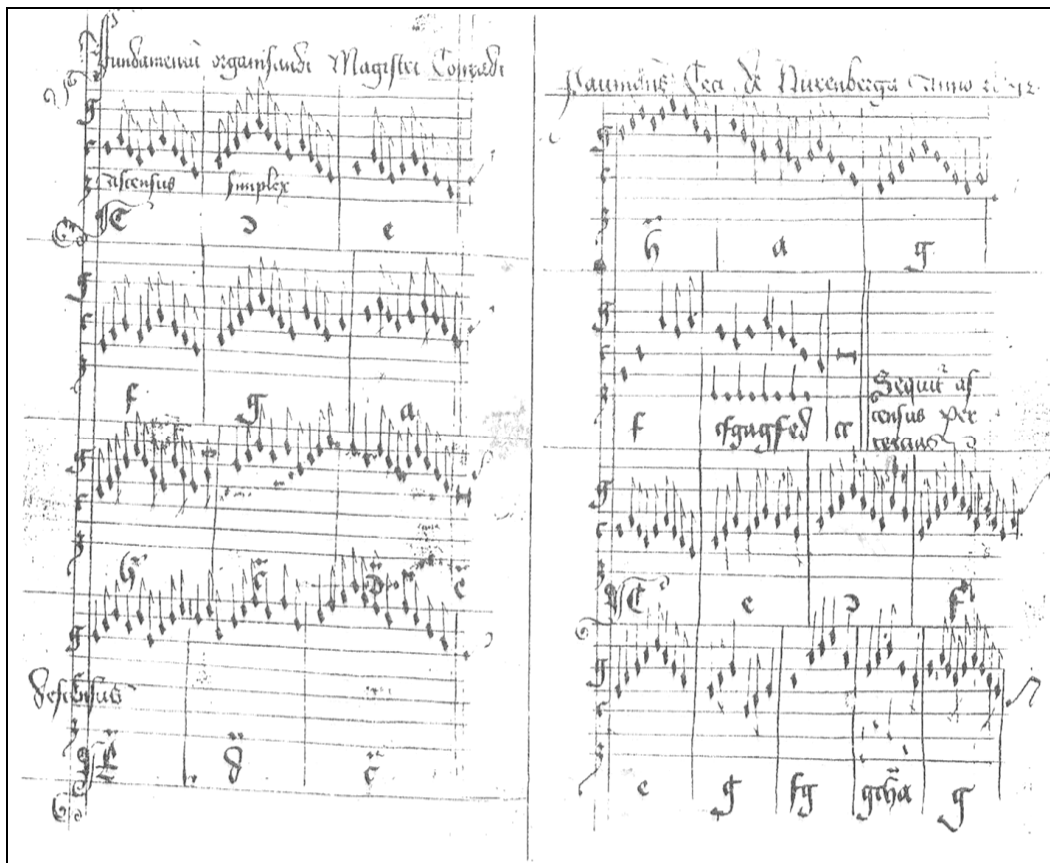
⁴⁰ Complete modern edition in W. Apel, *Keyboard music*, op. cit., 32-51.

⁴¹ *Fundamentum bonum trium notarum magistri Conradi in Nurenbergk* Ms. 554 (olm 729) University of Erlangen, fol. 129 v-133v.

⁴² *Fundamentum organisandi Magistri Conradi Paumanns ceci de Nürnbergga anno 1452* Mus. Ms 40613 Staatsbibliothek de Stiftung Preussischer Kulturbesitz, Berlin-Dahlem Kod. Zb. 14 s, 46-48.

⁴³ *Incipit Fundamentum m.C.P.C* (Munich, Bayerische Staatsbibliothek, Cim. 352b, olim Ms Mus 3725) and *Suquitur fundamentum magistri Conradi Pauman Contrapuncti* (Nr. 236, fol. 142v-157v).

⁴⁴ F. J. De Hen, 'Fundamentum organisandi', in: Douglass Bush (ed), *The organ: an encyclopedia*, Oxon, Routledge, 2006, 217.

