

# Contemporary Piano Music



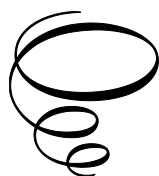
# Contemporary Piano Music:

## *Performance and Creativity*

Edited by

Madalena Soveral

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Edited by Madalena Soveral

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## INTRODUCTION

This volume brings together a set of essays presented at the 4th International Contemporary Piano Meeting, held in Porto in December 2019. Organised by CESEM in partnership with the Federal University of Minas Gerais (Brazil), the main objective of the event was to provide a forum for the discussion of the contemporary piano repertoire in the perspectives of creation, performance and musicology. The participation of specialists from various areas of study - musicologists, composers, performers - contributed to a rich and productive dialogue around these areas, showing the importance and meaning of their mutual relations. Using examples from different disciplines - music theory, performance studies, analysis, artistic research - the talks allowed us to identify points of intersection between theory and practice, proposing new and enriching perspectives for research.

*Contemporary Piano music: Performance and Creativity* adopts an interdisciplinary approach in linking these areas of knowledge. The 15 essays assembled here describe the complex nature of a phenomenon such as performance, alluding to the variety of possible approaches to be found in the different disciplinary fields. In fact, musical performance requires a set of multidisciplinary skills - technical, psychological, analytical - alongside other competences directly rooted in the concrete musical experience, and thus in strict relation with the various aspects of performance. Parallel to the aesthetic issues of musical creation, the essays at the same time examine the theoretical information that precedes performance as well as the technical aspects of the performance itself. Thus, this book serves a double purpose: firstly, to promote a discussion on the theoretical and aesthetic problems of composition, and, secondly, to extend the discussion to aspects related to interpretation and performance; all of this from the point of view of their relations with semiotic universes - stratifications of forms, languages, performative styles, traditions - which are more and more diverse and complex.

Focused on the piano repertoire, this collection, organised into 3 sections, presents a detailed analysis of the compositional techniques and performance practices of the 20th and 21st centuries: from the 1950s until the musical production of the beginning of the 21st century; from the piano repertoire of the last few decades to the most recent artistic practices – summarising some of the central issues involving contemporary artistic activity and research. Each chapter develops a specific point of view, tracing a path

that goes from the aesthetic and stylistic categories of the composition to new approaches to performance offered by experimental methods, with this also including interpretive issues underlying the act of execution. Within the light of the various historical-stylistic contexts accompanying this period, we will try to present these issues, identifying a set of articulations between the technical process of the writing and execution and the aesthetic paradigms that underlie them. Taking as reference the crucial periods that marked the musical aesthetic of the 20th century (the 1950s and 1970s/80s), this study tries to bring together a set of concepts and methods that are able to integrate the main problems raised by compositional works and practices (I), as well as assessing the questions that these practices pose to the interpretative and performative process (II). We end with a study of the most recent artistic experiences and their contribution to redefining the contemporary performative field (III).

The following description is meant to serve as an introduction to these themes. The articles are organized in order to link ideas, methodologies, and practices, through interconnecting the different sections.

The first chapter - Historical Approaches - is devoted to the technical and aesthetic aspects of the musical creation of the 20th century. Four articles offer a summarised image of the main issues that have accompanied the evolution of musical language over the past century. To this end, we have limited this study to a group of works of four leading composers - Messiaen, Xenakis, Górecki and Berio - whose musical production brings into play two opposing paradigms of contemporary musical thought: structure vs. perception.

The first of the 4 essays, written by Lee Kuo-Ying, examines the philosophical and theological concepts that supported Messiaen's rhythmic-temporal thinking. Using examples from various works, the author presents a detailed examination of technical methods and processes (modes and rhythms) and their relationship with formal structure. Concepts such as symmetry, recurrence and reversibility, typical of Messiaen's musical thought, provide for the creation of a relationship between rhythmic and harmonic structures, bringing into play a "new formal idea that, later on, would influence composers such as Pierre Boulez and Karlheinz Stockhausen". His piano work *Modes de valeurs et d'intensité* takes this issue further, putting into practice a structural relationship between different parameters (harmony, rhythm, attacks and intensity) in advocating serial formalism.

