

**A study of twelve-tone technique  
in selected pieces:  
Hans Joachim Koellreutter and César  
Guerra-Peixe.**

*by*  
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## ***ABSTRACT***

This work aims to present an analysis study of Brazilian composers that have employed the principles of the twelve-tone technique in some of their pieces: Hans Joachim Koellreutter and César Guerra-Peixe. In spite of be part of a relevant historic period in the scenery of Brazil's music, this repertory have not been yet explored from the point of view of their structures. The methodology consisted of the study of history, theory and analysis of the twentieth century music; the analysis of the pieces; the study of the pieces at the piano and the realization of the digitalized edition of the manuscripts. The analysis work has considered the following aspects: motives and sets; rows and their application; rhythm cells and textures. The conclusion shows the processes used by composers in an original use of the twelve-tone technique and in other procedures involving different pitch associations. With this dissertation it will be expected more information and spreading of Brazilian composers of the twentieth century music.

## INTRODUCTION

*“There is something fascinating about the  
very idea of analyzing music.”*  
NICHOLAS COOK

The diversity of tendencies, practiced by composers of the first decades of the twentieth century, brought, also, a diversity in the compositional classification, because the wide variety of the terms, such as atonal, pan-tonal, free-tonal, post-tonal and others. Each of these terms tries to understand the composition process that has been developed, dealing them as a material: the new scales, the formation of chords without considering the relations among them; the chords formed by varied intervals and the different rhythmic melodic arrangements. One of the ways of organizing the musical material was the process known today as serialism, that is, the combinations of a few pitches which were developed in horizontal, vertical arrangements and in transpositions.<sup>1</sup>

Between 1908 and 1923, the composer Arnold Schoenberg (1874-1951), as well as Anton Webern (1883-1945) and Alban Berg (1885-1935), known as *The Second Viennese School*, employed the serialism with large use of melodic/harmonic cell and structural use of intervals in different rhythmic and registral guises.<sup>2</sup>

After several attempts to obtain new orderings of pitches, in the early 1920s, Schoenberg reached the ordering of twelve tones. He began to compose music built on a specific ordering of the twelve pitch classes as a reference for the entire composition. Around 1925, Schoenberg arranged the twelve pitch classes into a particular series, or row, that would remain essentially constant throughout the composition. This technique<sup>3</sup> of composition with twelve tones which were related with one another is represented in *Piano Suite*, Op. 25. The row is based on twelve tones of chromatic scale and constitutes its basis, generating the main and accessory ideas, in vertical and horizontal aspects.<sup>4 5</sup>

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<sup>1</sup> SIMMS, 1995, p. 68.

<sup>2</sup> MORGAN, 1991, p. 192.

<sup>3</sup> According to Menezes, the twelve tone technique, to Schoenberg, is a method and not a system. It is spoken in tonal system and, in analogy, in serial system. However the twelve tone technique didn't match like system. (MENEZES, 2002, p. 207-8).

<sup>4</sup> KOSTKA, 1999, p.197.

<sup>5</sup> About terminology, Straus clarify that music which uses an ordered set is known as serial music. if all tones totalize twelve, serial music is also called twelve tone technique (or dodecaphonism). (STRAUS, 2000, p. 144).

Schoenberg considered this process like a substitute to the differentiations provided by tonal harmony. According to him:

“I called this procedure Method of Composing with Twelve Tones Which are Related Only with One Another. This method consists primarily of the constant and exclusive use of a set of twelve different tones. This means, of course, that no tone is repeated within the series and that it uses all twelve tones of the chromatic scale, though in a different order. It is in no way identical with the chromatic scale”.<sup>6</sup>

Afterwards, in post second war period, composers like Olivier Messiaen, Pierre Boulez, Karlheinz Stockhausen, and others, expanded the technique to others parameters beyond pitch, alike duration, dynamics, articulation, instrumentation and timbre, which is called as integral serialism.

The twelve-tone technique researches spread among Latin America countries, such as Chile and Argentina, with the “Grupo Renovación” in 1930, and the “Agrupación Nueva Musica” in 1937, respectively. In Brazil, in 1939 started the “Musica Viva” movement. It was led by German composer Hans Joachim Koellreutter – and a group of young composers, Cláudio Santoro, Edino Krieger, Eunice Katunda and Guerra Peixe -, they tended toward music without tonal center, serial music and twelve-tones music.<sup>7</sup>

Claudio Santoro studied with Koellreutter from 1940 on. He already had performed in several Works the transition from plain to dodecaphonic atonalism, demonstrating in that occasion, already, in the compositional maturity. Guerra Peixe, experienced musician and his friend since the early of 1944, starts to rapidly conceive his more significant results in that same direction.<sup>8</sup>

Between 1940 and 1941, the magazine “Musica Viva” publishes articles and studies about technical and aesthetic problems of the contemporary music, beyond composition analysis and information about national and international musical movements.<sup>9</sup> *Musica Viva* imposed itself, in that time, as legitimate agent of that what it was produced of more effective:

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<sup>6</sup> SCHOENBERG, 1984, p. 218.

<sup>7</sup> NEVES, 1981, p. 90.

<sup>8</sup> KATER, 2001, p. 56.

