

VARIATIONS ON TWO ROWS FOR PERCUSSION AND STRINGS BY  
ELEAZAR DE CARVALHO: A CRITICAL EDITION AND STUDY.

by

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A dissertation submitted to the Graduate Faculty in Music in partial fulfillment  
of the requirements for the degree of Doctor of Musical Arts,  
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**Abstract**

VARIATIONS ON TWO ROWS FOR PERCUSSION AND STRINGS BY ELEAZAR  
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by

Fernando Augusto de Almeida Hashimoto

Advisor: Professor Norman Carey.

This work consists of a critical edition of Eleazar de Carvalho's *Variations on Two Rows for Percussion and Strings*, with historical background, analysis and interpretative study. The unpublished work, written in 1968, is the first Brazilian concerto for percussion. The cadenza of the concerto was written by the American percussionist Richard O'Donnell, who premiered it in 1969 with the St. Louis Symphony Orchestra under direction of the composer.

Conductor, composer and pedagogue, Eleazar de Carvalho (1912-1996) is considered one of the most important Brazilian conductors. A Koussevitzky protégé (like Leonard Bernstein), Carvalho was a professor of conducting at the Berkshire Music Center – Tanglewood Festival from 1947 to 1962, as well a professor at The Juilliard School and Yale University. Seiji Ozawa, Claudio Abbado and Zubin Mehta, are among the many conductors who studied under Carvalho.

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**PART I**

## INTRODUCTION

My first contact with Eleazar de Carvalho's *Variations on Two Rows for Percussion and Strings* occurred in 1998. At that time, I was researching works for percussion by Brazilian composers for a catalogue that was funded under a Brazilian government grant,<sup>1</sup> and Carvalho's widow, the pianist Sonia Muniz de Carvalho, provided me with the manuscript of the score and a copy of the percussion cadenza.

In 2000, I was recording as soloist the CD *Brazilian Concertos for Percussion*, by IPH Records. The original intention was to record the first three Brazilian concertos ever written for percussion;<sup>2</sup> however, I was forced to cancel the recording of Carvalho's concerto because of uncertainties in the score. Nevertheless, I resolved either to recover the material of this piece or to produce a critical edition of this work.

The opportunity arose when I began doctoral studies in the United States under the auspices of a Fulbright/Capes Scholarship. A number of factors contributed decisively to the choice of this piece as my dissertation topic. First, a significant portion of the published material on Carvalho's career is to be found in the United States, where he was active as a composer, a conductor, and teacher, and second, I had the opportunity to contact the American percussionist Richard O'Donnell, who provided me with a score of

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<sup>1</sup> Fernando A. A. Hashimoto, *Catálogo de Peças Brasileiras para Instrumentos de Percussão Compostas no Estado de São Paulo até 1998* (São Paulo, Brazil: FAPESP, 1998).

<sup>2</sup> In addition to Carvalho's concerto, the CD featured the Radamés Gnattali's *Divertimento para Marimbafone e Orquestra de Cordas* (1973) and José Siqueira's *Concertino para Tímpanos e Orquestra de Câmara* (1976). Carvalho's concerto was replaced by Osvaldo Lacerda's *Concertino para Xilofone e Orquestra* (1998).

his original cadenza for the piece, as well as the audio recording of the premiere, and offered essential information about the percussion part.

This dissertation has three main sections: (1) a concise biography of the composer; (2) the critical edition of Eleazar de Carvalho's *Variations on Two Rows for Percussion and Strings* as the core of the dissertation; and (3) a musical analysis and interpretative study of the piece.

The genre of the percussion concerto is a recent development. The first work in this genre is Darius Milhaud's *Concerto pour batterie et petit orchestre*,<sup>3</sup> written in Paris in 1929 as his Opus 109 and dedicated to Paul Collaer, a close friend and biographer of Milhaud.<sup>4</sup> The concerto was premiered by the Pro Arte Orchestre, with Theo Coutelier as soloist and the composer as conductor in 1930 at the Palais des Beaux-Arts in Brussels.<sup>5</sup> Brazilian music influenced Milhaud, who, from 1917 to 1919, served as a diplomat in Brazil.<sup>6</sup> There, he was exposed to the music of composers such as Heitor Villa-Lobos,<sup>7</sup> who was famous for his extensive use of percussion instruments. This influence on Milhaud's works can be seen in pieces such as *Le Bouef sur le toit* (1919), *Saudades do Brasil* (1920), and *L'Homme et son Desir* (1918). This last work calls for fifteen percussionists. American jazz also influenced Milhaud, who made his first trip to United

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<sup>3</sup> Darius Milhaud, *Concerto pour batterie et petit orchestre* (Vienna: Universal Edition, 1967).

<sup>4</sup> Igor Lesnik, "Darius Milhaud's Concerto for Percussion," *Percussive Notes* 35, no. 2 (April 1997): 64-67.

<sup>5</sup> Stephen W. Dodge, "The *Concerto pour batterie et petit orchestre* by Darius Milhaud with a Look at Percussion in His Life," *Percussive Notes* 17, no. 3 (Spring/Summer 1979): 58-59.

<sup>6</sup> Barbara L. Kelly, *Tradition and Style in the Works of Darius Milhaud 1912-1939* (Burlington: Ashgate Publishing Ltd., 2003), 45-46.

<sup>7</sup> Darius Milhaud, *Darius Milhaud: An Autobiography. Notes without Music* (New York: Alfred A. Knopf, 1953), 78-87.

States in 1922. His *La Création du Monde* (1923) is notable for being one of the first concert works significantly influenced by American jazz.<sup>8</sup>

Lasting approximately seven minutes, Milhaud's percussion concerto employs a multiple percussion set similar to that used in the *La Création du Monde*. Both sets are inspired by the American jazz drum set, and Milhaud's concerto includes a pedal bass drum. The work calls for multiple percussion instruments to be played by a single percussionist. Although it was a novelty, this multiple percussion set was already used by Stravinsky's *L'Histoire du Soldat* in 1918, an important work in the development of percussion music.

About a decade after Milhaud's concerto, Paul Creston's 1940 *Concertino for Marimba and Orchestra* appeared, another work featuring the percussionist in the role of soloist. Orchestrette Classique premiered the concerto on April 29, 1940, at New York's Carnegie Chamber Music Hall. Frederique Petrides conducted, and Ruth Stuber Jeanne was the soloist.<sup>9</sup> It was Creston's only work for percussion, written in a traditional three-movement concerto format.<sup>10</sup> The second movement calls for a four-mallet technique, which contemporary critics referred to as a kind of novelty. The *New York Times* critics declared, "A concertino for marimba and orchestra—at first blush, that might read like a manifestation of the silly season. But don't laugh; it wasn't."<sup>11</sup>

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<sup>8</sup> Deborah Mawer, *Darius Milhaud, Modality & Structure in Music of the 1920's* (Brookfield: Ashgate Publishing Ltd., 1997), 9.

<sup>9</sup> Sarah Smith, "The birth of the Creston Marimba Concerto: An Interview with Ruth Jeanne," *Percussive Notes* 34, no. 2 (April 1996): 62-65.

<sup>10</sup> Kathleen Kastner, "Creston, Milhaud and Kurka: an examination of the marimba concerti," *Percussive Notes* 32, No. 4 (August 1994): 83-87.

<sup>11</sup> Howard Taubman, "Concert offered by Orchestrette," *New York Times*, April 30, 1940.

Creston's concerto was vital in promoting the marimba as a serious concert instrument. Although the concerto did not receive many performances in the two decades following its conception, after 1960 it became one of the most performed concertos for marimba, surpassed only by *Concerto para Marimba e Orquestra* by the Brazilian composer Ney Rosauo in 1986.<sup>12</sup>

In 1947, Milhaud, who was living in the United States at the time, wrote his *Concerto for Marimba and Vibraphone*, Opus 278. American percussionist Jack Connor had commissioned the work, and he premiered it as soloist with the St. Louis Symphony Orchestra, conducted by Vladimir Golschmann, on February 12, 1949. Milhaud believed that the marimba would not be well received as a soloist instrument.<sup>13</sup> Thus, the commissioning process took a long time; Connor had to make great efforts to convince the composer to write the piece. The composer explored new instrumental sonorities; various passages call for the performer to play with hands (without mallets) or with the shaft of the mallet.

The *Concerto pour percussion et orchestre* (1958), by the French composer André Jolivet, was extremely well received by critics and aroused great interest within the percussion community. Jolivet studied with Edgard Varèse,<sup>14</sup> an important composer for percussion and author of *Ionisation* (1931), a landmark work for percussion ensemble. Jolivet's concerto is dedicated to Félix Passerone and has four movements; the piece calls

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<sup>12</sup> Jeff Moore, "20 Years of the Rosauo Marimba Concerto," *Percussive Notes* 44, no. 3 (June 2006): 10-13.

<sup>13</sup> Ron Fink, "An Interview with Jack Connor, Marimba Virtuoso," *Percussive Notes* 16, no. 2 (Winter 1978): 26-27.

<sup>14</sup> Rollo H. Myers, "Music in France in the Post-War Decade," *Proceedings of the Royal Musical Association*, Oxford University Press, 81st Sess. (1954-55): 93-106.

for a large number of percussion instruments. As Gunther Schuller noted, “Jolivet’s *Concerto for Percussion and Orchestra* is a useful addition to the percussion repertory, the only other similar work of stature being Milhaud’s *Concerto* of 1930.”<sup>15</sup>

In 1969, two decades after the premiere of Milhaud’s second concerto by the St. Louis Symphony Orchestra, this same orchestra premiered the first Brazilian concerto for percussion, Carvalho’s *Variations on Two Rows for Percussion and Strings*. Begun in 1968, Carvalho’s concerto was originated in an unusual manner. Acting as artistic director of the St. Louis Symphony Orchestra (1963-68), the composer asked the orchestra’s percussionist, Richard O’Donnell, to write a cadenza for percussion. Carvalho then composed a concerto for percussion upon this cadenza. This process of composing a concerto around a cadenza can be viewed as not only unusual, but unique in the history of the cadenza’s role within a concerto.

The conductor and percussionist maintained a close professional relationship, having daily contact at the orchestra’s rehearsals. In addition, O’Donnell joined with the pianist Jocy de Oliveira, Carvalho’s first wife, to form a duo that had a regular concert agenda in the United States. In 1966, they expanded the agenda to include a Brazilian tour, performing in festivals of avant-garde music. O’Donnell recalls the beginning of the compositional process of the concerto:

He [Carvalho] asked me to write the cadenza and he told his idea writing this piece for two rows of strings and percussion. It was after we had gone to Brazil, in the summer of 1966 for an avant-garde music festival, and we had a lot of conversations about what is going on, what is music. I remember I was often

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<sup>15</sup> Gunther Schuller, “Concerto pour percussion et orchestre. Réduction pour percussion et piano by André Jolivet,” *Notes*, Reviewed Works, Music Library Association, 2nd Ser., vol. 18, no. 4. (Sep., 1961): 653.

mentioning Marshall McLuhan, *The Medium is The Massage*,<sup>16</sup> and we talked a lot about the ideas of music that were being generated by Stockhausen, Xenakis and Berio. He knew these people, especially Xenakis and Berio; that is why Xenakis was there in Brazil for that festival.<sup>17</sup>

O'Donnell wrote a virtuosic cadenza for multiple percussion employing graphic and proportional notation like that found in Stockhausen's *Zyklus Nr. 9* (1959). He utilized an enormous set of percussion instruments; many were exotic for that time, and many were built by O'Donnell himself.

O'Donnell is a multifaceted artist whose career as a recognized virtuoso percussionist, composer, teacher, writer, and designer/builder of percussion and electronic instruments spans more than 45 years. O'Donnell attended the St. Louis Institute of Music and North Texas State University, and he is currently director of the Electronic Music Studio at Washington University, head of the Washington University Percussion Department, and music director of the New Music Circle. He performed for 43 years with the St. Louis Symphony Orchestra, for most of that time as principal percussionist. Numerous composers have written compositions especially for him. Nowadays, O'Donnell creates interactive computer/synthesizer software to accompany live percussion performances, and continues to perform with other performer/composers in the United States and Europe. About his main influences in writing this cadenza O'Donnell reported the following:

Historically, a lot of the experimental music that I played was influenced by the composers using proportional notation. Perhaps the most notable is Stockhausen's

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<sup>16</sup> The title of McLuhan's *The Medium is the Massage* (published in 1967 by Random House, New York) was an error; the typesetter switched "message" to "massage." But when the author saw the error, he was amazed; he declared that the title now had possibly at least four new readings: "message" and "mess age," "massage" and "mass age." The general idea of McLuhan's book is that each medium, independent of the content it mediates, has its own intrinsic effects, which are its unique message.

<sup>17</sup> Richard O'Donnell, interview with the author, St. Louis, MO, 5 June 2007.

*Zyklus Nr. 9*. I also played some pieces of Roman Haubenstock-Ramati,<sup>18</sup> and I found that a lot of things that I was playing and writing felt much more comfortable in the role of non-meter, or non-quantized metric system... In this concerto, I have the timing marks or the second marks in there. And I think that is a direct relationship to *Zyklus*, where you have a timeline, you have to keep subconsciously an even tempo, and everything I should do above that is non-meter, but is that time that you keep, it is a sort of organization of this structure. I am doing the same thing with that.<sup>19</sup>

Carvalho was notable for promoting the works of the Second Viennese School, and this influence can be perceived in his use of the two twelve-tone rows that serve as the basis of his concerto. After he received the cadenza from O'Donnell, Carvalho wrote the concerto for percussion that employs a large string ensemble, and utilized three distinct compositional procedures: (1) traditional notation for all strings parts and in some sections of the percussion part; (2) graphic and proportional notation similar to the cadenza writing in some sections of the percussion part; and (3) cutting and pasting parts of the cadenza and pasted into the percussion part of the score. Carvalho also added new percussion instruments to O'Donnell's set. The additional instruments were marimba, vibraphone, glockenspiel, xylophone, and two suspended cymbals with different weights.

O'Donnell received the complete score just a few weeks before the premiere and affirmed that there was no cooperation by him other than the cadenza: "For me it was a very interesting experience, a strange sort of cooperation, because I had no input into

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<sup>18</sup> Roman Haubenstock-Ramati (b. Kraków, 1919; d. Vienna, 1994) was director of music for Kraków Radio and one of the most important composers of graphic notation; in 1959 he organized the first large exhibition of musical scores in graphic notation at Donaueschingen. His main works for percussion include *Liasons*, "Mobile" for vibraphone and marimba (1958), and the series of compositions called *Jeux* (1960-66) for different formations of percussion ensembles.

<sup>19</sup> Richard O'Donnell, interview with the author, St. Louis, MO, 5 June 2007.

what he did with the strings, with the final output, other than the cadenza...anything outside the cadenza is his creation, or somehow extraction from the cadenza.”<sup>20</sup>

The concerto, which is about nineteen minutes in length, was performed only twice: at the premiere in February 27, 1969 by O’Donnell as soloist with the St. Louis Symphony Orchestra at Powell Hall, under the direction of the composer; and in Brazil on October 2, 1978 by American percussionist John Boudler as soloist with the Orquestra Sinfônica do Estado de São Paulo at Teatro Cultura Artística, under the composer’s direction. The concert in Brazil was broadcast by Rádio e TV Cultura.

The St. Louis premiere also included Schoenberg’s *Erwartung* and Mahler’s *Symphony No. 4*. The published material on Carvalho’s *Variations on Two Rows for Percussion and Strings* consists entirely of the contemporary review of the premiere by Frank Peters, *St. Louis Post-Dispatch* critic, and the program notes from that concert by Arthur Custer.<sup>21</sup> Peters said about the premiere:

His “Variations on Two Rows” for percussion and strings was given its first performance. De Carvalho wrote it for his friend Richard O’Donnell, the Symphony’s brilliant young percussionist. “Rows” in the title means twelve-tone rows, and the organization of the strings part is serial, but this is of little importance to the listener and the work might be called a fantasy or concertino for percussion. The strings are deployed in an attractive variety of ways, and enhance the percussion solos effectively. They are fascinating in a tumbling passage that the program notes describe as a canon, with 12 parts following one another only a sixteenth-note apart, and in a slow dialogue of upward and downward tremolo glissandos. At the center of everything was a virtuoso performance by O’Donnell on three dozen instruments, including a gong played with a bow. O’Donnell worked the whole arsenal with delicacy and swift precision, varying timbres on a

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<sup>20</sup> Richard O’Donnell, interview with the author, St. Louis, MO, 5 June 2007.

<sup>21</sup> Arthur Custer, “Notes on the Program,” in *St. Louis Symphony Orchestra’s 1968-69 Season* (St. Louis: St. Louis Symphony Orchestra, 1968): 421-39.

given instrument by a shift of position on its surface or by use of a different beater. It was a pleasure to hear and to see.<sup>22</sup>

Recently, the work was scheduled to be performed in the St. Louis Symphony Orchestra's 2004-05 season but was canceled due to problems with the score. The main reasons for the small number of performances would seem to be that the work was never published, that the cadenza was not included in Carvalho's manuscript of the score (there is only an indication of where it occurs), that some pages of the original cadenza were lost, and that the score includes no performance notes, which are essential for pieces of this kind.

If the beginning of the twentieth century marked the "rediscovery" of percussion, the 1960s witnessed its affirmation or consecration. After a long "Cagean" influence on percussion music, the 1960s was radically plural and permeated by serialism, indeterminacy, electroacoustical music, minimalism, neo-tonality, ethnic music, quotation music, and so on.<sup>23</sup>

Stockhausen's *Zyklus Nr. 9* was commissioned in 1959 as a test piece for the Kranichstein Music Prize for percussion players in response to the near non-existence of major percussion works.<sup>24</sup> Other well-known composers wrote important percussion works at that period. These included Morton Feldman's *The King of Denmark* (1964), Luciano Berio's *Circles* (1960), Elliott Carter's *Eight Pieces for Four Timpani* (1950-

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<sup>22</sup> Frank Peters, "De Carvalho Welcomed," *St. Louis Post-Dispatch*, February 28, 1969.

<sup>23</sup> Robert P. Morgan, *A History of Musical Style in Modern Europe and America* (New York: W. W. Norton & Company, Inc., 1991), 327-34.

<sup>24</sup> Michael B. Williams, "Stockhausen: Nr. 9 Zyklus," *Percussive Notes* 39, no. 3 (June 2001): 60-67.

66), Steve Reich's *Marimba Phase* (1967; originally for piano), and Iannis Xenakis's *Persephassa* (1969).

In that same decade, a movement led by the marimbist Keiko Abe emerged in Japan. Abe was largely responsible for the evolution and recognition of the marimba as a solo concert instrument. On October 4, 1968, in Tokyo, Abe promoted what is considered to be the first classical marimba recital. In that concert, Akira Yuyama's *Divertimento for Marimba and Alto Saxophone* (1968), Minoru Miki's *Time for Marimba* (1968), and Teruyuki Noda's *Quintetto per Marimba, 3 Flauti e Contrabasso "Matinnata"* (1968) were premiered. All of the works performed that night became standards in the marimba repertoire.<sup>25</sup>

Carvalho's concerto for percussion was written in an important period for percussion in Brazil. In the 1960s, the first Brazilian percussion ensembles were established in professional and academic settings. In addition to Carvalho, renowned Brazilian composers premiered their first works for percussion during that decade.<sup>26</sup> The most representative movements of "new music" in Brazil were *Música Viva* and *Música Nova*. In 1939 the German-born Brazilian composer H. J. Koellreutter led the *Música Viva* movement, which was responsible for introducing serialism in Brazil, especially the works by Arnold Schoenberg. The movement created a great controversy and received a response from the nationalist composers headed by M. Camargo Guarnieri, who wrote

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<sup>25</sup> Rebecca Kite, *Keiko Abe: A Virtuoso Life: Her Musical Career and the Evolution of the Concert Marimba* (Leesburg: GP Percussion, 2007), 49-57.

<sup>26</sup> Fernando A. A. Hashimoto, *Análise musical de Estudo para Instrumentos de Percussão, 1953, M. Camargo Guarnieri; primeira peça escrita somente para instrumentos de percussão no Brasil*, M. A. thesis (Campinas: Universidade Estadual de Campinas, 2003), 66-82.

the *Carta Aberta aos Músicos e Críticos do Brasil* containing a severe criticism of serialism.<sup>27</sup>

The experimental avant-garde movements in Brazil culminated in 1963.<sup>28</sup> The *Música Nova* movement involved several young composers, who issued an article in the *Revista de Arte de Vanguarda Invenção* expressing the necessity of Brazilian music to be open to the reality of contemporary music and to all musical trends such as atonality, experimental music, electroacoustical media, polytonality, and so on. The movement promoted many festivals and performances of works by such composers as Berio, Boulez, and Stockhausen.

Among the composers of the *Música Nova* movement was Gilberto Mendes, who studied with Boulez, Pousseur, and Stockhausen at Darmstadt in 1962.<sup>29</sup> Mendes's *Blirium C-9*, an aleatoric piece for varied instrumentation, was premiered in 1965 in São Paulo by the percussionist Ernesto DeLuca.

Oswaldo Lacerda's *Três Estudos para Percussão* for percussion quartet, published by Paul Price Publications (USA) in 1966, serves as good example of the controversy between the nationalist and the avant-garde composers. Lacerda, a second-generation nationalist composer, included in his *Três Estudos para Percussão* a satire of twelve-tone music. In the third movement, the vibraphone, after a short silence, performs a twelve-tone series, which is replied by the *cuíca* imitating a laugh. Another attempt by the vibraphone is answered by a violent and noisy protest from other instruments. The piece

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<sup>27</sup> David P. Appleby, *The Music of Brazil* (Austin: University of Texas Press, 1983), 156-82.

<sup>28</sup> Gilberto Mendonça Teles, *Vanguarda Européia e Modernismo Brasileiro* (Petrópolis: Editora Vozes Ltda, 1972), 247-51.

<sup>29</sup> Vasco Mariz, *Figuras da Música Brasileira Contemporânea* (Brasília: Universidade de Brasília, 1970), 117.

ends with a nationalistic theme to affirm pro-nationalism. As Lacerda stated, “It is obvious that it [*Três Estudos para Percussão*] irritated the so-called avant-garde composers, who just to bother me declared that the only good thing in the three movements was the twelve-tone series!”<sup>30</sup>

Marlos Nobre is a composer with many different phases in his career, and has a unique compositional voice. His *Variações Rítmicas* for piano and percussion ensemble written in 1963 was the first Brazilian piece for percussion ensemble ever performed.<sup>31</sup> In 1968, Nobre wrote *Rhythmetron*, a work commissioned by the Companhia Brasileira de Ballet and based on choreography by New York City Ballet’s choreographer Arthur Mitchell.

Claudio Santoro’s *Diagramas Cíclicos* for percussion and piano was written in 1966. It employs traditional and graphic notation as well as free and controlled improvisation. The work was premiered and dedicated to O’Donnell and Jocy de Oliveira during II Semana de Música de Vanguarda de 1966. The O’Donnell Oliveira duo had a great impact on Brazilian percussionists at that time and stimulated the formation of new ensembles.

Probably the only concerto for percussion that employed graphic and proportional notation in the 1960s, Carvalho’s concerto is a portrait that reveals the musical scene of that decade. The graphic and proportional notation, the use of exotic instruments, the

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<sup>30</sup> Osvaldo Lacerda, interview with the author, São Paulo, Brazil, July 14, 2003. “É claro que isso [*Três Estudos para Percussão*] irritou os chamados compositores de vanguarda, que pra me chatear começaram a dizer que a única coisa boa dos três movimentos era a série de doze tons!” All the translations are by the present author unless indicated otherwise.

<sup>31</sup> M. Camargo Guarnieri’s *Estudo para Instrumentos de Percussão* was written in 1953 but was not premiered until 1979.

amplified tam-tam (which was previously used in Stockhausen's *Mikrofonie I*, 1964), the use of twelve-tone technique, the influence of popular music (Bossa Nova)—all of these aspects contributed to the final output of the work, which is itself a landmark in Brazilian music and deserves an accurate edition and wider recognition.

## CHAPTER 1

### Eleazar de Carvalho: Biographical Material and Career



Fig. 1.1 Carvalho's autographed photograph  
Courtesy of Morris Lang Personal Archives

Although critics consider Eleazar de Carvalho one of the most important Brazilian conductors of all times, no detailed biography has been published on his career. Only short entries in books and encyclopedias are to be found, which offer minimal data about his activities as composer, conductor, and educator.<sup>32</sup>

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<sup>32</sup> Data about Eleazar de Carvalho can be found in following encyclopedias and books: Slonimsky, N., L. Kuhn, and D. McIntire, 2001, *Baker's Biographical Dictionary of Musicians*, Centennial Edition. Nicolas Slonimsky, editor emeritus. New York: Schirmer, 590-1; Modi, S. 2001. Eleazar de Carvalho, in *The New Grove Dictionary of Music and Musicians*, 2nd ed. Ed. Stanley Sadie 5:216-17, London: Macmillan; Duprat, R., and M. Marcondes, 2000, *Enciclopédia da música brasileira erudite*, São Paulo: Publifolha;

This chapter is a concise synopsis of Carvalho's background as a composer, based on primary sources such as contemporary reviews from major American newspapers; on programs and concerts conducted by Carvalho in the United States, Brazil, and Europe; and on interviews. The chapter is organized in three parts. First, the beginning of Carvalho's career, his musical studies, and his most significant period as composer; second, his establishment as an international conductor; and third, Carvalho's pursuit of his ideal to build a Brazilian orchestra of excellence and his dedication to develop a new generation of Brazilian musicians.

### **Early Career**

Eleazar Segundo Afonso de Carvalho was born in Iguatu, Ceará State, northeastern Brazil, on July 28, 1912. His father, Manuel Afonso de Carvalho was of Dutch extraction, a military man and pastor at a Presbyterian Church. His mother, Dalila Mendonça, was descended from the Brazilian Indian tribe, Tabajaras.

Carvalho started his musical studies by chance, or, in his own words, because of "gluttony." In 1925 his father sent him to the town of Fortaleza (capital of Ceará State) for schooling. There he trained to become an apprentice seaman.<sup>33</sup> Once in the navy school, he discovered something that would change his life completely; Carvalho said: "I realized that the food provided to the kids that played in the band was better than ours. So, I offered myself to play although I did not play any musical instrument. I am a

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*Encyclopedie Van de Muziek*, ed. L.M.G. Arntzenius, Amsterdam: Elsevier, vol. 1, 1956-57; *Enciclopedia della Musica*, ed. Claudio Sartori, Milan: Ricordi, 1963: 421; among others.

<sup>33</sup> Boston Symphony Orchestra's concert program of December 16, 1947, Boston Symphony Orchestra Archives.

musician by gluttony!”<sup>34</sup> Carvalho’s musical experiences mirror the early experiences of many Brazilian musicians, who had their first contact with music in the bands of small cities.

Carvalho played tuba at the school and in 1928 he was transferred to the Brazilian Navy Symphonic Band in Rio de Janeiro, where he also studied harmony and solfège under the direction of Osvaldo Cabral.<sup>35</sup> In the following year, he auditioned and was appointed to the Orquestra do Teatro Municipal do Rio de Janeiro where he played from 1930 to 1940. In addition to his job at the orchestra, Carvalho pursued popular music. He played with a famous band in Rio de Janeiro called American Jazz, sharing the stage with important Brazilian popular musicians such as Almirante, Donga, and Pixinguinha. He was also music director of the Cassino da Urca’s orchestra, the Brazilian Serenaders, which included guitarist, Laurindo de Almeida; tenor saxophone player, Walter Rosa; Fafá Lemos, who incorporated the violin into Brazilian popular music; and the singer and pianist, Dick Farney. The music performed by American Jazz and Cassino da Urca’s orchestra was basically samba, choro, and American jazz.

During the years 1930 to 1946 when gambling was legal in Brazil, the Cassino da Urca was a center for popular artists in Rio de Janeiro. The casino was so famous that the two physicists Mário Schenberg and George Gamow named one of their discoveries the “Urca Process,” a cycle of nuclear reactions involving the loss of energy by the nucleus

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<sup>34</sup> Fundação Eleazar de Carvalho, “O Maestro,” <http://www.eleazarfundec.org.br/maestro.html> (accessed May 23, 2007). “Observei que a comida servida às crianças que tocavam na banda era melhor. Apresentei-me embora não tocasse qualquer instrumento. Sou músico por gulodice!”

<sup>35</sup> Vasco Mariz, *História da Música no Brasil* (Rio de Janeiro: Editora Civilização Brasileira S.A., 1994), 222.

and leading to the formation of a supernova. The name Urca was used by Gamow to remember the money that his wife lost gambling at the Cassino da Urca in the 1940s.<sup>36</sup>

Carvalho studied counterpoint and fugue at the Instituto Nacional de Música under the direction of Paulo Silva and graduated in 1934. He was accepted into the Escola de Música do Rio de Janeiro, where he studied composition and conducting with Francisco Mignone. He graduated in 1940. This period of studies under Mignone was crucial to Carvalho's development. Although Mignone did not receive the same international attention as composers such as Villa-Lobos, he was recognized as one of the most important Brazilian nationalist composers of that time. Mignone was an accomplished musician: a virtuoso pianist, a talented teacher, and an experienced conductor. Like the majority of pre-World War II Brazilian composers, he studied in Italy for nine years and had premiered some of his works with the Vienna Philharmonic under the direction of Richard Strauss. A prolific conductor, Mignone directed orchestras in Berlin and Rome in 1937 (the year that Carvalho was his student), and made his debut in the United States in 1942.<sup>37</sup> Mignone influenced Carvalho's writing and encouraged him to pursue conducting.