However, the search for formal constructions among the various sound elements, during the 1950s, was particularly driven by an exploration of logical-mathematical models, of which Xenakis was one of the main

protagonists. Although distant from serial thinking and the principle of “generalisation of the sound phenomenon”, Xenakis, like Boulez, argued for a formalisation of the compositional process and opted “for a rationalist conception of musical art” (Bayer 1981). From stochastic music to symbolic music, mathematical processes have always represented one of the sources of inspiration for Xenakis’s compositional thinking. These ideas are exemplified in the article by Helena Santana, in which the author examines the concept of Symbolic Music in the creative process of Xenakis, taking as a reference the works *Herma* (1961-62), for solo piano, and *Eonta* (1963-64), for piano and instrumental ensemble.

After a period marked by the formalist aesthetics of the European musical vanguard, based on abstract models, the 1970s and 1980s marked a new aesthetic orientation centered on the perceptual dimension of the musical phenomenon. The use of “flexible sound archetypes” of French spectral music, the introduction of elements of traditional language, (rhythmic pulsations and melodic figures) of repetitive American music, or the processes of integrating styles of the first German postmodern movement - all of these currents emphasise the concrete sound experience, testifying to the change in the aesthetic paradigm that accompanied the evolution of musical language in the last decades of the 20th century. It is this latter perspective that characterises the creative innovation of a composer like H. Górecki. The title of his work *Zderzenia* (*Scontri*, 1960) is very indicative of this connection between different musical realities that would entirely characterise his later production. This is particularly the case for his piano works - *Sonata no. 1* and *Recitatives and Ariosos ‘Lerchenmusik’* Op. 53 - analysed in the article by Anna Kijanowska. Music of contrasts and traditions, according to the author’s words, the compositional process brings together multiple references (from Bartok to Messiaen and Chopin) and convergences between different styles (minimalist materials, baroque forms and Polish popular music), responding to the aesthetic ideals of the first postmodern movement.

Indeed, this idea of opening up and bringing together heterogeneous materials and techniques also represented one of the focal points of the musical thought of composers such as Berio or Zimmermann. For example, *Sinfonia* (1960), one of Berio’s most emblematic works, integrates within its internal structure a wide variety of materials, styles and techniques from different musical traditions, anticipating the postmodern pluralist idea. It is perhaps this aesthetic diversity that best corresponds to his concerns as a composer, and to his need to explore different techniques, which thereby

defines the specific nature of his creative journey. In this regard, his work for piano is particularly representative. Covering a period of 54 years of creation, his pianistic repertoire concentrates various compositional strategies that form the basis of the Berian language, from the neo-classical style of the *Petite Suite* (1947) to the *Sonata* (2001), his last piano piece, from the serial experience of *Cinco Variazioni* (1952-53), and the tonal allusions and quotes in the *6 Encores* (1965-1990) to the concept of improvisation in *Sequenza IV* (1966), and the rewriting notion” in *Rounds* (1967), with all of these works testifying to the variety of their language and the multiplicity of their creative processes. These issues are particularly developed in the article by Mariachiara Grilli, in which the author presents a detailed analysis of Berio’s solo piano work, highlighting his methods and the interrelationships between the pieces. A central aspect of the essay concerns the role of instrumental discourse, as an element conveying expressiveness and musical gesture in performance.

These topics form the background that informs the discussions in the next chapter - Text, interpretation and performance - in which various issues related to musical interpretation and practice are addressed. The aim is to examine a series of progressions that are both theoretical and practical, providing for the identification of points of intersection between different aspects of the musical experience: composition/writing/interpretation and notation/gesture/performance. As is known, these questions refer to two epistemological positions that accompanied the debate on musical interpretation from the 1980s onwards: one based on the theoretical-analytical perspectives of the work and on the relationship between text and performance, with the other focused on performance actions and processes. This latter position forms the content of Alexandre Zamith’s article, in which the author proposes a reflection on performance, “as an object of study and research into music”. Performance for Zamith is thus reduced to a kind of event, the *hic et nunc* of a phenomenon self-legitimised by its specific characteristics. At the same time, and within the line of thought of several Anglo Saxon scholars, the performative act takes place within a network of experiences, combining a set of cognitive, physical and mental mechanisms (Clarke 2004), the action of which will be determinant for the process of musical realisation. It is these ideas that embody Ana Telles’ essay, in which she presents a study on the cognitive role of fingering in performing the contemporary repertoire, underlining its mediating function in the linking between the “mental representation” of the musical gesture, and its subsequent reproduction in the performative game.

Another fundamental issue for the interpretative process is the “field of tensions” that is created between the text and its interpretation/performance, whereby the diverse strategies of the compositional act converge. The following 4 articles (Madalena Soveral, Leticia Michielon, Carlos Taboada and Paulo Meirelles) explore this issue, presenting an analytical study of 4 piano works, showing a series of connections between the structural aspects of the composition and the interpretive and performative issues of the musical performance.

