|  |
| --- |
| **LITHUANIAN ACADEMY OF MUSIC AND THEATRE**  **Božena Čiurlionienė**  Kompozicijos katedra/  Department of Composition |
| Tritonio sampratos kismas ir sisteminis konstruktyvizmas XX a. kompozicijose /  Change in the Tritone Concept and Systemic Constructivism in the 20th Century Compositions |
|  |

**INTRODUCTION**

The object of the research, the tritone, has a very extensive history of change in its concept, which leads to a particularly diverse range of its analysis. Despite a small size of the research object, the tritone is characterised by special tension both of its sound and the related issues. Its functionality and significance are evidenced by the changing concepts and canons of use in different stages of music history, compositional techniques, and harmonic systems. However, the knowledge about the interval has not been systematised or classified. The information found in scientific sources has not been generalised, and no systems have been developed.

The study of change in the tritone concept can be divided into four main stages. The first was **prohibition-avoidance**, represented by Carl Alfonso El Sabio (1221–1284), Guillaume Dufay (1397–1474), Josquin des Prés (1455–1521), Jacob Obrecht (1457–1505), and Orlando di Lasso (1532–1594). The second stage was **consistent predominance**, found in the compositions of Carl Philipp Emanuel Bach (1714–1788), Wolfgang Amadeus Mozart (1756–1791), and Ludwig van Beethoven (1770–1827). The third stage, **apotheosis**, was illustrated by compositions of Ferenc Liszt (1811–1886), Josef Matthias Hauer (1883–1959), Arnold Schönberg (1874–1951), Anton Webern (1883–1945), Luigi Nono (1924–1990), Pierre Boulez (1925–2016), and Karlheinz Stockhausen (1928–2007). **Loss of relevance** as the fourth level was exposed in musical works of Gérard Grisey (1946–1998), Arvo Pärt (1935-), Michael Gordon (1956-), Henryk Mikołaj Górecki (1933–2010), and Božena Čiurlionienė (1988-). The tritone was conceptualised within the framework of the modal and tonal systems, however, its concept changed dramatically in the context of atonality. Although, in part, the concept of the tritone in modal and tonal music was established, the main problem is that music theorists limited themselves to several composers, sources, and theoretical treatises, while the totality was never summarised. The theories set out in treatises and focusing on early music covered quite a few aspects of research, however, they were only available in Latin. The use of the tritone was analysed in modal systems and in the principles of organisation of the compositional vertical, horizontal, and diagonal; moreover, it was analysed as an element forming the structure of a musical work.

Particular attention to the tritone in the 20th century was paid on a theoretical and creative plane: apotheosis and loss of relevance. In the 20th century, an important focus of analysis was symmetrical sequences centering on the tritone, surrounded by inverse intervals. Of an exclusive nature was the expression of this interval when coordinating the linear and vertical parameters of a musical composition, the tritone apotheosis in the postwar avant-garde structures, the functional change in the tritone control in sonoristic and spectralist compositions, and its loss of relevance in the second half of the 20th century. That is the main problem of the present discourse, and therefore it is necessary to reconsider the change in the tritone concept and its function not only in early music, but also in contemporary compositions. In the last stage of the research, the analyses of the tritone were transferred from the theoretical to the practical level and used in the composition of Božena Čiurlionienė *Confessiones* for symphony orchestra (2020). Here, the tritone operates at the structural level, on the horizontal, vertical, and diagonal, and it is assigned timbral properties. It is important to note that the tritone functions in the relationship with other intervals, and especially with the fifth and a unison.

**Research object** is the change in the tritone concept: prohibition, apotheosis, and loss of relevance.

**Research aim** is to investigate the change in the tritone concept in music theory and compositional practice from the Middle Ages to the late 20th century.

To attain the aim, the **following tasks** have been set:

1. To analyse the change in the tritone concept in music theory and compositional practice from the medieval tritone prohibition rule *mi contra fa diabolus in musica est* to its establishment in dissonant intervals and functions in the harmonic system of Classicism;

2. To unfold the extensive evolution of the tritone concept in the harmony and compositional practice of the 20th century employing the context of theoretical and individual compositional systems and the conducted acoustic research;

3. To study the constructiveness of the tritone symmetry phenomenon in the series of the 20th century compositions, harmony, and on the vertical and the diagonal based on the more vivid examples of postwar avant-garde music;

4. To highlight the causes and processes of the loss of tritone relevance in the musical compositions of the second half of the 20th century;

5. To reveal the design and constructive expression of the tritone phenomenon in individual work: the case of Božena Čiurlionienė's compositions.

**Novelty and relevance of the artistic research paper.** The contribution and significance of the present paper in the context of contemporary music composition and musicology manifests itself in the comprehensive presentation of the research into the change of the tritone concept, disclosing the understanding of the concept in music theory and compositional practice. The issue of the change in the tritone concept has been examined historically, in order to reveal the evolution of different interpretations of the tritone concept and their influence on the compositional process. The parts of the research paper reflect three significant stages of the change in the tritone concept: prohibition, apotheosis, and loss of relevance. In addition to historical analysis, conceptual and comparative analysis has been used to reveal the connection between the composition theory and practice, their relationship and contraposition.

The issues dealt with in the research paper can be used in the academic courses of composition and musicology. The examples analysed in the current paper as well as the interaction, relationships, and constructiveness of compositional systems unfolded in it can be used by composers with the aim of developing new music composition models. It might be noted that, in fact, this is basically the first work in which the change in the concept of the tritone as well as its dissemination in compositional systems has been analysed conceptually and chronologically.

**Research methods.** Analysis of scientific literature, theoretical analysis and generalisation, and comparative and typological methods have been used in the paper, as well as systemic, hermeneutic, and intertextual approaches.

**Review of scientific literature, research sources**: to substantiate the findings, musicological books and treatises dealing with the functioning of the tritone in compositional systems from different perspectives have been consulted. Regretfully, few Lithuanian translations in the area have been found. The research into the change in the tritone concept can be divided into three basic levels: prohibition, apotheosis, and loss of relevance.