At the time of his graduation, Carvalho premiered his first opera: *A Descoberta do Brasil*<sup>38</sup> at the Teatro Municipal do Rio de Janeiro on June 11, 1939. The opera was conducted by the composer himself. *A Descoberta do Brasil* is an opera in two acts,

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<sup>36</sup> Luís Nassif, "A Indústria do Entretenimento," *Folha de São Paulo*, São Paulo, March 5, 2006.

<sup>37</sup> Vasco Mariz, *História da Música no Brasil* (Rio de Janeiro: Editora Civilização Brasileira S.A., 1994), 231-45.

<sup>38</sup> The name of the opera *A Descoberta do Brasil* appears in some reviews as *O Descobrimento do Brasil*, according to Sonia Muniz de Carvalho the correct name is *A Descoberta do Brasil*. Sonia Muniz de Carvalho, interview with the author, Hartford, CT, 3 March 2008.

based on Paulo Barros' verses, with a libretto by Joaquim Ribeiro and Alfilio de Carvalho.<sup>39</sup> It has a civic theme with episodes extracted from Brazilian history; it dramatizes Portugal's "discovery" of Brazil and the first contact between the Europeans and the native Indians.

The musicologist Renato Almeida in his book, *História da Música Brasileira* (1942), mentions Carvalho's works for orchestra, piano, and voice, as well as the symphonic poem, *A Retirada da Laguna* (1941), and describes Carvalho's first opera as "a debut work, without the necessary orchestral plasticity. But interesting sections can be found such as *Jaci's Aria* in Act II."<sup>40</sup> Another review appears in Luiz Heitor's book, *150 anos de Música no Brasil* (1956):

*A Descoberta do Brasil...* does not have anything of the revolutionary. It is a loyal reproduction of the dramatic pathos of the Italian opera from the nineteenth century... Excellent musician, a conductor with great possibilities; Eleazar de Carvalho is enjoying a brilliant international career conducting the most famous orchestras of the Old and New World. There is no doubt that it is in the conducting area that he will earn, always, his rightful success.<sup>41</sup>

A better reception was granted to his second opera, *Tiradentes*, with a libretto by Figueira de Almeida, which premiered on September 7, 1941 at Teatro Municipal do Rio de Janeiro. Although Almeida noted that *Tiradentes* had a controversial political theme

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<sup>39</sup> Henrique Nunes, "Eleazar de Carvalho: O regente número um do Brasil," *O diário do Nordeste*, Fortaleza, March 5, 2001.

<sup>40</sup> Renato Almeida, *História da Música Brasileira* (Rio de Janeiro: F.Brighiet & Comp. Editores, 1942), 484-85. "É uma obra de estréia, sem a necessária plasticidade orquestral, embora se encontrem páginas interessantes, como a *Ária de Jaci*, no II ato."

<sup>41</sup> Luiz Heitor Azevedo, *150 Anos de Música no Brasil* (Rio de Janeiro: Livraria José Olympio Editora, 1956), 214-15. "*A Descoberta do Brasil...* nada tem de revolucionário. É uma reprodução fiel do pathos dramático da ópera italiana oitocentista... Excelente músico, regente de grandes possibilidades, Eleazar de Carvalho vem fazendo brilhante carreira internacional, já se tendo produzido a frente das mais famosas formações sinfônicas do Novo e do Velho Mundo. Não resta dúvida que é nesse setor, e não no da composição, que ele recolherá, sempre, seus mais legítimos sucessos."

and was quite long, he declared, “There are passages of intensity and freshness, with the incorporation of certain folk motifs, which give elegance and interest to the score, as in the *Bailado das Pedras Preciosas*... In addition to the mentioned ballet, *Abertura*, *Côro dos Garimpeiros*, and *Final* attest to the amazing qualities of the composer.”<sup>42</sup>

Works from Carvalho’s first period of compositional activity (1935 to 1945) include operatic, symphonic, instrumental, and vocal works in the nationalist style. We can highlight his third opera, *Guararapes* (1942), the symphony *Sinfonia Branca* (1941), the symphonic poems *Batalha do Riachuelo* (1944) and *A Traição* (1941), *Quarteto* for string quartet (1940), *12 Variações para Piano e Orquestra* (1938), and *Sonata Monotemática para Violino e Piano* (1938).<sup>43</sup> The composer considered the works from these years to be anachronistic.<sup>44</sup>

### The Conductor

Toscanini’s stint in Brazil in 1942 inspired the creation of the Orquestra Sinfônica Brasileira in Rio de Janeiro. The Hungarian conductor, Eugen Szenkar was appointed music director, and Carvalho, his assistant, a position he held until 1946.

Carvalho was a notable interpreter of contemporary music and considered a champion of the works of the Second Viennese School.<sup>45</sup> The twelve-tone technique was

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<sup>42</sup> Renato Almeida, *História da Música Brasileira* (Rio de Janeiro: F.Brighiet & Comp. Editores, 1942), 484-85. “Há trechos de intensidade e frescura, com o aproveitamento de certos motivos folclóricos, que dão graça e interesse a partitura, como o *Bailado das Pedras Preciosas*... Além do bailado referido, a *Abertura*, o *Côro dos Garimpeiros* e o *Final* testemunham as apreciáveis qualidades do compositor.”

<sup>43</sup> Claudio Sartori, ed., *Enciclopedia della Musica* (Milan: G. Ricordi, 1963), 421.

<sup>44</sup> City Brazil, “Eleazar Segundo Afonso de Carvalho,” <http://www.citybrazil.com.br/ce/iguatu/persona.htm> (accessed July 17, 2007).

almost unknown in Brazil until the arrival of the German composer, H. J. Koellreutter in Rio de Janeiro in 1937. Koellreutter led the *Musica Viva* movement, which promoted the first performances of Schoenberg's works in Brazil. Carvalho became familiar with the twelve-tone music promoted by Koellreutter and his followers during this period.

In addition to the works from the Second Viennese School, Carvalho always included Brazilian composers in his programs abroad, and promoted Brazilian musicians worldwide. The Academia Brasileira de Música was founded in 1945 and headed by Heitor Villa-Lobos: Carvalho was nominated founding member and awarded the chair number 32.

During World War II many European musicians and composers were exiled in America. Schoenberg left Berlin in 1931, Stravinsky applied for American citizenship in 1939, Hindemith arrived in the United States in 1940, and Béla Bartók emigrated in 1940, to name only a prominent few.<sup>46</sup> The attention that Brazil had given to the European musical scene for centuries started to shift toward the United States. Francisco Mignone travelled to the United States to premiere and record his *Festa das Igrejas* with the New York Philharmonic under the direction of Toscanini in 1942. Heitor Villa-Lobos performed his first tour in the United States in 1945. José Siqueira conducted in Canada and in the United States, where he led the Philadelphia Orchestra.

Carvalho was drawn to the new center of the international musical scene. In 1946, he travelled to the United States determined to conduct one of the leading American orchestras: Boston, Philadelphia, or New York. However, his first year in the United

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<sup>45</sup> Sorab Modi, "Carvalho, Eleazar de," Grove Music Online, ed. L. Macy, <http://www.grovemusic.com> (accessed August 15, 2007).

<sup>46</sup> Kyle Gann, *American Music in the Twentieth Century* (New York: Schirmer Books, 1997), 102-103.

States was a difficult one. After various attempts, the Brazilian Consulate offered him a concert at Carnegie Hall, but the offer included an offensive contingency: the poster advertising the event would show Carvalho wearing an Indian costume. Carvalho did not accept the offer. Instead, he protested, “I have not worn loincloth for a long time!”<sup>47</sup>

After that incident, he contacted Eugene Ormandy, conductor of the Philadelphia Orchestra, who advised him to go to Arizona and come back after 15 or 20 years. Carvalho was outraged. However, he persevered and contacted Sergey Koussevitzky, director of the Tanglewood Festival. Unfortunately, applications had closed and the season had already opened. Carvalho concocted a story that he was carrying a message from the president of Brazil for Koussevitzky. When he was received by the famous conductor, Carvalho confessed the truth and urged Koussevitzky to accept him as a student. Carvalho asked for five minutes to lead the orchestra. Perplexed but also impressed with Carvalho’s resoluteness, Koussevitzky agreed to the test. The following day Carvalho conducted Rimsky-Korsakov’s *The Russian Easter Overture* at a rehearsal with the Boston Symphony Orchestra and was accepted.<sup>48</sup>

Carvalho’s performances of Strauss’s *Death and Transfiguration* in Tanglewood that year were lauded by critics as “astonishing,” Leonard Bernstein was at the festival the same year. In fact, festival enthusiasts dubbed Carvalho “the Bernstein of Brazil.”<sup>49</sup>

Koussevitzky recognized Carvalho’s remarkable talent and Carvalho, like Bernstein, became a Koussevitzky protégé. Koussevitzky sponsored Carvalho

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<sup>47</sup> Regina Ivete Lopes, “Entrevista com o maestro Emílio de César,” Brasília: Livraria Musimed, Ano III (Jan/Fev/Mar 2007): 3. “Há muito tempo não visto tanga!”

<sup>48</sup> *Ibid.*, 4.

<sup>49</sup> “Ex-sailor for Podium – Young Brazilian Musician to Lead the Boston Symphony,” *Gazette*, Worcester, December 10, 1947.

internationally. He invited Carvalho to conduct the Boston Symphony Orchestra in 1947, and Carvalho became a frequent guest conductor for the orchestra until 1965.

Koussevitzky's support was important for launching Carvalho's international career. Differing only in their taste for the Second Viennese School, which Koussevitzky favored less than Carvalho (although he did give the first performance of Schoenberg's *Theme and Variations* in 1944, and the first US performance of Berg's *Violin Concerto* in 1937), Carvalho and his mentor became advocates of contemporary music. Koussevitzky premiered or commissioned several works by composers such as Bartók, Scriabin, Ravel, Prokofiev, Stravinsky, Barber, Copland, Hindemith, and Gershwin, among others.<sup>50</sup>

Carvalho also shared certain characteristics with his mentor such as an austerity and perfectionism at the podium. In his conducting technique he used exaggerated gestures such as the emblematic shaking left hand (a legacy from Koussevitzky), and the dramatic blow with the left hand against the chest.

Carvalho made his debut with the Boston Symphony Orchestra on December 19, 1947; the program included William Schuman's *Symphony for Strings*, Schoenberg's *Kammersymphonie* (first US performance), and Berlioz's *Fantastic Symphony*.<sup>51</sup> Schoenberg's *Kammersymphonie* had premiered in Brazil two years earlier with Carvalho conducting the Orquestra Sinfônica Brasileira.

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<sup>50</sup> José Bowen, "Koussevitzky, Sergey," Grove Music Online, ed. L. Macy, <http://www.grovemusic.com> (accessed June 1, 2007).

<sup>51</sup> "Brazilian Conductor to Give Premiere of Schönberg Work," *New York Times*, December 19, 1947.

As the date of the concert approached, Carvalho could not resist sending Ormandy a copy of his contract with the orchestra and two tickets; on a card he wrote, “See where I am already!”<sup>52</sup>

In the following week, he presented a program that included two premieres of scores by Brazilian composers: M. Camargo Guarnieri’s *Prólogo e Fuga* (dedicated to Carvalho) and Villa-Lobos’s *Madona* (first US performance and dedicated to Koussevitzky’s first wife).<sup>53</sup> Cyrus Durgin in the *Boston Daily Globe* wrote:

For once again the Boston Symphony put its best foot forward for the talented young guest conductor. Ten years from now Mr. De Carvalho will probably conduct with more personal distinction and more delicate nuances than he did yesterday. All the same, his reading did credit to him for they were musically and in good style, with none of the straining after effect or the tonal whoop-er-up that are apt to creep into the work of a young but not completely mature conducting talent.<sup>54</sup>

In 1947 Carvalho was invited to teach at the Berkshire Music Center – Tanglewood Festival. His long tenure at that festival lasted until 1962. Seiji Ozawa, Claudio Abbado, Zubin Mehta, Gustav Meier, Charles Dutoit, José Serebrier, and Harold Farberman were among the many conductors who studied under Carvalho.

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<sup>52</sup> Fundação Eleazar de Carvalho, “O Maestro,” <http://www.eleazarfundec.org.br/maestro.html> (accessed May 23, 2007). “Veja onde já estou!”

<sup>53</sup> Lisa M. Peppercorn, *The World of Villa-Lobos in Pictures and Documents* (Brookfield: Ashgate Publishing Ltd., 1997), 185.

<sup>54</sup> Cyrus Durgin, “Symphony Hall,” *Boston Daily Globe*, December 27, 1947.

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**Table 1.1 Eleazar de Carvalho at Tanglewood Music Center**


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1946	Student of Koussevitsky
1947-1951	Assistant to Koussevitsky
1956-58	Acting Head of Conducting Department
1959	Head of Conducting Department
1960-62	Head of Orchestra and Conducting

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Seiji Ozawa remembered Carvalho's direction in Tanglewood:

When I came to the United States for the first time in 1960 to study at Tanglewood, I worked with Maestro de Carvalho, whom I remember very well as a wonderful teacher and a very warm person. I will always remember and appreciate his guidance, which has been influential ever since that important time of my life.<sup>55</sup>

Zubin Mehta declared, "I really enjoyed studying under Eleazar de Carvalho. I remember him with affection. He gave me an important thing: the experience which a young conductor so needs."<sup>56</sup>

Claudio Abbado remembered his studies in the Tanglewood Festival in 1958: "It was a wonderful summer. Both Charles Munch and Pierre Monteux were there; Eleazar de Carvalho did most of the teaching, though."<sup>57</sup>

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<sup>55</sup> Seiji Ozawa, *The Boston Globe*, September 20, 1996; D17.

<sup>56</sup> Irineu Franco Perpetuo, "Zubin Mehta volta ao Brasil com a Filarmônica de Israel," *Folha de São Paulo*, September 21, 1997. "Gostei muito de estudar com Eleazar de Carvalho. Lembro-me dele com carinho. Ele me deu uma coisa muito importante: a experiência, de que um jovem regente tanto necessita."

<sup>57</sup> Claudio Abbado, *The Boston Globe*, February 14, 1982; B1.



Fig. 1.2 Claudio Abbado and Carvalho  
Tanglewood Festival 1958

Photograph by Whitestone, Courtesy BSO Archives



Fig. 1.3 Seiji Ozawa and Carvalho  
Tanglewood Festival 1960

Photograph by Whitestone, courtesy BSO Archives



Fig. 1.4 Carvalho, Koussevitzky, and Bernstein  
Tanglewood Festival 1946 - Photograph by Howard S. Babbitt, Jr.,  
courtesy BSO Archives

On February 10, 1948, Carvalho conducted the Chicago Symphony Orchestra for the first time, and although newspapers predicted that he would succeed Artur Rodzinski as musical director, this never happened,<sup>58</sup> even though, the conductor Alexander Leslie considered him “one of the most popular conductors in North America.”<sup>59</sup>

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<sup>58</sup> “May Succeed Rodzinski – Koussevitzky Protégé, Eleazar de Carvalho, Is Candidate,” *New York Times*, January 17, 1948.

<sup>59</sup> “Brazilian Said Considered for Rodzinski’s Job,” *Springfield News*, January 16, 1948.

Carvalho's prolific activities as conductor and educator overshadowed his compositional life during this period. Occasionally he would stop conducting to compose new pieces. In 1948 he became professor of conducting at the Juilliard School of Music at William Schuman's invitation. He also led the Juilliard's orchestra.<sup>60</sup>

After a concert with the Boston Symphony Orchestra in 1948, Carvalho was compared to Bernstein by *New York Times* critic, Olin Downes:

He [Carvalho] conducted entirely from memory, and he "wowed" the audience. Mr. Carvalho had an entirely different artistic personality than Mr. Bernstein, although, like Bernstein, he unconsciously emulated more or less the gestures and stylistic methods of Koussevitzky. He may prove to be the profounder talent of the two. He conducts with apparent certainty and authority the scores that he memorizes with astonishing rapidity, and with the effect of having fully thought out and practically conveyed his intentions. In the worn old phrase, he knows what he wants, and gets it.<sup>61</sup>

Carvalho became famous for leading challenging rehearsals and concerts without scores and for his "exceptional" sense of perfect pitch, as noted by Nicolas Slonimsky.<sup>62</sup> He conducted the main orchestras in the United States including the Cleveland Orchestra, the Los Angeles Philharmonic, and the Philadelphia Orchestra (whose conductor, Ormandy had refused him a few years before). Carvalho was also one of the conductors selected for the first American tour of the Israel Philharmonic Orchestra.<sup>63</sup>

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<sup>60</sup> "Music School Adds Three Guest Conductors as New Aides," *New York Times*, June 17, 1948.

<sup>61</sup> Olin Downes, "De Carvalho 'Wows' Throng at Tanglewood as He Leads His Mentor's Orchestra," *New York Times*, August 9, 1948.

<sup>62</sup> Nicolas Slonimsky, ed., "Eleazar de Carvalho," *Baker's Biographical Dictionary of Musicians* (New York: Schirmer Books, 1997), 1: 590-91.

<sup>63</sup> Peter Gradenwitz, "Israel's Orchestra – Arriving for its first visit in the United States," *New York Times*, December 31, 1950.

Eleazar de Carvalho made his first appearance in Europe in 1950 at the Palais des Beaux-Arts in Brussels, conducting works by Mahler, Beethoven, and Berlioz. In June 1950 he made his debut with the New York Philharmonic, receiving a warm review from the *New York Times*:

Mr. Carvalho conducts from memory. His interpretations of Tchaikovsky's *Fifth Symphony* and Berlioz's *Benvenuto Cellini Overture* were serious, earnest and conscientious. His tempos tended toward broadness; sometimes they were almost lethargically so, as in the pizzicato movement of the Tchaikovsky. He had the orchestra under control throughout, and his accompaniments in the concerto were excellently integrated.<sup>64</sup>

From 1951 to 1963 Carvalho served as music director of the Orquestra Sinfônica Brasileira.<sup>65</sup> He introduced an array of new musical works and also emphasized social projects such as the *Concertos da Juventude* (Youth Concerts), which attempted to create future audiences and promote music education. During this period he married the composer and pianist Jocy de Oliveira, with whom he had a son, Eleazar de Carvalho Filho.

His activity in Europe increased greatly after concertos with the Berlin Philharmonic, the Vienna Philharmonic, and the London Symphony Orchestra in 1953. In the following decades Carvalho conducted many major European orchestras including those in France, Germany, Italy, the Netherlands, Austria, Croatia, Poland, and Scandinavia. In addition to premieres, his programs typically included compositions of the Second Viennese School, at least one work by a Brazilian composer, and, whenever

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<sup>64</sup> "Brazilian Conductor Directs Philharmonic – Milstein Is the Violin Soloist," *New York Times*, June 27, 1950.

<sup>65</sup> Orquestra Sinfônica Brasileira, "OSB em Décadas," [http://www.osb.com.br/linha\\_tempo.htm](http://www.osb.com.br/linha_tempo.htm) (accessed August 16, 2007).

possible, Brazilian soloists. He was probably one of the greatest promoters of Villa-Lobos's works internationally.<sup>66</sup>

Other Brazilian composers in Carvalho's programs included Lorenzo Fernandez, Francisco Mignone, José Siqueira, M. Camargo Guarnieri, Claudio Santoro, Marlos Nobre, Almeida Prado, and Gilberto Mendes. Among Brazilian musicians, he worked extensively with the cellist, Aldo Parisot; and the pianists, Jacques Klein, Arnaldo Estrella, Guiomar Novaes, Felicja Blumenthal, and Jocy de Oliveira. Carvalho judged several music competitions including the Dimitri Mitropoulos International Music Competition for Conductors, which selected the assistant conductors of the New York Philharmonic.

Carvalho was appointed music director of the Saint Louis Symphony Orchestra in 1963. He brought a fiery musical style and intense commitment to contemporary music. As a leading exponent of contemporary and modern composition, Carvalho strove to establish the Saint Louis Symphony as a premier cultural institution dedicated to promoting an understanding of contemporary arts in the United States.

Carvalho's opening season concert with the Saint Louis Symphony Orchestra featured Gordon Binkerd's *Symphony No. 4* (world premiere), Stravinsky's *Le Sacre du Printemps* (first St. Louis performance), and Beethoven's *Symphony No. 1*.<sup>67</sup> In a review in the *St. Louis Post-Dispatch*, critic Thomas Sherman wrote:

It was obvious from the vigor and the precision of both weekend performances that they had been well prepared. It was also evident that conductor de Carvalho understood the character of the music and was able to keep it properly integrated.

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<sup>66</sup> Lisa M. Peppercorn, *The World of Villa-Lobos in Pictures and Documents* (Brookfield: Ashgate Publishing Ltd., 1997), 174-247.

<sup>67</sup> "Symphony Opening," *St. Louis Post-Dispatch*, September 6, 1963.

One should note in passing that he conducted without a score. The “Rite of Spring” created a riot at its first performance in Paris. It was greeted here with unmistakable signs of approval.<sup>68</sup>

Carvalho’s intention to promote contemporary music was apparent in his first season in which he premiered works by Stravinsky, Lukas Foss, Berio, Claudio Santoro, Henry Posseur, Villa-Lobos, and Copland. The first season also included works by Schoenberg, Ravel, Mahler, Prokofiev, Bach, and Beethoven, and four festivals honored Verdi, Strauss, Wagner and Tchaikovsky. Among the twenty-five soloists that season, two were Brazilians.<sup>69</sup>

During the subsequent years as music director, Carvalho promoted several American debuts of works by Alban Berg, Webern, Schoenberg, Stockhausen, and Kodaly. He commissioned works by Xenakis, Berio, Ben Johnston, and Gunther Schuller. The Saint Louis Symphony’s catalogue of world and US premieres and performances of recent compositions under Carvalho’s leadership is staggering. Indeed, the orchestra of this period must be viewed as foremost in the championing of new works.<sup>70</sup>

In 1968, at the zenith of his conducting career but after a long hiatus from composing, Carvalho wrote *Variations on Two Rows for Percussion and Strings*, his last work. The piece included a cadenza by the St. Louis Symphony Orchestra’s percussionist, Richard O’Donnell, who recalled his years under Carvalho’s direction:

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<sup>68</sup> Thomas B. Sherman, “Symphony Opens on Modern Note,” *St. Louis Post-Dispatch*, October 14, 1963.

<sup>69</sup> “Notes on the Program,” in *St. Louis Symphony Orchestra’s 1968-69 Season*, St. Louis: St. Louis Symphony Orchestra.

<sup>70</sup> St. Louis Symphony Orchestra, “Former Saint Louis Symphony Conductors,” <http://www.slsso.org/musicians/carvalho.htm> (accessed May 29, 2007).

More than any conductor or composer that I ever knew, we spent a lot of time talking about philosophy of music, the direction and future of music. He was in my opinion a person that was most dedicated to a principle of forwarding music as an alive art, not just a repetition of things from the past, and probably the most intellectual of conductors that I worked with.<sup>71</sup>

Although Carvalho's tenure as music director of the St. Louis Symphony Orchestra is remembered as a period of growth in both the number and caliber of new members and for relocating to the splendid new Powell Symphony Hall, the audiences of the time did not understand Carvalho's innovative programming and he began to lose support. After his five-year term at the St. Louis Symphony Orchestra, he moved to the Pro Arte Symphony Orchestra of Hofstra University in New York as conductor and music director. He concentrated during this period on twentieth-century music and on less familiar music of the past. A concert performed on October 18, 1969, included five American premieres: Artur Custer's *Found Objects II*, Xenakis' piano concerto commissioned by Pro Arte and dedicated to Jocy de Oliveira; Richard Arnell's *The Town-Crier*; Claudio Santoro's *Intermitências II*; and Schoenberg's *Four Orchestral Songs*. In the following weeks, the orchestra played a piece virtually vanished after 1950s: Anton Rubinstein's *D minor Piano Concerto*.<sup>72</sup>

Carvalho received his second doctoral degree from Hofstra College in 1970, where he was a conducting teacher until 1973.<sup>73</sup> He had received his first honorary doctoral degree in 1963 at Washington State University in St. Louis.

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<sup>71</sup> Richard O'Donnell, Interview with the Author, St. Louis, MO, 5 June, 2007.

<sup>72</sup> Raymond Ericson, "Not Going My Way," *New York Times*, October 26, 1969.

<sup>73</sup> St. Louis Symphony Orchestra, "Former Saint Louis Symphony Conductors," <http://www.slsso.org/musicians/carvalho.htm> (accessed May 29, 2007).

### **Carvalho's Ideal for a Brazilian Orchestra of Excellence**

Although Carvalho was always active in Brazil's music scene, in the 1970s he began in earnest to work on a large scale to build a Brazilian orchestra of excellence. By establishing several music festivals throughout the country and expanding his pedagogical activities, he sought to attract greater numbers of young musicians. In 1972 Carvalho succeeded the Italian conductor, Bruno Roccela as music director of the Orquestra Sinfônica do Estado de São Paulo.<sup>74</sup> Carvalho now had the opportunity to build an orchestra of excellence in Brazil.

Carvalho received support from federal and state governments to reorganize the orchestra, and, in 1973, held international auditions for new members. Carvalho conducted the orchestra until 1996; his 24-year term was characterized by both the high caliber of performance and by periods of extreme financial crisis. Carvalho was vital to the success of what is recognized today as the main orchestra of South America. He married his second wife, the pianist Sonia Muniz and had his second son, Sergei de Carvalho, named in homage to his mentor, Koussevitzky.

Carvalho's experiences in Tanglewood led him to reformulate the Festival de Inverno de Campos de Jordão (Campos de Jordão Winter Festival) according to the Berkshire model. The winter festival became and still is the most important music festival in South America. The festival was created in 1969 and included only classical concerts. Carvalho redefined the goals of the festival by adding courses to young students, all of whom received full scholarships. At the same time, the festival offered concerts by the major Brazilian orchestras with appearances by renowned international artists. The

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<sup>74</sup> Orquestra Sinfônica do Estado de São Paulo, "História," <http://www.osesp.art.br/osesp/orquestra/historia/> (accessed June 6, 2007).

festival produced a new generation of South American musicians. Carvalho directed the festival until 1986.<sup>75</sup>

Although Carvalho had directed virtually all of the major orchestras of his time, he may have had his most lasting impact as a teacher. His commitment to the new generation of musicians led him to create several festivals in Brazil including the Festival de Gramado (southern Brazil), the Festival de João Pessoa (northeastern Brazil), and the Festival de Artes de Itu (southeastern Brazil).

During this period he became music director of many Brazilian institutions, including the Orquestra Sinfônica de Porto Alegre from 1981 to 1987,<sup>76</sup> the Orquestra Sinfônica do Recife, and the Orquestra Sinfônica da Paraíba.<sup>77</sup> In 1987, Carvalho became professor of music at the Yale School of Music and conductor in residence of the Yale Philharmonia. He retired from teaching and was named professor emeritus in 1994. According to Paul Hawkshaw, former associate dean at the Yale School of Music, “Maestro de Carvalho was one of the most beloved and respected pedagogues in the musical world in this century.”<sup>78</sup> His farewell concert as conductor of Yale Philharmonia took place on December 14, 1994. The concert featured *Serenatta das Sete Notas* by Villa-Lobos (one of his favorite composers); Stravinsky’s *Le Sacre du Printemps* (a

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<sup>75</sup> Luis S. Krausz, “Festival de Inverno de Campos de Jordão,” <http://www.bravonline.com.br/imprensa.php?edit=mu&numEd=82> (accessed June 19, 2007).

<sup>76</sup> Orquestra Sinfônica de Porto Alegre, “A orquestra,” <http://www.ospa.org.br/orquestra.asp?tipo=2> (accessed July 2, 2007).

<sup>77</sup> Orquestra de Câmara Eleazar de Carvalho, “Eleazar de Carvalho,” <http://www.orquestra.ce.gov.br/eleazar.htm> (accessed June 6, 2007).

<sup>78</sup> Yale University, “Obituary: Eleazar de Carvalho,” <http://www.yale.edu/opa/ybc/v25.n5.obit.02.html> (accessed June 19, 2007).

signature piece of his repertoire); and Vivaldi's *Bassoon Concerto in E Minor*; Frank Morelli was soloist.<sup>79</sup>

The International Gustav Mahler Society awarded Carvalho the Gustav Mahler Medal in Gold for conducting all Mahler's symphonies. He also received the Carlos Gomes Award for conducting all of Gomes's operas by memory in the 1950s.