Beyond this notion of the interpretative phenomenon based on the relationship between composition and performance and on the ontological status of the text and its relationship with the act of execution, more recent experiences put into practice another approach to performance, based on new methodological procedures. Including musical research in the creative process of performance, these experiences create a new experimental method, serving to consolidate experiences that have considerably changed the performative field (Fernando Lazzetta 2011). This methodological position is shared in Helena Marinho’s article, dedicated entirely to the study of three mixed media works by the Portuguese composer Constança Capdeville (1937-1992). Using an interdisciplinary approach, based on the linking of archaeological and ethnographic research, experimental methods and her own experience as a performer, the study highlights the diversity of methods and processes that make up the performative area of the present day.

What are the new musical challenges of contemporary artistic creation and what are the implications of these challenges for current artistic practices? How does contemporary praxis problematise the classic model of reproduction, inviting exploration and experimentation? (Antoniadis, 2019)

These and other questions are the object of study in the 3rd chapter - Past and present exchanges in present-day artistic practices. Four articles offer a brief overview of contemporary artistic practices, and their implications for the construction of new paradigms. Questions such as text, notation, repertoire, virtuosity and autonomy, for example, serve as a guiding thread to offer a reflection on the meaning and function of musical traditions in the current artistic context, and in so doing thereby inviting a comparison or a reassessment of their concepts, practices and paradigms.

A particular perspective is that of Pavlos Antoniadis’s essay, in which the author reflects on the relation between intelligence and spirit in contemporary piano performance, taking as an example the works of Klaus Hubler (1986) and Wieland Hoban (2002). The aim is thus to examine how

“compositional intelligence, communicated through symbolic musical notation, authorises new forms of interaction embodied by the musician, inviting exploration and experimentation”. To this end, the author argues for a new performative paradigm, designated as “embodied navigation”. Its novelty lies in rethinking the classic notion of textual interpretation as a dynamic system between various elements - “scripts, bodies and instruments” - linking the issues of notation and the pianistic touch to the musical idea and its meaning in the work. These reflections are part of a broader investigation into the theory of interaction incorporated with musical notation, as exemplified in the creation of an interface designed by the author - GesTCom (Gesture Cutting Through Textual Complexity) - a particularly useful tool in the analysis and control of pianistic gesture associated with the notational complexity of contemporary music.

The whole discussion about writing and notation is, at the same time, a discussion about its relationship with the historical moment of each stylistic period, and with the aesthetic paradigms underlying this. In opposition to the pointillistic writing of the music of the 1950s, conveying the idea of discontinuity and fragmentation of the sound discourse of the serial technique, in the last two decades of the century we have witnessed a return to traditional aesthetics and their notational systems, and thereby completely renewing the previous strategies. *Territoires de l'oubli* by Tristan Murail (1977), *Three pieces for two pianos* by Ligeti (1976) or *Phrygian Gates* by John Adams (1977), for instance, clearly respond to this logic of integration, proposing a new technical orientation in which the codified elements of the traditional language are linked to innovative technical procedures, contributing to the definition of personal and specific aesthetic and technical criteria. This is the focus of Helen Gallo's essay, in which she undertakes a critical evaluation of the traditional concept of virtuosity, its historical antecedents in the past and its potential to be updated in the present, taking as reference the works of Berio, Ligeti and Jean-Claude Risset.

Within a completely different perspective, Joana Sá examines the virtuosic phenomenon in the light of her own experience as a performer and composer, trying to identify how this concept can be evaluated in current practices. In opposition to the traditional concept of musical achievement based on the relationship between composer/interpreter, the study places the corporal aspect as the centre of the creative process, its autonomy in relation to the musical idea and the composer. The concept of work is thus replaced by the notion of process (Lazzetta 2011), in which gesture and bodily movement are elements that drive musical creation and performance. This new context opens the path for other performance approaches based

on experimental strategies, completely changing the traditional models of performance, as discussed by Heloisa Amaral in her essay, with which we conclude this chapter. Starting from the traditional model of performance in concert music, the author demonstrates how the concepts of “autonomy and purity” that prevailed in the musical experience of the 19th century have, in recent practices, been replaced by convergences between different areas, thus opening up a new discursive space for increasingly open and complex artistic projects. This paradigm shift, says the author, “questions not only the discourse of classical and contemporary performance that has remained protected from external influences, but also the role of the performer who is led to think curatorially”, through a direct involvement in the “conception, production and realisation of collective and collaborative projects”, testifying to the transformation that the traditional figure of the performer has undergone in the contemporary artistic scene.