<sup>9</sup> NEVES, 1981, p. 90.

movements toward modernity. It set up the Brazilian musical scene a more contemporary, daring, uneasy and consequently more dynamic musical order.<sup>10</sup> This group of composers had a great interaction in *Musica Viva* movement, of more wider spectrum and a base of renovation in Brazilian music in respect of composition, instruction and musical exposure, through broadcasting programs and publications.

H. J. Koellreutter (1915) and César Guerra-Peixe (1914/1993) employed the twelve-tones technique of different ways, in different phases of their compositions. Koellreutter arrived in Brazil in 1937. He brought with him his experiences that was acquired from Hermann Scherchen – his teacher in Geneva and Budapest and great exposé of contemporary music – whom deepened his knowledge about “the peculiarities from Second Viennese School”.<sup>11</sup> Employed the twelve tones between 1940 and 1953, approximately<sup>12</sup> and Guerra-Peixe between 1944 and 1949.<sup>13</sup>

To the present study the following pieces were selected:

**a. Hans Joachim Koellreutter**

- *Música 1941* (1941)

- i) Tranquilo;
- ii) Muy Expresivo;
- iii) Muy Ritmado y Destacado.

**b. César Guerra-Peixe**

- *Música nº1* (1945)

- i) Lento;

- *Peça p'ra dois minutos* (1947)

- i) Allegro.

Taking into consideration the peculiarities which the twelve-tone technique may produce according to the individual styles, the realization of the research had the concern of

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<sup>10</sup> KATER, 2001, p. 15.

<sup>11</sup> NEVES, 1981, p. 90.

<sup>12</sup> KATER, 2001, p. 105, 110.

<sup>13</sup> LIMA, 2003, p. 28-32.

answering the following question: “What and from what manner the serial procedures occur in the selected pieces?”. Thus, the objectives of this work are:

- Analysing connections, having as basis the use of motives and sets;
- Mapping the rows and its uses in texture;
- Digitizing the manuscript scores.

This study is justified by the lack of researches that investigate the composition and analytic plan in the context of Serial and Twelve Tone music in Brazil. Considering the variety of approaches of those pieces, this dissertation opted to focus on the recognition of row, of motivic material and of sets.

At the opening of each chapter there is the explanation about the format, tools and complementary information of the piece.

Each study is divided according to topics below:

1. Tone row
2. Cells and Sets<sup>14</sup>
3. Segments
4. Synthesis

The words underlined<sup>15</sup> report to Glossary – *Annex I*. The study is presented in three chapters and in complementary materials which are presented in Annexes .

*Chapter I* show the steps that culminated in twelve-tone technique which are concentrated in the figure of composer Arnold Schoenberg. It approaches the atonality, the serialism and at last, the twelve tones.

*Chapter II* analyses the three movements from *Musica 1941* by H. J. Koellreutter. The composer utilizes two rows, *basic row* and *derive row*. In first movement there are serial procedures, but not using the twelve-tone technique. In second and third movements different

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<sup>14</sup> It was considered cells when the motives were short, with few notes.

<sup>15</sup> In this present version to English language, we suppressed the underlined words because the *Glossary* and others *Annexes* are not present here.

processes are applied in the serial segments. The last one uses the tone row exploring it in different manners.

*Chapter III* studies two pieces by César Guerra-Peixe: *Música nº1* – Lento – by 1945; and *Peça p'ra dois minutos* – Allegro – by 1947. Although the pieces have been composed in proximate dates, there are differences in the treatment of row and in connections of motives.

In Annex I is situated the *Glossary*, with the terminology from analyze tools and other technical terms, that are underlined in the text.

In Annex II is situated the *Steps of Analyzing* with the systematic study from all measures of each piece. This material consists basically:

- a) in cells and sets variations;
- b) in mapping of the tone row segments.

In *Annex III* is situated the tone row *matrix* of the all pieces.

In *Annex IV* is situated the digitalized and edited scores.



## 1. *Basis to analysis*

Analysis may undertake the maximum observation of the facts in the purpose of revealing the operation and principal relationships constituent from the piece. According to Nogueira, "*o analista contemporâneo não está mais preocupado em responder quão bem ou quão mal uma determinada obra é construída, mas simplesmente em determinar um modo viável da percepção de sua estrutura*"<sup>16</sup>. Nicolas Meeùs complements that the musical analysis is a branch from musicology that tries to understand and explain the structure from a musical work, being the musical piece determined like a complex of interdependent elements articulated among themselves.<sup>17</sup>

Some factors may cause difficulties to find the rows in a piece, such as: using of the vertical textures, making obscure the order; using of more than one *original set*<sup>18</sup>; simultaneous presence of different row forms; and not the presence of the row in the beginning of piece. Whereas the use of rows intend to give coherence to the text, it is important in the act of analyzing the piece, to examine how the different row forms are given. As well as their relations, their nexus, combinations, in short, several possibilities of the row. For the comprehension and execution of a piece, is not *sine qua non* condition the knowledge of all row forms employed, because its logic is intrinsically connected to composition.<sup>19</sup>

Lester emphasizes that to classify the series and try to hear them in the piece, it is a particularly poor way of learning about that music. According to him:

Composers such as Schoenberg, Berg, Webern, and Stravinsky did not compose twelve-tone music to construct unhearable complexities. They adopted this system because it enable them to control certain aspects of musical structure while it left their creative imaginations free to deal with those aspects they were already exploring in their earlier music.<sup>20</sup>

The tools to this present study of analysis are: *set theory* and *motivic analysis*.