Carvalho's work as a composer was eclipsed by his much-lauded performance as a conductor. His international conducting career was most active between 1943 and 1963, a period in which he conducted the main orchestras of the world. During this period, he reached the peak of his career as director of the St. Louis Symphony Orchestra, where he was able to build a world-class orchestra, in an acoustically rich symphony hall, establish a contemporary repertoire, and work closely with some of the most prominent composers of that period. During this period, he also composed his concerto for percussion. Carvalho's final phase, at age 60, was characterized by his unstinting efforts to establish high-level Brazilian orchestras and to stimulate and attract young musicians.

Eleazar de Carvalho died of cancer on September 12, 1996, in São Paulo. He did not live to witness his dream come to fruition: Sala São Paulo, a theater for the Orquestra Sinfônica do Estado de São Paulo, opened a few years after his death. In an obituary published by *New York Times*, critic Anthony Tommasini said, "though outside of Brazil, Mr. de Carvalho never achieved the renown of Bernstein or Mr. Shaw, his career was full and impressive."<sup>80</sup>

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<sup>79</sup> Robert Sherman, "Chopin and a Tuba," *New York Times*, December 11, 1994.

<sup>80</sup> Anthony Tommasini, "E. De Carvalho, Composer, Conductor and Teacher," *New York Times*, September 15, 1996.

Many institutions paid homage to Carvalho in memoriam: the Brazilian Ministry of Education and Culture established the Eleazar de Carvalho Award, Yale University founded the Eleazar de Carvalho Scholarship for conducting students, the São Paulo State Government incorporated the Eleazar de Carvalho Week as an official event, and the Orquestra Petrobras Sinfônica sponsored the Eleazar de Carvalho Competition for Young Conductors.<sup>81</sup>

Carvalho was called “O Maestro” (the Maestro) by the Brazilian musical community. His work may be characterized in general terms by his commitment to promote both contemporary music, and Brazilian music. Carvalho is a legend in Brazil. The numerous stories of his life would certainly fill an entire book.

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<sup>81</sup> Orquestra Petrobras Sinfônica, “Concurso Eleazar de Carvalho para Jovens Solistas,” <http://www.petrobrasinfonica.com.br/opes/cgi/cgilua.exe/sys/start.htm?inford=10&sid=36> (accessed June 10, 2007).

## CHAPTER 2

### Analysis

#### *Preliminary Notes*

In this study, pitch-class names are given in uppercase letters or integers from 0 to e, where integers ten and eleven receive lowercase letters t and e respectively. Pitches in specific octaves are identified by an uppercase letter with an integer, where C4 is the middle C. Members of sets in normal form are indicated by square brackets and separated by commas. Hyphens between the members are used to indicate ordered succession. Prime forms are written in parentheses with no commas between members and Allen Forte's set names are also given. The graphic notation utilizes a time-scale grid in which each unit is delimited by vertical lines that mark out one-second intervals. The spaces between adjacent vertical lines in graphic notation are referred to here as "bars," which are not to be confused with "measures" in the conventional sense.

Conventional symbols are used to identify the ordering of series and set operations as described in Table 2.1.

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**Table 2.1 Glossary of Symbols**


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$P_0$	prime ordering of series
$P_n$	prime ordering $P_0$ transposed by $n$
$R_n$	retrograde of $P_0$ transposed by $n$
$I_n$	inversion of $P_0$ transposed by $n$
$RI_n$	retrograde-inversion of $P_0$ transposed by $n$
$T_n$	transposition by interval $n$
$T_nI$	inversion around 0 and transposed by $n$
$H_1$	hexachord formed by the first six pitch-classes of the series
$H_2$	hexachord formed by the last six pitch-classes of the series

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### *Analysis*

Following John White the analytic method consists of a descriptive analysis followed by synthesis and conclusion.<sup>82</sup> The descriptive analysis concerns the macro aspects of the piece: the form and the instrumentation. Following, the analysis deepens the discussion of the materials found in each section of the piece by drawing attention to the relevant characteristics of the materials, including rhythmic structure, melodic development, pitch material, and texture, as well as by identifying relationships between phrases and cells. Since Carvalho made use of twelve-tone technique in this concerto, the nomenclature and theoretical approach to post-tonal music employed by Allen Forte<sup>83</sup>

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<sup>82</sup> John D. White, *Comprehensive musical analysis*, London: The Scarecrow Press, 1994.

and Joseph N. Straus<sup>84</sup> are used at this level of the analysis. The first step is to identify the two rows and examine the relationships between them. Matrices derived from each row will help identify the composer's manipulation of the rows and their permutations. The remaining steps in the analytical process, synthesis and conclusion, provide global information about the compositional language and its elements. This analysis is based on the critical edition that includes all of the corrections listed in the Part II of this dissertation.

### Descriptive Analysis

In *Variation on Two Rows for Percussion and Strings*, Carvalho employed two distinct compositional materials. The first is twelve-tone technique employing two series. The second is based on parts extracted from the percussion cadenza written by O'Donnell. As the analysis demonstrates, the pitch material extracted from the cadenza is not related to the twelve-tone organization of the piece.

This procedure was clearly emphasized by the composer in the concert program of the premiere, in which he affirmed that the percussion “adds a certain flexibility” in a “totally organized structure based on 12-tone rows.” Carvalho also stated that the “process of variation is achieved by permutation of pitches, inversions, retrograde, etc., sometimes involving the entire row, but often involving only part of the set such as 1<sup>st</sup> to 6<sup>th</sup>, 7<sup>th</sup> to 12<sup>th</sup>, 6<sup>th</sup> to 1<sup>st</sup>, 12<sup>th</sup> to 7<sup>th</sup>, etc.”<sup>85</sup>

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<sup>83</sup> Allen Forte, *The structure of atonal music*, New Haven, Yale University Press, 1973.

<sup>84</sup> Joseph N. Straus, *Introduction to Post-Tonal Theory*, 3rd. ed., Upper Saddle River: Prentice-Hall, 2005.

As this analysis demonstrates, Carvalho did not manipulate the twelve-note technique in a restrictive manner in this piece; sometimes he freely manipulated the rows. It is important to point out that, of the two rows, greater use is made of series B. In Figures 2.1 and Figure 2.2, the two series are represented as they are originally introduced horizontally; series A in mm. 4-5, and series B in mm. 8-10.



Fig. 2.1 Series A, mm. 4-5



Fig. 2.2 Series B, mm. 8-10

In series A, we note the predominance of interval classes 2 and 4, the absence of interval class 1, and the appearance of two tritones, as shown in Figure 2.3.

Ordered Pitch Interval:	+8	+6	+2	+3	+2	+4	+2	+3	+4	+7	+6	
	^	^	^	^	^	^	^	^	^	^	^	
Series A:	C#	A	Eb	F	Ab	Bb	D	E	G	B	F#	C
	v	v	v	v	v	v	v	v	v	v	v	
Interval Class:	4	6	2	3	2	4	2	3	4	5	6	

Fig. 2.3 Ordered pitch intervals and interval class of series A

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<sup>85</sup> Arthur Custer, "Notes on the Program," in *St. Louis Symphony Orchestra's 1968-69 Season* (St. Louis: St. Louis Symphony Orchestra, 1968: 425-27).

Series B is characterized by a great incidence of interval class 1 and the presence of a tritone between  $H_1$  and  $H_2$ , as shown in Figure 2.4.

Ordered Pitch Interval:	-11	-8	+14	+1	-11	-6	+11	-4	+1	+5	-10	
Series B:	^	^	^	^	^	^	^	^	^	^	^	
	B	C	E	F $\sharp$	G	A $\flat$	D	D $\flat$	A	B $\flat$	E $\flat$	F
	v	v	v	v	v	v	v	v	v	v	v	v
Interval Class:	1	4	2	1	1	6	1	4	1	5	2	

Fig. 2.4 Ordered pitch intervals and interval class of series B

Another important compositional factor is the use of three- and four-note subsets of these two series, which are largely responsible for the general sonority of the piece. Figure 2.5 shows the discrete tetrachords of series A, which instantiate 4-24 (0248), 4-25 (0268), and 4-8 (0156), and also three important three-note subsets of series A, namely set class 3-8 (026), 3-7 (025), and 3-5 (016). The subset  $[C\sharp, A, E\flat]$  is related by  $T_6I$  to the subset  $[A, E\flat, F]$ , by  $T_{11}I$  to the subset  $[A\flat, B\flat, D]$ , and by  $T_1$  to the subset  $[B\flat, D, E]$ . Subset  $[E\flat, F, A\flat]$  is related by  $T_1I$  to the subset  $[F, A\flat, B\flat]$ , and by  $T_{11}$  to the subset  $[D, E, G]$ .

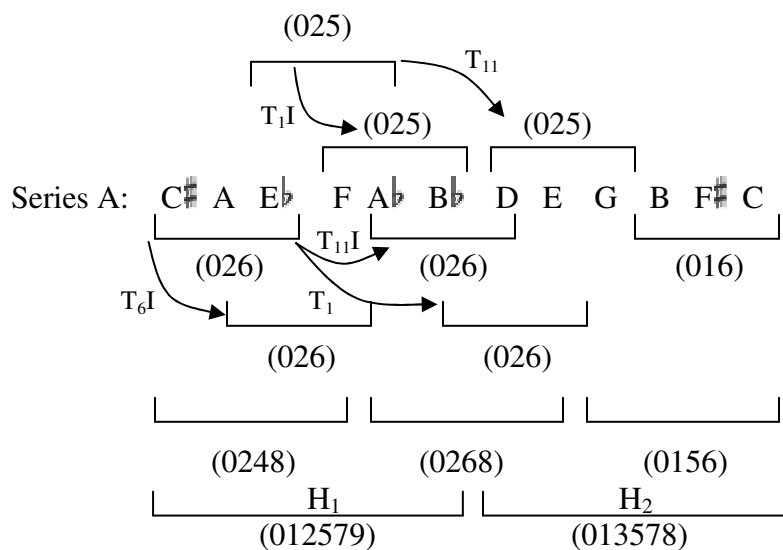


Fig. 2.5 Subsets of series A

As Figure 2.6 shows, series B does not share many significant subsets with series A. The most important set class of the piece is the first tetrachord of series B, set class 4-16 (0157), which appears as the first and last tetrachord of the series. Other important subsets of this series are trichords 3-4 (015) and 3-5 (016), as well as tetrachord 4-2 (0124). These sets become important musical motives throughout the piece. The set [B, C, E] is related by  $T_1I$  to the set [D, D $\flat$ , A]. Set [G, A $\flat$ , D] is related by  $T_6$  to the set [A $\flat$ , D, D $\flat$ ], and by  $T_5I$  to the set [A, B $\flat$ , E $\flat$ ].

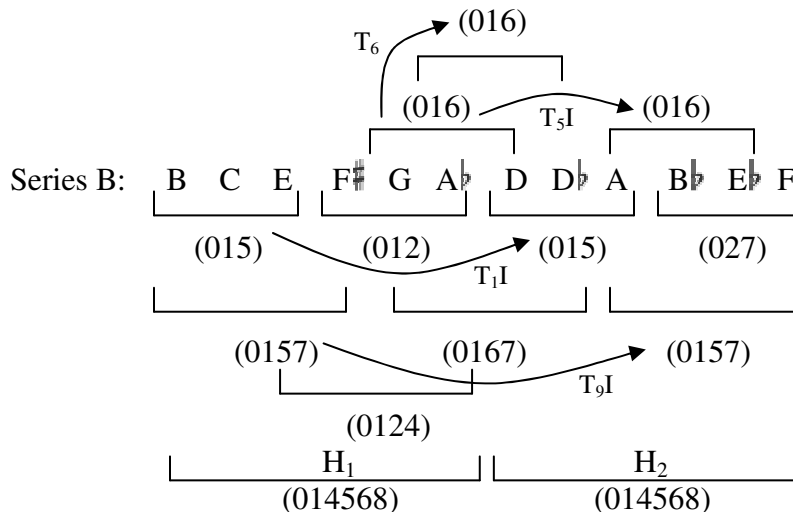
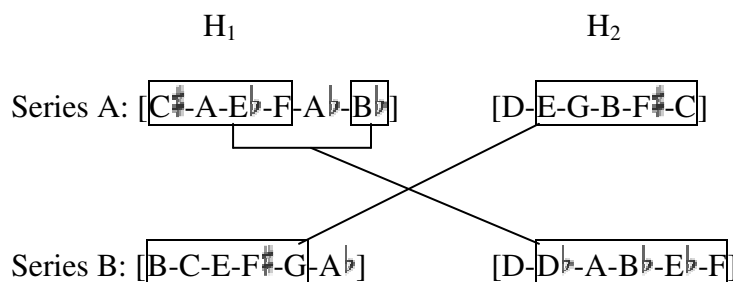


Fig. 2.6 Subsets of series B

Although the two series employed by Carvalho have distinct intervallic characteristics—series A features triadic relationships and series B chromatic ones—they both pursue combinatorial relationships between their hexachords. As Figure 2.7 shows, the first hexachord (H<sub>1</sub>) of series A shares five members of the second hexachord (H<sub>2</sub>) of series B, a similarity that the composer exploits in the composition.

Fig. 2.7 Relationship between  $H_1$  and  $H_2$  of series A and B

By the use of rotation, omission of members of the series, and the use of non-serial elements, the constituent hexachords ( $H_1$  and  $H_2$ ) of the two series are treated as basic harmonic units throughout the piece, and in some cases the ordering within them has no significance. Although the  $H_1$ , set class 6-Z48 (012579), and  $H_2$ , set class 6-Z26 (013578), of series A have a retrograde-inversional combinatoriality (at  $RI_4$ ), and although  $H_1$ , set class 6-16 (014568), and  $H_2$ , set class 6-16 (014568), of series B have an inversional combinatoriality (at  $I_{11}$ ), Carvalho did not utilize the combinatorial properties of these rows. All orderings of series A and B employed by Carvalho can be found in Figure 2.8.

**Series A:**

<b>P<sub>1</sub></b>	C $\sharp$	A	E $\flat$	F	A $\flat$	B $\flat$	D	E	G	B	F $\sharp$	C	<b>R<sub>1</sub></b>
<b>P<sub>6</sub></b>	F $\sharp$	D	A $\flat$	B $\flat$	C $\sharp$	E $\flat$	G	A	C	E	B	F	<b>R<sub>6</sub></b>
<b>P<sub>0</sub></b>	C	A $\flat$	D	E	G	A	C $\sharp$	E $\flat$	F $\sharp$	B $\flat$	F	B	
	E $\flat$	B	F	G	B $\flat$	C	E	F $\sharp$	A	C $\sharp$	A $\flat$	D	<b>R<sub>3</sub></b>
	A $\flat$	E	B $\flat$	C	E $\flat$	F	A	B	D	F $\sharp$	C $\sharp$	G	<b>R<sub>8</sub></b>

**Series B:**

<b>P<sub>11</sub></b>	B	C	E	F $\sharp$	G	A $\flat$	D	D $\flat$	A	B $\flat$	E $\flat$	F	<b>R<sub>11</sub></b>
<b>P<sub>0</sub></b>	C	D $\flat$	F	G	A $\flat$	A	E $\flat$	D	B $\flat$	B	E	F $\sharp$	

Fig. 2.8 Orderings of series A and B employed by Carvalho

The second device employed in the piece is the manipulation of the cadenza written by O'Donnell. The cadenza, which served as the basis for the percussion part, makes use of pitched and unpitched material. As previously mentioned, the percussion part is written in graphic and proportional notation as well as in conventional notation at various times.

According to O'Donnell, the compositional process took into consideration two main aspects: (1) the variation of timbre, and (2) the distinction between undefined pitch and *glissando*.

Since timbre is a complex attribute determined by several factors, the variation of timbre in this study is limited to two aspects: the material of the instrument and its frequency range. Variation of timbre is obtained by the large and varied instrumentation in the percussion set, which includes instruments of three kinds of material: metal, skin, and wood. Each of these instrumental groupings has a wide frequency spectrum.

With regard to the dialogue that occurs throughout the cadenza between sections of *glissando* and sections of undefined pitch, O'Donnell explained, "I was involved in electronic music and interested about the possibility of changing timbres very quickly, in texture changes." O'Donnell added that at that period, it "was expected" that a great number of instruments would be used in the percussion set. Regarding the shifting instrumental colours, he said, "Some of the instruments have *glissando* potential as the talking drum, flexatone, and at that time they also divided the grouping of instruments in metal, skin, and wood. I consider percussion instruments those we shake, scrape, or

strike, and rather than thinking so much in pitches, I was thinking more like Webern's *Klangfarbe* role, where we have *glissando* and definite sounds."<sup>86</sup>

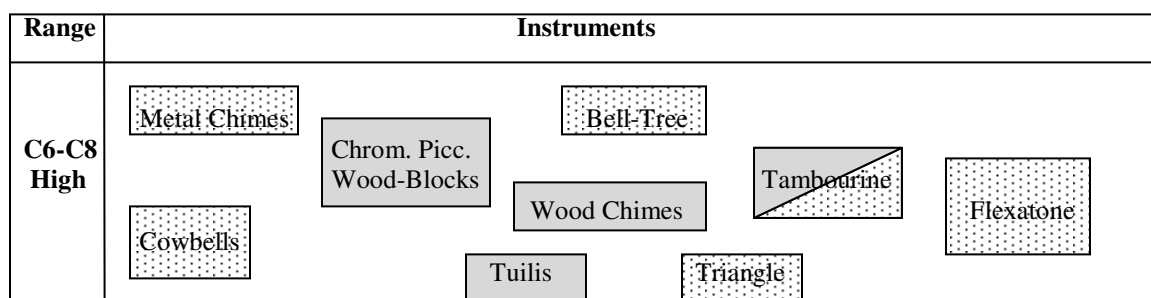
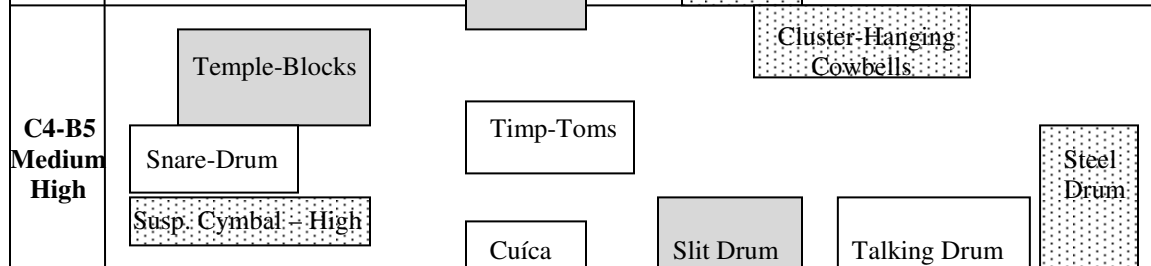
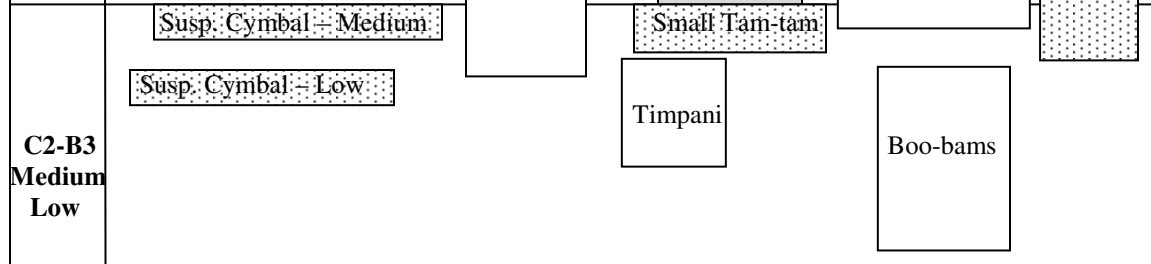
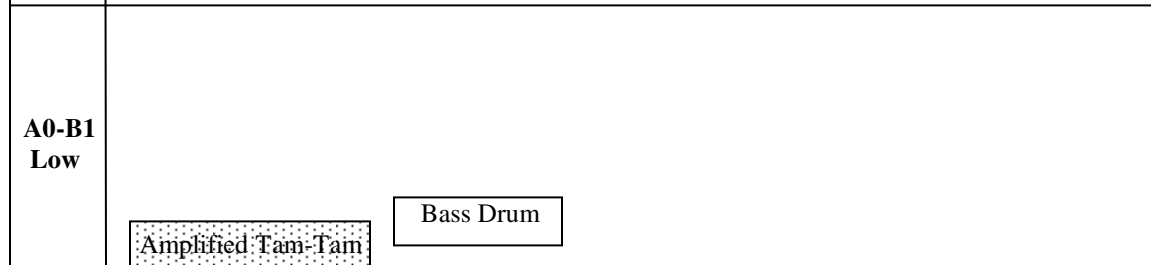
The analysis follows Table 2.2 regarding the timbre of the undefined pitch material in the percussion part. Note that Table 2.2 only includes the instruments used by O'Donnell in the cadenza. The instruments which were added to the percussion set by Carvalho, including marimba, xylophone, vibraphone, and glockenspiel, are treated when they appear in the piece as material related to the serial context of the piece. There is only one instrument that is employed in both contexts throughout the piece: the timpani. The instruments of definite pitch that O'Donnell used in the cadenza, such as boo-bams and steel drum, are treated as material outside of the serial context in this analysis.

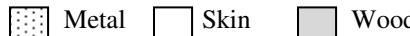
The approximate range of the undefined pitch instruments in Table 2.2 employed as its parameter the choices of the percussion instruments used in O'Donnell's premiere. Using audio software (Sound Forge), the percussion instruments from the recording were isolated and their frequency range identified. The frequency range was divided into four areas for this study: low, medium low, medium high, and high. The frequency map in Table 2.2 shows only approximate values because instruments of undefined pitch can vary in frequency due to different selections from one performance to the next.

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<sup>86</sup> Richard O'Donnell, interview with the author, St. Louis, MO, 5 June 2007.

**Table 2.2 Percussion Instruments Identified by Frequency and Material**

Range	Instruments
<b>C6-C8 High</b>	
<b>C4-B5 Medium High</b>	
<b>C2-B3 Medium Low</b>	
<b>A0-B1 Low</b>	



### Form

Carvalho's *Variations on Two Rows for Percussion and Strings* can be considered a concertino for percussion and strings. Because it is a solo work written in one movement, with sections characterized by changes of character,<sup>87</sup> it is less ambitious in

<sup>87</sup> Arthur Hutchings, "Concertino," Grove Music Online, ed. L. Macy, <http://www.grovemusic.com> (accessed January 4, 2008)

scale than a concerto. Another characteristic of the piece is its frequent alternation between *tutti* and solo passages, which recalls the structure of the pre-classical concerto.

The piece starts with an Introduction featuring unaccompanied percussion, followed by five principal sections as well as the cadenza between sections four and five. Each section may be characterized by changes in the manipulation of the pitch material, tempo, texture, dynamic contrast, and rhythm. The percussion has a solo passage between each section. Table 2.3 shows the form of the piece. A detailed table indicating the main elements of the sections and their subsections is found in Appendix 2.

<b>Table 2.3 Form</b>	
<b>Introduction</b>	
Intro (a)	m. 1 (1"-11" seconds)
Intro (b)	m. 1 (12"-21.5")
<b>Section 1</b>	
Section 1(a)	mm. 2-13
Section 1(b)	mm. 14-22
Section 1(c)	mm. 22-28
<b>Section 2</b>	
Section 2(a)	mm. 29-32
Section 2(b)	mm. 33-35
Section 2(c)	mm. 36-46
Section 2(d)	mm. 46-49
<b>Section 3</b>	
Section 3(a)	mm. 50-57
Section 3(b)	mm. 57-68
<b>Section 4</b>	
Section 4(a)	mm. 69-98
Section 4(b)	mm. 98-108
<b>Cadenza</b>	m. 109
<b>Section 5</b>	
Section 5(a)	mm. 110-120
Section 5(b)	mm. 120-133
Section 5(c)	mm. 134-140

### *Instrumentation*

Carvalho's *Variations on Two Rows for Percussion and Strings* calls for a large string ensemble and percussion solo. The string ensemble must include a minimum of the following instruments: Twelve first violins, twelve second violins, ten violas, ten cellos, and two basses (Carvalho's suggested minimum of two basses is, I believe, too low: I would recommend a minimum of four basses for the sake of balance within the ensemble).

The percussion part employs a multiple percussion set which includes both traditional and non-traditional instruments, some of which are not commercially available. Table 2.4 includes all percussion instruments employed in the piece; unusual instruments receive a short description:

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**Table 2.4 Percussion Instruments**

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Amplified tam-tam
Steel drum (range of G3-B4)
Bass drum
5 Temple blocks
4 Slit drum
Boo-bams – chromatically tuned drums (E2-F3) constructed with a shell of PVC pipe of 3 inches of diameter with a single regular plastic drum head. The depth of the shell determines the desired pitch.
Timpani (26" – B $\flat$ 2-G3)
3 suspended cymbals: low, medium, and high
Cuíca
Bell tree
Small tam-tam
Snare drum
5 Cowbells
Wood chimes
Metal chimes
Cluster-hanging cowbells

Chromatic piccolo wood-blocks

Timp-toms (4 different pitches) – double headed drums with shell made of a heavy wall cardboard tube of 8 inches in diameter and 6 inches in depth. Tuning is determined by the tension of the heads.

Triangle

Tambourine

Talking drum

Flexatone

4 Tuilis – similar in construction to a large wood-block; regarding timbre, it is between that of a wood-block and temple-block.

Xylophone

Vibraphone

Glockenspiel

Marimba (4.6 octaves F2-C7)

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*Introduction – Subsection a) m. 1 (1-11 seconds)*

The piece begins with a solo passage in the percussion based on an extraction of bars 1”-7” of the cadenza written in Carvalho’s hand. Although completely based on the extraction, Carvalho slightly changed the rhythmic content of the amplified tam-tam and also expanded the passage by four seconds. The rhythmic activity is minimal in this subsection. The passage uses only the metallic timbre, which is used in both low and medium low frequencies by the harmonics produced by the cello bow.

*Introduction – Subsection b) m.1 (12-21.5 seconds)*

Subsection b is based on an extraction of bars 21”-23” of the cadenza (see Figure 2.9) in which the steel drum employs pitch material with the following succession of notes: [A $\flat$ -F $\sharp$ -D-C $\sharp$ -F-G-D-E-D-E-A]. Carvalho modified this material by removing

repeated notes and adding note B $\flat$  to obtain a set of twelve pitch classes, referred to here as series P. Figure 2.10 shows the manipulation of the original line.

Fig. 2.9 Bars 21"-23" of the cadenza

Original line: A $\flat$  - F $\sharp$  - D - C $\sharp$  - F - G - D - E - D - E - A

Series P: A $\flat$  - F $\sharp$  - B - C $\sharp$  - F - G - D - E - C - D $\sharp$  - B $\flat$  - A

↓

Fig. 2.10 Series P based on bars 21"-23" of the cadenza

To alter the original line, Carvalho inserted important material from series A and B in this row. The first tetrachord of the original line is the same set class (0157), the main material of the piece, found in the first tetrachord of series B is altered to a set class (0257) in the first tetrachord of series P. He also used the same trichords found in series A, set classes (025), (026), and (016), in the series P (see Figure 2.11). This is the only passage in the piece that employs series P.

Series P:

A $\flat$	F $\sharp$	B	C $\sharp$	F	G	D	E	C	D $\sharp$	B $\flat$	A
(025)			(026)			(024)			(016)		
(0257)											

Fig. 2.11 Subsets of series P in m. 1

The timbre is from the same category of metal instruments as that of the previous subsection but with a different frequency area and completely different rhythmic activity. Considering that each bar lasts one second, the phrase played by the steel drum is at the proportion of  $\downarrow = 240$ . With an overall *diminuendo* from *fortissimo* to *pianissimo*, this repeated phrase serves as a transition between the Introduction and Section 1.

*Section 1 – Subsection a) mm. 2-13*

Subsection 1a can be considered the exposition of the “themes” of the piece, or more specifically, the exposition of the two rows which make up the main compositional material of the piece. This subsection starts with series A stacked bottom up on the strings on mm. 2-3. As Figure 2.12 shows, the series is stacked to maintain the same pitch-class intervals of the series on its prime ordering. The procedure of stacking all twelve pitch classes is constant during the piece, thus becoming a defining element of the sonority of the work.



Fig. 2.12 Series A stacked bottom up

The horizontal exposition of series A on its prime ordering occurs on m. 3-4 with the cello and is replied by violin I playing the  $R_1(A)$  on mm. 6-7 in the same rhythmic value. In m. 8, series P played repeatedly by the steel drum in dynamic *pianissimo* since

the Introduction stops. This row played by the steel drum can be considered an element that reinforces the twelve pitch classes stacked on the strings because it is played in a very fast tempo with regular rhythm.

Carvalho wrote in such a way that using the proportional notation of the percussion and the traditional notation of the strings creates a rhythmic proportion of 5:1 between the two parts. Figure 2.13 shows that each bar of the percussion part lasts 1 second, thus  $\downarrow = 240$ . The rhythm thus superimposed on the strings playing in a tempo equal to  $\downarrow = 48$  creates a 5:1 proportion between ‘bars’ and measures. Further, there is a superimposed rhythmic pattern of 14 thirty-second notes that is displaced throughout the passage creating a proportion 7:5.