We can thus verify - as mentioned at the beginning - the considerable vastness of a phenomenon such as performance in which the scientific aspects of theory, aesthetics and analysis, which point to objective and universally communicable data (Zurletti 2010), come into contact with the artistic perspectives of execution as characterised by ambiguity, and by the singular immediacy of their experiences. At the same time, these questions recall two lines of force that guided the organization of this collection, marking a path ranging from the objectivist/structuralist discourses of musical creation and its interpretative practices, to the new concepts of practice of current performative experiences, guided by an experimental aesthetic, which is naturally complex and ambiguous. The diversity of the points of view presented by performers and researchers certainly testifies to the richness and theoretical potential of this theme, which can only be enriched by new debates, thus being able to provide innovative perspectives for this multifaceted field of research.

I am most grateful to the authors of this volume, without which it would not have been possible to realise this project. My thanks to all those who participated in creating this project, with their valuable contributions in revising the texts and organising this collection. My special thanks to CESEM (Centre for the Study of the Sociology and Aesthetics of Music) for the support given to this project.

Madalena Soveral  
December 2020





# CHAPTER ONE

## HISTORICAL APPROACHES



# AN ANALYSIS OF SYMMETRICAL STRUCTURES IN PIANO MUSIC BY OLIVIER MESSIAEN

LEE KUO-YING

## Abstract

Olivier Messiaen (1908-1992) stands as one of the most innovative composers of the twentieth century. His compositions feature diverse nuances of depth, while in his piano works, in particular, he innovatively applied the modernist technique of symmetrical structure.

In musical perception, symmetrical permutation refers to a set of repeated elements that are approximately unchanged after respellings and transformations. Messiaen's application of symmetric structures significantly established a new system of time and pitch which was set in contrast to the traditional utilization of symmetry. Moreover, his symmetric musical process reflects the religious concept of eternity. My research will set out to classify the multiple symmetries in Messiaen's piano music through theoretical analysis. This theoretical analysis will rely primarily on the method outlined in Messiaen's *La technique de mon langage musical* as a point of departure regarding compositional principles. In addition to the composer's own ideas, I will approach two contrasting analytical methods proposed by the British theorist, Peter Deane Roberts, and also utilized in traditional Pitch-Class set theory. In his theory, Roberts emphasizes melodic derivations from various synthetic scales which connect Messiaen's earlier approach with the traditions of the Russian modernists and the French Impressionists. Pitch-Class set theory can thus provide guidance for the comprehension of Messiaen's ideas concerning the non-tonal hierarchy and also provide a guide to Messiaen's original ideas concerning this which will subsequently lead toward his later serial techniques. It is very interesting that Messiaen's spirituality led him to important theoretical discoveries, and, very possibly, vice-versa. This study will therefore aim to explore the diverse structural concepts of symmetry in Messiaen's works.

## 1. Introduction

### Review of Messiaen's Piano Works

In Messiaen's remarkably creative life, the great majority of his works were written for organ and piano. His piano output is a genre which particularly demonstrates the stylistic development of his works over his lifetime. This is partially because Messiaen's wife, Yvonne Loriod, was a remarkable pianist who greatly influenced his prodigious writing for his piano oeuvre. The first published set of Messiaen's piano works, the *Huit Préludes*, dates from 1929 and was written when he was still a student at the Paris Conservatoire. It already possessed an originality and immediately gained the interest of the public. Messiaen's last piano piece, *Petites Esquisses d'oiseaux*, was completed in 1985, seven years before his death. Thus, Messiaen's piano oeuvre can be perceived as a sum of most of his innovative techniques.

Starting from the beginning of the 1940s, Messiaen began to experiment with innovative musical vocabularies. For instance, his interest in rhythm, which was inspired by the ancient Greek world, and Hindu rhythm, led him to perceive and coin the term, "personnages rythmiques"<sup>1</sup> which involves nonretrogradable, additive and subtractive rhythms.<sup>2</sup> Messiaen's piano works from the same period, such as *Visions de l'Amen* (1943), *Vingt Regards sur l'enfant-Jésus* (1944), and *Quatre Études de rythme* (1949), developed these approaches. His "Mode de valeurs et d'intensités" from *Quatre Études de rythme* for solo piano is one of the pioneering works applying serial techniques to the parameters of duration, register, dynamics and pitches.