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<sup>16</sup> "The contemporary analyst isn't more concerned about questioning whether good or bad a piece of work is constructed, but to determine a viable way of the perception of its framework" (NOGUEIRA, 1992, p.4).

<sup>17</sup> MEEÛS, 1994, p. 7.

<sup>18</sup> See row form at Glossary – Annex I.

<sup>19</sup> LESTER, 1989, p. 189.

<sup>20</sup> Ibid.

## 1.1. Set theory

The *set theory* is based on Allen Forte work<sup>21</sup>. In this present study it was preferred to utilize the approaches from the theorists Joseph Straus - *Introduction to post-tonal music*<sup>22</sup> -, Joel Lester - *Analytic Approaches to Twentieth-Century Music*<sup>23</sup>, because they adopted the set theory in practical manner on musical application.

Before 1960s, attempts to analyse music out of the models of tonality tended to refer back to tonal categories and to explain progressions as if they were tonal structures with elaborate chromatic alterations. Set theory deliberately broke away from this line of inquiry and sought to interpret aspects of post tonal music as a system made from structures of free categories, with their own logic independent of tonal laws.<sup>24</sup> In this realm, set theory seemed to offer both a way of increasing the sophistications of the twelve tone system and a way of relating pitches systematically that was as highly organized as the tonal system without depending of traditional tonality in any acoustical sense.<sup>25</sup>

The initial process of analysis, according to the set theory application consists on the selection and chooses of the segmentation of the pitches. According to Hasty, “*segmentation is generally understood as the division of a musical work into structural components. In the context of post-tonal music it also refers more specifically to the selection of structurally relevant pitch components or pitch-class sets*”.<sup>26</sup> In the following path, this “*notes grouping*” (set) is described, categorizing it from what is used to call as *list of set classes*”.<sup>27</sup> Finally, it is attributed to set the distribution of its intervals in its most compact form, known as *prime form*. According to Tomlin prime form is useful because it is “*an abstraction of set classes that gives a unique ‘picture’ of that particular collection of notes*”<sup>28</sup>. He declares:

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<sup>21</sup> FORTE, Allen. **The Structure of Atonal Music**. New Haven, Conn: Yale University Press, 1973.

<sup>22</sup> STRAUS, Joseph. **Introduction to post-tonal music**. 2 ed. Upper Saddle River: Prentice-Hall, 2000.

<sup>23</sup> LESTER, Joel. *Analytic Approaches to Twentieth-Century Music*. New York: W. W. Norton, 1989.

<sup>24</sup> BENT, 1990, p. 102.

<sup>25</sup> BENT, 1990, p.62.

<sup>26</sup> HASTY, 1981, p. 54.

<sup>27</sup> In the list of set classes by Allen Forte, he identifies each with a pair of numbers separated by a dash (e.g.,3-4). The first number tells the number of pitch classes in the set. The second number gives the position of the set on Forte’s list. Set class 3-4, for example, is the fourth set on Forte’s list of three-note sets. (STRAUS, 2000, p. 49).

<sup>28</sup> TOMLIN, Jay. All about Set Theory. Disponível em:

<<http://www.jaytomlin.com/music/settheory/help.html#primeform>>. Acessed in 03/13/05.

If two sets have the same prime form, we can be assured that they will sound similar to one another. Sets with the same prime form contain the same number of pitches and the same collection of intervals between its pitches, hence they are in some sense aurally 'equivalent,' in much the same way that all major chords are aurally equivalent in tonal music.<sup>29</sup>

The set theory operates with particular reference to three sequences of numbers:

- a) the collection representing the twelve different pitch classes, from 0 to 11, where C is designated 0;<sup>30</sup>
- b) the collection representing the six different interval classes; from 1 to 6;
- c) the sequence of prime form pitch class sets.<sup>31</sup>

Straus argues that "When we listen to or analyze music, we search for coherence. In great deal of post-tonal music, that coherence is assured through the use of pitch-class sets."<sup>32</sup>

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<sup>29</sup> Ibid.

<sup>30</sup> C = 0, Db = 1, D = 2, Eb = 3, E = 4, (...), B = 11.

<sup>31</sup> DUNSBY, 1988, p. 135.

<sup>32</sup> STRAUS, 2000, p. 30.

## 1.2. Motivic Analysis

The studies developed by Arnold Schoenberg in his book “*Fundamentals of musical composition*”<sup>33</sup> discuss the nature of the motives and the use of its variations in tonal music.