The image shows a musical score with two staves. The top staff is labeled 'Orchestra' and is in 4/4 time, containing four quarter notes. The bottom staff is labeled 'Percussion' and is in 4/4 time, containing a complex rhythmic pattern of 14 thirty-second notes. Above the percussion staff, there are four horizontal lines, each labeled with the number '5', indicating a 5-measure interval between the lines.

Fig. 2.13 Rhythmic proportion 7:5 between strings and percussion

In mm. 8-10 the cello introduces series B in its prime ordering, followed by violin I playing the  $R_{11}(B)$  on mm. 10-13 in a kind of question-answer structure, very much like the presentation of  $P_1(A)$  and  $R_1(A)$ . However, there is a passage of six seconds between  $P_{11}(B)$  and  $R_{11}(B)$  in the percussion part, which, by Carvalho’s own hand, is based on an extraction from bars 138”-143” of the cadenza. Similar to the Introduction, this passage starts with an instrument of a low frequency range with minimum rhythmic activity that

contrasts with the timbre of a wood instrument with more rhythmic activity at the end of the passage.

At the end of the exposition of  $R_{11}(B)$  by violin I on mm. 13, a passage appears in the percussion part written in Carvalho's own hand based on an extraction from bars 72"-82" of the cadenza. As he did in subsection b of the Introduction, Carvalho altered the original pitch material content of bars 72"-82" of the cadenza and slightly varied the rhythm. Figure 2.14 shows the alteration Carvalho made on the original line.

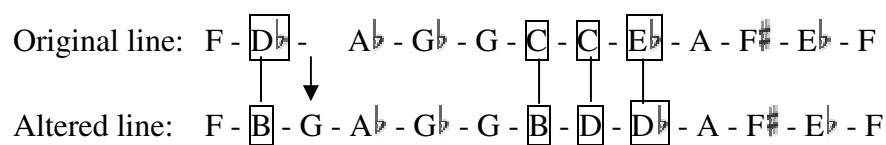


Fig. 2.14 Alteration on the original line - steel drum in m. 13

A timpani *glissando* divides the two parts of this passage. The second part (8"-11" seconds) was also altered by the composer, and Figure 2.15 shows the changes made in the pitch material to obtain a new line. Again, Carvalho chose parts of the percussion cadenza which are distinct in timbre as well as rhythmic activity. It is the first time in the piece that instruments of wood, skin, and metal are employed simultaneously.

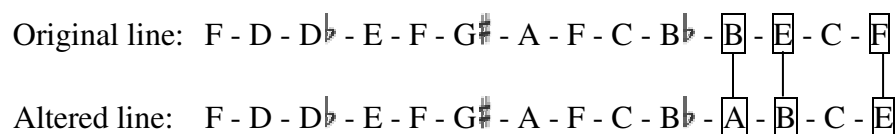


Fig. 2.15 Alteration on the original line - boo-bams and steel drum in m. 13

With this alteration, the two altered lines include some characteristics from series A and B such as the first trichord formed by notes (F-B-G) in the first altered line, a set

class (026), which is an important subset of series A, or the emphasis on the interval class 1 in the second altered line. The first altered line is a set complement of set class (016), a set found in series A and B. However, both altered lines have no other strong relationships with the two rows of the piece. Based on these facts, I conclude that Carvalho used the definite pitch material of the cadenza not as an element related to the two rows but rather as another percussion instrument of undefined pitch with a function restricted to the timbre variation. In this way, the “certain flexibility” related to the percussion part mentioned by Carvalho also refers to its pitch material, which was written by O’Donnell without the intention of following a dodecaphonic technique.

Subsection 1a serves as a general presentation of the material to be used during the piece: the two rows, their horizontal and vertical manipulation, and the percussion part with its variation of timbre. The rhythms related to the series are also recurrent throughout the piece. Figure 2.16 shows that series A has, as a rhythmic characteristic, a written-out *rallentando* over two measures, while series B is characterized by the rhythm shown in Figure 2.17. Note that the rhythm is identical in the first two tetrachords and varied in the last tetrachord of series B. It is interesting to point out that the third tetrachord reverses the contour of first two.



Fig. 2.16 Series A played by cello in mm. 4-5



Fig. 2.17 Series B played by cello in mm. 8-10

*Section 1 – Subsection b) mm. 14-22*

The main element of subsection 1b is a row derived from series B which will be called series B<sub>D</sub>. See Fig. 2.18. In mm. 14-16 the first H<sub>1</sub> of series B<sub>D</sub> [C, B, A<sup>b</sup>, F<sup>#</sup>, E, D], a member of set class 6-34 (013579), is played by violins I and II. After a pause, the H<sub>2</sub> of series B<sub>D</sub> [G, F, E<sup>b</sup>, D<sup>b</sup>, B<sup>b</sup>, A], another member of 6-34 (013579), is played by viola, timpani, cello, and bass. This row is derived by the interchange of members from series B. In Figure 2.18, note that H<sub>1</sub> of series B shares five pitch classes of the H<sub>1</sub> of series B<sub>D</sub>. By interchanging notes G and D and changing the ordering of the set, Carvalho obtained a descending line for both hexachords of series B<sub>D</sub>. This characteristic differs from the ascending line of series A. Also, while the prime ordering of series A and B features leaps, the presentation of series B<sub>D</sub> is much more scalar.

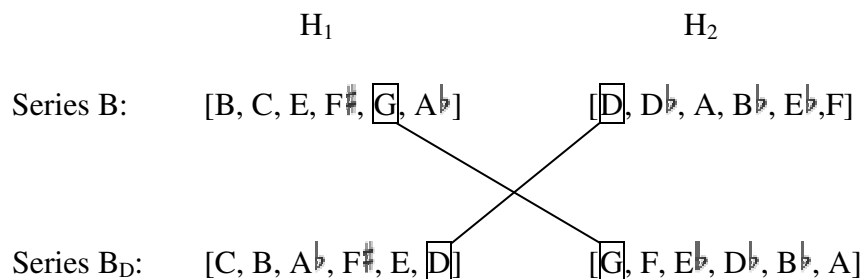


Fig. 2.18 Relationship and interchange between H<sub>1</sub> and H<sub>2</sub> of series B and series B<sub>D</sub>

Carvalho built this row with interesting characteristics. The set has an intervallic palindrome involving the two hexachords, generating subsets of common set classes in both hexachords, as Figure 2.19 demonstrates. The set [C, B, A<sup>b</sup>] is related by T<sub>9</sub>I to the set [D<sup>b</sup>, B<sup>b</sup>, A], set [F<sup>#</sup>, E D] is related by T<sub>1</sub> to the set [G, F, E<sup>b</sup>], and set [C, B, A<sup>b</sup>, F<sup>#</sup>] is related by T<sub>9</sub>I to the set [E<sup>b</sup>, D<sup>b</sup>, B<sup>b</sup>, A]. Again, Carvalho did not explore the inversional combinatoriality between the two hexachords of series B<sub>D</sub> at I<sub>9</sub> in the piece.

Series  $B_D$ , a new component in the piece, is characterized by rhythmic regularity, as it employs only half-notes and quarter-notes.

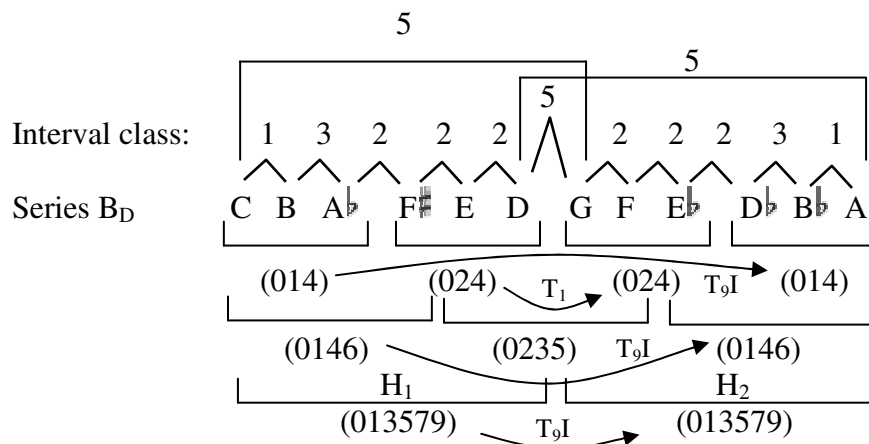


Fig. 2.19 Subsets of series  $B_D$

In mm. 18-20 series  $B_D$  is stacked top down in the strings in short attacks. The percussion uses the material of bars 79''-82'' of cadenza, but now with traditional notation and with addition of suspended cymbal to reinforce the attacks on the strings. Subsection 1b features a percussion part of denser texture wherein the composer employs instruments of all categories: wood, metal, and skin. As a link to the next subsection, the xylophone plays  $R_1(A)$ , followed by  $P_{11}(B)$  and  $R_{11}(B)$ , repeating the first tetrachord of series B [B-C-E-F $\sharp$ ] at the end of the phrase, as Figure 2.20 shows. The rhythm in the xylophone is a variation of the rhythm associated with the first tetrachord of series B.

The musical notation for the xylophone part in mm. 20-22 is shown in three measures. The first measure is labeled  $R_1(A)$  and the second measure is labeled  $P_{11}(B)$ . The third measure is labeled  $R_{11}(B)$  and includes a dynamic marking  $p$ . The notation shows a sequence of notes and rests, with a 14-measure rest in the first measure and a 6-measure rest in the third measure.

Fig. 2.20 Mm. 20-22: percussion part

*Section 1 – Subsection c) mm. 22-28*

Subsection 1c is characterized by the manipulation of the two hexachords of series  $B_D$  and by the motion from set to set involving a single set class, set class 4-2 (0124), which is formed from the 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> members of series B, [E, F $\sharp$ , G, A $\flat$ ]. When this set is transposed by  $T_4$  [A $\flat$ , B $\flat$ , B, C], its prime and retrograde orderings become the beginning and the end of the phrase. The set [A $\flat$ , B $\flat$ , B, C] is related by  $T_1$  to the set [C $\sharp$ , D, E $\flat$ , F], as shown in Figure 2.21. In this subsection, the texture is polyphonic, and although the violin I plays the series  $B_D$  with a variation of the rhythm related to series B, most of the subsection is characterized by the regular grouping of eighth and sixteenth notes, a characteristic associated with series  $B_D$ .

Violin I starts playing  $H_1$  of series  $B_D$  in m. 22 and ends the hexachord on the first beat of m. 23, where series  $B_D$  is stacked, and the  $H_2$  of series  $B_D$  is played by the cello. At this point, Carvalho rotated the  $H_2$  of the series  $B_D$  in the violin I starting in D $\flat$  to accord with the cello. In m. 24, the last part of this first phrase, the four first notes of  $H_2$  of series  $B_D$  (G, F, E $\flat$ , D $\flat$ ) in violin I are superimposed with the four first notes of  $H_1$  of series  $B_D$  in the viola (C, B, A $\flat$ , F $\sharp$ ).

On the upbeat to m. 25, the development of two musical ideas begins: the use of the motive [A $\flat$ -B $\flat$ -B-C] set class 4-2 (0124) and the juxtaposition of series  $B_D$  in its prime and retrograde orderings, creating a great emphasis on the interval class 1 throughout subsection 1c, as the mapping in Figure 2.21 demonstrates. In m. 27, the same development is compressed into one measure, ending with the set class 4-2 (0124), [A $\flat$ -B $\flat$ -B-C] in its retrograde ordering.

The image shows a musical score for five instruments: Violin I, Violin II, Viola, Cello, and Bass. The score is annotated with various musical concepts and transformations:

- Violin I:** Starts with  $H_1$  of series  $B_D$  (mm. 23-24) and transitions to  $H_2$  of series  $B_D$  rotated in  $D^b$  (mm. 25-26).
- Violin II:** Features dynamic markings  $sfz$  and  $p$ . A transformation  $T_1I$  is indicated between measures 25 and 26.
- Viola:** Features dynamic markings  $sfz$ ,  $p$ , and  $mf$ . A transformation  $T_1I$  is indicated between measures 25 and 26.
- Cello:** Features dynamic markings  $sfz$  and  $p$ . A transformation  $T_1I$  is indicated between measures 25 and 26. A box labeled  $P_0(B_D)$  is shown in measure 26.
- Bass:** Features dynamic markings  $sfz$  and  $p$ . A transformation  $T_1I$  is indicated between measures 25 and 26. A box labeled  $R_0(B_D)$  is shown in measure 26.
- Chord Progression:** A box in measure 26 shows the chord sequence:  $F$ ,  $E^b$ ,  $D^b$ ,  $B^b$ ,  $A$ .
- Set Classes:** The set class  $(0124)$  is identified in measures 25 and 26. The set class  $(0235)$  is also mentioned in the text.
- Performance Markings:** *tutti*, *arco*, *pizz.*, and *div.* are used throughout the score.

Fig. 2.21 Section 1 – subsection c) mm. 23-25

Subsection 1c ends in m. 28 with the vibraphone in a solo passage playing  $R_6(A)$  ordered from top down with the last two notes transposed ( $D$  and  $F^\sharp$  an octave higher to be in the range of the vibraphone). The twelve notes are ordered to generate in its first and last tetrachord the set class 4-2 (0124), and in the second tetrachord the set class (0235), which is the same set class of the second tetrachord of series  $B_D$ , as Figure 2.22 shows. The solo passage on the vibraphone serves as a transition to Section 2.

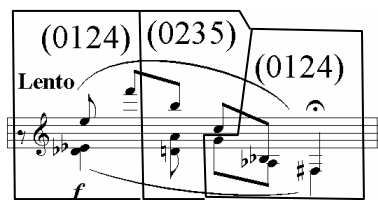


Fig. 2.22 Vibraphone solo passage on m. 28

*Section 2 – Subsection a) mm. 29-32*

In subsection 2a, a new rhythmic element appears in the piece that is based on Brazilian popular music, specifically the rhythm of the Bossa Nova. In the 1960s, the Bossa Nova reached its apex of popularity in the United States with the 1967 recording of the LP *Francis Albert Sinatra and Antonio Carlos Jobim*.<sup>88</sup> Most likely influenced by the moment, Carvalho added some Brazilian musical characteristics to his piece, explaining “The syncopated rhythm is emphasized as a pattern peculiar to Brazilian music.”<sup>89</sup>

Section 2 is also characterized by short subsections that alternate between *tutti* and percussion solo passages. The section begins in m. 29 with series A stacked bottom up in a *pianissimo* dynamic. In the next measure, the strings maintain the stacked series A with a syncopated rhythm. Although the tempo is the same as that of the previous section ( $\downarrow = 48$ ), the impression caused by the subdivision in sixteenth-notes is that of a doubling of tempo. In this passage, Carvalho simply wrote an indication of the rhythm of Bossa Nova for the percussion part, specifically a graphic of dynamic with a *diminuendo* followed by a *crescendo*. The rhythm in the strings is not a typical Bossa Nova rhythmic cell. The superimposition of the rhythm played by the strings with the basic rhythmic cell

<sup>88</sup> Santuza Cambraia Naves, “Os 50 anos da Bossa Nova,” *Ciência Hoje* 41 (March, 2008): 23-27.

<sup>89</sup> Arthur Custer, “Notes on the Program,” in *St. Louis Symphony Orchestra’s 1968-69 Season* (St. Louis: St. Louis Symphony Orchestra, 1968: 425-27).

played by percussion generates a polyrhythm. Figure 2.23 shows the accents of the strings superimposed with the traditional rhythm of Bossa Nova. Note that the Bossa Nova rhythm was doubled to accord with the strings.

The figure displays three musical staves. The top staff, labeled 'Traditional Bossa Nova Rhythmic Cell', is in 3/4 time and shows a sequence of notes: a quarter note, an eighth note, a quarter note, an eighth note, and a quarter note. The middle staff, labeled 'Percussion', is in 2/4 time and shows a complex polyrhythmic pattern with multiple notes per beat. The bottom staff, labeled 'Strings', is also in 2/4 time and shows a syncopated rhythm that is a double of the traditional Bossa Nova rhythm.

Fig. 2.23 Syncopated rhythm on strings superimposed with traditional Bossa Nova rhythm.

In m. 32 a percussion solo passage extracted from bars 1''-25'' of the cadenza serves as a link to the next section. This passage is the first time in the piece that Carvalho literally cut pieces of the cadenza and pasted them into the score. Figure 4.1 in the Editor's Note on the Critical Edition illustrates this process. Note that parts of this material were previously used in the piece. Bars 1''-7'' and bars 21''-23'' of the cadenza served as foundations for the material in m. 1. The new element for the percussion in this passage is the extensive use of *glissandi*, which covers a great range of frequency, including skin instruments of medium low and medium high frequency and the metallic timbre of the bell tree in a high frequency. At the end of the passage at the fourth beat of m. 32, Carvalho wrote by his own hand a  $P_6(A)$  for the marimba with a characteristic rhythm related to series A, but inverted. Interesting to point out that the marimba regular range in 1968 was only 4 octaves starting in A3 and Carvalho wrote the first of  $P_6(A)$ , note of  $F\sharp_3$ , in this passage.

Section 2 – Subsection b) mm. 33-35

Subsection 2b has similarities with subsection 1c regarding texture and manipulation of the pitch material. In mm. 33-34, Carvalho used set class (0124) under transposition or inversion along with shared common members among the sets to construct this passage. Set  $[D, E\flat, E, F\sharp]$  is related by  $T_0I$  to the set  $[F\sharp, A\flat, A, B\flat]$ , by  $T_{11}$  to the set  $[C\sharp, D, E\flat, F]$ , by  $T_7I$  to the set  $[A, B, C, C\sharp]$ , and by  $T_9$  to the set  $[B, C, D\flat, E\flat]$ , as shown in Figure 2.24.

The figure displays a musical score for measures 33-35, annotated with set theory. The score includes staves for Violin I, Violin II, Viola, Percussion, Cello, and Bass. The key signature is three flats (B-flat major/D minor), and the time signature is 3/4. The music is marked *unis. cantabile* and *f*. Several boxes and arrows illustrate the relationships between different instances of the set class (0124) and its transformations:

- Violin I:** Contains the original set class (0124) in measures 33-34. A transformation  $T_9$  is indicated, pointing to a box labeled (0124) in measures 34-35.
- Violin II:** Contains the original set class (0124) in measures 33-34. A transformation  $T_{10}$  is indicated, pointing to a box labeled  $H_1$  of series  $B_D$  rot.  $B \rightarrow$  in measures 34-35.
- Viola:** Contains the original set class (0124) in measures 33-34. A transformation  $T_{11}$  is indicated, pointing to a box labeled (0124) in measures 34-35. A transformation  $T_7I$  is also indicated, pointing to a box labeled (0124) in measures 34-35.
- Percussion:** Contains the original set class (0124) in measures 33-34. A transformation  $T_3$  is indicated, pointing to a box labeled (0124) in measures 34-35.
- Cello:** Contains the original set class (0124) in measures 33-34. A transformation  $T_0I$  is indicated, pointing to a box labeled (0124) in measures 34-35.
- Bass:** Contains the original set class (0124) in measures 33-34. A transformation  $T_3$  is indicated, pointing to a box labeled  $H_2$  of series  $B_D$  in measures 34-35.

Fig. 2.24 Set class (0124),  $H_1$  and  $H_2$  of series  $B_D$  in mm. 33-35.

In mm. 34-35 violin II plays the  $H_1$  of series  $B_D$  rotated to start on B4 (third note of m. 34). Using the same rhythm, the viola plays the rotated  $H_1$  of series  $B_D$  transposed by  $T_{10}$  and the cello is the same hexachord transposed by  $T_3$ . With this procedure Carvalho produced a chordal passage in which the chords belong to set class 4-22 (0247) and 4-13 (0136), as demonstrated in Figure 2.25.

Violin II	B	A $\flat$	F $\sharp$	E	D	C	$H_1$ of series $B_D$ rot. B $\rightarrow$ $T_{10}$ $T_3$
Viola	A	F $\sharp$	E	D	C	B $\flat$	
Cello	D	B	A	G	F	E $\flat$	
Bass	G	F	E $\flat$	D $\flat$	B $\flat$	A	$H_2$ of series $B_D$
	↓	↓	↓	↓	↓	↓	
	(0247)		(0136)		(0247)	(0136)	

Fig. 2.25 Set classes on mm. 34-35

### Section 2 – Subsection c) mm. 36-46

As in other subsections, the twelve pitch classes are stacked at the beginning of subsection 2c, sharply changing the texture from the last subsection. The syncopated rhythm is applied once again in the strings, but this time the rhythm is divided among the string sections. The resultant rhythm of the strings is depicted in Figure 2.26 below.

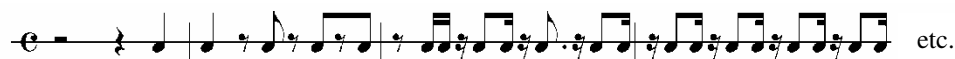


Fig. 2.26 Resultant rhythm of the strings on mm. 37-42

In mm. 39-41 series A and B are superimposed in their prime orderings for the first time in the piece. The cello plays  $P_1(A)$  and the viola plays  $P_{11}(B)$ , with its original rhythm diminished to accommodate series B in the same duration as that of series A. After the last note of series A is played by the cello on m. 41 (the high C), a conversation ensues among the cello, violin I, and bass. Violin I replies to the cello by playing the  $H_1$  of series  $B_D$  followed by the two first notes of  $H_2$  of series  $B_D$  (G-F). The cello then plays the  $H_2$  of series  $B_D$  in retrograde, and finally the bass plays the  $H_1$  of series  $B_D$ , ending with a triplet played together with the cello on notes E and D of  $R_0(B_D)$ . These two notes (E and D) have already been anticipated by violin I. The dialogue culminates with a *tutti* in *sforzatissimo* in which the notes of the series are divided among the strings.

In the *tutti*, the percussion has an instruction to play “with all instruments” in an overall diminuendo from *fortisissimo* to *pianisissimo*. Beginning with xylophone C6 and D6 in m. 42, a rotated form of  $H_1$  of series  $B_D$  continues with the first note of  $H_1$  of series  $B_D$  and then with the sixth note (D6) in a triplet figure again in *tutti*. The xylophone in this passage brings to mind the xylophone in Bartók’s *Music for Strings, Percussion and Celesta*. In mm. 44-45, the xylophone again makes the connection to note B5, the second note of  $H_1$  of series  $B_D$ ; however, the serial development is momentarily suspended by a percussion solo passage. After the roll on note C5 on the xylophone in m. 45, Carvalho pasted another extraction of the cadenza from bars 26”-52.” This passage contrasts greatly in its rhythmic activity; the beginning and ending of the passage has maximal activity while the middle has a minimum of activity.

Carvalho wrote in his own hand a note for tam-tam at the end of the passage preceding the conclusion of the phrase suspended in the xylophone at the beginning of

the measure. The triplet played in *tutti*, which includes notes C and B (the first two notes of series B<sub>D</sub>), is followed by the complement of series B<sub>D</sub> [A<sup>b</sup>-F<sup>#</sup>-E-D-G-F-E<sup>b</sup>-D<sup>b</sup>-B<sup>b</sup>-A] stacked top down in all strings.

On m. 46 Carvalho pasted an extraction from bars 53"-82" of the cadenza into the score. This passage has four sections with more rhythmic activity that alternates with *glissandi* on the suspended cymbal and timpani. Since the material is the same as that found in the cadenza, a more detailed discussion is presented in the analysis of the cadenza.

#### *Section 2 – Subsection d) mm. 46-49*

In the last subsection of section 2, the ensemble is divided into three parts. The first part, which is comprised of violin II, viola, and cello, uses the H<sub>1</sub> of series B<sub>D</sub> in retrograde ordering as material. Under the same rhythm, they are displaced as a six-part canon with entrances a quarter-note apart. The second part is played by violin I, which uses the same H<sub>1</sub> of series B<sub>D</sub> in retrograde ordering but with rhythm based on triplets and a slower melodic movement. The third part is played by the bass which, in opposition to violin I, has a descending line using the H<sub>1</sub> of series B<sub>D</sub>. In m. 48 Carvalho employed set class 4-2 (0124) to link the H<sub>1</sub> e H<sub>2</sub> of series B<sub>D</sub>. The passage ends on the first beat of m. 49 with H<sub>1</sub> of series B<sub>D</sub> stacked in all strings (see Figure 2.27).

The musical score for Section 2 – subsection d, mm. 47-48, is presented in five staves. The top staff, Violin I, is titled "H<sub>1</sub> of R<sub>0</sub>(B<sub>D</sub>)" and features a melodic line with triplets and slurs. The second staff, Violin II, is titled "H<sub>1</sub> of R<sub>0</sub>(B<sub>D</sub>) rotated starting on F<sup>#</sup>" and includes a "Divisi a 3" instruction. The Viola and Cello staves provide harmonic support with sustained notes and some melodic movement. The Bass staff is divided into three distinct sections: "H<sub>1</sub> of P<sub>0</sub>(B<sub>D</sub>)", "(0124)", and "first tetrachord of H<sub>2</sub> of P<sub>0</sub>(B<sub>D</sub>)". The score is in 3/4 time and includes various musical notations such as triplets, slurs, and dynamic markings.

Fig. 2.27 Section 2 – subsection d, mm. 47-48

The last solo percussion passage in section 2 serves as a transition to section 3. Carvalho wrote in his own hand three attacks for large tam-tam, small tam-tam, and suspended cymbal, followed by the  $R_{11}(B)$  on the glockenspiel, which is replied by the vibraphone playing the  $P_{11}(B)$ . After this passage, Carvalho created a link to the next section by pasting an extraction from bars 105''-115'' of the cadenza with an addition in his own hand of three more bars with a single note on the bass drum for each bar. Note that Carvalho inserted a fourth bar in the first beat of m. 50, first measure of section 3.

*Section 3 – Subsection a) mm. 50-57*

In section 3 the tempo changes to  $\downarrow = 60$ . This change permitted Carvalho to utilize the graphic and proportional notation of the percussion part in accordance with the traditional notation of the strings. As each bar of the proportional notation is equal to one second, each bar corresponds to a quarter-note in the strings part.

Again, series A is stacked bottom up on the strings and the cello plays the  $H_1$  of series  $B_D$  two times before repeating the first three notes of  $H_1$  [C-B-A $\flat$ ] to link with the  $H_2$  of series  $B_D$  on m. 56. The rhythm employed is based on rhythm related to series A but augmented and inverted, much as Carvalho did before using the series  $B_D$  with the rhythm related to series B on mm. 22-24.

*Section 3 – Subsection b) mm. 57-68*

Subsection 3b is characterized by the use of the syncopated rhythm played by all strings using the twelve pitch classes stacked. Throughout the subsection the dynamic, which starts in *fortisissimo*, decreases to *pianisissimo*, and the instrumentation is reduced.

The percussion enters just as the dynamic in the strings arrives at *pianisissimo* in m. 61. In the percussion part, Carvalho pasted an extraction from bars 84”-104” followed by an extraction from bars 116”-120.” At this point on mm. 65-66, Carvalho wrote in a passage on the temple blocks based on bars 144”-148” of the cadenza. The strings playing *pianisissimo* give prominence to the subtlety of the amplified tam-tam played with cello bow and to the dialogue with simultaneous *glissandi* played in the talking drum and flexatone.

*Section 4 – Subsection a) mm. 69-98*

At the beginning of section 4 the tempo changes sharply to the double, contrasting with the calm atmosphere at the end of section 3. Section 4 is a twelve-part canon that runs throughout the subsection 4a involving all strings and the xylophone. Violin I (*divisi* 1) is the leading voice, Violin II (*divisi* 2) enters nine beats later, and from each nine beats another voice is added.