Messiaen's other beliefs and interests, seemingly outside musical technique or theory, often inspired his piano works. His Catholic faith and his contemplation of mysticism are reflected in his solo piano work.<sup>3</sup> For example, the set for piano solo, *Vingt Regards sur l'enfant-Jésus* (1944), is one of the most exceptional works of Messiaen, consisting of twenty pieces centring on the theme of God. Moreover, he also revealed his fondness for nature in another set of pieces for solo piano, *Catalogue d'oiseaux* (1956-58). These

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<sup>1</sup> This term means "rhythmic characters" e.g. Igor Stravinsky's utilizations of rhythm. Messiaen also later developed this technique into new constructive principles.

<sup>2</sup> Christopher Dingle, Nigel Simeone, *Olivier Messiaen: Music, Art and Literature*, 2<sup>nd</sup> ed. (New York: Routledge, 2016), 48.

<sup>3</sup> Siglind Bruhn, *Messiaen's Contemplations of Covenant and Incarnation: Musical Symbols of Faith in the Two Great Piano Cycles of the 1940s* (Hillsdale, NY: Pendragon Press, 2007), 20.

pieces depict birdsong and synesthetic perception. Expanding from a similar idea, Messiaen continued to compose sets of interpretations of birdsongs such as *La Fauvette passerinette* (1961), *La Fauvette des jardins* (1970-72), and *Petites esquisses d'oiseaux* (1985) in his last compositional period.

Although much of Messiaen's piano works and symmetrical permutations have been individually addressed in various texts, I have not come across any publication exploring the symmetrical structure across all levels in his piano works. This study will therefore aim to demonstrate how Messiaen's symmetrical structure unified his most innovative techniques and also served as the structural framework for the musical form of his piano works. The religious and philosophical significance of symmetry will also be a focus of this research, in order to explore the significance of symmetry beyond the surface outline of musical structure.

## Symmetry as a Basis for Structure

Throughout the history of Western culture, symmetry has been a universal principle. It is associated with the measurement of time and the repetition of musical elements. Symmetry's own fundamental nature applies to arts of all kinds. For example, the body structure of humans and most animals exhibits mirror symmetry. In addition, symmetry is one of the oldest and most continuously utilized ordering principles in architecture, providing a sense of harmony and balance in its proportions and arrangements. In literature, the palindrome is another representative example, which reads the same backwards and forwards. In a broad way, there are various types of symmetrical geometric objects found all around us, in nature, architecture, and paintings. In musical art, mirror symmetry in the structure of compositions can be found as early as in medieval Gregorian chant with the presence of a balanced rondo form. Symmetrical patterns also occurred later in vocal polyphonic music of the Renaissance in retrograde imitation, and its canonical inversion was also similar to a mirror reflection around a horizontal axis.<sup>4</sup> J. S. Bach utilized this tradition to compose his two-part canon, "Canon cancrizans", BWV 1079.3a, in the Baroque period.<sup>5</sup> Bach also used contrary motion in many of his fugues to

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<sup>4</sup> Davorin Kempf, "What is Symmetry in Music", *International Review of the Aesthetics and Sociology of Music* 27, No. 2 (Dec., 1996):155-165, accessed April 20, 2020, doi:10.2307/3108344.

<sup>5</sup> *Ibid.*, 159.

create ascending and descending contrapuntal lines across the central axis in diagonal symmetrical structures. In the realm of Baroque musical style, the symmetrical ternary form of *Da capo* also anticipated the sonata form of the approaching Classical period. In the Classical era, the balanced ternary musical form of a sonata presented a homophonic symmetry.

In the Romantic tradition, symmetrical utilization was limited in part because musical logic changed at the time, and the expression of human emotions often dominated the main content of the music. Furthermore, during this period, diatonic major and minor scales with a tonic-dominant relationship resulted in a primary focus on asymmetry in the tonal system, except for a few cases, such as diminished and augmented chords, which were employed to create vertical intervallic symmetries in late 19<sup>th</sup>-century music. This practice was altered when twentieth-century music developed the new technique of dividing the octave into two symmetrical halves through a tritone. Based on this approach, the respelling of the tritone-related structure built up pluralistic types of symmetries.