Figure 3: First page of Paumann's *Fundamentum* from the *Lochamer Liederbuch*

As most of the other *fundamenta*, *PFO* deals with four aspects of organist skills, namely the treatment of ascending and descending melodic lines in a tenor (*ascensus* and *descensus*), the ornamentation of final closing intervals (*pauses regulas*), the invention of pieces with repeated notes (*Redeutes*) and the embellishment of the *Clausulae* (cadential formulas). The *PFO* is in some ways a continuation and expansion of the principles already laid down in the *M Tr*, although Paumann's approach is more systematic.⁴⁵

Ascensus and descensus

Paumann provides 9 examples for treating ascending and descending tenor lines of different types: stepwise, rising and falling thirds, fourths, fifths and sixths. The following example shows a more progressive combination of consonances and figuration above an ascending tenor line moving in thirds:

⁴⁵ For the purpose of this article, the musical examples are taken from the copy in the *Lochamer Liederbuch*, as transcribed by W. Apel, *Keyboard music*, op. cit., 32ff.

Example 8: Paumann, *Ascensus secundus per tercias*

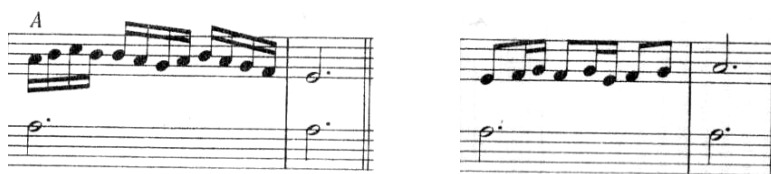
Ascensus secundus per tercias

The *pausae*

The elaboration on a lengthened final chord (consonance) of a piece was common practice in the organ playing of the 15th century.⁴⁶ After the mere reference to the *pausae* in the text of *M Tr* and the examples thereof in the accompanying piece, the *PFO* provides more examples for this practice. Paumann illustrates several *pausae* on each note of the hexachord. He seems to have a predilection for figures 4 and 8 (as identified in the *M Tr*) and uses less variety.

Example 9: Paumann, *Pausae* on notes of the hexachord

⁴⁶ M. Kugler, op. cit., 192; A. Schering, op. cit., 29.



The improvisational execution of a *pausa* is suggested in the three pieces in the *Lochamer Liederbuch*. In *Des Klaffers neyden* and *Tenor Mein hercz in hohen freuden* the *pausae* are indicated and written out and it corresponds to Paumann's first example for the *pausa* on *A* (See Example 9).

In *C[on] l[agreme]* the improvisation of the *pausa* is suggested by the indication above the last note. In the well-known *Mit ganzem Willen wünsch ich dir* the two *pausae* in the first section are based on the examples given in the *PFO* but the two *pausae* in the second section demonstrate new possibilities:

Example 10a: *Mit ganzem Willen*, *pausae* in the second section



Likewise, several 'new' *pausae* can be observed in *Sequitur tenor Benedicite almechtiger got*. Of these, the concluding *pausa* reveals the real skill of the player in a semi-echo repetition of figures in the lower octave as well as the repetition of the final cadence:

Example 10b: *Sequitur tenor Benedicite*, concluding *pausa*



From these *pausae* examples it is clear that the power of invention was multi-layered, especially where a player of the caliber of Paumann was concerned. The multiple examples of the figuration of melodic line and embellishment of the cadential formulas or the invention of a second voice above standard tenor lines enable the training organist to gather practical experience in organ playing. The expansion of the application of figuration to both hands in a semi-echo also points towards the development of keyboard technique. Paumann must have used similar techniques in his own playing and by transferring them to his

fundamentum, encouraged his students to constantly search for new and innovative ideas in their own improvisations.

Redeuntes

According to Vogel, the *Redeuntes* might have been an invention of Paumann and could well have been played together with the sounding of the church bells. One could then describe the art of the *redeuntes* as the improvisation of preludes used as processional pieces marking the beginning of the mass.⁴⁷ The *redeunte* pieces are based on repeated notes in the tenor and might be described as a continuation of the *pausae* formulas. In his progressive manner, Paumann first introduces the *Redeuntes simplices* (in 2 voices) and then also gives examples in three parts as illustrated in the next example:

Example 11: *Redeuntes in idem per 6 [?] voces*

Redeuntes simplices super sex voces

The musical score consists of two systems, each with a treble and bass staff. The first system is labeled 'ut' and the second system is labeled 're'. The bass line in both systems consists of repeated notes, while the treble line features more complex rhythmic patterns. The score is underlined in red.