The motive generally appears in a characteristic and impressive manner at the beginning of a piece. The features of a motive are intervals and rhythms, combined to produce a memorable shape or contour which usually implies an inherent harmony. Inasmuch as almost every figure within a piece reveals some relationship to it, the basic motive is often considered the ‘germ’ of the idea.<sup>34</sup>

Not to occur monotony, the motive is varied and its basic form is altered. Alterations occur taking into account elements from rhythm, harmony, intervals and contour. Schoenberg declares that “*variation requires changing some of the less-important features and preserving some of the more important ones*”. The repetitions of the motives may be literal or modified. In the first case, “*preserve all features and relationships*”, and in the second case, “*they provide variety and produce new material [...] for subsequent use*”. To the last ones, Schoenberg attributed the term *motive-form*.<sup>35</sup> Frequently, “*several methods of variation are applied to several features simultaneously; but such changes must not produce a motive-form too foreign to the basic motive.*”<sup>36</sup> Moreover, “*Some variation, however, are merely local ‘variants’ and have little or no influence on the continuation*”.<sup>37</sup>

With respect to considerations exposed by Schoenberg, Simms declares that such characteristics may equally serve to describe the use of the motive in post tonal music.<sup>38</sup> In fact, Schoenberg endeavors that attempt analyzing his own piece *Four Orchestral Songs*, Op. 22, in which he identifies motivic variations.<sup>39</sup>

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<sup>33</sup> SCHOENBERG, Arnold. **Fundamentals of Musical Composition**. Gerald Strang and Leonard Stein (ed.). London: Faber & Faber, 1970.

<sup>34</sup> SCHOENBERG, 1970, p. 8.

<sup>35</sup> SCHOENBERG, 1970, p. 9.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.

<sup>38</sup> SIMMS, 1995, p. 25-26.

<sup>39</sup> Jack Boss systematizes and extends the observations by Schoenberg about the analysis of its Op. 22, emphasizing parallels and considerations in relation to differences between tonal and atonal variations, valorizing the efficiency of the terms and the composer’s categories, and his own, to expose his ideas in respect from this music. Cf. BOSS, Jack. Schoenberg’s op. 22 radio talk and developing variation in atonal music. *Music theory Spectrum*, V. 14, n. 4, 1992, p. 129-130.

In describing the motivic analysis stages, Dunsby considers that “*the analyst will determine an ‘abstract’ motive, or basic shape, and trace processes of variation and transformation*”<sup>40</sup>. Yet, he differentiates two distinct types of motivic analysis :

the first is expressed primarily through the actual pitches, intervals, durations and other features present in the music ; the second tends to concentrate on pitch, and to reduce the pitches and intervals to classes, as in the early stages of a pitch-class-set analysis.<sup>41</sup>

With this research, one expects to contribute to the spread the repertory of Brazilian composers for the piano who have utilized the serialism and the twelve-tone technique. On the other hand, it’s expected to serve as a starting point to forthcoming works and enlarge the Brazilian music knowledge still little explored under the viewpoint of their framework..

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<sup>40</sup> (DUNSBY, 1988, p. 158).

<sup>41</sup> (DUNSBY, 1988, p. 158).

## 1. Twelve-tone technique – Context

*“composition with twelve tones has no other aim than comprehensibility”.*<sup>42</sup>

*“.The method of composing with twelve tones grew out of a necessity”.*<sup>43</sup>

The processes that characterizes the post tonal music originate in an attempt to liberate the chords material and melodic lines from the diatonic functional associations still retain in “chromatic” music. In late nineteenth-century, the harmonic vocabulary had extended the range of tonal relationships to the point where the traditional articulative procedures were no longer adequate.<sup>44</sup> From the first decade of the twentieth century are dated the first steps in direction to the definitive hierarchy of values that intended to break with everything to do with the tonal universe.

### 1.1. Atonality

The term atonal<sup>45</sup> was first used in the German musical criticism shortly 1920 to refer pejoratively to a variety of modern works. Schoenberg argued that "atonal" signifies *"something that does not fit to the nature of a tone"* and suggested the words *"polytonal"* or *"pantonal"* instead.<sup>46</sup> Still, according to him,

*I am a musician and have nothing to do with things atonal. The word 'atonal' could only signify something elderly inconsistent with the nature of tone. [...]. A Piece of music will always have to be tonal, at least in so far as a relation has to exist from tone to tone by virtue of which the tones, placed next to or above one another, yield a perceptible continuity [...] Nevertheless, to call any relation of tones atonal is just*

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<sup>42</sup> SCHOENBERG, 1984, p. 215.

<sup>43</sup> SCHOENBERG, 1978, p. 432.

<sup>44</sup> PERLE, 1981, p. 1.

<sup>45</sup> Although the term atonal has been largely used to characterize pieces that the tonal center is not perceived, it has not been had universal acceptance. Non-tonal and post-tonal are probably the least problematic terms. (DUNSBY, 1988, p. 105).

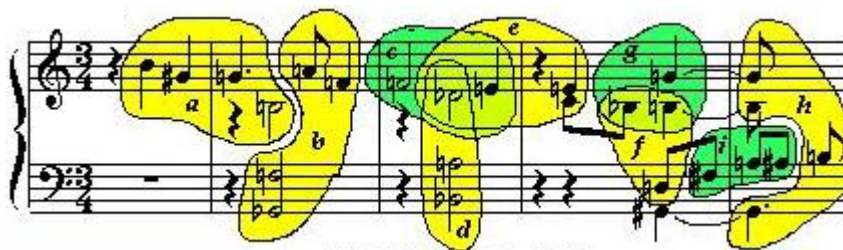
<sup>46</sup> Arnold Schönberg, *Harmonielehre*, 3rd ed. Wien: Universal Edition, 1922, pp. 487-488.