**The examination of the period of the tritone prohibition has been based on the following sources:** **Guido Aretinus'** *Micrologus* (1025/26), **Hermannus Contractus'** *Opuscula Musica* (~1030); **Pietro Aaron's** Libri tres de institutione harmonica (1516); **Michael** **von Troschke's** *Tritonus* (1989); **Edward MacDowell's** *Critical and Historical Essays: Lectures Delivered at Columbia University* (1912). De-coding of the rule *mi contra est Diabolus in Musica*: **Johann Joseph Fux'** *Gradus at Parnassum* (1725), **August** **Wilhelm Ambros'** *Geschichte der Music* (1880). In the second stage, gradual establishment of the tritone in music – on the diagonal, vertical, and horizontal – was analysed, based on **Hugo Spechtshart's** Flores musicae (1488); **Johannes Tinctoris'** *Liber de arte contrapuncti* (1477); **Gioseffo Zarlino's** *Le institutioni harmoniche* (1558); **Adrianus Petit Coclico's** *Compendium musices* (1552); **Nicola Vicentino's** *L'antica musica ridotta alla moderna prattica* (1555); **Thomas Noblitt's** *Chromatic Cross-Relations and Editorial Musica Ficta in Masses of Obrecht* (1982); and **Robert Stewart's** *An Introduction to Sixteenth Century Counterpoint and Palestrina's Musical Style* (1994). The significance of the tritone in music rhetoric was explored, based on **Marc-Antoine Charpentier's** *Regles de Composition* (1682); **Johann Kirnberger's** *Die Kunst des reinen Satzes in der Musik: aus sicheren Grundsätzen hergeleitet und mit deutlichen Beyspielen erläutert* (1774); **Markus Bandur's** *Musica Poetica* (2000); and **Johann** **Mattheson's** *Der Vollkommene Capelmeister* (1739).

**The tritone is inseparable from the tension-resolution construct in music,** which is directly related to the establishment of the tritone in dissonant harmonies and functions in the harmonic system of Classicism. The current aspect was analysed, based on **Marinn** **Mersenne's** *Harmonie Universelle contenant la theorie et la pratique de la musique* (1636–37); **Antonio** **Filippo** **Bruschi's** *Regole per il Contrapunto e per l'accompagnatura del Basso Continuo* (1711); **Jean**-**Philippe** **Rameau's** *Traité de l'harmonie réduite à ses principes naturels* (1722); **Martino** **Pesenti's** *Il primo libro delle correnti alla francese per sonar nel clavicembalo, et altri s[t]romenti* (1635); **Alexander**-**Étienne** **Choron's** *Sommaire de l’histoire de la musique* (1810); **François**-**Joseph** **Fétis'** *Traité complet de la théorie et de la pratique de l'harmonie, contenant la doctrine del la science et de l'art* (1849); **Jacques Chailley's** *Expliquer l’harmonie* (1967); **Jurij** **Cholopov's** [Yuri Kholopov, *On the Evolution of the European Tonal System*] (1972). **In the third stage of the research, focus was placed on the apotheosis of tritone and its loss of relevance in composition systems.** There, the tritone operated at all levels of tonal organisation as well an in the compositional structure. **Ton de** **Leeuw** in his*Music of the Twentieth Century – A Study of Its Elements and Structure* (2005) described the tritone as *enigmatic* (mysterious, puzzling); **Arnold** **Schönberg**in *Harmonielehre* (1922), *Stil und Gedanke* (1976) associated the tritone with the vertical tension; **Paul** **Hindemith** in *The Craft of Musical Composition* (1945) related the tritone to the harmonic intensity, and **Juzef** **Kon** in*Об одном свойстве вертикали в атональной музыке* [On Verticals in Atonal Music] (1973), to the vertical density. The phenomenon of the tritone sound intensity and the generated tension was also explored by **Josef** **Matthias** **Hauer**in *Vom Wesen des Musikalischen* (1920) and in *Zwölftontechnik. Die Lehre von den Tropen* (1926); the issue was also dealt with in **Ernst** **Křenek's** *Studies in Counterpoint* (1940); **Howard** **Hanson's** *Harmonic Materials in Modern Music: Resources of the Tempered Scale* (1960); **Vincent****Persichetti's** *Twentieth-Century Harmony: Creative Aspects and Practice* (1961); and **Arved** **Ashby's** *Klein, Fritz Heinrich* (2001). The exclusivity of the tritone in the paper was explicated through acoustic studies, see **Diana** **Deutsch** *The Tritone Paradox: An Influence of Language on Music Perception* (1991); **David** **Butler** *Describing the Perception of Tonality in Music: A Critique of the Tonal Hierarchy Theory and a Proposal for a Theory of Intervallic Rivalry* (1989); **Herman** **Helmholtz** *Die Lehre von den Tonempfindungen als physiologische Grundlage* *für die Theorie der Musik* (1877); and **Carl** **Stumpf** *Tonpsychologie* (1883–1890).

**No theoretical studies focusing on broad, in-depth, and comprehensive exploration of the change in the tritone concept have been written or published in Lithuania**. However, this does not mean that the issue has not been addressed. Several main works cited in the current paper deserve mentioning: **Rytis Ambrazevičius'** article *Konsonansas ir disonansas muzikos psichologijoje* [Consonance and Dissonance in Music Psychology] (2006); **Gražina** **Daunoravičienė's** studies *Das Generalbaßzeitalter epochoje* [In the Epoch of *Das Generalbaßzeitalter*] (2006), *Cum essem parvulus: nuo Orlando di Lasso iki Ryčio Mažulio. Pamatinių kompozicinių idėjų kaita* [*Cum essem parvulus*: from Orlando di Lasso to Rytis Mažulis. Change in the Basic Compositional Ideas] (2008), *Lietuviškojo modernizmo magistralės ir Naujosios Vienos mokyklos idėjų paraštės* [Highways of Lithuanian Modernism and Margins of the Second Viennese School Ideas] (2008), *Lietuvių muzikos modernistinės tapatybės žvalgymas* [Exploration of the Modernist Identity of Lithuanian Music] (2016); **Rimantas** **Janeliauskas'** PhD dissertation *Funkcinės dinamikos aspektai* *šiuolaikinių lietuvių kompozitorių kūryboje* [Aspects of Functional Dynamics in the Works of Contemporary Lithuanian Composers] (1983) and articles *Osvaldo Balakausko dodekatonika kaip komponavimo sistema* [Osvaldas Balakauskas**'** Dodecatonics as a Compositional System] (2001), *Monarika kaip komponavimo bendrybė* [Monarics as a Common Trait of Compositing](2002), and *Binary Principle as a Way of the Actualisation of Lithuanianness in Music* (2016);and **Aleksandra** **Pister's** article on music rhetoric *Muzikos retorikos tradicija Johano Kuhnau „Biblinėse istorijose“. Teorinis konceptas I dalis* [The Tradition of Music Rhetoric in Johann Kuhnau's *Biblical Stories.* Theoretical concept, Part 1] (2005).