The most notable occurrences of symmetry within the harmonic system utilized by composers, in particular by Alexander Scriabin (1872-1915), Arnold Schoenberg (1874-1951), and many of their contemporaries, is the fourth interval and its expansions, which replaced the tertian harmonic tradition. This complex of symmetries applied to numerous styles including the Impressionist, Neo-Classical, twelve-tone, and serial approaches, among others. For example, the widespread use of the symmetrical whole-tone scale is encountered throughout Claude Debussy's oeuvre. His rhythmic and phrase structures are also often built on symmetry, partially because of the influence of the poetic form of works by French Symbolist poet, Stéphane Mallarmé. In another example, Igor Stravinsky's "Petrouchka chord" is comprised of a paired symmetry and a bisection of the octave. Scriabin increasingly utilized symmetry in modes, chords, focal arrangement and underlying harmonic structure in most of his late piano works. Schoenberg continued to develop the concept of symmetrically constructed chords and expanded the idea to systematic properties. His pupil, Anton Webern, further developed a more complex system of symmetrical interrelation in the realm of the twelve-tone row in his *String Quartet Op. 28*.<sup>6</sup> Thus, the presence of symmetry has, in various ways and on very different levels of musical form and structure, been relevant to a synthesis of elements in great art throughout the history of music. Messiaen had also experimented with different methods of symmetrical contexts. The next paragraph will illustrate Messiaen's penchant for making use of the symmetrical process.

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<sup>6</sup>. Ibid., 162.

## 2. Messiaen's Musical Discoveries

### La technique de mon langage musical

Messiaen's treatise, *La technique de mon langage musical*, was published in 1944. He wrote this book with the purpose of providing the public with an understanding of his techniques. By means of the guidance in this book, Messiaen's music became more comprehensible to his audience. He laid out several principles in terms of rhythmic complexity, melodic resources, bird song, diverse forms, harmonies, modes of limited transposition, polymodality and terminations. Many of his techniques were shown to be guided by the main idea of his "Charm of Impossibilities". Messiaen described this compositional force as a "magic spell" created through mathematical impossibilities.<sup>7</sup>

Most of Messiaen's methods are logically designed, and symmetrical formation is clearly one of the most significant devices. One can also observe that symmetry-related elements are found in both "modes of limited transposition", as well as "nonretrogradable rhythms". It is worth mentioning that Messiaen described both of these techniques as being two striking facts of impossibilities.<sup>8</sup> Commonly, they are both symmetrical due to their constructive features. The modes of limited transposition recurrently split the tempered twelve-tone octave into several interval groups of non-overlapping notes. These modes can be divided into symmetrical groups as the transposable pattern eventually goes back to the very beginning of the mode. Thus, the mode is incapable of being respelled beyond a certain number of times without repetition. The nonretrogradable rhythms are symmetrically arranged with the same duration of notes when they are played forward or backward. Above all, these two techniques display Messiaen's innovative use of symmetry in vertical and horizontal directions.<sup>9</sup> Messiaen's own doctrine stands as the main model of reference for the analysis.

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<sup>7</sup> Olivier Messiaen, *Technique of my musical language (Technique de mon langage musical)*. Translated by John Satterfield. (Paris: Alphonse Leduc, 1944), 13.

<sup>8</sup> Ibid.,18.

<sup>9</sup> Ibid.,10.

## Peter Dean Roberts' Theory

Many symmetrical formations had already been encountered prior to Messiaen's music, such as the symmetrical constructions found in earlier tonal and atonal compositions. There are examples in 19<sup>th</sup>-century Russian music, such as the French sixth chord and the octatonic scale. The alternation of whole tones and semitones is the constructive element of the octatonic scale. It is employed and labelled by Messiaen as the second mode of his limited transpositions. In addition to adopting the symmetrical idea from traditional scales, Messiaen further developed the tertiary-harmonic progression to achieve a fourth-interval based harmonic scheme.<sup>10</sup> The British scholar, Peter Deane Roberts, emphasizes the connection between Messiaen's harmonic development and a wide variety of Russian music. He considers the double-fourth focus a fundamental element in a wide variety of folk songs, such as Armenian songs and Bashkir melodies.<sup>11</sup> The octatonic scale also occurs in South-Georgian as well as certain Russian folk songs. Not just exclusively in Russian folk music, the octatonic scale is also very present in the music of Rimsky-Korsakov, Scriabin and in Stravinsky, fragmentally.<sup>12</sup> From Scriabin's "mystic chord", Messiaen also developed a new harmonic idea which is interpreted as a quartal hexachord consisting of a six-note set spaced in fourths.<sup>13</sup> Peter Deane Roberts' theory associates Messiaen's music with some late 19<sup>th</sup>-century tonal music and corresponds to Messiaen's own statement in the first chapter of his treatise, *La technique de mon langage musical*, in which he stresses the importance of maintaining certain practices of traditional compositional rules with respect to new sonorous effects.<sup>14</sup>

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<sup>10</sup> Peter Deane Roberts, *Modernism in Russian Piano Music: Scriabin, Prokofiev, and Their Russian Contemporaries*. (Bloomington: Indiana University Press, 1993), 65.