as farfetched as it would be to designate a relation of colors aspectral or acomplementary.<sup>47</sup>

The definition was consolidated thereafter by Josef Matthias Hauer<sup>48</sup> in his *Lehrbuch der atonalen Musik* (1923) and still today is used: “In atonal music there is no longer tonic, dominant, subdominant, scale step, resolution, consonance, or dissonance: instead, only the twelve intervals of equal temperament. Its ‘scale’ consists of tempered semitones.” Although Hauer readily accepted the term atonal to describe his music, it was rejected by Schoenberg and his circle because of its negative connotation.<sup>49</sup>

The post tonal music, more notably that composed by Arnold Schoenberg, Anton Webern e Alban Berg between 1908 and 1923, uses different principles of melodic-harmonic cells organization. In this stage, composers built his compositions from the manipulation of unordered collections of pitch classes.<sup>50</sup> In the first piece of “Drei Klavierstück, Op. 11” (1909), Schoenberg uses a cell of three pitches from which all material is derivated. The figure 1 shows that from the cell *a* other motives (vertical and horizontal) are generated. The motives *b*, *d*, *e*, *f*, *h* represent transpositions from cell *a*, whereas the motives *c*, *g*, *i*, represent its inversion (also transposed).

m. 1-5



**Figure 1 – Derivation of cell *a* – Drei Klavierstück. Op. 11 n°1 by Arnold Schoenberg**

According to Morgan, the development of the composition in Schoenberg, in this period, may be understood as a gradual outgrowth of two already well-established features: (1)

<sup>47</sup> SCHOENBERG, 1999, p. 559.

<sup>48</sup> Josef Matthias Hauer (1883-1959) was a musician, theorist and Austrian composer. In independent manner he developed researches about the twelve tone technique, and in 1919 he discovered “laws of twelve tones”. There was a certain kind of dispute between Hauer and Schoenberg for the paternity of the serial finding. However, although it seems incontestable that Hauer have been, in fact, the pioneer in this line of research under the formal plan, the focuses and realizations undertaken by two composers are particular. (WEBERN, 1984, p. 133).

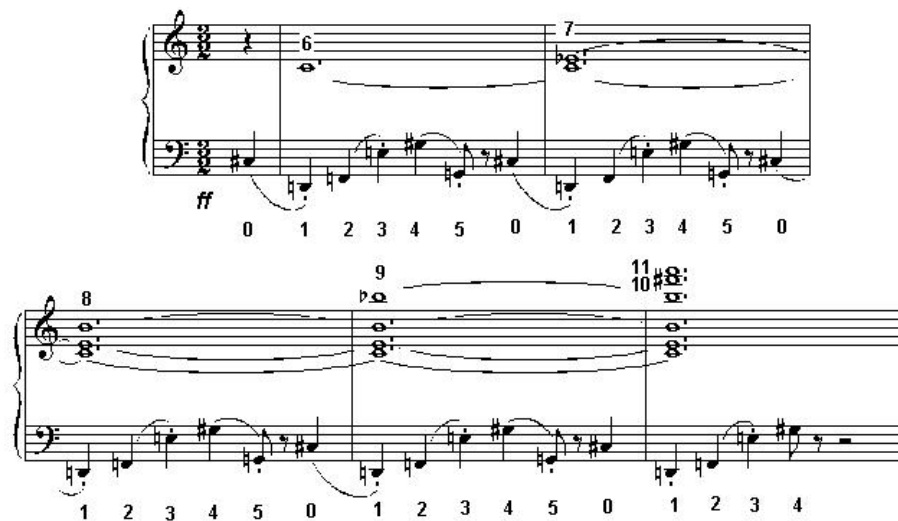
<sup>49</sup> SIMMS, 1995, p. 64-65.

<sup>50</sup> DUNSBY, 1988, p. 138.

The tendency to derive melodic material from a limited number of basic intervallic cells through variation procedures and (2) the tendency toward chromatic saturation through the use of all twelve pitches in more or less constant rotation.<sup>51</sup>

### 1.1. Serialism

The compositions from 1908 on, Schoenberg worked in the structural functions of harmony reorganization, starting to recognize his own efforts by imposing a *new unity* and a *new order*. The next important step occurred in 1917, with his unfinished work, the oratory *Die Jakobsleiter*.<sup>52</sup> See a fragment from this one (Fig. 2) in which a segment represents the six first notes in *basso ostinato* and the six following notes, represented through notes that superpose themselves, step by step, in upper voice, forming a vertical idea.





Later, Schoenberg had the intuition that this was the beginning of a truly composition with twelve tones based in a procedure in which he called “*Method of Composing with Twelve Tones Which are Related Only with One Another*”.<sup>53</sup>

The systematic fundamentals of twelve-tone technique were constructed in non-tonal compositions<sup>54</sup> by Schoenberg, and also from the composers Berg e Webern, in the same period. This means that Schoenberg had already used a kind of “cellular serialism” in some of his compositions around 1908, such as pieces from *Opus 11* (1909) and *Opus 23* (1920). After all, he had seen that like an important step to the technique development: he perceived that little motives could serve as base to his works, beyond being the own material, treated in inversions, retrogrades and transpositions.<sup>55</sup> So, from a few number of tones until they reach twelve, Schoenberg experimented with various forms of serial organization before ultimately deciding upon the twelve-tone approach.<sup>56</sup>

On the other hand, the theorist Ralph Turek explains that certain ordering techniques basic to the twelve-tone method (transposition, inversion, retrograde, and retrograde inversion) can also be seen in Schoenberg’s earlier atonal works based on the cell. However, an important difference between the two techniques is this: ordering is the essence of a twelve-tone row’s identity, whereas intervallic content, irrespective of ordering, is the primary means by which a cell is identified.<sup>57</sup>

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<sup>53</sup> SCHOENBERG, 1984, 218.