**The works related to the topic of the artistic research paper have been analysed, and their list is presented in Appendix 1.**

**The structure of the research paper consists of an introduction, three main chapters, conclusions, bibliography, and appendices.** Chapter 1discusses the change in the tritone concept from its prohibition in the Middle Ages to its establishment in the harmonic system. Its constructing function on the vertical, horizontal, and diagonal as well as at the structural level has been highlighted. Chapter 2focuses on unfolding of the extensive evolution of the tritone concept. Great attention has been paid to the exploration of theoretical and individual compositional systems and acoustic research. Chapter 3deals with the constructiveness of the tritone symmetry phenomenon in the 20th-century compositions; more striking works of the postwar avant-garde have been analysed, and the reasons for the loss of tritone relevance have been explicated and highlighted. Chapter 4 is devoted to the expression of the tritone in Božena Čiurlionienė's composition *Confessiones* (2020). The appendices provide the analyses that contributed to revealing the change in the tritone concept, substantiating its relevance to composers, and unfolding the tritone operation in compositional systems.

1. **THE TRITONE CONCEPT IN MUSIC THEORY AND COMPOSITIONAL PRACTICE**

The chapter deals with the change in the tritone concept from its prohibition in the Middle Ages to its establishment in the harmonic system. The issues of the tritone in modal systems, its expression in the rhetoric of music, and its function in the processes of formation of the harmonic system have been consistently examined. Moreover, the chapter focuses on the constructive function of the tritone on the vertical, horizontal, and diagonal and at the structural level.

**1.1. The tritone concept. *Diabolus in musica* in modal systems and *musica ficta***

In medieval treatises on music, the tritone was usually called a problematic interval: in sound organisation systems, it was characterised by the following epithets: *confusio* – confusing, tricky; in compositional practice, *non multum in usu* (to be used scarcely, in sound relationship systems); *asper –* rough, coarse (Troschke 1989: 1). The use of the tritone (the augmented fourth, the diminished fifth – *Quinta falsa*) in church music was strictly forbidden (ibid.: 2). In the strict style, even a sequence of two major thirds in a row (f – a, g – h) was not allowed, because a tritone was formed between the lower and upper sounds of the sequence. The tritone *mi contra fa* was regarded as an undesirable interval primarily on the vertical, while any assumptions about its possible operation on the diagonal or the horizontal were strictly rejected.

As for the dissonant character of the tritone, we have to point out that the culturally conditioned concept of dissonance can change: when listening to the tritone for a long time, it may seem less harsh; however, from a sensory viewpoint, the dissonant nature of the tritone will always remain. Although in the 20th century a number of studies (e.g. Butler; Deutsch) were conducted to analyse human hearing and the perception of music, naturally, those studies were not finite, as due to the change in music and in the conception of the vertical, horizontal, and diagonal, cultural hearing tended to change as well. Taking into account the findings of the studies of the sensory dissonance of the tritone, we can conclude that, in this respect, its dissonant nature remains the same now as it was thousands of years ago. In this case, it is important to raise the question of what predetermined its apotheosis. We can assume that depends on the reduced dissonance of the tritone from a cultural point of view. In other words, our hearing is more accustomed to the tritone sound than in the Middle Ages for a very simple reason: we hear it more often and we are more accustomed to it. After conducting the current research, we clearly realise that, although the dissonance of the tritone is equivalent from a sensory point of view, its harshness used to be significantly stronger from a cultural point of view.

The avoidance of the tritone and its prevalence in music can also be explained through the ideas of the French musicologist Jacques Chailley (1910–1999), set out in his *Expliquer l'harmonie* (1967); it was also referred to by the Lithuanian musicologist Algirdas Ambrazas, who spoke of "the historical development of musical consciousness as a mode of mastering increasingly complex intervals of the natural tone series, next to Schönberg and Hindemith" (Daunoravičienė 2017: 19). This idea was first published in Chailley**'**s *Traité historique d’Analyse musicale* (1951). Formerly an intolerable element in music, the tritone emerged on the compositional horizontal, in which it was supplemented with transitional tones from the very beginning. Gradually, the tritone came to be also used on the compositional vertical (the 17th through 18th century).

**1.2. The expression of the tritone in musical rhetoric**

In the studies of the Renaissance or Baroque music, it is necessary to make use of musical rhetoric, also known as *musica poetica*, which defines the relationship between the music and the poetic text. Music, which aims to convey the meanings of a poetic text, is created by choosing a specific tonality and intervals that arouse interest in the composition. The tritone is used to intensify the psychophysical effect by evoking emotions and conveying the meaning to the audience.

The tritone boasted an obvious relationship with the affect theory in which it also possessed its own meaning and was used with the aim of conveying a certain text, a certain idea to the audience. In the examples of the Renaissance music, we discovered several episodes with the tritone in rhetorical figures; however, it was in the Baroque era that an entire theory with the system of tonalities and interval meanings formed. In that system, the tritone often manifested itself in cadences as well as in specific rhetorical figures.

Analyses of compositions revealed that the tritone functioned not only as an element coordinating the compositional horizontal, vertical, and diagonal, but also as a part of their rhetoric. In many cases, it was associated with numerical symbolism or used to reinforce the meaning of the text.

**1.3. Functional changes of the tritone on the vertical and the diagonal**

In the Late Renaissance and the Baroque era, the tritone interval was already treated much more freely than in the previous epochs: manifestations of crystallisation of the functional system were quite evident in music. Despite the fact that in the 18th through 19th century the tonal-functional system was finally formed, and by the end of the epoch it was already affected by various processes of deformation, up to the 18th century, the tritone was characterised as insidious, unnecessary, and imperfect[[1]](#footnote-1).