<sup>11</sup> *Ibid.*, 62.

<sup>12</sup> Messiaen, *Technique*, 59.

<sup>13</sup> Scriabin's "mystic chord" consists of two augmented fourths, one diminished fourth, and two perfect fourths. It appears in Messiaen's piano work, *Vingt regards sur l'enfant-Jésus* (1944). Messiaen further developed his own invented chords, including "accord en quartes" (the chord in fourths), which frequently combines with other chords of transposition, and the chords of contracting resonance.

<sup>14</sup> *Ibid.*, 10.



## Pitch-Class Set Theory

Scholars such as Robert Sherlaw Johnson (1932-2000),<sup>15</sup> Wei-Ling Cheong,<sup>16</sup> Grant Michael Sawatzky,<sup>17</sup> Amy Bauer,<sup>18</sup> and Vincent Benitez<sup>19</sup> have, in their dissertations, utilized set-class theory to discuss Messiaen's symmetrical permutations, in order to focus on the purpose of reconstructing Messiaen's compositional process through multiple mathematical approaches. In contrast to absolute pitch in the tonal analysis of harmonic progression, pitch-class set theory uses a mathematical labelling system to group musical elements into measurable segments. In order to avoid tonal implications, these segments are categorized and identified by numbers as well as dimensions.

Messiaen's late works abandon the key signature, and his use of modes creates a new scope for harmony which breaks the constraint of the tempered system of the twelve semitones. During the 1940s, Messiaen further experimented with the technique of serialism, and he discussed the path of serial music in his later treatise, *Traité de Rythme, de Couleur, et d'Ornithologie* (1949-1992). Because several of Messiaen's late works establish a new basis for musical coherence, which does not belong to the traditional music context, my own study makes use of Pitch-Class set theory to analyse his piano music written after 1940. The next section of this article will interpret Messiaen's symmetrical applications in his piano music through differing analytical approaches and ideas.

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<sup>15</sup> A British composer, pianist, and music scholar who specialized in Messiaen's music. He discovered the contour inversion symmetries in *Mode de valeurs et d'intensités*.

<sup>16</sup> Wei-Ling Cheong, "Symmetrical permutation, the twelve tones, and Messiaen's 'Catalogue d'Oiseaux'", *Perspectives of New Music* 45, no. 1 (2007):110–136.

<sup>17</sup> Grant Michael Sawatzky, "Olivier Messiaen's permutations symétriques in theory and practice", MA thesis, University of British Columbia, 2013.

<sup>18</sup> Amy Bauer, "The Impossible Charm of Messiaen's *Chronochromie*", *Messiaen Studies*, ed. Robert Shall, 2007. Cambridge: Cambridge University Press.

<sup>19</sup> Vincent Benitez, "Reconsidering Messiaen as Serialist", *Musical Analysis* 28, nos. 2/3 (2009):267-299.

### **3. Messiaen's Symmetrical Applications in His Piano Works Types of Symmetry and Modes of Limited Transposition**

The classification of symmetry is mandatory for a close investigation of Messiaen's symmetrical applications. The theorist, Peter Deane Roberts, divides symmetrical structure into three categories which enable us to connect Messiaen's symmetries with musical traditions:

- (1) a uniform arrangement of notes around a central axis, which may be stated or implied;
- (2) a succession of notes which have the same intervallic series in retrograde or inversion; and
- (3) a pattern that repeats in one direction as do the minor third segments in the octatonic scale.<sup>20</sup>

Moreover, Roberts proposes that symmetrical formations develop from a motive to a background of structure as modes of limited transposition. In Messiaen's category of modes of limited transposition, there are seven modes in total. Mode 1 has only two transpositions, and Mode 2 has three transpositions in total. Mode 3 can be transposed four times, and Mode 4, Mode 5, Mode 6 and Mode 7 have a maximum of six transpositions.<sup>21</sup> All these modes are symmetrical scales with different intervallic combinations. Mode 7 has the longest succession of notes, inclusive of Mode 4 and Mode 5. Overall, a symmetrical scale equally divides the octave by a succession of notes which has the same intervallic series in retrograde, and a mode can be transposed by moving up in semitones. The origin of each mode is called the first position, and the process of chromatic transpositions results in a limited number of times for the transposition of each mode. This limitation results from the fact that, after a certain amount of transpositions, the notes repeat and the scalar pattern becomes equivalent to the first position of the mode.