<sup>54</sup> In period from 1908 to 1923, approximately.

<sup>55</sup> WHITTAL, 1999, p. 61.

<sup>56</sup> MORGAN, 1991, p. 192.

<sup>57</sup> TUREK, 1996, p. 404.

### 1.3. *Twelve-tone technique*

From 1921 on, Schoenberg started to compose music built from a specific arrangement of twelve tones. It consists in a tone row<sup>58</sup> of twelve tones, which constitutes the base to the composition. Webern says that he and his group used to compose having as base a scale, not of seven, but of twelve tones, whose order is determined.<sup>59</sup> In that time all was derived by this twelve tone sequence, chosen by the composer, and it is upon this base that was performed, like in former times, the thematic labor. The most advantage was that they could treat the thematic material a lot more freely, because the coherency was perfectly assured by basic row. The idea was always the same, just the ways from which it was manifested was different.<sup>60</sup>

To Schoenberg the twelve tone technique is a result of the *unity* and *coherence* which he always attempted. Morgan explains that Schoenberg started to use twelve tone rows exclusively, leaving aside his experiences with other sets, due to the fact of *the twelve tones* “provided him with a ‘closed’ system encompassing all of the material available in the twelve-tone chromatic scale, as well as an orderly means for handling this material.”<sup>61</sup> He adds, “It is not difficult to see why Schoenberg soon ceased experimenting with other types of series and concentrated exclusively on rows containing all twelve pitch classes.”<sup>62</sup>

When Schoenberg exposes the technique to his pupils in 1923, he concludes: “You use the row and compose as you had done it previously. That means: ‘Use the same kind of form or expression, the same themes, melodies, sounds, rhythms as you used before’”.<sup>63</sup> From 1923 on, the twelve tone technique suffered multiple alterations according to individual criteria from several composers.

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<sup>58</sup> Basic principles from twelve tone series are: (1) A dodecahonic row consists in the arrangement of the twelve tones from chromatic scale in a specific order; (2) No note should appear more than once before all of the notes have been introduced; (3) Each row may be used in four forms: Original, Retrograde, Inverted and Retrograde-Inverted forms; (4) The row, or segment row, may be disposed horizontally or vertically; Each of these forms may also be transposed to begin on any note of the chromatic scale. (MENEZES, 2002, p. 209).

<sup>59</sup> WEBERN, 1984, p. 98.

<sup>60</sup> WEBERN, 1984, p. 97.

<sup>61</sup> MORGAN, 1991, p. 192.

<sup>62</sup> Ibid.

<sup>63</sup> SCHOENBERG, 1984, p. 213.

Turek clarifies that in past what was viewed as a revolutionary concept, may be seen at present as a continuity of the traditional technique of development and variation. He concludes:

These techniques that formerly had been applied to musical themes and motives by composers such as Beethoven, Brahms, and Wagner, were now applied to twelve-tone rows by Schoenberg and his followers. [...] it will be helpful for you to think of the row as a “theme” that can be subjected to all the traditional techniques of development.<sup>64</sup>

According to Schoenberg, the basic row holds a role seemed to the motive, he states that “*The basic set functions in the manner of a motive (...). It does not make much difference whether or no the set appears in the composition at once like a theme or a melody, whether or not it is characterized as such by features of rhythm, phrasing, construction, character, etc.*”<sup>65</sup> In his *String Quartet*, Op. 37, the basic row is showed in first movement, according to the Fig. 3:

m. 1



**Figure 3 – Row – Schoenberg, String Quartet n°4, Op. 37 (I)**

In measure 167, the organization of the row is viewed in the way not ordered. In second violin the order number 9, 10, 11 occur out of numeric order. In words from Lester, “*Such rearrangements occur occasionally in Schoenberg’s twelve-tone music, usually in developmental sections.*”<sup>66</sup> As is viewed in Fig. 4:

<sup>64</sup> TUREK, 1996, p. 404.

<sup>65</sup> SCHOENBERG, 1984, p. 219.

<sup>66</sup> LESTER, 1989, p. 213-14.

m. 165 - 168

Figure 4 – Schoenberg, String Quartet n°4, Op. 37 (I)

Schoenberg considers the *Suite for Piano*, Op. 25 his first dodecaphonic work, published in 1925, despite his prepare in antecedent years.<sup>67</sup> In that composition all movements begin in row form O-0, occurring the use of just eight different forms along all piece: O-0, R-0, O6, R6, I-0, RI0, I6, RI-6. The first movement, *Prelude*, begins in form O-0, at upper line, and O6, at lower line. As it is observed in Fig. 5:

c. 1-3

Figura 5 – Schoenberg, Suíte para Piano, Op. 25 (1)

Pierre Boulez notices that in Schoenberg the instauration of the series result from an ultrathematization in which the intervals' theme may be considered as absolute, untied from

<sup>67</sup> The first use by Schoenberg in twelve tone set was in *Suite for Piano*, Op. 25, composed in 1921. All its movements were finished in 1923, but it just was edited in 1925. (ANTOKOLETZ, 1992, p. 39).

any rhythmic or expressive commitment. This ultrathematization is subjacent to row idea.<sup>68</sup> Now in Webern, on the contrary, the row take on the aspect of interval function, in which its base framework is the composition itself.