During the Renaissance, the tritone was gradually introduced to various levels of composition. In Maria Rika Maniates' book *Mannerism in Italian Music and Culture*, *1530–1630* (1979), Vincenzo Galilei (1520–1591) and Claudio Monteverdi (1567–1643) were named as the innovators of the period. Nicola Vicentino (1511–1575) called the tritone the most underrated interval and described the effect it caused as wonderful or celestial. Although some innovations in the Renaissance music emerged due to the use of the tritone, it was found out that, in Jacob Obrecht's *Missa Libenter gloriabor*, the tritone was avoided in the melodic line (by lowering the sound *e*). It should be noted that, when the tritone was eliminated from the melody, it emerged on the diagonal. Although such examples were rare in the Middle Ages, in our analysis of the change in the tritone concept, we found *Agnus Dei* (1465) by Dufay from the Mass *Ave Regina caelorum*, where the tritone formed on the diagonal of the composition in an attempt to avoid a sequence of two major thirds. Despite the attempts of the above-mentioned theorists to emphasise the need for the tritone, a more conservative approach to that interval still prevailed. Giovani Maria Artusi (1540–1613) in his treatise *Delle imperfezioni della moderna musica* (1600–1603) condemned Monteverdi for the misuse of the tritone interval, as composers ought to follow the rules of counterpoint presented by authoritative theorists. Adrianus Petit Coclico in the treatise *Compendium musices* (1552) argued that dissonances were possible and even indispensable in music; however, they had to be resolved correctly and immediately. Marin Mersenne in the treatise *Harmonie Universelle contenant la theorie et la pratique de la musique* (1636–37) proposed the use of the tritone in order to evoke the effect of tension or energy or to convey the mood of warfare. As observed, the rhetorically used tritone leaps in melody systematically led to the establishment of the tritone on the vertical of the musical composition (the 16th through 17th century). During the 16th through 17th century, the tritone emerged in the clausulas and cadences of compositions (e.g. Claudio Monteverdi's *Litany of Loretto*; Giuseppe Tartini's *Stabat Mater I*). It is believed that specifically the establishment of the tritone on the vertical, together with the entrenchment of the major-minor system (the 17th through 18th century), became a turning point in the compositional processes, after which the said interval began operating at the structural levels of compositions (cf. C. Ph. E. Bach, J. S. Bach, W. A. Mozart). It became obvious that, in the composing process, the tritone operated not only as the smallest element, but also organised the functional plan, the compositional form (Carl Philipp Emanuel Bach's *Rondo*; Wolfgang Amadeus Mozart's *Kyrie* KV90, *Idomeneo*). We can see that it was during that period that the tritone emerged and took root at the structural level of the composition.

1. **THE TRITONE IN THE 20TH CENTURY COMPOSITIONAL SYSTEMS**

The tritone in the compositional systems of the 20th century strongly predetermined the process of composition and the structure of a musical work as well as generated the harmonic horizontal, vertical, and diagonal. The tritone, which influenced the formation processes of the modal system, also deformed it, as evidenced by the analyses of the compositions of Beethoven, Verdi, Puccini, and Liszt in the current research. The all-time tremendous and enigmatic history of the change in the tritone concept had, in principle, never been systematised, and in order to unfold the broad operational range of the said interval, it was necessary to find out not *what* was created but *how* it was created. It could be said that there was a real revolution in the approach to the tritone: formerly a difficult-to-explain, never used in music, and even forbidden interval, in the 20th century compositions, the tritone became an indispensable interval and a basis for a number of compositional systems.

The tritone was a means whose use inspired the 20th century composers to develop new systems and compositional techniques, to expand the field of systemic constructivism, and thus open the way for microtonal music – that of Gérard Grisey (1946–1998) and Iannis Xeanakis (1922–2001), and for sonoristic music – that of Krzysztof Eugeniusz Penderecki (1933–) and György Ligeti (1923– 2006).

**2.1. The context of the 20th century theoretical systems: evolution of the tritone concept**

In the 20th century, the tritone interval became an integral part of the compositional vertical and horizontal. In theoretical and practical systems, the tritone was increasingly frequently associated with harmonic/melodic intensity and tension. Arnold Schönberg (1874–1951) introduced the term *vertical tension* (German *Intensität*), Jusef Kon (*Ю́зеф Ге́йманович* *Кон*, 1920–1996), that of *vertical density* (Кон 1973: 299), and Paul Hindemith (1895–1963): 219), *harmonic strength* or, more precisely, a German term *Gefälle*, 'a slope'). In that way, composers and theorists were introduced to a relatively new phenomenon, that of sound intensity and tension, which was generalised and taken from the most important acoustic characteristic of the tritone.

Herbert Eimert (1897–1972), Vincent Persichetti (1915–1987), Ernst Křenek (1900–1991), and Rimantas Janeliauskas (1947–) in their studies not merely associated the tritone with tension, but also took the next step: they sought to mathematically calculate and theoretically substantiate the intensity of chords. Upon engaging in a discussion and speaking of the tension of chords in his book *Harmonic Materials in Modern Music*: *Resources of the Tempered Scale* (1960), Howard Hanson (1896–1981) faced the problem of determining the degree of consonance and dissonance. Hanson argued that, after several dissonances and consonances got concentrated in one compound, it was difficult to judge the level of consonance tension (cf. Hanson 1960: 2–4).

In the 20th century, the tritone began to be called a neutral interval (cf. Persichetti; Křenek), which was possibly related to the autonomy of all intervals in compositional systems as well as to the increasingly less emphasised boundary between consonances and dissonances.

**2.2. Tritonal constructivism of the compositional vertical in the compositional system of Alexander Scriabin**

In Scriabin's system, the tritone manifested itself in the dominant with the diminished fifth and formed a tritonal chain, by which two tonalities separated by a distance of two tritones were connected. As noticed, Scriabin's strict system did not limit his musical language. The analysis revealed moments when Scriabin violated the system in order to maintain audience attention. We can conclude that such a strict system was the result of the musical thought aiming to convey complex musical information, while the totality of the exploited enharmonic properties of the tritone allowed Alexander Scriabin to create the nucleus of compositional construction, i.e. an enharmonic chain.