The material used is series B in its  $P_{11}$  and  $R_{11}$  orderings. Carvalho freely manipulated series B under rotation, permutation, and omission of its members. The first tetrachord of series A appears only once in the canon. Table 2.5 lists all of the variations that occur in the leading voice. (check also the Score with Row Chart in Part II)

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**Table 2.5 Leading Voice of the Canon on Section 4.a**

---

- 2<sup>nd</sup> beat of m. 69 to 3<sup>rd</sup> beat of m. 71 –  $P_{11}(B)$
- 4<sup>th</sup> beat of m. 71 to 2<sup>nd</sup> beat of m. 74 –  $R_{11}(B)$
- 2<sup>nd</sup> beat of m. 74 to 4<sup>th</sup> beat of m. 76 –  $H_2$  of  $P_{11}(B)$  followed by  $H_1$  of  $P_{11}(B)$
- 4<sup>th</sup> beat of m. 76 to 3<sup>rd</sup> beat of m. 79 –  $H_2$  of  $R_{11}(B)$  followed by  $H_1$  of  $R_{11}(B)$
- 3<sup>rd</sup> beat of m. 79 to 4<sup>th</sup> beat of m. 81 –  $P_{11}(B)$  rotated to start on G
- 1<sup>st</sup> beat of m. 82 to 1<sup>st</sup> beat of m. 85 – First tetrachord of  $P_1(A)$  superimposed with  $P_{11}(B)$  rotated to start on  $E\flat$ :

Series B rotated:  $\left[ t \ e \ 0 \ 1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \right]$

$D\flat-A-E\flat-F-B-C-E-F\sharp-G-A\flat-D-D\flat-A-B\flat$

First tetrachord  
 of series A

- 1<sup>st</sup> beat of m. 85 to 1<sup>st</sup> beat of m. 87 – Permutation of series B: e-0-2-3-4-5-7-8-9 with omission of members 1 and t

- 1<sup>st</sup> beat of m. 87 to 2<sup>nd</sup> beat of m. 89 – Permutation of series B: 9-e-0-1-3-4-6-8-t-2-5-7
  - 2<sup>nd</sup> beat of m. 89 to 3<sup>rd</sup> beat of m. 91 – Permutation of series B: t-0-1-4-5-7-8-9-e-2-3-6
  - 3<sup>rd</sup> beat of m. 91 to 4<sup>th</sup> beat of m. 93 – Permutation of series B: 1-2-4-5-6-8-9-0-3-7-e-t
  - 4<sup>th</sup> beat of m. 93 to 1<sup>st</sup> beat of m. 96 – Permutation of series B: 2-3-5-6-4-9-0-t-1-e-7-8
  - 1<sup>st</sup> beat of m. 96 to 2<sup>nd</sup> beat of m. 98 – Permutation of series B: 3-6-7-t-9-1-2-e-4-5-8-0
- 

Each phrase encompassing the series lasts 10 beats and the canonical entrances occur every 9 beats. By thus ordering the phrases, Carvalho obtained the sonority of the juxtaposition of the  $H_1$  on  $H_2$  of series B at the beginning of the canon, as shown in Figure 2.28. The rhythm on subsection 4a is derived from series B with small variations; a simple use of combinatoriality.

The musical score for Violin I, measures 69-74, is shown. It is in 4/4 time, marked 'Doppio Presto' with a tempo of 120. The first staff (Violin I) contains two phrases:  $P_{11}(B)$  from measure 69 to 73, and  $R_{11}(B)$  from measure 74 to 78. The second staff (Violin I) contains a phrase  $P_{11}(B)$  from measure 74 to 78. Dynamics include *ff* and *mf*. The score is marked 'Divisi a 4'.

Fig. 2.28 Canon on mm. 69-74

After m. 82, Carvalho started to freely change the ordering within the series of the leading voice. However, it seems that his choices regarding the changes are related to the

entrance of a new voice in the canon. One beat after the introduction of a new voice, the leading voice in violin I is changed to play the first notes of series B as if in response to the new voice, as Figure 2.29 demonstrates.

The figure shows a musical score for Violin I, Violin II, and Viola. The score is in 3/4 time and features a complex rhythmic pattern. The dynamics range from *pp* (pianissimo) to *ff* (fortissimo). Vertical dashed lines indicate the staggered entrances of the voices. Three specific musical phrases are highlighted with rectangular boxes: one in Violin I at measure 82, one in Violin II at measure 84, and one in Viola at measure 86. The Viola part is marked "Divisi a 2".

Fig. 2.29 Permutations of the leading voice of the canon - mm. 82-87

#### Section 4 – Subsection b) mm. 98-108

In subsection 4b, the twelve-part canon employs only the two first tetrachords of series B. The canonical entrances are one sixteenth-note apart. The music reaches its climax leading into the cadenza, which is linked with subsection 4b by a solo percussion passage written in Carvalho's own hand. The passage starts with the vibraphone playing

the  $P_{11}(B)$ , followed by its retrograde. Using an overall *diminuendo* until the last *pianisissimo* in the tam-tam Carvalho linked section 4 with the cadenza using the instrument that begins the cadenza.

#### *Cadenza – m. 109*

The alternation between the instruments with *glissandi* and undefined pitch is the basic compositional element of the cadenza. It creates a dialogue which serves to determine the subsections of the cadenza. Each subsection is characterized by its rhythmic activity, texture, and timbre. Timbre in this analysis is restricted to frequency and material. The cadenza has six subsections, which are described in the tables of rhythmic activity and timbre map below.

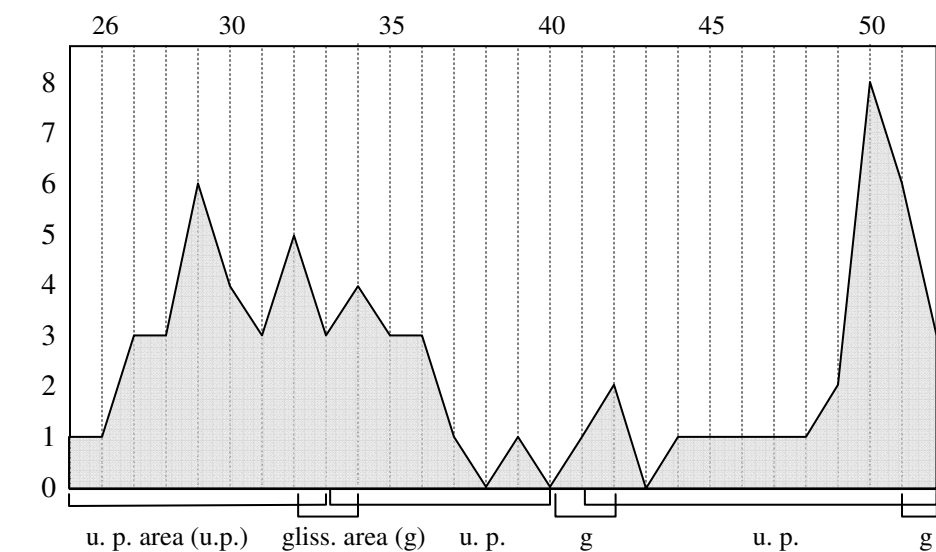
Since graphic and proportional notation does not allow a measurement based on the traditional rhythmic figures and subdivisions, the rhythmic activity is quantified based on what I will call *attacks*. For the analysis of the cadenza, an attack is considered to be the beginning of any distinct sonic event. In the case of the *glissandi*, a figure or gesture counts as one attack per bar, which also applies to the long notes on the tam-tam played by cello bow.

Regarding timbre, this study differentiates among instruments of metal, skin, and wood, as well as among the frequency areas mapped previously in Table 2.2. In the cadenza, percussion instruments with definite pitch, such as boo-bams and steel drum, are treated in the same way as those of undefined pitch. It should be noted that the cadenza has no indication of dynamic. The interpretation of the dynamic is discussed in the interpretative study in the following chapter.

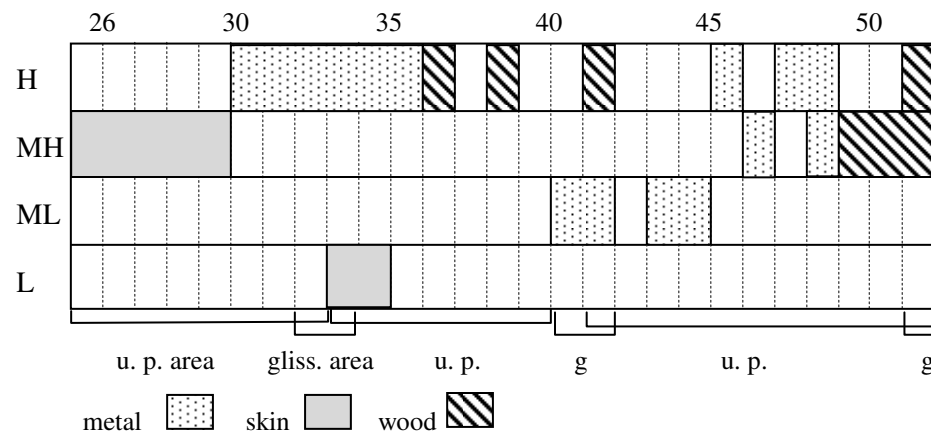


Lasting 27 seconds (bars 26''-52''), subsection b has three areas of undefined pitch delimited by short *glissandi* areas. The first area of undefined pitch (bars 26''-33''), which almost starts as an *accelerando* on the snare drum, has a regular rhythmic activity. In contrast, the second and third areas of undefined pitch have peaks of activity that contrast with silent bars. Until this point of the cadenza, the instruments are played in quasi-alternation, and there are few places where two categories of instruments are played simultaneously. As can be observed in Table 2.7.b, the high frequency area, with emphasis on the metal instruments, is the most frequently employed in this subsection.

**Table 2.7.a Rhythmic Activity of Subsection B – Bars 26''-52''**

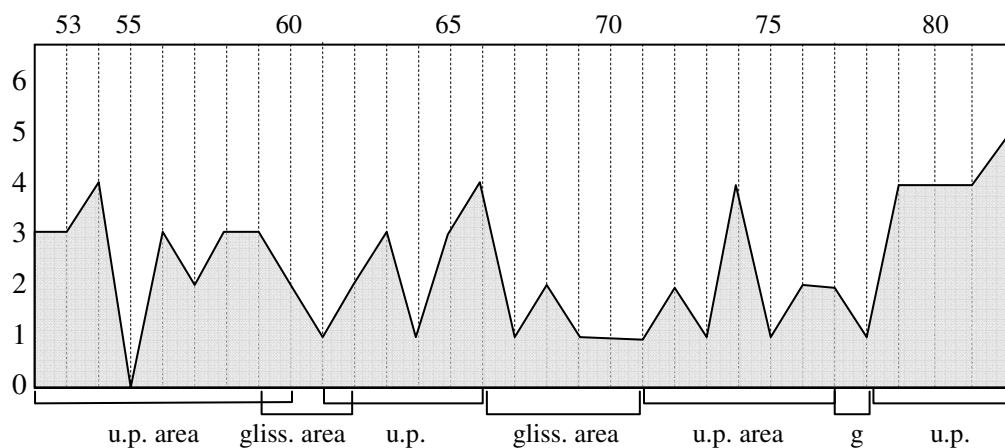


**Table 2.7.b Timbre Map of Subsection B – Bars 26”-52”**

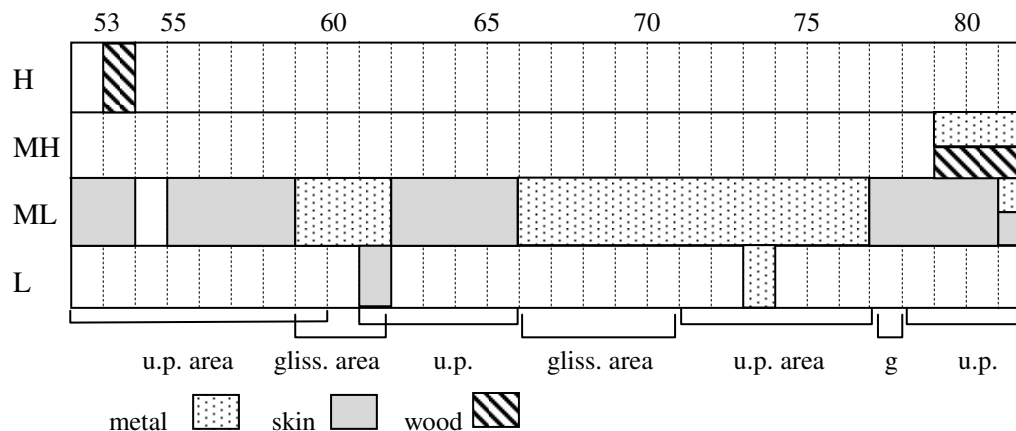


Subsection c (bars 53”-82”) has the most regular rhythmic activity in the cadenza, with 2.33 attacks per bar on average. Subsection c almost entirely utilizes medium low frequencies, with little use of single attacks in other frequency areas. At the end of bars 80”-82,” the texture changes, and, for the first time in the cadenza, instruments of all categories, including skin, wood, and metal, are superimposed, as Tables 2.8.a and 2.8.b show.

**Table 2.8.a Rhythmic Activity of Subsection C – Bars 53”-82”**



**Table 2.8.b Timbre Map of Subsection C – Bars 53”-82”**



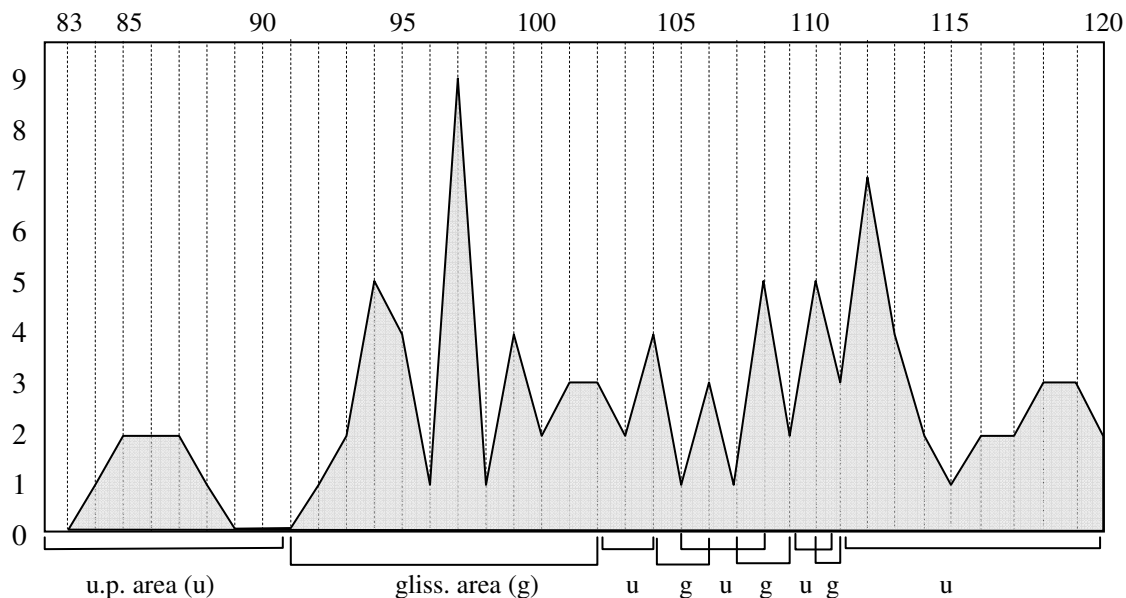
Subsection d, bars 83”-120,” begins similarly to the beginning of the cadenza, with four bars of tam-tam played by cello bow in dialogue with rolls on the tambourine, followed by a long *glissandi* area. This passage, bars 92”-102,” is the most active of the *glissandi* areas in the cadenza, and features a dialogue between a skin and metal instrument.

The last half of subsection d is characterized by the alternation between short areas of *glissandi* and undefined pitch and a change in timbre, which is emphasized in the wood instruments. Note that it is the only subsection in the cadenza without instruments from the low frequency area.

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**Table 2.9.a Rhythmic Activity of Subsection D – Bars 83''-120''**

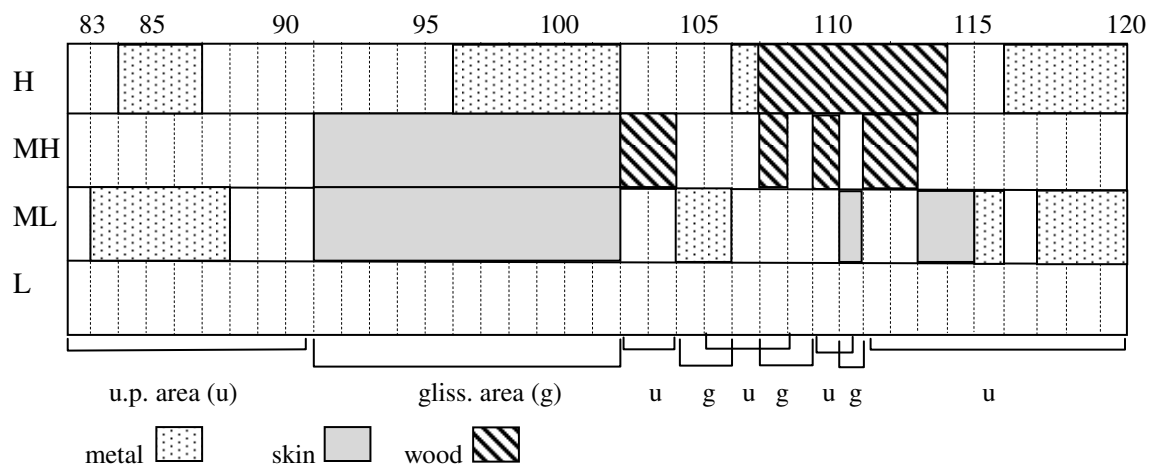

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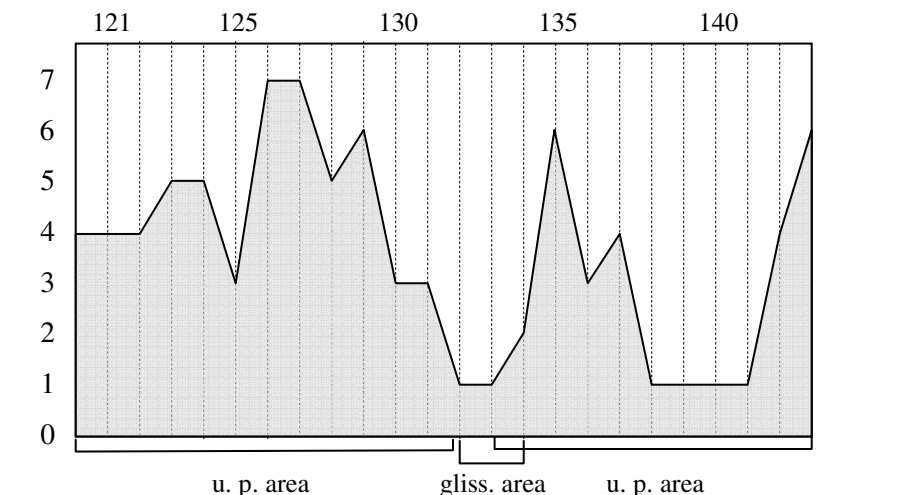
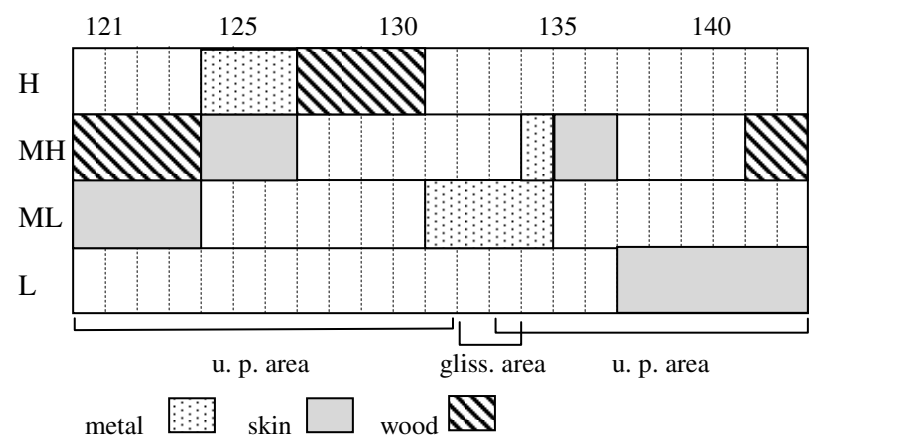

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**Table 2.9.b Timbre Map of Subsection D – Bars 83''-120''**


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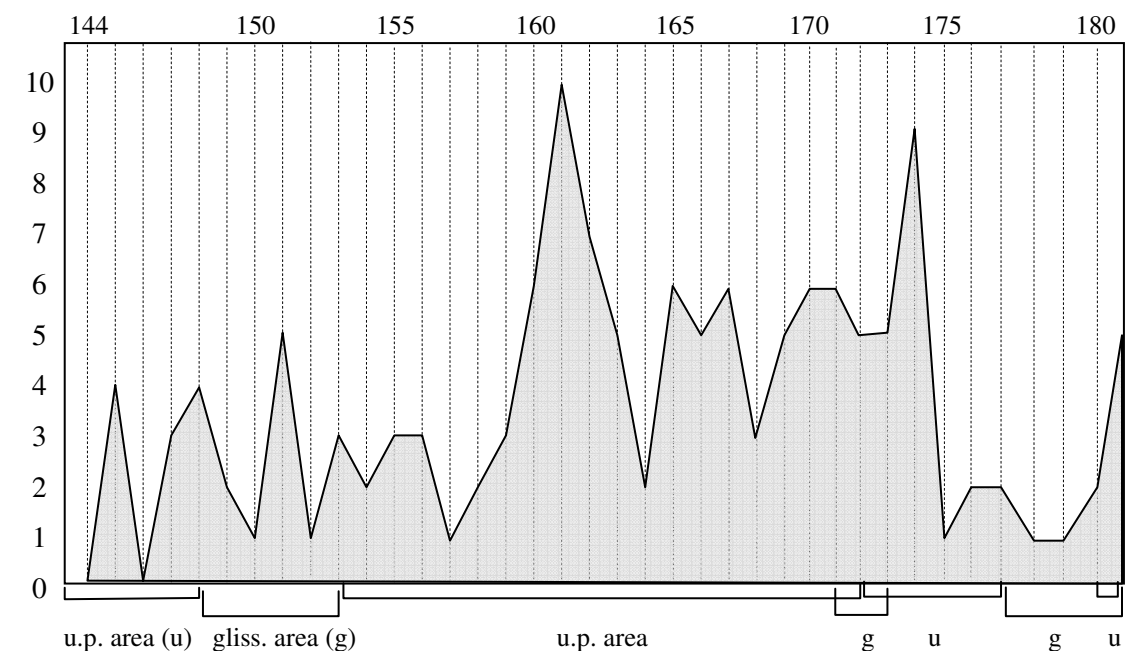
In subsection e, the rhythmic activity increases. There are two areas of undefined pitch, characterized by blocks with two distinct categories of superimposed instruments, such as instruments of skin and wood on bars 121''-124'' and 142''-143'' and instruments of skin and metal on bars 125''-127.''

**Table 2.10.a Rhythmic Activity of Subsection E – Bars 121”-143”****Table 2.10.b Timbre Map of Subsection E – Bars 121”-143”**

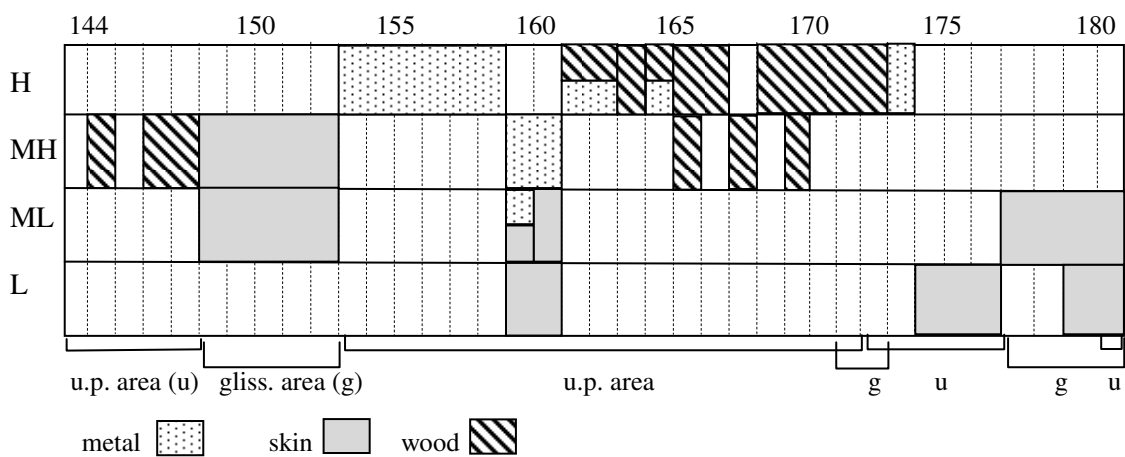
The peaks of rhythmic activity of the cadenza occur in subsection f. This subsection has three parts, the first of which, bars 144”-153,” comprises an area of undefined pitch and an area of *glissandi* in which the rhythmic activity is uniform. The second part, bars 154”-174,” is the peak of rhythmic activity of the cadenza. The texture and variation of timbre change drastically with the superimposition of different categories of instruments, with emphasis on wood instruments from the high frequency area. In the

third part, O'Donnell employed only skin instruments with a minimum of rhythmic activity, similar to those employed at the beginning of the cadenza. The cadenza ends with a dialogue between *glissandi* and undefined pitch instruments at the last bar.

**Table 2.11.a Rhythmic Activity of Subsection F – Bars 144”-181”**



**Table 2.11.b Timbre Map of Subsection F – Bars 144”-181”**



By comparing the six subsections of the cadenza, it is possible to see the differences in rhythmic activity and timbre among them. In general, the little rhythmic activity generated in the first four subsections increases during the last two subsections, as Table 2.12 shows. However, this rate is just 3.60 attacks per bar in the subsection which has the apex of rhythmic activity.

With exception of subsection d, which does not include any instrument from the low frequency area, all of the subsections use a collection of instruments covering a large range of frequencies. Subsections e and f have more equilibrium among the categories of instruments and among the variety of frequency areas. It should be noted that the instruments of wood are employed less frequently during the cadenza.

**Table 2.12 Comparison of the Subsections of the Cadanza**

				<b>3.60</b>	<b>3.60</b>	
<b>4</b>						
	<b>2.32</b>	<b>2.48</b>	<b>2.33</b>			
<b>3</b>						
<b>2</b>	H- 7.5% MH- 38.5% ML- 46.5% L- 7.5%	H- 44.5% MH- 34.5% ML- 14% L- 7%	H- 3% MH- 8.5% ML- 83% L- 5.5%	H- 33% MH- 27% ML- 40% L- 0%	H- 21% MH- 36.5% ML- 24.5% L- 18%	H- 37% MH- 26.5% ML- 22.5% L- 14%
<b>1</b>	Metal- 38% Wood- 13% Skin- 48.5%	Metal- 52% Wood- 24% Skin- 24%	Metal- 48.5% Wood- 10% Skin- 41.5%	Metal- 40% Wood- 20% Skin- 40%	Metal- 25% Wood- 30% Skin- 45%	Metal- 24.5% Wood- 32% Skin- 43.5%
	<b>a</b>	<b>b</b>	<b>c</b>	<b>d</b>	<b>e</b>	<b>f</b>

*Section 5 – Subsection a) mm. 110-120*

After the cadenza, section 5 begins, as the tempo changes to  $\downarrow = 80$  there, Carvalho makes use of many different orderings of the two series. In m. 110, the cello plays its signature  $P_1(A)$ , followed by the retrograde. The rhythm of these two statements is augmented in relation to the original rhythm of series A in mm.4-5. Using the same augmented rhythm, the bass plays the  $P_1(A)$  superimposed by the  $R_1(A)$  played by the cello in mm. 113-115, creating a palindrome with the two voices. In mm. 115-117, the violin II plays the  $P_0(B)$ , ending with *ponticello* on note  $F^\sharp$ . The same occurs in violin I in mm. 118-120.

As Figure 2.30 shows, the viola plays the  $H_2$  of the  $R_3(A)$  in m. 116, followed by the  $H_1$  of the  $R_3(A)$ , which, at the end of the exposition of the hexachord, repeats its fifth member to end on  $F^\sharp$ . The cello plays  $H_1$  of  $P_0(A)$  starting at the eighth note before m. 116, followed by  $H_2$  and  $H_1$  of  $R_3(A)$ , which repeats its fifth member to end with  $F^\sharp$  in *ponticello*, as the viola did earlier. The bass plays the  $R_8(A)$ , sharing the first note of the series with the cello and viola, as shown in Figure 2.30. Carvalho manipulated all of the series in this passage to reach note  $F^\sharp$  at the end of subsection 5a.



an interval class 6 from F $\sharp$ . The *divisi* in the strings are in open fifths until m. 128, where all twelve pitch classes are stacked. From there, each voice maintains the same note, performing a written-out *rallentando* that is displaced among the voices.

*Section 5 – Subsection c) mm. 134-140*

The last subsection of the piece starts with a rhythmic variation maintaining the same notes previously stacked, thus basically using eight different rhythms superimposed on mm. 134-136. All of the variations are depicted in Figure 2.31.

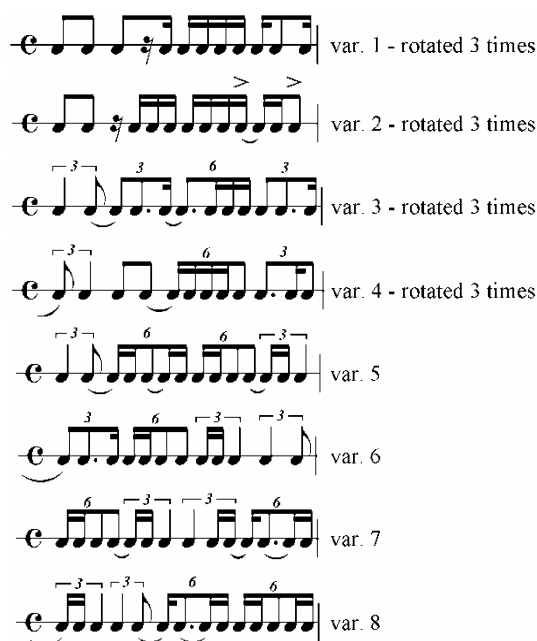


Fig. 2.31 Rhythmic variations on m. 134

With an overall *diminuendo* to *pianisissimo*, the strings cease their rhythmic activity and sustain a long note, establishing a kind of curtain of sound as background to the last and longest percussion solo passage of the piece, in which Carvalho used the last

61 seconds of the cadenza (extraction from bars 121''-181''). The piece ends with the vibraphone playing the first tetrachord of series B [B-C-E-F $\sharp$ ] from set class (0124).