Around 1925, Anton Webern and Alban Berg went on in twelve tone technique. In Webern<sup>69</sup>, the row is concise and comes up from the use extremely concentrated of small number of pitches. See in the first measures from the *Concerto for Nine Instruments*, Op. 24 (1934) in which the row is distributed symmetrically, through four small set of three tones, as is viewed in the Fig. 6:

m. 1-3

The figure shows a musical score for measures 1-3 of Webern's *Concerto for Nine Instruments*, Op. 24 (I). The score is written for four instruments: Flauta, Oboe, Clarineta, and Trompeta. The Flauta staff has notes labeled 3, 4, 5. The Oboe staff has notes labeled 0, 1, 2. The Clarineta staff has notes labeled 9, 10, 11. The Trompeta staff has notes labeled 6, 7, 8. The notes are distributed symmetrically across the four staves, representing a twelve-tone row.

**Figure 6 – Webern, Concerto for Nine Instruments, Op. 24 (I)**

Webern argues about the intuitional twelve tone row application in his pieces Op. 9, *Bagatelles for String Quartet*, “When all twelve notes have gone by, the piece is over. Much later I discovered that all this was a part of the necessary development.”<sup>70</sup>

<sup>68</sup> BOULEZ, 1995, p. 241-42.

<sup>69</sup> Webern utilized symmetric rows to compose the piece and rarely employed that as a melodic theme in constant timbre. He followed the Schoenberg’s propose of that just only one tow should be used in the composition. (GRIFFITHS, 2001, p. 164).

<sup>70</sup> WEBERN, 1963, p.51.

Although the row determines the succession of pitches used in a piece, it does not determine their registers or their durations. Nor does it prescribe (though it may influence) the music's textural layout or its form.<sup>71</sup>

Posteriorly, just after the Second World War, the experiments from the *Second Viennese School* provided attempts of the enlargement of their constructive principles, which would culminate in the integral serialism. This technique serialized, beyond pitches, the parameters of the rhythm, dynamics, instrumental articulations and timbres

The technique by Schoenberg abolished the centers. All twelve tones from chromatic gamut are in equality among themselves. The principle which unifies and organize the piece started to be the arrangement of twelve tones – the row. It has permitted to composers create through a great degree of liberty and it has determined as a good successful way of regulating the atonality.

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<sup>71</sup> MORGAN, 1991, p. 189.

## CONCLUSION

This present analysis study observed that the composers J. H. Koellreutter and César Guerra-Peixe employed the serialism in their pieces having as base the twelve tone technique and serial procedures involving different numbers of pitches lower than twelve. Besides, in dealing with the row in texture of piece, the composers have used resources of series fragmentation and of alteration in the arrangement of their elements.

### *Musica 1941 – H. J. Koellreutter*

The *Musica 1941* uses two twelve tone series:

- a) the *basic* row – utilized in movements (I) and (III);
- b) the *derive* row – utilized in movement (II).

In the three movements there is the use from derive row segments with small alterations in their order. These alterations obey the following criteria: 1) by alteration at a semitone: when one of the pitch from row is altered a half tone below or above; 2) by omission: when one pitch is missing discontinuing the serial order; 3) by permutation: when the row elements are permuted themselves; 4) by repetition: when some elements are recurrent inside the row.

The movement (I) doesn't use the twelve tone technique. It was verified that the texture is constituted by different serial elements which mix themselves, forming a complex and heterogeneous whole. These elements, proceeding from *basic* row, are the following:

- a) Rhythmic cells characterized by three and four tones that gender rhythmic-melodic variations;
- b) Serial segments which utilize a varied number between six and nine pitches;
- c) Segments with alteration in the row order.

The movement (II), on a slow movement, makes the use of the twelve tone technique. The row is utilized in his *prime form*, but in several transpositions. There is no the systematic use of twelve tones, because the row appears with its twelve tones only in two specific moments. The form is constituted basically of five variations from the initial segment exposed under two cells of contrasting character, but that complement each other: cell *a* (horizontal) and cell *b* (*vertical*).

The movement (III) is the one in which the twelve tone technique is utilized in its classic use. This movement is the one in which less row fragmentation is presented, rendering the row more recognizable. There is the resort from four row forms; P, R, I and RI, in several transpositions. The row distribution at texture is given through multiples<sup>72</sup> rhythmic cells distributed under several meters forming vertical and horizontal motion.

To conclude, we stand out the compositor concern in coherency in the sonority characterized by relations of *minor second* and *tritone*<sup>73</sup>. See the indications of these intervals on measures 1 and 2 (in movements I, II and III), according to Fig 7.