**2.3. The tritone expression as a factor coordinating the linear parameter of a composition**

For Béla Viktor János Bartók (1881–1945), the polar intersection of parallel tritone sounds allowed a new glimpse at the T–S–D functional system. In the analysis of Bartók's works, it is necessary to pay attention to the "Axis system" developed by musicologist Erna Lendvai (1925–1993) (Lendvai 1971: 1).

As can be seen, his compositions contain twelve-tone structures, however, that can in no way be called dodecaphony, because such structures were always organised by Bartók in accordance to modal schemes. It is obvious that Bartók's music can be characterised by micromotive operations, and the sound material of his compositions is modal. The rhythm is organised by the counterpoint coordination of micromotives. Unequivocally, the most important principle of Bartók's compositional system is the intersection of the parallel tritone sounds, which allows for a fresh look at the functional system. In the analysis of Bartók's compositions, the tritone manifests itself in several aspects: in the *Axis* system, in the full tone series, and on the structural plane. It is important to emphasise that the tritone was a key element not merely in Bartók's system; Hindemith also identified it in his compositional system (see *Unterweisung im Tonsatz*), and so did Messiaen, in *Modes à transposition limitées.*

One can draw parallels between those systems, since they are related by the tritone interval. "We can draw a line between Bartók and Schönberg's *Zwölftonmusi*k. Bartók perfectly synthesises Schönberg's atonality and harmonic thinking and thus obtains a unique result" (ibid.: 16). We can also draw a line between Bartók's system and Messiaen's limited transposition modes. This parallel is reflected in the analysis of Messiaen's second mode and transpositions. The performed analyses showed that the systems based on the tritone interval correlated with each other at the theoretical level.

**2.4. Tritonal constructivism of the compositional vertical in Olivier Messiaen's system**

Symmetric tritone-based structures present the basis of Olivier Messiaen's limited transposition modes (tone series, modes), the symmetry of which results from the tritone dividing the tone series into two symmetrical parts. "Based on our present chromatic system, a tempered system of 12 sounds, these modes are formed of several symmetrical groups, the last note of each group always being common with the first of the following group. Each mode has a specific number of non-repeating transpositions" (Messiaen 1954: 58). The first mode is full-tone harmony, which can be transposed twice, with three tritones in each transposition. The second mode correlates with the Bartók-Lendvai system.

Regarding the tritone in the modal structure, it is important to note that it symmetrically divides the first (*c, d, e, f-sharp, g-sharp, b-flat, c*), the second (*c, d-flat, e-flat, e, f-sharp, g, a, b-flat, c*), the fourth (*c, d-flat, d, f, f-sharp, g, b-flat, b, c*), the fifth (*c, d-flat, f, f-sharp, g, b,*), the sixth (*c, d, e, f, f-sharp, g-sharp, b-flat, b, c*) and the seventh (*c, d-flat, d, e-flat, f, f-sharp, g, g-sharp, a, b, c*) modes. We observe that not only does the tritone divide the segments symmetrically, but is also used to control the parameters of the compositional vertical. The tritone used in verticals, like in Messiaen's *Thème et variations*, connects the tones of the first and second segments. The tritone interval operates in that way on each vertical, in the system's marginal chords, and on the central vertical. In that way, a homogeneous, structured tritone-ratio based compositional system is formed.

1. **THE TRITONE'S APOTHEOSIS AND LOSS OF RELEVANCE**

The chapter focuses on the apotheosis and loss of relevance of the tritone in the compositional practice of the second half of the 20th century. The existence and function of the tritone in both theoretical and practical compositional systems are examined. Based on the literature (listed in the introduction) on tritone-based systems, we reveal how they operate in compositions. The main task of the chapter is to investigate the connections and boundaries between the tritone apotheosis and the search for deactualisation/loss of relevance.

**3.1. Symmetric tritone sequences as a manifestation of systemic constructivism**

Determining the exact time of the emergence of a serial technique is quite complicated. Its minimal beginnings were already visible in Liszt's *Bagetelle sans tonalité* (1885), yet in the early 20th century, we see a much more systematic functioning of a twelve-tone series. We observe the first constructive beginnings of this compositional technique in Josef Matthias Hauer's composition *Nomos* (1911), while in his book *Vom Wesen des Musikalischen* (1920), Hauer first tried to define the concept of a 12-tone system. In a later work, *Zwölftontechnik* (1926), Hauer proposed the introduction of a new method of notation, using eight lines instead of a stave. In that system, which corresponded to a keyboard and did not require alteration symbols, Hauer formed a 44-trope system[[2]](#footnote-2) in which the tritone manifested itself in a specific way.

**3.2. The 20th century symmetry of the horizontal and vertical**

In the analysis of symmetric structures in the compositional systems of the first decades of the 20th century, it is necessary to discuss the two symmetric chords formed in 1921 by Fritz Heinrich Klein (1892–1977) on the basis of the tritone, the pyramid chord (from Germ. *Pyramidakkord*) and the mother chord (from Germ. *Mutterakkord*). Nicolas Slonimsky (1938) added a third, grandmother's chord (from Germ. *Grossmutterakkord*). In his research into the 20th century music from the viewpoint of structuralism, Arved Ashby highlighted Klein's research, which also led to the formation of his style; Ashby stated that music went through a number of stages from elementary triads to the above mentioned complex chords, but "in the kingdom of tones all citizens were equal" (Ashby 1995: 73).

Constructivism was especially typical of the compositional systems of the representatives of the Second Viennese School (Schönberg, Berg, Webern). Arnold Schönberg (1874–1951), the eldest of them, systematised and developed the ideas of Hauer's dodecaphonic system. Schönberg observed the evolution of Hauer's system and offered him to collaborate on a book on the dodecaphonic system[[3]](#footnote-3); however, the collaboration did not take place, and over time it was Schönberg's system that became widely known and used, in which one can notice a strong contradiction between the serial intonation and the tonal harmony, the traditional texture, polyphony, and treatment of form used in his own compositions. Schönberg was a particularly prominent follower of German music traditions just at the level of the tonal prototype. As Schönberg himself argued in his article *National Music* (1931), his compositional ideas were greatly influenced by Bach, Mozart, Beethoven Wagner, Brahms as well as Schubert and Mahler[[4]](#footnote-4), thus we can see links between the twelve-tone technique and the strict-style polyphony. In his opinion, the emergence and establishment of the serial technique in the 20th century music testified to the revival of the old counterpoint instruments, since that technique was based on the principles of old polyphony. The methods of variation (inversion, retrograde, retrograde inversion, rhythmic augmentation, diminution) established in the strict polyphony style (the 15th through 16th centuries) as well as the counterpoint-imitational (and especially canon) technique of microstructures became the rational basis of serial composition. Importantly, the "tonality" of dodecaphony was particularly emphasised by Schönberg at the end of his life in the United States, see, e.g., his lecture *My Evolution*[[5]](#footnote-5) (1949).