### Synthesis and Conclusion

In *Variations on Two Rows for Percussion and Strings*, Carvalho utilized two distinct materials to compose the work: the dodecaphonic technique and the manipulation of the material comprised in the *cadenza* written by O'Donnell.

In relation to the first material, Carvalho used few dodecaphonic operations on the two series during the piece. From series A, he mainly employed the prime ( $P_1$ ) and retrograde ( $R_1$ ) orderings, and only once used other forms such as  $R_6$ ,  $P_6$ ,  $R_3$ ,  $R_8$ , and  $P_0$ . The same occurs with series B in which, besides its prime ( $P_{11}$ ) and retrograde ( $R_{11}$ ) forms, he employed  $P_0$  only once. Others operations generated under free operation by Carvalho are related to series B, such as the derived row (series  $B_D$ ), the fragment of series B, set class 4-2 (0124), obtained under transposition  $T_4$ , and the permutations and rotations performed in 12-part canon.

Concerning Carvalho's manipulation of the percussion in the piece, a feasible hypothesis is that he did not expect to receive a cadenza from O'Donnell that included definite pitch percussion instruments. In examining the manuscript, it becomes clear that, for the beginning of the piece, Carvalho used the cadenza written by O'Donnell as the basis but in his own handwriting, and for which he created slight modifications. Carvalho's alterations of the pitched material of the cadenza, shows that, at first, he tried

to change the original content of the cadenza as little as possible to remain in accord with the dodecaphonic context of the piece. However, shortly after, he “gave up” trying to alter the pitch material of the cadenza and literally started to cut and paste extractions of the cadenza into the score. That is, he started to consider these elements as undefined pitch percussion instruments. Another factor that reinforces this hypothesis is that when Carvalho used pitch material in the percussion, he always utilized the instruments that he had added to O’Donnell’s original set-up, including marimba, xylophone, vibraphone, and glockenspiel, never the boo-bams or steel drum.

This unique composition process, which began with a cadenza written by a performer that was then superimposed onto another piece, leads me to ponder the level of collaboration this piece should be considered to have, as Carvalho employed all of the material from the cadenza in his piece. Should this piece be considered a composition by Carvalho *and* O’Donnell? When I posed this question to O’Donnell, he confidently asserted, “He [Carvalho] asked me to write the cadenza... The original concept to do the piece is his...It is his piece. I thought that was a gesture of friendship of our conductor/performer relationship. I did what he asked me to do, with the greatest effort I can bring to it, with the best I can do. And then, he made something else, he crafted the piece.”<sup>90</sup>

A great part of the sonority of the work is related to the twelve pitch classes stacked in the strings. This aspect appears in basically three ways during the piece: (1) stacking in long notes that serve as a curtain of sound or background on which statements of the series are played, in general, by single voices; (2) reinforcing attacks in *tutti*; and

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<sup>90</sup> Richard O’Donnell, interview with the author, St. Louis, MO, 5 June 2007.

(3) performing syncopated rhythms in passages with all strings together as well as with the rhythm displaced among the string sections. Other important sonorities in the piece are the numerous passages of solo percussion and sections with polyphonic texture which are related to the manipulation of the material from series B and in which, outside the 12-part canon section, percussion instruments are not included. The characteristics of the cadenza are the contrasts between glissando areas and undefined pitch areas, along with the great variation of timbre.

Regarding rhythm, Carvalho linked each major element of pitch material with specific rhythmic characteristics. Series A is related to the rhythm of a written-out *rallentando*, series B is related to the rhythmic figure of its first tetrachord, and series B<sub>D</sub> is related to regular rhythmic activity. Carvalho varied these elements in only a few ways, including augmentation, diminution, retrogradation, and suppression of the original rhythmic cells and its inversions. Other interesting rhythmic procedures Carvalho employed were the rhythmic palindrome and the procedure to accommodate the metric of the traditional notation with the graphic and proportional notation, as occurs in the proportion 7:5 at the beginning of the piece and in section 3.

In general, the piece neither poses performance challenges for the strings nor presents any major innovations. The form of the work, even though includes free variations, is fairly standard. It is possible to identify the beginning as an exposition of the prime forms of the rows, sections strongly related with rhythmic *ostinato*, as section 2 with the Bossa Nova, changing in density and tempo, and the insertion of a canon, the preferred imitative technique by the composers of the Second Viennese School, by whom Carvalho was much influenced.

## CHAPTER 3

### Interpretative study

#### *Preliminary Notes*

This interpretative study discusses performance issues for the soloist that arise from the technical and expressive demands of the music and presents solutions to those problems. Prior to embarking on the interpretative study, it is necessary to discuss two performance-related elements: the percussion set-up and the four-mallet grip.

In multiple percussion pieces such as Carvalho's concerto, the set-up of the percussion instruments is all-important. Achieving an optimal set-up is an experimental process, and the percussionist should study the problematic sections of the performance as well as consider the global structure of the piece. Issues relating to the physical space between the instruments as well as the need for smooth transition between them must be examined carefully. Another aspect is the reduction of unnecessary movements, which would make the performance distracting to the audience and stressful to the performer.

The Scottish percussionist Evelyn Glennie, one of the most active soloists in recent years, said about her preparation to perform a multiple percussion piece:

I quite literally begin by looking at the score... If it's a multi piece, I begin by drawing different types of setups, although a lot of changing is done once I start performing the piece in concert. Experimenting is very important. Also, the eye can actually see a lot of mechanical details—the physical details of playing where there could be awkward spots and things like that. Once I've sorted those out, I'm

not stumbling over myself when I actually go to my instrument. I am prepared for those little corners, and they're not so scary anymore.<sup>91</sup>

Figure 3.1 shows the percussion set-up suggested by the author as solution to issues related to the physical space. All movements and techniques described in this chapter are based on this set-up.

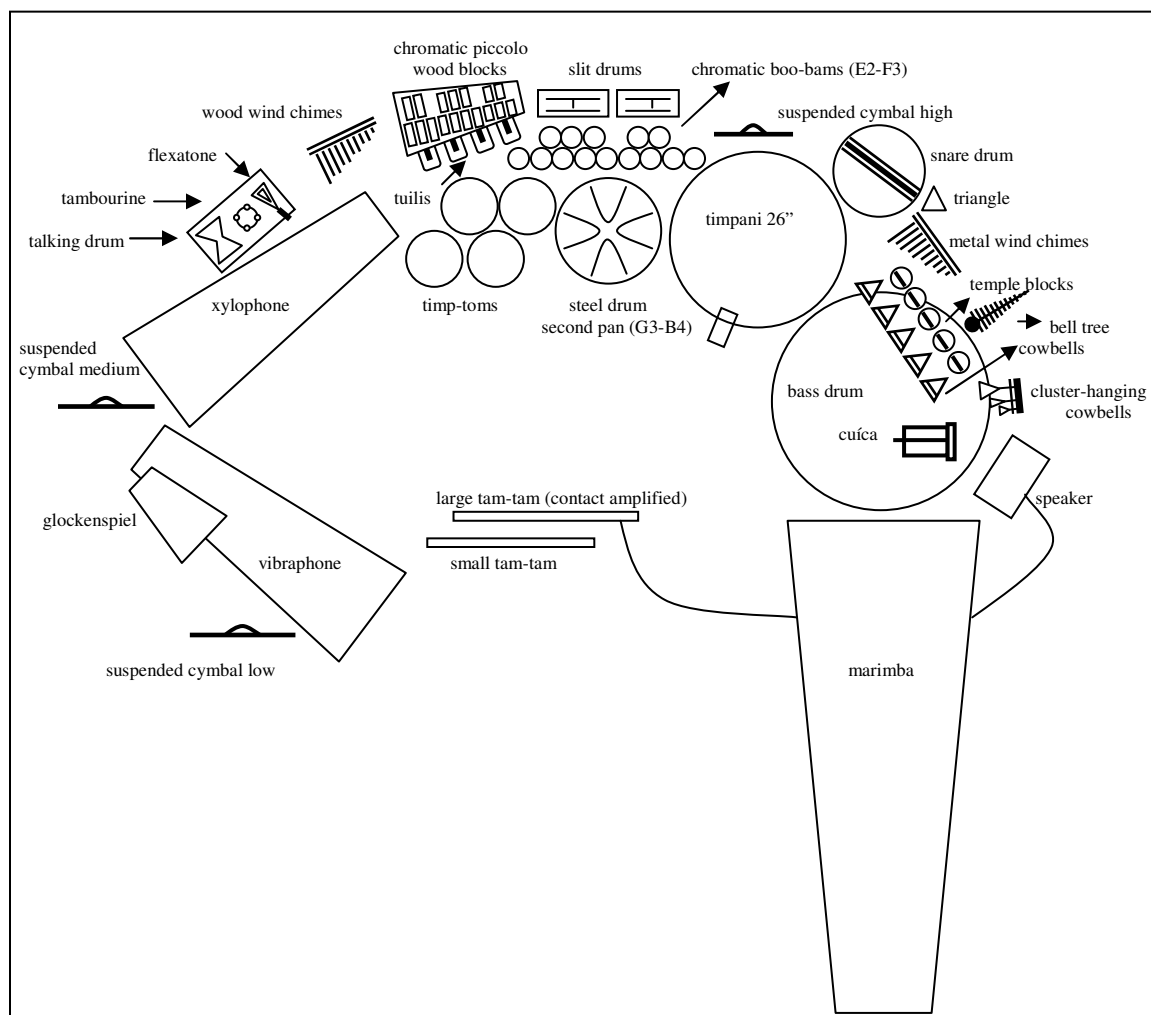


Fig. 3.1 Percussion set-up suggested by the author

<sup>91</sup> Lauren V. Weiss, "Evelyn Glennie," *Percussive Notes* 40, No.2 (April 2002:12-9).

Figure 3.2 (mm. 14-18) demonstrates the utility of this set-up. Note that the timpani and suspended cymbal must be physically close in mm. 14-17. The thirty-second note passage in m. 18 employs another micro-set consisting of steel drum, boo-bams, slit drums and suspended cymbal. Note that in these measures all of these instruments are in close proximity as shown on the top of Figure 3.1.

Fig. 3.2 Carvalho, *Variations on Two Rows for Percussion and Strings*, percussion part - mm. 14-18

The second performance-related element is the four-mallet grip. The author suggests the use of two mallets in some parts and four mallets in others to provide a technical solution to certain passages. When four-mallet playing is recommended, sticking and mallet positions are based on the grip developed by Leigh Howard Stevens.<sup>92</sup> In the following study, the mallets (or beaters) are numbered to indicate right and left hand and will follow the numbers indicated in Figure 3.3. Mallets 1 and 4 are known as the “outside mallets,” mallets 2 and 3 are known as the “inside mallets.” Figure 3.2 above utilizes this mallet numbering system suggested by the author.

<sup>92</sup> Leigh Howard Stevens, *Method of Movement for Marimba* (New York: Marimba Productions, 1979).

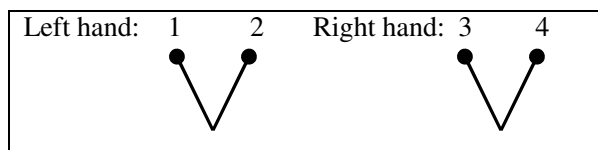


Fig. 3.3 Mallet numbers in the four-mallet grip

The interpretative study below follows the form of the piece.

### *Introduction*

The Introduction consists of a solo passage that lasts twenty-one and a half seconds, and is divided into two parts. There are two specific issues to address: the interpretation of the rhythms in the graphic notation and the use of the amplified tam-tam.

The composer's graphic notation utilizes a time-scale grid in which each unit is delimited by vertical lines that mark out one-second intervals. The space between adjacent vertical lines will be referred to here as "bars," which are not to be confused with "measures" in a conventional sense. Figure 3.4 shows the beginning of m. 1, the first eleven seconds of the piece.

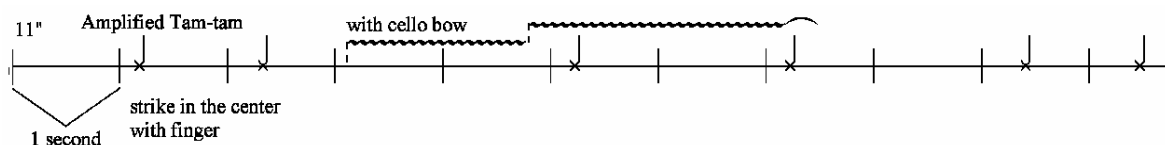


Fig. 3.4 Carvalho, *Variations on Two Rows for Percussion and Strings*, m. 1 – first part

Carvalho's notation here is similar to that of Stockhausen's *Zyklus No. 9*,<sup>93</sup> where graphic notation is used in conjunction with conventional signs. The composer sometimes

<sup>93</sup> Michael B. Williams, "Stockhausen: Nr. 9 Zyklus," *Percussive Notes* 39, No. 3 (June 2001): 60-7.

employs standard rhythmic figures, such as quarter and eighth notes, but the performance of the rhythms must accord with the graphic placement of the notes within the bars rather than with their conventional values. The performer must realize the sounds temporally, observing their relative graphic positions.

In Figure 3.5 (m. 10), for instance, the point of the attack of the note in the second bar will be, according with the time-space grid, slightly later than the placement of the note in the first bar. These small differences must be accurately reflected in the rhythmic performance. The fact that these differences are only indicated graphically allows the soloist a certain amount of freedom within an organized framework. Therefore the author advises not transcribing these patterns into standard rhythmic notation; for instance, do not convert into the standard rhythms shown on the bottom of Figure 3.5; doing so will eliminate the element of indeterminacy that is critical for the composer's conception of the piece. This notation, "meticulous in imprecision," using Boulez's words,<sup>94</sup> will very likely produce rhythms that will not be performed twice in the same way. The length of the sounds are completely determined by the decay of the instrument itself; short durations for dry instruments such as wood blocks, and long durations for resonant instruments such as cymbals.

Figure 3.5 consists of two musical staves. The top staff is a graphic notation where notes are placed at specific horizontal positions on a staff to indicate timing. Labels above the staff include ".Bass Drum triangle beater", "6 inch center", "near rim", "Temple Blocks", and "soft yarn mallets". The bottom staff is a standard rhythmic notation, labeled "conversion not recommended:", showing the same notes converted into standard musical symbols like quarter notes, eighth notes, and triplets.

Fig. 3.5 Carvalho, *Variations on Two Rows for Percussion and Strings*, m. 10

<sup>94</sup> Pierre Boulez, "Alea," *Perspectives of New Music* 3, no. 1 (Autumn-Winter, 1964): 44.



on the surface of instrument for the placement of the microphone. The author suggests that it be placed mid-way between the edge and the center of the instrument. Although Carvalho's asked for a dynamic of *mezzo-forte* from the tam-tam, it must be played instead with a dynamic between *piano* and *pianissimo*; the volume is then increased by the amplifier to *mezzo-forte*. This procedure will prevent distortions and audio feedback generally produced when an amplified tam-tam is played louder than *piano*.

The amplified tam-tam needs to yield two distinct harmonics as indicated in Figure 3.4. Bowing the tam-tam ordinarily projects its lower harmonics only. In order to obtain higher harmonics, the author suggests that the percussionist bow with one hand and touch the edge of the tam-tam with one finger of the other hand. The pressure of the finger will determine the pitch of the harmonic; the greater pressure the higher the pitch.

These two issues will pose similar problems later in the piece as well. The graphic notation occupies 17% of the percussion part and the amplified tam-tam is called upon five more times. In all cases these can be solved by the suggestions presented above.

### *Section 1*

In the beginning of section 1, the score indicates that the percussionist must repeat the phrase until the conductor's signal at m. 8, as the orchestra has a different pulsation in relation to the soloist. The orchestra plays in  $\text{♩} = 48$  and the soloist in  $\text{♩} = 240$ , that is, in the rhythmic proportion 7:5, as explained in the analysis. The author suggests that the performer use the  $R_{11}(B)$  played by the Violin I solo on mm. 6-7 as a cue. This will provide the percussionist an opportunity to execute a gradual *decrescendo* in m. 7. The

author recommends that the soloist end with the seventh note of its row (note D) just after the last note of the Violin I solo (note C $\sharp$ ) to be in accordance with the proportion 7:5.

One of the challenges of this piece is the constant changing of mallets, sticks, and beaters throughout the work. O'Donnell utilized the following mallets or beaters in the cadenza: snare drum sticks, xylophone wood sticks, soft timpani mallets, hard steel drum beaters, brushes, soft yarn mallets, medium hard yarn, hard yarn mallets, rubber mallets, a triangle beater, metal mallets, a beater/brush (nylon bristles taped at the end).

O'Donnell also utilizes a chain (to be described later), and a cello bow. In addition, the list of mallets and strikers includes mallets for the instruments added by Carvalho, such as marimba, vibraphone, glockenspiel, and xylophone.

In m. 10, as the percussionist does not have time to change mallets, the author suggests the following four-mallet grip and distribution: position 2 and 3 with hard yarn mallets and position 4 with a triangle beater.

Another problem for the soloist is the absence of dynamic annotation; in fact, the cadenza does not include dynamic markings anywhere. Dynamics have to be considered on two levels in this piece. The first level is related to the dynamic balance among the diverse instruments of the set-up. The dynamic may be used to unify the set, ensuring that the set sounds like a single instrument rather than a collection of different ones. The second level involves the relation of the percussion part within the ensemble.

In m. 10, the dynamic should be as well matched as possible in the bass drum and temple blocks and should follow the dynamic of *mezzo-forte* of the cello solo and violin I solo, which are playing series B. At the end of m. 10, the dynamic should be at a level that allows one to hear the entrance of the violin I solo playing the first note of R<sub>11</sub> (B).

In m. 13, Carvalho calls for the steel drum to be played by friction—a very different technique for the instrument at that time. The technique entails creating friction on the steel drum with fingers covered by soft rubber finger tips. As the finger tips will be employed in some passages of the piece and there is no time to remove them between passages, the author suggests that the tips remain on the middle fingers of both hands from the beginning of the piece. The middle finger is the ideal choice, as it will be able to play freely even if two mallets are held in one hand, as is the case in the passage that follows the playing of the steel drum by friction, which employs a timpani and a micro-set consisting of slit drum, steel drum, and boo-bams. The author suggests the following mallet distribution and grip in this passage: position 1 with soft yarn mallet; positions 2 and 3 with hard steel drum beater; and position 4 with timpani mallet. The suggested sticking is shown in Figure 3.7.

The figure shows a musical score for the percussion part of 'Variations on Two Rows for Percussion and Strings' by Carvalho, measures 13-15. The score is written on five staves. The first staff is for the Steel Drum, marked '6" friction'. The second staff is for the Slit Drum, marked '1" Timpani'. The third staff is for the Steel Drum, marked '4" soft yarn mallets'. The fourth staff is for the Boo-bams. The fifth staff is for the Suspended Cymbal, marked '1/4 Susp. Cymbal with timpani sticks'. The score includes various rhythmic notations, including eighth and sixteenth notes, and rests. Dynamic markings include *p* and *ff*. The sticking is indicated by numbers 1, 2, 3, and 4 above the notes.

Fig. 3.7 Carvalho, *Variations on Two Rows for Percussion and Strings*, percussion part - mm. 13-15

In Figure 3.7, for the first note in m. 14, the suspended cymbal has to be played with the timpani mallet in position 4 and begins the roll with one hand, while the left hand will change from the soft yarn mallet to the timpani mallet in position 1, which will join the rolls for the *crescendo*. This mallet configuration should continue until the third beat of m. 20. The sticking of this passage was previously described in conjunction with

Figure 3.2. On the third beat of m. 20, there is another mallet change; this time, four mallets are exchanged for two xylophone mallets.

Out of the various options for interpreting the vibraphone solo passage in m. 28, I believe that two are most coherent. First, as Carvalho used a slur over all notes in the passage, the percussionist can simply play all notes *forte*, depressing the pedal throughout the passage, and the result will be the sound of twelve-notes together. In addition, the use of a hard mallet in position 4 gives emphasis to interval class 1.

## Section 2

To perform the required rhythm of bossa nova in mm. 30-31, it is good to keep in mind that bossa nova is a Brazilian popular music style characterized by reduction and to be less percussive. Entirely different than the samba, which is centered around a multitude of percussion instruments, the bossa nova typically uses guitar and voice. When the drum set is used, it is played very discretely.

As shown in Figure 3.8, the percussionist should play the thirty second-notes on the snare drum with brushes in one hand, and with another hand play the basic rhythmic cell of the bossa nova with the snare drum stick crossed on the rim of the snare drum.

Avoid the use of low register instruments as they will evoke the traditional samba style.

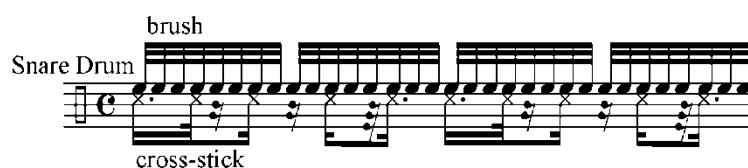


Fig. 3.8 Rhythm of the Bossa Nova on mm. 30-31

In m. 32, the material, which was already presented at the beginning of the introduction, can be played here in a different dynamic. In bars 8"-12" of m. 32, use a single mallet in each hand: the left hand holds a snare drum stick, and the right hand, after releasing the cello bow, holds a soft timpani mallet. In bars 14-16, the *cuíca* (which has to be mounted fixed and upside down) demands that the percussionist release the mallets and play with the right hand creating friction in the inner stick of the *cuíca* and with left hand pressing the head to make the *glissando*. This technique is specifically to the downwards *glissando* in which is necessary to use two hands. In the following bars, due to the dialogue with the *glissandi* of the bell tree, the *cuíca* must be played with one hand only.

To perform the upwards *glissando* in the *cuíca* with one hand, the percussionist has to press the inner stick of the *cuíca* in a slow movement. Little by little, the percussionist should diminish the tension on the inner stick and accelerate the movement, which will generate the upwards *glissando*. I play this dialogue as the climax of the dynamic in this passage for two reasons. First, I seek to make a distinction between undefined pitch and *glissandi* areas; second, this approach makes it easier to execute *glissando* with one hand, which is difficult to achieve in a dynamic *piano*.

The *cuíca* was the only traditional Brazilian instrument utilized by O'Donnell in the cadenza. In 1967, the Brazilian percussionist Aírto Moreira moved to the United States and began to play with musicians such as Cannonball Adderley, Lee Morgan, Paul Desmond, Joe Zawinul, and Miles Davis. Aírto used the *cuíca* regularly at this time, and Aírto's playing likely influenced O'Donnell.

A short transition from bar 20'' to 21'' in this passage forces the percussionist to play the steel drum phrase in bar 21''-22'' with the left hand only, while the right hand switches to the beater/brush to play the timpani. I recommend reducing the dynamic to *piano* to match the initial dynamic of the marimba on the last beat of m. 32.

At the next entrance of the percussion in mm. 42-43, Carvalho calls for all instruments to be played with a diminuendo from *fortisissimo* to *pianisissimo*. More important than using all the instruments of the set-up, I believe, is using the diverse intercalating instruments of metal, wood, and skin in all their frequency areas. The first note, played together with the attack on the strings, can be played by a low skin instrument with great resonance such as a bass drum or timpani, together with a metal instrument with a long sustain such as a suspended cymbal or large tam-tam.

From m. 42 up to bar 11'' of m. 45, the grip recommended is four-mallet, where positions 1 and 4 use soft yarn mallets and positions 2 and 3 use hard xylophone mallets. The mallets need to change in bars 12''-18'', when the right hand holds a beater/brush to make the *glissando* on the suspended cymbal. The percussionist has to bend a thin suspended cymbal against the ribs while striking it with the beater to obtain the desired *glissando*. Another mallet change occurs again on bars 19''-21'', where the right hand switches to the cello bow and the left hand to the wood mallets.

I suggest playing a *diminuendo* on the roll on the xylophone (C5) in m. 45, which will link to the soft playing with the finger tips on the snare drum on the first five bars of this passage. Note that covering the middle fingers of both hands with rubber finger tips is the best option, as it is not necessary to release the mallets to perform the snare drum

with them, as shown in Figure 3.9. Another suggestion is to add a *crescendo* in the last 6 bars of this passage to reach the *fortissimo* on the tam-tam.



Fig. 3.9 Mallet grip and rubber finger tips

The next percussion solo passage in m. 46 can be performed with just two mallets, with the exception of the last 4 bars, in which the same four-mallet grip and sticking used in m. 13 should be employed. I suggest maintaining the dynamic in *forte* throughout the passage up to the last 4 bars, where a *diminuendo* to *piano* is a good way to achieve a good balance with the strings on the third beat of m. 46. Note here that the chain is called for in bar 10", to be used on the bass drum. This device is made of five or six pieces of 16-inch metal chain with links of approximately one inch, which are taped on the end, as shown in Figure 3.10. The sound produced by the chain striking the bass drum is that of a big metal whip, and greatly resonant.



Fig. 3.10 Chain made by O'Donnell

The last percussion solo passage of section 2 in m. 49 uses the  $R_{11}(B)$  followed by the  $P_{11}(B)$ . In the initial part, I suggest the four-mallet grip where positions 1 and 4 use vibraphone cord mallets and positions 2 and 3 use hard xylophone mallets. There is a mallet change after the vibraphone phrase, in which one switches the vibraphone mallet to a triangle beater in position 4. I suggest not playing the freely rhythm indicated for glockenspiel and vibraphone in a regular rhythmic way, but in some form of a rhythmic palindrome to reflect the pitch palindrome between the  $R_{11}(B)$  and  $P_{11}(B)$ .

### *Section 3*

In section 3, the only technical challenge is found in mm. 63-65, in the dialogue between the talking drum and flexatone. The percussionist should place the talking drum under the left arm and use the pressure against the ribs to change the tension of the cords to obtain the glissando. At same time, the percussionist holds the flexatone in the left hand, changing the pitch with the fingers to obtain the glissando, while the right hand strikes the talking drum head with the beater. This passage demands great coordination, especially on beats 3 and 4 of m. 65.

### *Section 4*

In m. 94, the percussionist needs to switch to a four-mallet grip where positions 1 and 4 use vibraphone cord mallets and positions 2 and 3 use hard xylophone mallets,

because there is no time to change xylophone mallets to vibraphone mallets between mm. 101-102.

### *Cadenza*

All previous suggestions regarding technical problems and mallet-changing in the extractions of the cadenza can be applied in the cadenza. There are only two passages that were not employed in the music before the cadenza. The first section is from bars 121"-137". Begin with a four-mallet grip in which positions 1 and 4 use soft yarn mallets and positions 2 and 3 use hard xylophone mallets, changing on bar 131" to a four-mallet grip with positions 2 and 3 using rubber mallets and position 4 using a beater/brush. The second section is from bars 149"-181". The percussionist should use a hard xylophone mallet in the right hand and a brush in the left hand. The mallet changing occurs in bar 162", where the four-mallet grip should switch so that positions 2 and 3 hold metal beaters and positions 1 and 4 have hard xylophone mallets. As there is no time to change mallets between bars 174" and 175", the bass drum is played with a hard xylophone mallet in bar 175"; after that, the last mallet change occurs, in which the percussionist holds one soft timpani mallet in each hand up to the end of the cadenza.

The performer has two principal options in playing the cadenza. The cadenza can be played with the same interpretation previously given to the extractions during the piece, which I believe is unattractive to the audience, and also because my interpretation to these parts was related to what was happening in the strings. In the cadenza, my interpretation is concerned with two main issues: the differentiation between undefined pitch and *glissando* areas, and the macro-structure of the cadenza considering its 6

subsections and how they are developed in the analysis shown in the previous chapter. Thus, I treat undefined pitch areas with a lesser dynamic in contrast to the *glissandi* areas in the first 4 subsections of the cadenza. As the rhythmic activity increases in the last 2 subsections, I perform a gradual *crescendo* from bar 121” to bar 174” of the cadenza, followed by a *diminuendo* toward the end where the strings return in a dynamic *piano* on the next measure.

### *Section 5*

In the last section, I repeat the same interpretation given to the last 2 subsections of the cadenza, following the idea of O’Donnell, who thinks of this last passage as a remembrance of what just happened in the cadenza.<sup>95</sup> The piece ends with the vibraphone playing the main motive of the piece in a slow tempo. Although Carvalho did not write a slur over the four notes, my suggestion is to play the four notes with pedal on, and after the last F $\sharp$ , to damp the other notes softly using the hand instead the pedal from B down to E, leaving the F $\sharp$  with its natural decay.