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<sup>20</sup> Roberts, *Modernism*, 61.

<sup>21</sup> Messiaen called the original form of each mode the first transposition, and there is no prime form.

According to Messiaen's own description in his treatise, he aimed to create a new and different system from most of the existing diatonic scales, which are transposable in twelve variants and tonally restricted.<sup>22</sup> His new technique allows composers to have a certain flexibility in tonal shifts. Therefore, Messiaen's melodic and harmonic resources are mostly derived from the modes of limited transpositions.

## Mode 1

The first mode is symmetrically divided into six groups of two notes each, and is exactly identical to the whole-tone scale. This mode has been explored to the greatest extent in music by Claude Debussy (1862-1918), and Paul Dukas (1865-1935). Messiaen avoided it except in the instance when it was hidden in a superimposed method in combination with other modes.<sup>23</sup>

## Mode 2

The octatonic scale is Messiaen's second mode, which can be symmetrically divided into four symmetrical groups of three notes each. There are three transpositions for Mode 2. The elements of the octatonic scale began to occur in Messiaen's works as early as his first published piano work, *Huit Préludes* (1928-1929). A representative example is illustrated below as the pattern from B#-C#-D#-E-F#-G-A-A#-B# in the first four measures of the second prelude, "Chant d'extase dans un paysage triste". It appears enharmonically as the first position of the second mode. This example shows the key signature of F-sharp minor, while the shape of the melodies offers no clues to the work's tonality:

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<sup>22</sup> Ibid., 55-56.

<sup>23</sup> Ibid., 56.

**Lent et triste**

Example 1-1: “Chant d’extase dans un paysage triste”, mm. 1-4. Transcribed from Durand et Cie.

The second transposition of Mode 2 also exists in the third prelude of the same set, “Le nombre léger”, at the beginning, in the top melodic line, as shown below in Example 1-2:

**Vif et léger**  
*le chant expressif* ♩ = 120

Example 1-2. “Le nombre léger”, mm. 1-4. Transcribed from Durand et Cie.

Some other illustrations of an octatonic scale occur in the upper and lower voices in the same prelude, “Le nombre léger”, appearing at measures 12 and 25, respectively, where two horizontal lines create similar mirroring contours in the shape of a melodic inversion. As shown in the examples given below, Messiaen combines two symmetrical scales together in contrary motion. First, Example 1-3 illustrates the second transposition of

mode 2 in the top line of the right hand, accompanied by an inversion in the left-hand part:

Example 1-3. “Le nombre léger”, measure 12. Transcribed from Durand et Cie.

Example 1-4 presents the first transposition of mode 2 in the left-hand part, along with its inversion in the right-hand part of the top voice:

Example 1-4. “Le nombre léger”, measure 25. Transcribed from Durand et Cie.

### Mode 3

The third mode has three symmetrical groups of four notes each, with each group comprised of one whole tone followed by two semitones. It contains four transpositions, and structurally it is similar to an augmented triad. The representative example is seen in the sixth prelude of *Huit Préludes*, “Cloches d’angoisse et larmes d’adieu”. Example 1-5 shows the notes from the first transposition of mode 3: C-D-Eb-E-F#-G-Ab-Bb-B. In Example 1-5, there is apparently a G-minor tonic triad on the first staff, with a prolonged dominant note in the bottom of the bass line. As Messiaen expressed in his treatise, a mixed use of mode and tonality aids the flexibility of musical expression:<sup>24</sup>

<sup>24</sup> Messiaen, *Technique*, 64.

Encore plus vif Mode 3-1

Dominant of G minor

Example 1-5. “Cloches d’angoisse et larmes d’adieu”, mm. 28-30. Transcribed from Durand et Cie.

In a different pattern, the mirroring shape of pitch which has a symmetrical pattern constructs a vertical symmetry in chords. The relation between notes of these chords remains the same when they are played and viewed upside down. In the “Cloches d’angoisse et larmes d’adieu”, the presence of two combined diminished chords fits this criterion. At the same spot, the double notes on the top staff present a mirror symmetry in the phrase as shown in Example 1-6 below:

ppp

mf

pp

Example 1-6. Diminished sevenths, “Cloches d’angoisse et larmes d’adieu”, measure 55. Transcribed from Durand et Cie.

Furthermore, the bass notes occur most frequently in the dominant or the tonic of the key signature in each section despite the absence of a traditional harmonic progression. The overall design of the key scheme in this prelude