The analysis of the tritone operation principles in the twelve-tone music is continued by using Anton Webern's (1883–1945) Symphony Op. 21 (1927–1928). In the series of this composition, we observe the tritones unfolding from the central tritone, and also the tritones on the series form (P, I, R, IR) vertical. Importantly, the initial twelve-tone series form (P) and its retrograde interval structure are identical. Going deeper into the principles of the tritone operation, we find that it forms symmetrical structures on the vertical, horizontal, and diagonal. The series (P0) is divided symmetrically in half by the tritone, and the fact that the reversal of the tritone is equal to itself creates the conditions for an identical section of the series at the interval of the tritone in all its forms.

The tritone is the axis of the composition and series symmetry. We can disclose the in-depth structure of the series through the feature of the tritone to maintain an identical interval structure in the reversal. In the series matrix of Symphony Op. 21, we can see the equations between the series forms:

P4 = P10, P5 = P11, P1 = P7, P2 = P8, P3 = P9, P0 = P6;

R4 = R10, R5 = R11, R1 = R7, R2 = R8, R3 = R9, R0 = R6;

I8 = I2, I7 = I1, I11 = I5, I10 = I4, I9 = I3, I0 = I6;

RI8 = RI2, RI7 = RI1, RI11 = RI5, RI10 = RI4, RI9 = RI3, RI0 = RI6.

Identical structures form not only on the horizontal and vertical, but also on the diagonal:

I2 = RI8, RI2 = I8, I1 = RI7, I7 = RI1, I11 = RI5, RI11 = I5, I4 = RI10, I10 =RI4, I3 = RI9, RI3=I9, I0 = RI6, RI0 = I6;

P10 = R4, P4 = R10, P5 = R11, P11 = R5, P1 = R7, P7 = R1, P8 = R2, R8 = P2, P9 = R3, R9 = P3, P0 = R6, P6 = R0.

A similar situation exists in the first movement of Symphony Op. 21, which testifies to the conceptuality of the composition. Already in the first bars, tritonal equations are observed between the shapes of the series, and more specifically we can identify: P0 = RI6 (E-flat–A, A–E-flat), RI2 = I8 (F–B, B–F). We see that the series used in Webern's compositions are characterised not only by a consistent tritone sequence from the central to the marginal tones in opposite directions, but also by other features of symmetry and structure. Webern's Symphony Op. 21 (1927–28) does not use a series of all intervals, which allows him to develop a pattern of tone connection. We note that the properties of the tritone interval allowed for a systemic analysis of Anton Webern's Symphony Op. 21 (1927–28). It is important that the identified equations between the shapes of the series were formed in the same way as the tritone sequences, from the central tritone gradually to the marginal one. It follows that the series is composed on the tritone base that operates not only in the centre of the series but also between the marginal tones.

**3.3. The tritone in postwar avant-garde theories and compositional practice**

Continuing the study of the 20th century music composition systems in terms of the tritone concept evolution, we see that the tritone became a particularly significant factor in the 20th century compositional formation. The data of the analysis of acoustic and compositional systems enable us to confirm the hypothesis that the said interval possesses different physical and psychophysiological perception traits: the ability to produce a sonorous effect, to stimulate chromaticity, it is characterised by modal instability and attraction to other intervals, the absence of constant tones and the presence of only the leading ones, and the disclosure in specific dissonance and tension. Tritonal symmetry and strict constructivism were characteristic of the postwar avant-garde music leaders Nono, Boulez, or Stockhausen, who participated in the Darmstadt Summer Course, the centre of post-Webernian serialism.

In the analysis of the change in the tritone concept in the context of postwar avant-garde theoretical-compositional systems, the principles of the tritone operation in Luigi Nono's composition *Il Canto Sospeso* (1955–1956), Pierre Boulez's series in The Second Piano Sonataand its operation in that Sonata,and Karlheinz Stockhausen's serial structure from the harmonic and melodic viewpoint and its spread in the composition *Klavierstück II* (1952) were disclosed. The selected examples reveal conceptual, tritone-based, constructive thinking. Despite the tritone apotheosis, in the late 20th century, as a counterweight to the dominance of the tritone, the processes of its loss of relevance began: In Penderecki's work *3 Miniatures* (1955) for piano, when the compositional generativity of the 12-tone series weakens and the intensity of the tritonal tension decreases, the series is deconstructed and divided into smaller rows. The dogmas of serialism are not strictly followed in composing.

**3.4.** **The loss of tritone relevance**

To proceed with the consideration of the change in the tritone concept, we must raise fundamental questions about its role in compositional practice, since in the late 20th century we are confronted not only with the apotheosis of the tritone, but also with its loss of relevance. Consequently, we need to reconsider the change in the approach to the twelve-tone compositional system: do we still have to talk about the compositional vertical, horizontal, and diagonal, or can we relate the changing function of the tritone interval to timbre and colour? Does the tritone still generate new compositional paradigms or does it become a quote from the past (the Second Viennese School)?

The conducted research revealed the change in the tritone concept in the compositional systems of the second half of the 20th century. Symmetry and strict constructivism were characteristic of the leaders of the postwar avant-garde music (Nono, Boulez, or Stockhausen). Through the analysis of the change in the tritone concept in the context of postwar avant-garde theoretical systems, we revealed the principles of the tritone operation in Luigi Nono's composition *Il Canto Sospeso* (1955–1956), Pierre Boulez's series in *The Second Piano Sonata*, Karlheinz Stockhausen's *Klavierstück II* (1952). Processes of the loss of tritone relevance became apparent. An analysis of Penderecki's *3 Miniatures for Piano* (1955) revealed that the compositional generativity of the twelve-tone series weakened, the intensity of the tritonal tension decreased, the series was deconstructed and divided into smaller rows, and the dogmas of serialism were not strictly followed in the process of composition.