Clausula

The final part of the *PFO* consists of a *Fundamentum breve ad ascensum et descensum*. In fact, these examples are nothing more than formulas for a variety of cadences (*clausulae*) on C, D, E, F and G where the *finalis* is approached from either above or below. Not only is the discant spun out, but the bass lines are also ornamented. This underlines the simultaneous development of manual skills in both hands as well as the general possibilities that could be explored through improvisation.

⁴⁷ See H. Vogel, 'Das Zusammenwirkung von Glocken und Orgelspiel', *Musica Sacra*, 1983, 103(1), 33-40.

Example 12: Clausula on *f e d c* with ornamented bass**Conclusion**

When comparing the *fundamenta* of the 15th century, such as the *M Tr* and *PFO*, the characteristics and development of the art of organ playing can be observed. The general approach is that of improvisation. Although the *PFO* is in some ways a continuation of the skills taught in the *M Tr*, with regard to the preparation and use of consonances and the application of the playing figures, the *PFO* suggests a more developed technique of playing. The expanding of the note values from *longa* to the *semiminima* (already notated in *M Tr*) allows for the invention of more varied rhythms in the playing figures. It exposes the ability to improvise not only horizontally (creating the second voice) or vertically (filling out of the *tactus*) but also within the rhythmic context. The inclusion of fauxbourdon techniques (for example in *Mit ganzem Willen*), as noted by Buchner, indicates an awareness of the polyphonic writings of the time and the ability to incorporate such techniques into the *ex improviso* playing. The way in which playing figures naturally suit the fingers of the keyboard player also points strongly to the simultaneous invention and playing of pieces.

In the 15th century, improvisation was the way in which good players provided their own music. In combination with the mastering of the crafts and skills of the player, a vigorous capacity for invention and innovative application of the manual skills distinguished the virtuoso organists. The skills which the organist acquired through the theoretical knowledge and musical examples in the *fundamenta* are fourfold: correct application of consonances when improvising a polyphonic voice to a given *cantus firmus*, the manner in which to improvise free embellishments on the *pausae* and *clausulae*, the technique of embellishing a melody, and how to invent the *redeuntes* or preludes that were used as processional pieces at the beginning of the mass.

The organist's skills, taught in the *fundamenta*, can be observed quite clearly in the written organ pieces of the time. In all probability these pieces are outcomes of the teaching and studying of the *fundamenta*, as they clearly reflect the principles advocated and taught in these manuscripts. Given the obvious similarities between techniques displayed in the pieces and those taught by means of the *fundamenta*, the pieces may be regarded as written testimony of the improvisation practices of the 15th century organists in Germany.

САЖЕТАК

Дален Кругер

ОРГУЉСКА ИМПРОВИЗАЦИЈА НЕМАЧКИХ ФУНДАМЕНАТА 15. ВЕКА

Када се упореде *фундаменти* 15. века као што су *Минхенски трактат* и *Фундаментум Органисанди* Паумана (Paumann), могу се пратити одлике и развој оргуљског извођачког стила. Општи приступ јесте импровизацијски, а циљ је да се оргуљаши оспособе да импровизују различите врсте музике које ће им требати за њихове свакодневне дужности. Иако је *Фундаментум Органисанди* у неку руку наставак вештина којима учи *Минхенски трактат*, у погледу припреме и употребе консонанци и примене фигура *Фундаментум Органисанди* указује на развијеније технике свирања. Продужавање трајања са *лонге* на *семиминиму* (већ примећено у *Минхенском трактату*) допушта инвенцију разноврснијих ритмова у свирању фигура и пружа могућност да се импровизује не само хоризонтално (стварајући други глас) или вертикално (испуњавањем *тактуса*) већ и унутар ритмичког контекста. Начин на који фигуре прате природни распоред прстију свирача на инструменту са диркама такође снажно указује на истовременост инвенције и свирања комада.

У 15. веку је импровизација била начин уз помоћ којег су добри свирачи стварали сопствену музику. У комбинацији са усавршавањем заната и вештине свирача, способност за инвенцију и иновативну примену мануелних вештина издвајале су оргуљске виртуозе. Вештине оргуљаша којима уче *фундаменти* видљиве су и у оргуљским делима компонованим у то доба. Ти рани комади за оргуље могу да буду посматрани и као резултат проучавања и подучавања из *фундамента* будући да су принципи који предлажу ове методе јасно видљиви у тим делима. Шта више, ова дела су писани докази импровизацијске праксе у процвату.