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<sup>95</sup> Richard O’Donnell, interview with the author, St. Louis, MO, 5 June 2007.

**PART II**

Handwritten musical notation for Percussion and Strings, first system. The notation includes a circled 'A' at the beginning, followed by notes with stems. Annotations include 'STRIKE WITH FINGER' below the first notes, 'BOW' above a wavy line, 'WOOD STK' with a symbol above notes, and 'H. BR.' with an upward arrow above notes. A second staff below shows a wavy line.

*Variations on Two Rows for Percussion and Strings*

by Eleazar de Carvalho, 1968

Handwritten musical notation for Percussion and Strings, second system. The notation includes notes with stems and various annotations: 'H MAL' with a triangle symbol, 'W III' above notes, '44 SEC' above notes, 'CHAIN BOW' with an upward arrow, 'M III' above notes, and 'SOFT' below notes. A circled 'A' is also present.

Handwritten musical notation for Percussion and Strings, third system. The notation includes notes with stems and various annotations: 'O O O O' above notes, 'CHAIN OR BR' above notes, '1/2 H MAL' above notes, 'H MAL' above notes, 'CHAIN' below notes, '67 SEC' below notes, and 'RUB' above notes. A circled 'A' is also present.

Critical Edition by Fernando Hashimoto - full score

# Variations on Two Rows for Percussion and Strings

Eleazar de Carvalho, 1968

cadenza by Richard O'Donnell

Intro All strings *fermata* for 21.5 seconds

Violin I

Violin II

Viola

Percussion

Cello

Bass

11" Amplified Tam-tam  
1 second strike in the center with finger

with cello bow

Steel Drum  
hard mallets  
*ff*

Repeat three times with an overall *diminuendo* to *ppp*. Keep repeating after the orchestra begins to play until conductor's signal to stop.

**A** Lento  $\text{♩} = 96$

Violin I  
*Div. a 4*  
*p*

Violin II  
*Div. a 4*  
*p*

Viola  
*Div. a 2*  
*p*

Perc.  
 Keep repeating *ppp* the last 3 bars in the same speed as before

Cello  
*Div. a 2*  
*p*  
 solo  
*mf*

Bass  
*Div. a 2*  
*p*  
 arco >  
 pizz. >  
*sfz*

This musical score page, numbered 104, features six staves. The Violin I staff begins with a 'solo' marking and a dynamic range from *p* to *mf*. It includes an 8-measure rest and a triplet of eighth notes. The Violin II, Viola, and Bass staves provide harmonic support with sustained notes. The Percussion staff shows a 'morendo' dynamic and 'Percussion stops' indicated by slashes. The Cello staff has a 'solo' marking and a dynamic range from *p* to *mf*. The score is written in a key with one sharp (F#) and a 4/4 time signature.

Violin I

Violin II

Viola

Perc.

Cello

Bass

10

*solo*

*a tempo*

*mf*

6" center

near rim

Temple Blocks

soft yam mallets

Detailed description: This page of a musical score, numbered 105, features six staves. The Violin I staff begins at measure 10 with a melodic line marked 'solo' and 'a tempo', starting with a mezzo-forte (*mf*) dynamic. The Violin II, Viola, Cello, and Bass staves provide harmonic support with sustained chords. The Percussion staff includes instructions for a Bass Drum (triangle beater, 6" center, near rim) and Temple Blocks (soft yam mallets). The score is written in a key with one sharp (F#) and a common time signature.



This page of a musical score, numbered 107, contains six systems of staves. The first system is for Violin I, the second for Violin II, the third for Viola, the fourth for Percussion, the fifth for Cello, and the sixth for Bass. Each system begins with a measure number '17'. The Violin I and II parts are marked 'Tutti Div. a 3' and 'ff'. The Viola part is marked 'Div. a 2' and 'ff'. The Percussion part includes parts for Slit Drum, Susp. Cymbal, Steel Drum, and Boo-bams. The Cello and Bass parts are marked 'Div. a 2' and 'ff'. The score includes various musical notations such as dynamics, articulation marks, and performance instructions like 'pizz.' and 'ff'. The Percussion part features complex rhythmic patterns with sixteenth notes and sixteenth rests, some grouped with slurs and the number '6'. Vertical ellipses on the right side of the page indicate that the score continues on the following page.

Violin I

Violin II

Viola

Perc.

Cello

Bass

20

*tutti express.*

*f*

*arco*

*colla percus.*

*arco-div.*

*fff*

*pp*

*dim.*

Xylophone

14

6

*p*

*fff*

*colla percus.*

*arco*

*fff*

*pp*

*dim.*

*fff*

*pp*

*dim.*

*fff*

*pp*

*dim.*

Detailed description: This page of a musical score, numbered 108, features six staves. The Violin I staff begins at measure 20 with a rest, followed by a note marked *tutti express.* and *f*, with an *arco* instruction above. The Violin II and Viola staves play a sustained chord, starting with *arco-div.* and *fff*, then tapering to *pp* and finally *dim.*. The Percussion staff includes a Xylophone part with a 14-measure phrase and a 6-measure phrase, ending with a *p* dynamic. The Cello and Bass staves mirror the Violin II and Viola parts, also using *fff*, *pp*, and *dim.* dynamics. The *colla percus.* instruction is placed above the strings.



Violin I  
*f* *ff* *pp* Div. a 4 **Lento** B

Violin II  
*ff* *pp* Div. a 3

Viola  
*ff* *pp* Div. a 2

Perc.  
Vibraphone motor on slow *f* **Lento**

Cello  
*unis.* *ff* *pp* Div. a 2

Bass  
*ff* *(pp)*

Detailed description: This page of a musical score, numbered 110, contains measures 27 through 30 for six instruments: Violin I, Violin II, Viola, Percussion, Cello, and Bass. The score is written in 3/4 time and features a key signature of one flat. The tempo is marked 'Lento'. The Violin I part begins with a dynamic of *f*, reaches *ff* by measure 29, and then drops to *pp* for a four-measure division. The Violin II part starts with *ff* and drops to *pp* for a three-measure division. The Viola part starts with *ff* and drops to *pp* for a two-measure division. The Percussion part features a vibraphone with a motor on, playing a melodic line starting at measure 29 with a dynamic of *f*. The Cello part starts with a *unis.* (unison) marking, reaches *ff* by measure 29, and drops to *pp* for a two-measure division. The Bass part starts with *ff* and drops to *(pp)* at the end of measure 30. A rehearsal mark 'B' is placed above the first measure of the Violin I part.

This page contains a musical score for measures 30 through 39. The score is arranged in a system with six staves. The instruments are Violin I, Violin II, Viola, Percussion, Cello, and Bass. The Percussion part is specifically marked as 'Bossa Nova Rhythm' and includes a 'Z' symbol. The Violin I and II parts feature complex rhythmic patterns with many beamed notes and accents. The Viola part has a similar rhythmic texture. The Cello and Bass parts provide a steady, rhythmic accompaniment. The score is written in treble clef for Violin I, Violin II, and Percussion, and in bass clef for Viola, Cello, and Bass. The key signature has one sharp (F#) and the time signature is 4/4. The measure numbers 30, 31, 32, 33, 34, 35, 36, 37, 38, and 39 are indicated at the beginning of each staff.

Violin I

Violin II

Viola

Perc.

Cello

Bass

32

Amplified Tami-tan  
strike with finger

how

5

Temple blocks  
with wood sticks

2

Timpani  
with soft mallets

Cuba

4

Bell Tree  
h. br.

Steel Drum  
hard mallets

3

Small  
Tambourine  
brush

Marimba  
(fast) **ff**

Detailed description of the musical score: The page contains six staves. Violin I and Violin II are in treble clef with a key signature of one flat. Viola is in alto clef. Cello and Bass are in bass clef. The Percussion staff is in treble clef and contains a complex sequence of sounds: an amplified tam-tan struck with a finger, a 'how' sound, temple blocks with wood sticks, timpani with soft mallets, a Cuban rhythm, a bell tree with a hard brush, a steel drum with hard mallets, and a small tambourine with a brush. The Marimba part begins at measure 34 with a triplet of eighth notes, marked '(fast)' and 'ff'.

33 *unis. cantabile*  
*f*

Violin I

Violin II *unis. cantabile*  
*f*

Viola *unis. cantabile*  
*f*

Perc. 33

Cello *unis. cantabile*  
*f*

Bass *unis. cantabile*  
*f*

Detailed description: This page of a musical score contains six staves for Violin I, Violin II, Viola, Percussion, Cello, and Bass, covering measures 33 to 35. The Violin I staff begins with a treble clef, a key signature of one flat, and a 3/4 time signature. It features a melodic line starting with a triplet of eighth notes (G4, A4, B4) marked *f* and *unis. cantabile*. The Violin II staff is mostly silent, with a triplet of eighth notes (B3, C4, D4) marked *f* and *unis. cantabile* in measure 34. The Viola staff starts with a bass clef and a 3/4 time signature, playing a triplet of eighth notes (G3, A3, B3) marked *f* and *unis. cantabile*. The Percussion staff is marked with a treble clef and a 3/4 time signature, showing a single eighth note in measure 33. The Cello staff uses a bass clef and a 3/4 time signature, playing a triplet of eighth notes (B2, C3, D3) marked *f* and *unis. cantabile*. The Bass staff uses a bass clef and a 3/4 time signature, playing a triplet of eighth notes (G2, A2, B2) marked *f* and *unis. cantabile*. Vertical dotted lines on the right side of the page indicate the continuation of the score.

This page of a musical score contains five systems of staves for Violin I, Violin II, Viola, Cello, and Bass. The music is in a key with one flat and a 4/4 time signature. Measure 36 begins with a dynamic of *f* and a *tr* (trill) over a note. The Violin I part features a long, sweeping melodic line with a fermata. The Violin II part is marked *Divisi a 12* and consists of six staves. The Viola part is marked *Divisi a 10* and consists of three staves. The Cello part is marked *Divisi a 10* and consists of three staves. The Bass part is marked *Divisi a 2* and consists of two staves. Dynamics range from *f* (forte) to *pp* (pianissimo). The score includes various musical notations such as slurs, ties, and articulation marks.

*tutti unis.*  
*p* *ff*

Violin I *Divisi a 12* *p*

Violin II *ff* *tutti unis.* *p*

Viola *Divisi a 10* *p*

Cello *tutti unis.* *ff*

39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107

Detailed description: This page of a musical score, numbered 115, contains measures 39 through 107. It features four staves: Violin I, Violin II, Viola, and Cello. The Violin I staff begins with a dynamic marking of *p* and includes the instruction *Divisi a 12*. The Violin II staff has a *ff* marking and *tutti unis.* instruction. The Viola staff is marked *Divisi a 10* and *p*. The Cello staff has a *ff* marking and *tutti unis.* instruction. The score is written in a key signature of one flat and a 4/4 time signature. The music consists of dense, rhythmic patterns, primarily eighth and sixteenth notes, with frequent use of slurs and ties. The *Divisi* markings indicate that the strings are playing in divided parts. The page concludes with measure 107.

This page of a musical score, numbered 116, contains measures 42 through 49. The score is arranged in a standard orchestral layout with the following parts:

- Violin I:** Features a melodic line with dynamic markings of *sfz* and *ff*. It includes instructions for *Divisi a 6* (measures 42-45) and *Divisi a 4* (measures 46-49).
- Violin II:** Plays a rhythmic accompaniment of sixteenth notes, also marked with *sfz* and *ff*. It includes instructions for *Divisi a 6* (measures 42-45) and *Divisi a 4* (measures 46-49).
- Viola:** Provides harmonic support with sixteenth-note patterns, marked with *sfz* and *ff*. It includes instructions for *Divisi a 4* (measures 42-45) and *Divisi a 4* (measures 46-49).
- Percussion:** Features a xylophone part with a complex rhythmic pattern of sixteenth notes. Dynamics range from *ppp* to *fff*. A box labeled "with all instruments" spans measures 42-45.
- Cello:** Plays a melodic line with dynamic markings of *sfz* and *ff*. It includes instructions for *Divisi a 4* (measures 42-45) and *Divisi a 4* (measures 46-49).
- Bass:** Provides a bass line with dynamic markings of *f* and *sfz*. It includes instructions for *Divisi a 2* (measures 42-45) and *Divisi a 2* (measures 46-49).

The score includes various musical notations such as slurs, accents, and dynamic markings. The key signature has one flat, and the time signature is 4/4.



Violin I

Violin II

Viola

Perc.

Cello

Bass

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Violin I *ff*

Violin II *ff*

Viola *ff*

Perc. *ff* Large Tam-tam *ff* Susp. Cymbal *ff* Small Tam-tam *ff* Bells *longa* Vibraphone motor on *ff* Susp. Cymbal hard mallet *ff* Triangle beater *ff* Temple Blocks *ff* Chrom. Pic. *ff* Wood-Blocks *ff* *h* *hr* Wood Chimes *ff* Bass Drum 10

Cello *ff*

Bass *ff* with 8<sup>th</sup>

Detailed description: This page of a musical score, numbered 120, features six staves. The top three staves are for Violin I, Violin II, and Viola, each with a treble clef and a forte (*ff*) dynamic marking. The fourth staff is for Percussion, with a complex arrangement of instruments including Large and Small Tam-tam, Suspended Cymbal, Bells, Vibraphone (with a motor on), Suspended Cymbal (played with a hard mallet), Triangle beater, Temple Blocks, Chromelino Piccolo, Wood-Blocks, Wood Chimes, and Bass Drum 10. The percussion part includes various rhythmic patterns and dynamic markings such as *ff* and *longa*. The bottom two staves are for Cello and Bass, both with a forte (*ff*) dynamic marking. The Bass staff includes the instruction 'with 8<sup>th</sup>'.

**C** Allegro Moderato  
♩ = 60

Violin I  
*Divisi a 6*  
*sfz mf*

Violin II  
*Divisi a 6*  
*sfz mf*

Viola  
*Divisi a 3*  
*sfz mf*

Perc.  
(Bass Drum)  
*fff*

Bass  
*Divisi a 2*  
*sfz mf*

Violin I

Violin II

Viola

Cello

Bass

54

*tutti*

*ff*

*unis.*

57

Detailed description: This page of a musical score contains five systems of staves. The first system is for Violin I, the second for Violin II, the third for Viola, the fourth for Cello, and the fifth for Bass. Each system consists of two staves. The Violin I and II parts feature long, sweeping melodic lines with many slurs and ties, leading to a dense, rhythmic texture in measures 56 and 57. The Viola part is primarily harmonic, with long notes and ties. The Cello part begins at measure 54 with a *tutti* dynamic and *ff* (fortissimo) intensity, playing a melodic line with triplets and slurs. The Bass part follows a similar pattern to the Violin parts, with long notes and ties, and a *unis.* (unison) marking in measure 57. Measure numbers 54, 57, and 57 are indicated at the start of the Cello and Bass staves respectively. The page number 122 is in the top right corner.



Violin I *ppp*

Violin II *ppp*

Viola *ppp*

Perc. 5 Amplified Tam-tam bow Tambourine shake 3 Susp. Cymbal drum stick 7 Talking Drum thin stick Flexatone 6

Cello *ppp*

Bass *ppp*

Detailed description: This page of a musical score, numbered 124, contains measures 61 through 64. The score is arranged for a string quartet and a percussion ensemble. The string parts (Violin I, Violin II, Viola, Cello, and Bass) are all marked *ppp* (pianissimo). The Violin I and II parts feature complex rhythmic patterns with many slurs and accents. The Viola part has a more steady, eighth-note accompaniment. The Percussion part is highly detailed, showing specific techniques for various instruments: Amplified Tam-tam (played with a bow), Tambourine (shaken), Suspended Cymbal (played with a drum stick), Talking Drum (played with a thin stick), and Flexatone (played with the hand). The percussion notation includes rhythmic patterns, dynamic markings, and articulation symbols. The score is written in a key signature of one sharp (F#) and a 2/4 time signature.

65

Violin I

Violin II

Viola

Perc.

Cello

Bass

Slit Drum 2

wood stick

Susp. Cymbal drum stick

5

Tambourine

Temple Blocks

Detailed description: This page of a musical score, numbered 125, begins at measure 65. It features six staves: Violin I, Violin II, Viola, Percussion, Cello, and Bass. The Violin I, Violin II, and Viola staves contain complex rhythmic patterns with many slurs and accents. The Percussion staff includes parts for Slit Drum 2 (with a wood stick), Suspended Cymbal (with a drum stick), Tambourine (marked with a '5'), and Temple Blocks. The Cello and Bass staves play a steady, rhythmic accompaniment. The score is written in a key with one sharp (F#) and a 4/4 time signature.

**Doppio Presto**  
**D** ♩ = 120

Violin I  
*ff* *f* *mf*  
*Divisi a 4*  
*ff* *f*  
*ff*

Perc.  
 1<sup>o</sup>

Cello  
*ff*

Bass  
*ff*

Violin I  
*mp* *p*  
*mf* *mp*  
*f* *mf* *mp*  
*ff* *f* *mf*

Violin II  
*ff* *f*  
*Divisi a 3*  
*ff*

82

Violin I

Violin II

Viola

*Divisi a 2*

*p* *pp* *p* *pp* *mp* *p* *mf* *mf* *ff* *f* *ff* *f* *ff*

88

Violin I

*ppp*

*pp*

*ppp*

*pp*

*ppp*

*ppp*

Violin II

*p*

*p*

*pp*

*mp*

*p*

*p*

*mp*

*p*

Viola

*mf*

*mp*

*f*

*mf*

Cello

*tutti*

*ff*

*f*

Bass

*tutti*

*ff*

94

Violin I

*ppp*

Violin II

*pp*

*p*

Viola

*mp*

*p*

Perc.

Xylophone

*ff*

*f*

Cello

*mf*

*mp*

Bass

*f*

*mf*

Detailed description: This page of a musical score, numbered 129, contains six systems of staves. The first system is for Violin I, with two staves and a *ppp* dynamic marking. The second system is for Violin II, with two staves and *pp* and *p* dynamic markings. The third system is for Viola, with two staves and *mp* and *p* dynamic markings. The fourth system is for Percussion, specifically Xylophone, with one staff and *ff* and *f* dynamic markings. The fifth system is for Cello, with one staff and *mf* and *mp* dynamic markings. The sixth system is for Bass, with one staff and *f* and *mf* dynamic markings. The score begins at measure 94. The music is written in a key with one flat and a 4/4 time signature. Various musical notations such as slurs, ties, and dynamic markings are used throughout.

Violin I

Violin II

Viola

Perc.

Cello

Bass

*marcato*  
*ff marcato*

*ppp* *pp* *ff marcato*

*ff marcato*

*ff marcato*

*ff marcato*

*ff marcato*

*ff marcato*

*ff marcato*

Vibraphone

Perc.

Small Tam-tam

Large Tam-tam

Susp. Cymb. High

Susp. Cymb. Low

Susp. Cymb. Medium

Large Tam-tam

*ff* *f* *mf* *p* *pp* *ppp*

**Cadenza**

1" Amplified Tam-tam  
7" strike with finger

bow

5 Temple Blocks with wood sticks

2 Timpani with soft mallets

14" Cuíca

4 Bell Tree

beater/brush

5 Steel Drum hard mallets

3:2

5 Small Tam-tam brush

5 Snare Drum with fingers

Timpani beater/brush

27" Cowbells hard mallets

6

3 Bass Drum soft mallets

7 Wood Chimes

40" Susp. Cymbal chain bow

2 Amplified Tam-tam bow

4 Metal Chimes

Cluster-Hanging Cowbells

3 Slit Drums wood mallets

Chrom. Piccolo Wood-Blocks

(Chrom. Pic. W.BI.)

53" Timp-toms

7

2 Susp. Cymbal chain or brush

1 Bass Drum chain

4 Boo-bams medium hard mallets

Susp. Cymbal

5 (Boo-bams) hard mallets

66" Steel Drum rubber mallets

6

1 Timpani br.

79" yarn mallets

5

3 Amplified Tam-tam bow

7 Susp. Cymbal drum stick

Boo-bams

Steel Drum

Tambourine shake

92" Talking Drum thin stick

Flexatone 6

Slit Drum 2 wood stick

105" Susp. Cymbal

2 hard mallet

triangle beater 7

Triangle

Wood Chimes

Chrom. Pic. Wood-Blocks beater/brush

Temple Blocks

Bass Drum 6

Susp. Cymbal drum stick 5

Tambourine

118" Slit Drum soft mallets 4

Boo-Bams

Cowbells 3

Timp-toms

Chrom. Pic. Wood-blocks 4

131" Susp. Cymbal 3

beater/brush

Steel Drum 1

rubber mallets

Timp-toms rubber mallets 2

Bass Drum 7

triangle beater center

near rim

Temple Blocks 7

soft yarn mallets

144" Talking Drum 5

hard mallet

Cowbells 6

brush

157" Steel Drum 2

metal beater

Timpani

Bass Drum

Cowbells 4

Chrom. Pic. Wood-blocks hard mallets

Wood Chimes 5

3/4 hard mallets

Tuilis

170" Cowbells 3

metal mallets

Timpani 1

soft mallets

Bass Drum 7

rim

Violin II **E** **Moderato** ♩ = 80

110 *solo* *p*

Cello *solo* *p*

Bass *solo* *p*

Violin I *solo* *p* *tutti Pont.* *p*

Violin II *Pont.* *sempre Pont.* *tutti Pont.* *p*

Viola *solo* *p* *Pont.* *tutti Pont.* *p*

Cello *tutti Pont.* *p*

Bass *tutti Pont.* *p*

This page contains the musical score for measures 122 through 125 for five string instruments: Violin I, Violin II, Viola, Cello, and Bass. The score is written in treble clef with a key signature of one sharp (F#) and a time signature of 4/4. The dynamics are marked *pp* (pianissimo) throughout. The Violin I part features a melodic line with glissandos and a *sempre Pont.* instruction. The Violin II part includes *Divisi a 3* and *sempre Pont.* markings, with staccato and simile passages. The Viola part features *Divisi a 2* and *sempre Pont.* markings, with staccato and simile passages. The Cello part features *Divisi a 2* and *sempre Pont.* markings, with staccato and simile passages. The Bass part features *Divisi a 2* and *sempre Pont.* markings, with staccato and simile passages. The score includes various performance instructions such as *slow gliss.*, *gliss.*, *stacc.*, and *simile*, along with fingering numbers (6, 8) and articulation marks.

This page contains the musical score for measures 127 through 130, featuring five instruments: Violin I, Violin II, Viola, Cello, and Bass. The score is written in a common time signature with a key signature of one flat (B-flat).

- Violin I:** Measures 127-130. Starts with a tremolo in measure 127. Measures 128-130 feature a rhythmic pattern of eighth notes with slurs and accents. Performance markings include *stacc.* and *simile*. Fingering numbers 6, 8, 4, and 3 are indicated.
- Violin II:** Measures 127-130. Features a melodic line with slurs and accents. Fingering numbers 4 and 3 are indicated.
- Viola:** Measures 127-130. Features a melodic line with slurs and accents. Fingering numbers 3 and 4 are indicated.
- Cello:** Measures 127-130. Features a melodic line with slurs and accents. Fingering numbers 6, 4, 3, and 4 are indicated.
- Bass:** Measures 127-130. Features a melodic line with slurs and accents. Performance markings include *stacc.* and *simile*. Fingering numbers 8, 6, 4, and 6 are indicated.

The score includes various musical notations such as slurs, accents, and performance markings like *stacc.* and *simile*. Fingering numbers (6, 8, 4, 3) are placed above or below notes to indicate fingerings.



All instruments repeat the bar several times and *poco a poco alla corda* with an overall *diminuendo* to *pppp* until the *fermata* of each group.

134

Violin I

*Divisi a 6*

Violin II

*Divisi a 6*

Viola

*Divisi a 4*

Cello

*Divisi a 4*

Bass

134

The musical score for page 137, measures 134-137, is divided into five parts: Violin I, Violin II, Viola, Cello, and Bass. Each part begins at measure 134. The Violin I and II parts are marked 'Divisi a 6', indicating six parts. The Viola, Cello, and Bass parts are marked 'Divisi a 4', indicating four parts. The score features complex rhythmic patterns, including triplets and sixteenth notes, and dynamic markings such as 'pppp' and 'fermata'. The overall tempo and dynamics are indicated by the text at the top of the page.

Violin I

Violin II

Viola

*Aleatoria a perc.*

\* Perc.

Cello

Bass

The score is for a piece titled "Aleatoria a perc." (Aleatoric Percussion). It features six staves: Violin I, Violin II, Viola, Percussion, Cello, and Bass. The percussion part is the most complex, consisting of several lines of music with various rhythmic patterns and dynamic markings. The instruments and techniques used in the percussion part include:

- Slit Drum (soft mallets)
- Boo-Bans
- Cowbells
- Timp-toms
- Chrom. Pic. (Chromatic Piccolo)
- Wood-blocks
- Susp. Cymbal (beater/brush)
- Steel Drum (rubber mallets)
- Timp-toms (rubber mallets)
- Bass Drum (triangle beater)
- near rim
- center
- Temple Blocks (soft yarn mallets)
- Talking Drum (hard mallet)
- brush
- Steel Drum (metal beater)
- Bass Drum
- Timpani
- Chrom. Pic. (hard mallets)
- Cowbells
- Wood Chimes
- Tutis
- 3/4 hard mallets
- Cowbells (metal mallets)
- Timpani (soft mallets)
- Bass Drum
- rim

The score includes various time signatures (4/4, 3/4, 6/8, 7/8) and dynamic markings (mf, f). The percussion part is marked with an asterisk (\*), indicating that the lines are to be played consecutively, not simultaneously.

\* Lines to be played consecutively, not simultaneously.



### Editor's Notes on the Critical Edition

The practice of editing or emendation of percussion music has become more common recently. The practice extends from the timpani parts of the standard orchestral repertory to concerti for percussion and has been carried out primarily by percussionists. The range of these studies has been limited to a number articles and dissertations; few critical editions have been commercially published that deal with this repertoire.<sup>96</sup> A good example is Milhaud's concerto for percussion. Although many discrepancies have been detected between the editions of Milhaud's concerto for percussion, there exists today no critical edition of the work.<sup>97</sup>

The present edition makes Carvalho's *Variations on Two Rows for Percussion and Strings* available in print for the first time. As in many other 12-tone pieces,

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<sup>96</sup> Editing and reviews of percussion music can be found in many articles and dissertations written since the 1970s. These studies cover different genres; for example, on timpani parts from Beethoven to Strauss (Eric Remsen, "Editing the Timpani Parts of the Orchestral Music of the 18th and 19th Centuries," *Percussive Notes* 21, No. 2 (January 1983: 50-59); Stravinsky's works (Morris Lang, "A Journey to the Source on *L'Histoire du Soldat*," *Percussionist* 12, No. 2 (Winter 1975: 50-54); marimba repertoire (William Moersch, "Beyond the Notes: Phrasing and Structure in *After Syrinx II*, *Merlin*, and *Reflections on the Nature of Water*," *Percussive Notes* 35, No. 5 (October 1997: 60-61); Yun-Kwong Chung, *Hans Werner Henze's Five Scenes from the Snow Country*, D.M.A. diss. New York: City University of New York, 1991) – later editions of Henze's work were based on Chung's analysis; and on percussion concerti (Igor Lesnik, "Darius Milhaud's Concerto for Percussion," *Percussive Notes* 35, No. 2 (April 1997: 64-67), to cite only a few.

<sup>97</sup> Milhaud's concerto for percussion is published by Universal Edition, A. G. Vienna. Discrepancies can be detected among the following editions: complete concert material (UE 13867, 1967), pocket-score format (UE 13866, 1966), and the piano reduction (UE 6453, 1931, revised in 1958—in which the percussion part was possibly revised by the composer himself).

Carvalho's manuscript contains some notes that are inconsistent with the serial context, as well as other discrepancies. As noted by Joseph N. Straus, "Contradictions of this kind—notes in the published score that are 'row-incorrect'—are a persistent feature of music by all serial composers."<sup>98</sup> Not only is the manuscript itself unclean, but the percussion parts in particular are riddled with uncertainties.

The questionable passages Carvalho's concerto can be organized into these categories: (1) typographical errors and omissions, (2) uncertainties in the score regarding performance notes, and (3) notes that apparently violate the prevailing idiom of the composition including 'row-incorrect' notes.

In correcting "mistakes" in serial music, an editor has to take into account the possibility that the composer consciously chose to deviate from the row. However, on this question I am guided by the composer's own words; Carvalho declared that his concerto for percussion is a "totally organized structure based on two 12-tone rows."<sup>99</sup>

### *The Source*

This edition is based on Carvalho's manuscript of the score and O'Donnell's manuscript of the cadenza. The corrections of misprints in the score are based on the analysis, audio recording of the premiere, and an interview with the cadenza's author.

The only source of the *Variations on Two Rows for Percussion and Strings* is Carvalho's autograph manuscript, which is kept in the personal files of his widow, Sonia

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<sup>98</sup> Joseph N. Straus, "Stravinsky's Serial 'Mistakes,'" *The Journal of Musicology*, Vol. 17, No. 2 (Spring, 1999: 231-71).