Even more distinct, based on physics research, processes of the tritone loss of relevance were found in the compositions of spectralists, such as Gérard Grisey, Tristan Murail, and Michaël Levin, as well as those of minimalists. In the presented analyses of the compositions of Arvo Pärt, Henryk Górecki, Aleksander Lasoń, and Michael Gordon we saw as if an arch connecting the Renaissance compositional models and the late 20th century compositional principles, in which the tritone and the constructive and symmetrical structures developed on its basis lost their relevance.

**4. THE TRITONE IN BOŽENA ČIURLIONIENĖ'S COMPOSITION *CONFESSIONES* (2020)**

In this chapter, the expression of the tritone and the canon of its use in the compositional practice of the author of the present artistic research was revealed in three stages. The purposefully chosen titles of the sections – *Dispositio, Elaboratio,* and *Decoratio* – organically reflected the course of the composition process, discussed in Heinrich Christoph Koch's (1749–1816) three-volume work *Versuch einer Anleitung zur Composition[[6]](#footnote-6)* (1782, 1787, 1793). The stages identified by Koch could be defined as: 1) *Dispositio* – the process of material devise, generation of ideas; 2) *Elaboratio* – project preparation, elaboration, and development; and 3) *Decoratio* – decoration.

**4.1.** ***Dispositio***.

At the first stage of the compositional process (*Dispositio*), the idea of the whole composition is formed. The stage is one of the most important, because during it the concept of ideas and proportions are modelled; it is like an architectural drawing. Generating material and its potential spread and development are also envisaged at this stage.

At the first stage of writing a composition for symphony orchestra, I made use of the book *Confessiones* (397–400) by St. Augustine (354–430), in which the author described his spiritual life and the way of knowing God. St. Augustine's *Confessions* correlated with the object of this artistic research, i.e. the tritone, its instability and the demand for resolution, and the search. At that stage of the compositional process, I carried out in-depth studies of the philosophical ideas of Aurelius Augustinus and their correlation with my research. It was a search for the ultimate meaning, insights into nature, and reconsideration of them. However, that book became not only a philosophical rationale, but also the basis of the vertical, horizontal, diagonal, the structure and the proportions of my musical composition.

**4.2. *Elaboratio***

In the second stage, the transfer of the created material to the composition *Confessiones* was examined,or we can call this process the materialisation of ideas. *Elaboratio* is also a concept of rhetoric; it is important to note that St. Augustine also studied the art of rhetoric in-depth. In his book *On Christian Teaching* (2013), where Aurelius Augustinus focused on the interpretation of the importance of faith, he also talked about Christian rhetoric, although in principle he did not separate it from other branches of rhetoric; the only and most significant difference was the topics and values that the speaker was to follow. The relevance of the art of rhetoric has remained important for several millennia and therefore, in our view, it perfectly reflects not only the process of language but also the process of composing music. Man and his soul are affected by both language and music.

**4.3. *Decoratio***

*Decoratio*, Germ. *Ausarbeitung:* at this stage of composing, we are talking about the decoration, embellishment, and putting the finishing touches to the composition. Koch's theory is closely related to Sulzer's ideas, as evidenced by Sultzer's repeated quotations in Koch's works. In the comments on the final stage of composing, in his work *Allgemeine Theorie der schönen Künste*, Sultzer points out: "The more important the fire of imagination is to the conception of a composition, the more it hampers its completion (…). Cold-bloodedness is very important here (…) Perfect accomplishment lies not in the abundance of details, but in their successful selection " (Sultzer 1771–74: 249–250). In the third stage of the process of composing *Confessiones* (2020), minor details were focused upon:ge ornamentation, nuances of orchestration, and rhythmic diminution or augmentation. At that stage, the system of the tritone operation had already been defined, and the focus was on subtleties. In the composition *Confessiones,* one can also see the approximation and retraction of the tritonal sequence.

In the composition for symphony orchestra *Confessiones* (2020), the tritone operates at four levels: rhetorical, constructive, acoustic, and philosophical. The first comes from the numbering of Aurelius Augustinus' book, directly related to 6, the number of the tritone, 7, the number of the fifth, and 13, which denotes all the sounds of the octave, and that is directly related to the chromaticity stimulated by the tritone; hence the structure of the composition, based on the balance between the tritone and the fifth. At the acoustic level, particular attention is paid to the dynamics of the tritone, orchestration, texture density, timbre, and range, thus regulating the tension created by the tritone. Philosophically, the tritone in the composition interacts with the unison, the fifth, and the octave, thus drawing the line between the Apollonian and Dionysian origins.

In addition to philosophy, my compositional process was also affected by natural processes, such as unexpected changes, metamorphoses, transformations, and changes in texture: hence pulsating textures and timbral variations; transformation and synthesis of musical material; unexpected pauses or a sudden dynamic leap to *fff*; and the balance between the filled and transparent space. By means of dynamics, the space was created – the sounds were brought closer or carried away from the listener. Changes in the timbre and texture – densifying, dispersing, texture transformation – referred to colours. The main goal was clear, not overburdened, refined musical material.

**CONCLUSIONS**

The present artistic research paper unfolded the change in the tritone concept and, despite the small-size object, the research helped to find more than one fundamental answer. It can be firmly argued that the tritone-related issues were characterised by specific tension, which was discussed and unfolded in the current paper. The tritone was often automatically assigned the epithet *diabolus in musica*, which had been changing over the centuries until it finally (in the 18th century) became *mi contra fa diabolus in musica est*. It is specifically the current research that made it possible to understand the problematic nature of that very small object, evidenced by the extremely diverse history of change in its concept. The interval had attracted the attention of composers, theorists, and philosophers at all times. The exploration of the change in the tritone concept revealed the epithets characteristic of it, which, despite the liberalising rules of the tritone use, were similar and remained unchanged since the period of its prohibition, establishment, apotheosis, and loss of relevance. That was predetermined by the acoustic properties of the tritone (sensory dissonance), which were underpinned in the paper by the conducted research.