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<sup>72</sup> We reached the characterization of, at least twenty rhythmic cells differentiated (showed in *Figure 28* in Second chapter).

<sup>73</sup> Interval Classes 1 and 6, respectively.



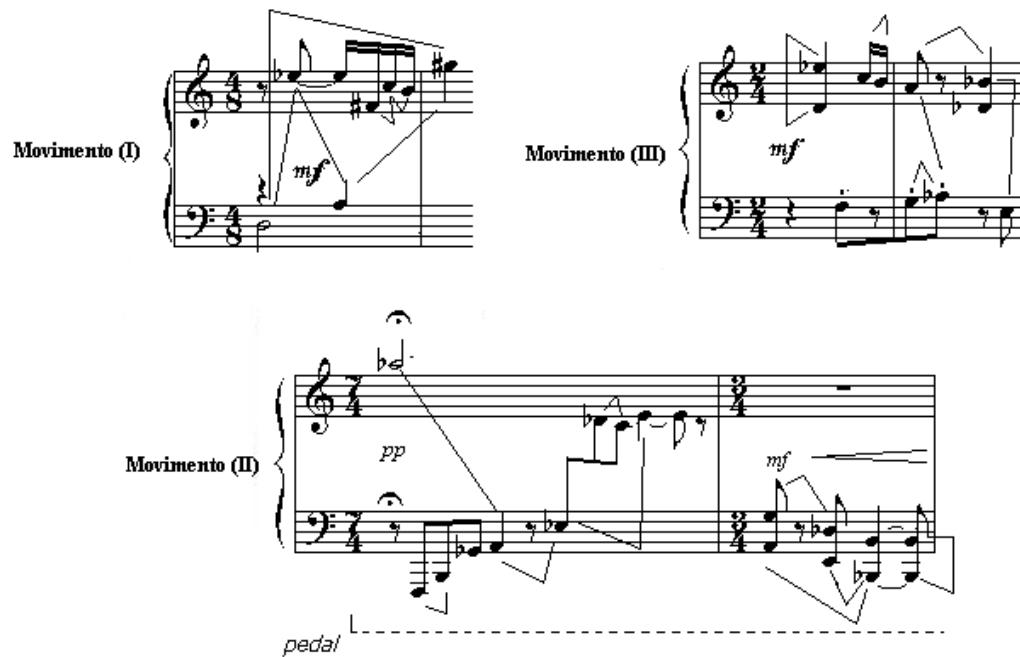


Figure 7 – Relations between interval class 1 and 6 – Koellreutter, Música 1941 (Movements I, II e III)

### ***C. Guerra-Peixe***

The pieces *Música nº1* (1945) and *Peça P'ra dois minutos* (1947) reveal distinctive uses of the row: as will be show following:

#### ***Música nº1 – Lento***

Here, the twelve tone technique has as base a symmetric row. The twelve tones are maintained in continuous currency. There is the use of the row only in his *prime form* without any transposition. Its texture is predominantly polyphonic.

The form is constituted of seven variations from initial segment that is represented by row appearance in counterpoint with itself.<sup>74</sup> The segment variations take into account characteristic of rhythm, of outline and of textures. They are identified by four different motives from *initial segment*.

The segments which constitute the row are represented mostly by entire and ordered row. However, procedures like permutation and omission of the row are used causing alteration in the row order.

#### ***Peça p'ra dois minutos***

Here is used a ten tone row. Its use is exclusively in the *prime form* containing some transpositions.

There is the occurrence of different textures, however there is the predominance of homogeneity among the voices and constant rhythmic. The last one is characterized by formation of two cells that complement each other: of six tones (cell *a*) and four tones (cell *b*). They are combined taking in account the following serial processes:

- the cells have the same row form (in this case occurs the complete ten tone row);
- the cells are independent because they present different row forms.

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<sup>74</sup> Procedures showed in Fig. 53 from Third chapter.

As for the non serial segments, they occur from the following processes:

- segments which contain ten tones and are constituted by cells *a* and *b*, where each one has an individual row form.
- independent segments, constituting different combinations of cells or other sets. In this there isn't the intent of integrating the ten tone row.

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It is concluded, that the composers have utilized individual treatment of the serialism to each movement of the piece, demonstrating fertility and originality in cope with the material. Eimert affirms that “... *la técnica dodecafónica sufrió múltiples modificaciones, de acuerdo a principios de estilo, formas, estéticas y temperamentos, con lo que demostró su fecundidad y su adaptación a múltiples criterios individuales*”<sup>75</sup> and the musicologist Juan Carlos Paz considers the technique like the *Ars Nova in relation to tonalism* when declares that “*houve tantos dodecafonismos quanto dodecafonistas*”<sup>76</sup>.

With this study we hope to contribute to the piano repertory propagation by Brazilian composers that have utilized the serialism and the twelve tone technique. On the other hand, we hope that it will attend as starting point for future Works. And them, rediscover new serialism faces in national context.

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<sup>75</sup> “*The twelve tone technique has suffered multiple modifications, according to principles of style, forms, aesthetics and temperament, demonstrating fecundity and adaptation to the multiple individual criteria*” (EIMERT, 1959, p. 14).

<sup>76</sup> “there has been as far dodecaphonisms as dodecaphonists” (PAZ, 1976, p. 101).

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