1. Upon analysis of the processes of change in the tritone concept in music theory and compositional practice from the Middle Ages to its establishment in dissonant chords and functions of the harmonic system of Classicism, the tritone characteristics were revealed that influenced the compositional processes of the 20th century. As revealed by the research, the characteristics attributed to the tritone correlated at different times, despite being separated by centuries. In the 16th and the 20th centuries, the tritone was called neutral by theorists: Aaron (1516); Coclino (1552); Persichetti (1961); and Křenek (1940), as well as the theorists of the 15th and the 20th centuries attributed to the tritone the characteristics of an unstable and dissonant interval, cf. Tinctoris (1447); Mersenne (1636–1637/2001); Zarlino (1558); Hindemith (1945); Hanson (1960); and Javorski (1972), while in the 11th and 20th centuries, despite of a gap of almost 1,000 years, the tritone was considered to be unpredictable, insidious, and imperfect, cf. Aretinus (1026), Contractus (~ 1030); and Cope (1977). This testifies to the (un)changing nature of the tritone characteristics over time. In other words, whether we talk about Pythagorean times or about our era, the regulations for the tritone use changed, but its own *dissonance from a sensory viewpoint* remained the same. The analysis revealed that the use of the tritone extended the major-minor system (Liszt) to twelve tones. The tritone acted as a factor organising the structure of a composition, cf. Beethoven's *Fidelio*, Verdi's *Otello*, and Puccini's *Tosca*. Compared to Renaissance or Baroque compositions, a marked change could be observed in the music of Classicism and Romanticism. The analysed examples revealed that it was during the said period that the tritone emerged and took root on the structural plane of the composition. One can argue that it was in Classicism that the tritone took root in dissonant chords and functions, and in the first half of the 20th century, it became established from a constructive viewpoint.
2. The extensive evolution of the tritone concept in the 20th-century harmony and composition was substantiated through the context of theoretical and individual compositional systems and acoustic research. As demonstrated by the conducted analyses, the tritone and its acoustic properties were of particular importance for the twelve-tone music. The enharmonic characteristics of the tritone inspired Scriabin to discover and adapt the tritonal chain to the compositional system. In the Bartók-Lendvai Axis system, its harmonic functionality was newly substantiated using the polar intersection of parallel tritones. Before the mid-20th century, both in theories and in compositional practice, the tritone predetermined the structure of the vertical, horizontal, and diagonal. The monolith of the Messiaen's modes of limited transposition is based on the sonority of the tritone interval. The conducted analyses substantiated the tritonal constructivism of the compositional vertical, horizontal, and diagonal. Acoustic studies confirmed that the interval had different characteristics of physical and psychophysiological perception, i.e. the ability to induce a sonorous effect and to stimulate chromaticity, it was characterised by modal instability and attraction to other intervals, had no constant tone but only the leading ones, and unfolded itself with specific dissonance and tension.
3. The constructiveness of the tritone symmetry phenomenon in the series of the 20th century compositions, in harmony, and on the vertical and diagonal was stimulated by the tonal indefiniteness of the tritone. That was particularly evident in the analysis of postwar avant-garde music examples dominated by symmetrical series. The tritone symmetry was most distinctly expressed in Webern's work, in Zimmermann's system, and in the compositions of the postwar avant-garde leaders Nono, Boulez, or Stockhausen who had participated in the Darmstadt Summer Course, the centre of post-Webernian serialism. The 20th century postwar avant-garde musical compositions featured the operation of symmetrical, tritone-based series on the vertical, horizontal, and diagonal and in the compositional structure. However, after the total apotheosis of the tritone in music, the processes of the tritone loss of relevance became apparent in music compositions of the second half of the 20th century.
4. In the second half of the 20th century, the expression of the tritone and its compositional generativity weakened; composers turned to medieval music and sought inspiration in the music of different nations, which was reflected in the expression of the tritonal tension of sound, deconstruction of the series, and loss of relevance of the serialism dogmas. Distinct processes of the tritone loss of relevance, based on physics research, could be seen in the compositions of spectralists, such as Grisey, Murail, and Levin, as well as of minimalists. In the analyses of works by Pärt, Górecki and Gordon, carried out during the research, we see as if the arch connecting the Renaissance compositional models and the late 20th century principles of composition in which the tritone and the tritone-based constructive and symmetrical structures finally lose their relevance.
5. The conducted research into the change in the tritone concept inspired its conceptualisation and constructive expression in individual creation. The conducted artistic research, given the symbolic meaning of the tritone, its acoustic parameters, and the balance of tension and resolution, made it possible to finally understand the meaning of the tritone in the compositional system. As a composer and theorist, I could emphasise that the study provided the understanding of a comprehensive, universal system and inspired new research. It is particularly important to note that, despite the symmetry of the tritone and the charm of the systems based on it, despite the instability and tension caused by it that has predominated in music for the last few centuries, it should be remembered that, as Plato (428/427–348/347 BC) wrote in *The Republic* (375 BC), "a king lives 729 times more pleasantly than a tyrant" (729: 1) and that the tyrant lives just as many times less pleasantly" (Plato, 587e).

1. *Quarta falsa ir quarta superflua, quinta deficiens* (Troschke 1989: 1). [↑](#footnote-ref-1)
2. Lat. *tropus*, Gr. *tropos – '* a turn'. [↑](#footnote-ref-2)
3. In a dodecaphonic system, the composer forms a tone row, a series. Schönberg marked the series and its forms with letters (O – original series, R – retrograde, I – inversion, RI – retrograde inversion). [↑](#footnote-ref-3)
4. For more details on those inspirations see *Style and Idea – Selected Writings of Arnold Schoenberg* (1931), (p. 169–165), ed. Leonard Stein. [↑](#footnote-ref-4)
5. Schönberg's lecture *My Evolution* <https://www.youtube.com/watch?v=c_4LnBU8e_w> [↑](#footnote-ref-5)
6. Volume 1: *Von der Art und Weise wie Töne an und für sich betrachtet harmonisch verbunden werden und Vom Contrapuncte* (1782); Volume 2: *Von der Art wie die Melodie in Rücksicht der mechanischen Regeln verbunden wird* (1787), and Volume 3: *Fortsetzung Von den mechanischen Regeln der Melodie: Von der Verbindung der melodischen Theile, oder von dem Baue der Perioden* (1793). The work is available online at <https://archive.org/details/versucheineranle00koch/page/n406> [↑](#footnote-ref-6)