<sup>99</sup> Arthur Custer, "Notes on the Program," in *St. Louis Symphony Orchestra's 1968-69 Season* (St. Louis: St. Louis Symphony Orchestra, 1968: 425).

Muniz de Carvalho, in São Paulo, Brazil. The score is written on 33 pages of 26-staff manuscript paper in “portrait” format. The pre-printed names of standard instruments were crossed out, and the staff was adapted to strings and percussion. On the top left of the first page is a hand-written note; “First Performance Feb 21 – 1968, St. Louis Symphony Hall, Powell Symphony Hall, St. Louis, MO.” The date indicated on the manuscript is wrong, as the first performance took place on February 27, 1969. The top right displays Eleazar de Carvalho’s signature. The composer signed and dated the last page. The score did not include the percussion cadenza; there is only an indication of where it is to be played on page 25. Although the score does not have a clean-looking appearance, it is more than just a draft, as we can see by the clear, determined handwriting and the presence of few apparent corrections. The score is difficult to read because of percussion parts that were extracted from the cadenza and pasted or attached to the score with tape. See Figure 4.1.

O’Donnell’s cadenza is a manuscript of three pages written on white paper in “landscape” format, which were numbered on the bottom center of the pages. The manuscript is not autographed or dated, nor did it include performance notes. O’Donnell was not responsible for either the performance notes or the percussion instrument list provided in the premiere’s concert program.<sup>100</sup> The manuscript of the cadenza has remained in Richard O’Donnell’s personal files in St. Louis, Missouri. The score of the cadenza is very clean-looking, and the “bars” have an even and consistent distance between the vertical lines throughout the three pages. See Figure 4.2.

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<sup>100</sup> Richard O’Donnell, interview with the author, St. Louis, MO, 5 June 2007.

O'Donnell owns an audio recording of the premiere. Even if the recording does contain mistakes by the performers, the recording was helpful in elucidating discrepancies in the score and in confirming the analysis. The author takes into account that Carvalho was famous for his perfect pitch, and the recording helps to confirm both dubious passages of the scores and the authentic errors by the composer.

The taped interview with O'Donnell is found in the author's personal files. Some of the uncertainties in the percussion part were cleared up by what O'Donnell revealed in this interview.

The image shows a handwritten musical score on page 16 of Carvalho's manuscript. The score is organized into several systems of staves. On the left side, the instruments are listed vertically: Flute (Fl.), Viola, Cello (Celi), Solo, Percussion (Percuss), Bass, Violin I (I), Violin II (II), Viola, Drums (Drums, Triangle, Tam-tam, etc.), Percussion (Perc.), Violin III (III), Violin IV (IV), Violoncello (Vcllo), and Bass.

The score includes various musical notations such as notes, rests, and dynamic markings like *p* (piano) and *f* (forte). There are also handwritten annotations and diagrams. A large curved arrow points from the upper right section of the score down to a specific measure in the lower section. Two diagrams are present: one in the upper right showing a sequence of notes with labels like "CHAIN OR BR" and "H.MAL", and another in the lower middle showing rhythmic patterns with labels "RUB." and "YARN MAL".

Measure numbers 44 and 45 are clearly marked. The score concludes with a boxed measure number "45" at the bottom right.

Fig. 4.1 Page 16 of Carvalho's manuscript of the score

The manuscript consists of several staves of music with various performance instructions and time markings:

- Staff 1:** Includes instructions for "WOOD STK" (woodstock), "BOW", "STRIKE WITH FINGER", "H. BR." (high bow), "SOFT", and "BR. FINGERS". A time marking of "22 SEC." is present.
- Staff 2:** Features "H. MAL." (high mallet), "WOOD MAL." (wood mallet), "M III" (mallet III), "BOW", "44 SEC.", "CHAIN BOW", and "SOFT".
- Staff 3:** Contains "H. MAL.", "CHAIN OR BR." (chain or bow), "1/2 H. MAL.", "67 SEC.", and "CHAIN".
- Staff 4:** Shows "RUB." (rubato), "H. MAL.", "T" (trill), and "67 SEC.".
- Staff 5:** Includes "YARN MAL." (yarn mallet), "BR." (bow), and "23 SEC.".

The manuscript is written in a cursive, handwritten style with various musical notations such as notes, rests, and dynamic markings.

Fig. 4.2 Page 1 of O'Donnell's manuscript of the cadenza

### *Editorial methods*

- (1) The numbering of measures in the manuscript is occasionally incorrect. The manuscript numbers m. 2 as m. 1; m. 42 is numbered as m. 40; m. 68 is numbered as m. 65; m. 110 is numbered as m. 106. The critical edition does not follow the inconsistent numbering of measures in the manuscript. All numbers of measures in this chapter refer to the numbering of the critical edition.
- (2) Rehearsal letters were added in this edition. Double-bar lines in the composer's hand appear in measures 49, 68, and 108 in the manuscript, the other double-bar lines were added in this edition.
- (3) In the original manuscript, symbols were utilized to identify different percussion instruments. In this edition, percussion instruments are identified by names instead of symbols. Although idiomatic in the 1950s and 1960s, these symbols could only serve to confuse modern performers (see Figure 4.2).
- (4) It was important that the graphic and proportional notation used in the percussion part should mirror the original manuscripts as accurately as possible. The percussion part entailed three different procedures by the composer. Where the composer wrote graphic notation by hand, his spacing is not consistent, and the distance between the vertical lines that delimitate the "bar" is uneven (see Figure 4.3).

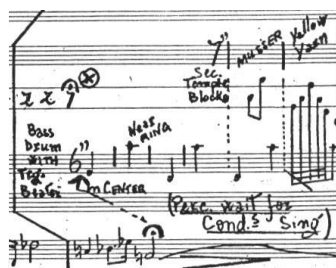


Fig. 4.3 Percussion part m. 10

In passages in which the composer pasted parts of the cadenza into the score, the spacing is regular. This regularity persists in the cadenza as well as where the distance between the vertical lines is consistent (see Figures 4.1 and 4.2). In all cases, the process for editing the graphic notation was to scan each bar and utilize a gauge of five equidistant vertical lines to capture the precise location of the note inside the bar. After the scanning process, notation software (Finale) was used to mirror the original manuscript as accurately as possible (see Figure 4.4).



Fig. 4.4 On the left is the original manuscript with the gauge. On the right is the digitalization of the bar.

(5) Some percussion instruments were notated with the use of additional staves to obtain greater precision and legibility. The staff was altered for the following instruments: temple-blocks, cowbells, slit drums, tuillis and timp-toms (see Figure 4.5). Single instruments such as bass drum are written in one-line staff in this edition.

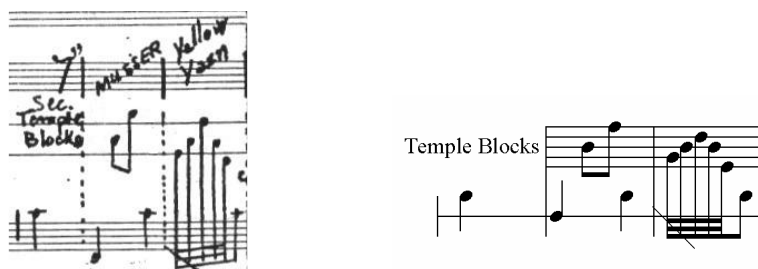


Fig. 4.5 On the left, the temple-blocks are written in a two-line staff in the manuscript. On the right is the notation employing five lines of the edition.

(6) All dynamic markings, articulations, tempo indications, and bowings were maintained as indicated in the manuscript. Some dynamics were added, however (see critical commentary).

(7) The performance notes were corrected grammatically, and they were revised for clarity.

(8) The use of accidentals in the edition appears according to modern convention: Accidentals are valid for the duration of the measure unless they are specifically cancelled out by a natural. This rule serves for regular measures, as well as measures without time signatures. Carvalho's use of accidentals is consistent. He writes all "courtesy" accidentals throughout the measure. The edition retains the "courtesy" accidentals only in measures with no time signature.

(9) Carvalho wrote rolls in the percussion instruments in two ways: with trill signal above the notes, and with regular abbreviation on the notes. The edition employs the standard abbreviation for all rolls in the percussion part.

### *Critical commentary*

Table 4.1 lists all instances in which Carvalho's manuscript differs from the present edition. The first column of the table indicates the measure number. The second column describes the problem. The third column describes, as succinctly as possible, how the manuscript differs from the edition and presents the editor's justification. All notes and markings that have been corrected or added to the edition are printed in parentheses.

Table 4.1 Critical Commentary

location	description	comment
m. 1 – Performance note to the strings.	“All strings <i>fermata</i> for 19 to 20 seconds.”	Changed to “All strings <i>fermata</i> for 21.5 seconds.” This is the exact length of the passage.
m. 1 – Percussion	Performance note to the amplified tam-tam: “Struck in center with finger.”	Changed to “Strike in the center with finger.”
m. 1 – Percussion	Performance note to the Steel Drum: “Repeat with <i>dim.</i> to <i>ppp</i> three times. Keep repeating after orchestra begins to play, until Conductor’s signal to stop.”	Changed to “Repeat three times with an overall <i>diminuendo</i> to <i>ppp</i> . Keep repeating after the orchestra begins to play until conductor’s signal to stop.”
m. 1 – Percussion	Instrument name: “Jamacian [ <i>sic</i> ] Steel Drum.”	Changed to “Steel Drum”
m. 2 – Percussion	Performance note: “Keep repeating <i>ppp</i> the last 3 bars and on the same speed as before.”	Changed to “Keep repeating <i>ppp</i> the last 3 bars in the same speed as before.”
m. 8 – Percussion	Performance note: “Percussion stop.”	Changed to “Percussion stops.”
m. 10 – Percussion	Performance note: “Percussion begins [ <i>sic</i> ] only after the 3 <sup>rd</sup> beat with Cond.’s signal.”	The performance note is eliminated. The spatial organization in the manuscript was confusing. In the edition, the spacing has been clarified, making the note superfluous.

Table 4.1 (continued)

location	description	comment
m. 13 – Percussion	There is no indication of the instrument after the timpani line.	This passage in the percussion part is based on an extraction of bars 79”-82” of the <i>cadenza</i> , which utilizes the steel drum. The recording confirms this.
m. 14 – All instruments	Tempo indication “ <i>in tempo.</i> ”	Changed to “ <i>a tempo.</i> ”
m. 14 – Violin I (solo)	Throughout the piece a number of corrections in ink on the note B. In m. 14, a flat sign (♭) was superimposed on the original natural sign (♮) of third note of the measure (B). See Figure 4.6.a.	The H <sub>1</sub> of the row derived from series B (series B <sub>D</sub> ), set [C-B-A♭-F♯-E-D], is followed, after a short pause, by its complement set [G-F-E♭-D♭-B♭-A]. Changing the B♮ to B♭ would alter the intervallic similarity between the sets. The correction is apparently not in the hand writing of the composer. Furthermore, the recording confirms the B natural. <sup>101</sup>
m. 14 – Violin I ( <i>divisi</i> 1 and 3)	Correction in ink on the third note (B).	Same as above; it is a passage in unison with the violin I (solo).
m. 18 – Percussion	There is no indication of the instrument after the timpani line.	Similar to m. 13, this passage in the percussion part is based on an extraction of bars

<sup>101</sup> For more detailed information about this passage, see the analysis in the following chapter.

Table 4.1 (continued)

location	description	comment
		79''-82'' of the <i>cadenza</i> , which utilizes the steel drum.
m. 18 – Violin I ( <i>divisi</i> 2)	There is a correction in ink on the note B; a flat sign ( $\flat$ ) was superimposed on the original natural sign ( $\natural$ ).	The previous set employed in the preceding four measures is stacked from top down in this measure.
m. 19 – Violin I ( <i>divisi</i> 2)	Same as above.	
m. 20 – Violin II ( <i>divisi</i> 1)	Same as above on the second note, B natural.	
m. 20 – Percussion	The original score has eight simultaneous notes for the percussion set on the third beat, including two notes ( $E\flat$ and $B\flat$ ) to be played on one timpani. (See Figure 4.7)	The edition follows the recording in which just four instruments are played: slit drum, suspended cymbal, timpani ( $E\flat$ ) and steel drum (F).
m. 20 – Percussion	Xylophone, third beat, second 32 <sup>nd</sup> note (F).	Serial error. The note was corrected to $F\sharp$ . Xylophone should be $F\sharp$ instead of F, second note of $R_1(A)$ .
m. 24 – Viola ( <i>divisi</i> 1)	Correction in ink on the second note (B); a flat sign ( $\flat$ ) was superimposed on the original natural sign ( $\natural$ ).	The added flat was eliminated. The figure is a recurrent fragment employed previously: C-B-A $\flat$ - $F\sharp$ .
m. 26 – Viola ( <i>divisi</i> 1)	Same as above on the second sixteenth-note.	

Table 4.1 (continued)

location	description	comment
m. 27 – Bass	The bass clef is missing.	The last four notes of this measure have to be understood in the bass clef in order to maintain the unison with the ensemble.
m. 29 – Viola and Cello		The indication for “ <i>divisi a 2</i> ” was missing.
m. 29 – Bass.	Missing dynamic mark.	A <i>pp</i> was included for consistency with the dynamic of the ensemble. Confirmed by the recording.
m. 30 – All strings	There is an extra accent crossed out over the last 32 <sup>nd</sup> -note of the third beat of violin II, viola, celli and bass.	It seems to be the only correction in the composer’s own handwriting. The accent was excluded in the edition. The recording confirms that the accent was incorrect.
m. 31 – All Instruments	The manuscript has “repeat bar” symbols.	M. 31 is now written-out for the strings.
m. 32 – Percussion	Marimba part, notes third- and fourth-to-last, B and E <sup>b</sup> .	Serial error. The notes were corrected to C and E respectively. This is the P <sub>6</sub> (A).
m. 32 – Percussion	Triplet sign on the 9 <sup>th</sup> , 10 <sup>th</sup> , and 11 <sup>th</sup> notes of marimba is missing.	The triplet sign was included for clarity.
m. 34 – Bass	Second note (D)	D corrected to D <sup>b</sup> , to be in unison with cello and viola. It seems to be a simple missing accidental.

Table 4.1 (continued)

location	description	comment
m. 36 – Viola ( <i>divisi</i> 3)	The treble clef is missing.	Treble clef added. Confirmed by the same note tied on treble clef in the next measure (m. 37), and the recording.
m. 41 – Violin I	Correction in ink on the second beat; a flat sign ( $\flat$ ) was superimposed on the B $\sharp$ and its grace note.	It is the H <sub>1</sub> of series B <sub>D</sub> , set [C-B-A $\flat$ -F $\sharp$ -E-D], explained on m. 14.
mm. 41-42 – Viola	Confusing notation.	The parts were modified to obtain a better reading of the score. The <i>divisi</i> is indicated in the edition by Arabic numerals.
m. 42 – Bass.	Correction in ink on the second note: a flat sign ( $\flat$ ) was superimposed on the B $\sharp$ .	It is the H <sub>1</sub> of series B <sub>D</sub> , set [C-B-A $\flat$ -F $\sharp$ -E-D], explained on m. 14.
m. 43 – Percussion	The triplet sign is missing above the 6 <sup>th</sup> , 7 <sup>th</sup> , and 8th sixteenth-notes of the Xylophone part.	Added to score. Confirmed by the recording.
m. 45 – Bass	Missing <i>divisi</i> .	Note A was added on the last note of m. 45. Series B <sub>D</sub> is ordered from top down, and the last note (A) is missing. In the manuscript all strings has 2 <i>divisi</i> but the bass.

Table 4.1 (continued)

location	description	comment
m. 46 – Bass	Fourth beat, note D $\flat$ .	Serial error. The note was corrected to D $\sharp$ . The bass plays the H <sub>1</sub> of series B <sub>D</sub> rotated to start on D $\sharp$ .
m. 47 – Bass	There is a flat sign ( $\flat$ ) in parentheses over the second note (B $\flat$ ). See Figure 4.6.b.	See m. 42. The correction is apparently not in the hand of the composer, and in addition the recording confirms the B $\sharp$ .
m. 47 – Violin II ( <i>divisi</i> 1)	Second beat, note B $\flat$ .	Serial error. The note was corrected to B $\sharp$ . Violin II, viola, and cello play a canonic passage (mm. 46-49) using the H <sub>1</sub> of series B <sub>D</sub> on its retrograde ordering.
m. 47 – Violin II ( <i>divisi</i> 2)	Second beat, note A $\flat$ .	Serial error. The note was corrected to A $\sharp$ . The same canonic passage explained above.
m. 47 – Violin I	Fourth beat, note B $\flat$ .	Serial error. The notes were corrected to B $\sharp$ . Same as above.
m. 48 – Violin II, viola, and cello	There is a flat sign ( $\flat$ ) over the B $\flat$ in all these instruments. See Figure 4.6.c.	See m. 42. The correction is not apparently in the hand of the composer, and in addition the recording confirms the B $\sharp$ .

Table 4.1 (continued)

location	description	comment
m. 48 – Bass	First note (E)	The note was corrected to C. Apparent note shifted to wrong ledger line. Set class (0124) is used to connect H <sub>1</sub> to H <sub>2</sub> of series B <sub>D</sub> .
m. 49 – Viola ( <i>divisi</i> 1).	There is a flat sign ( $\flat$ ) in parentheses over the first note (B $\flat$ ).	See m. 48.
m. 49 – Cello	First note, E.	Serial error. The note was corrected to F $\sharp$ . The H <sub>1</sub> of series B <sub>D</sub> [C-B-A $\flat$ -F $\sharp$ -E-D] is stacked. The F $\sharp$ is missing, and following the canonic organization of the passage, the cello is supposed to play the F $\sharp$ .
m. 49 – Percussion	Fifth note in the glockenspiel part (A $\flat$ ).	Corrected to A natural; the passage employs the R <sub>11</sub> (B).
m. 49 – Percussion	Ninth note in the vibraphone part (A $\flat$ ).	Corrected to A natural; the passage employs the P <sub>11</sub> (B).
m. 49 – Percussion	Triangle indication.	Although a triangle was not included in O'Donnell's suggested set-up, nor in the instrumentation list provided in the premiere's concert program, the triangle is clearly indicated by its characteristic symbol in this

Table 4.1 (continued)

location	description	comment
		passage; confirmed by the recording.
mm. 49-50 – Percussion	The score is unclear in this passage. The last note of the Bass Drum was written in m. 49, as well as in the beginning of m. 50.	As the recording confirms, the bass drum has 6 notes at the end of this passage, in which the sixth note occurs in the first beat of m. 50.
m. 54-56 – Cello	There are flat signs ( $\flat$ ) over the three notes ( $B^{\flat}$ ) on these measures.	Cello plays the $H_1$ of series $B_D [C-B-A^{\flat}-F^{\sharp}-E-D]$ . See m. 14.
mm. 68-69 – Percussion	There is no indication for the instrument in these measures.	This passage in the percussion part is based on an extraction of bar 145''-148'' of the <i>cadenza</i> where the temple blocks are indicated. The recording also confirms this.
m. 92 – Violin I ( <i>divisi</i> 3)	Last note ( $A^{\flat}$ )	Serial error. Corrected to $A^{\natural}$ , according to the canon.
m. 93 – Bass	Third beat, note $A^{\flat}$ .	Serial error. Corrected to $A^{\natural}$ , according to the canon.
m. 95 – Violin I ( <i>divisi</i> 4)	First beat, note $A^{\flat}$ .	Serial error. Corrected to $A^{\natural}$ , according to the canon.
m. 97 – Violin II ( <i>divisi</i> 1)	Second beat, note $A^{\flat}$ .	Serial error. Corrected to $A^{\natural}$ , according to the canon.
m. 100 – Percussion	Next-to last sixteenth-note of xylophone part ( $E^{\flat}$ ).	$E^{\flat}$ is incorrect, as confirmed by the canonic imitation in the strings, which employs

Table 4.1 (continued)

location	description	comment
		the first two tetrachords of series B: [B-C-E-F <sup>♯</sup> ] and [G-A <sup>♭</sup> -D-D <sup>♭</sup> ]. The note was corrected to D <sup>♭</sup> .
m. 101 – Violin I ( <i>divisi</i> 4).	The 6 <sup>th</sup> sixteenth-note C <sup>♭</sup> .	Corrected to A <sup>♭</sup> , according to the canon.
m. 116 – Viola	Last note (E <sup>♭</sup> ).	Serial error. Corrected to D. Viola plays the H <sub>2</sub> followed by H <sub>1</sub> of R <sub>3</sub> (A).
m. 117 – Cello	Last note (E <sup>♭</sup> ).	Corrected to D. Idem as above.
m. 120 – Viola	<i>Divisi</i> indication.	The indication for the <i>divisi</i> was eliminated because the “ <i>divisi a 3</i> ,” in fact, occurs two measures later, in m. 122.
m. 134 – General instruction	In the manuscript, m. 134 is followed by a blank measure with the instructions, “All instruments repeat the precedent bar several times and <i>poco a poco alla corda</i> and <i>dim.</i> to a <i>ppppp</i> at the <i>fermata</i> of the each group.”	In the edition m. 134 is written within repeat signs with the performance note rewritten as: “All instruments repeat the bar several times and <i>poco a poco alla corda</i> with an overall <i>diminuendo</i> to <i>pppp</i> until the <i>fermata</i> of each group.”
m. 135 – Viola ( <i>divisi</i> 2 and 3)	Measure incomplete.	A quarter-note (E) was added to the last beat, tied to the preceding note E, and also to the note of the following measure.

Table 4.1 (continued)		
location	description	comment
m. 138 – Percussion		The three lines are to be played consecutively; explained in performance note.

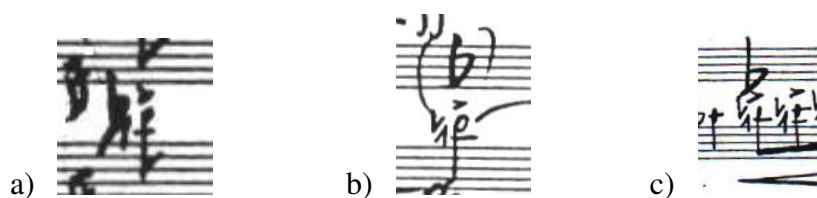


Fig. 4.6. Corrections in ink on note B natural throughout the piece: a) flat sign superimposed on the original natural sign; b) flat sign in parentheses over the note; and c) flat sign over the note.

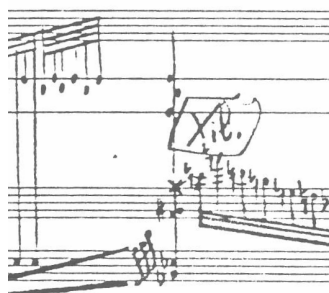


Fig. 4.7. Percussion part – m. 20

## APPENDIX 1

## Form

Table 5.1.a Subsections of the Introduction

<b>INTRODUCTION</b>		
	<b>Intro (a)</b> m. 1 (1''-11'' seconds)	<b>Intro (b)</b> m. 1 (12''-21.5'')
<b>Strings</b>	Tacit	Tacit
<b>Percussion</b>	Extraction from bars 1''-7'' of the cadenza	Series P extracted from bars 21''-23'' of the cadenza

Table 5.1.b Subsections of Section 1

<b>SECTION 1</b>			
	<b>1(a)</b> mm. 2-13	<b>1(b)</b> mm. 14-22	<b>1(c)</b> mm. 22-28
<b>Strings</b>	Series A stacked bottom up  P <sub>1</sub> (A) and R <sub>1</sub> (A)  P <sub>11</sub> (B) and R <sub>11</sub> (B)	Series B <sub>D</sub> derived from series B  Series B <sub>D</sub> stacked top down	P <sub>0</sub> (B <sub>D</sub> ) and R <sub>0</sub> (B <sub>D</sub> )  Tetrachord of the series B – set class (0124)
<b>Percussion</b>	Series P extracted from bars 21''-23'' of the cadenza  Extraction from bars 138''-143'' of the cadenza  Extraction from bars 72''-82'' of the cadenza	H <sub>2</sub> of series B <sub>D</sub>  Extraction from bars 79''-82'' of the cadenza  R <sub>1</sub> (A)  P <sub>11</sub> (B) and R <sub>11</sub> (B)	Tetrachord of the series B – set class (0124)

**Table 5.1.c Subsections of Section 2**

<b>SECTION 2</b>				
	<b>2(a)</b> mm. 29-32	<b>2(b)</b> mm. 33-35	<b>2(c)</b> mm. 36-46	<b>2(d)</b> mm. 46-49
<b>Strings</b>	Series A stacked bottom up  Syncopated rhythm	H <sub>2</sub> and H <sub>1</sub> of series B <sub>D</sub>  Tetrachord of the series B – set class (0124)	Series A stacked  Syncopated rhythm  P <sub>1</sub> (A)  P <sub>11</sub> (B)  H <sub>1</sub> and H <sub>2</sub> of series B <sub>D</sub>	H <sub>1</sub> of series B <sub>D</sub> on its prime and retrograde orderings, and stacked  H <sub>2</sub> of series B <sub>D</sub>
<b>Percussion</b>	Bossa Nova rhythm  Extraction from bars 1''-25'' of the cadenza  P <sub>6</sub> (A)	Tacit	H <sub>1</sub> of series B <sub>D</sub>  Extraction from bars 26''-52'' of the cadenza  Extraction from bars 53''-82'' of the cadenza	P <sub>11</sub> (B) and R <sub>11</sub> (B).  Extraction from bars 105''-115'' of the cadenza

**Table 5.1.d Subsections of Section 3**

<b>SECTION 3</b>		
	<b>3(a)</b> mm. 50-57	<b>3(b)</b> mm. 57-68
<b>Strings</b>	Changing in tempo  Series A stacked bottom up  H <sub>1</sub> and H <sub>2</sub> of series B <sub>D</sub>	Series A stacked  Syncopated rhythm
<b>Percussion</b>	Tacit	Extraction from bars 83''-104'' of the cadenza  Extraction from bars 116''-120'' of the cadenza  Extraction from bars 144''-148'' of the cadenza

Table 5.1.e Subsections of Section 4

<b>SECTION 4</b>		
	<b>4(a)</b> mm. 69-98	<b>4(b)</b> mm. 98-108
<b>Strings</b>	Changing in tempo  12-part Canon  Series B is varied under retrograde, rotation, omission, permutation  First tetrachord of series A	12-part Canon employing two first tetrachords of series B
<b>Percussion</b>	Canon  $P_{11}(B)$ and $R_{11}(B)$	Canon employing two first tetrachords of series B  $P_{11}(B)$ and $R_{11}(B)$

Table 5.1.f Subsections of the Cadenza

<b>CADENZA</b>	
<b>Percussion</b>	m. 109 – Six subsections (a-f)  Variation of Timbre Dialogue between <i>glissandi</i> and undefined pitches

Table 5.1.g Subsections of Section 5

<b>SECTION 5</b>			
	<b>5(a)</b> mm. 110-120	<b>5(b)</b> mm. 120-133	<b>5(c)</b> mm. 134-140
<b>Strings</b>	Changing in tempo  $P_1(A)$ , $R_1(A)$ , $R_3(A)$ , and $R_8(A)$  $H_1$ of the $P_0(A)$  $P_0(B)$	Glissandi up and down  12 pitch classes stacked under interval 5  Written <i>rallentando</i>	Variations on the rhythm  12 pitch classes stacked under interval 5
<b>Percussion</b>	Tacit	Tacit	Extraction from bars 121''-181'' of the cadenza  First tetrachord of the series B

**APPENDIX 2**

**Score with Row Chart**

# Variations on Two Rows for Percussion and Strings

Eleazar de Carvalho, 1968

cadenza by Richard O'Donnell

**Intro** All strings *fermata* for 21.5 seconds

Violin I

Violin II

Viola

Percussion

Intro (a)

Intro (b)

11" Amplified Tam-tam  
1 second strike in the center with finger

with cello bow

Steel Drum  
hard mallets  
*ff*  
Repeat three times with an overall *diminuendo* to *ppp*. Keep repeating after the orchestra begins to play until conductor's signal to stop.

Series P

Cello

Bass

### Subsection 1(a)

A Lento ♩ = 96

The score is for Subsection 1(a) and includes the following parts and markings:

- Violin I:** *Div. a 4*, *p*
- Violin II:** *Div. a 4*, *p*
- Viola:** *Div. a 2*, *p*
- Perc.**: *Keep repeating ppp the last 3 bars in the same speed as before*
- Cello:** *Div. a 2*, *p*
- Bass:** *Div. a 2*, *arco >*, *p*, *pizz. >*, *sfz*

Other annotations include "Series A stacked" and a solo section for Cello labeled "P<sub>1</sub>(A)".

Violin I

Violin II

Viola

Perc.

Cello

Bass

6

SOLO

*p* *mf*

*8<sup>va</sup>*

$R_1(A)$

3

6

*p*

*mf*

SOLO

$P_{11}(B)$

Percussion stops

*morendo*



Subsection 1(b)

The musical score for Subsection 1(b) is arranged in a standard orchestral format. It includes the following parts and markings:

- Violin I:** Starts with a measure marked  $R_{11}(B)$ . The section begins with a  $P_0(B_D)$  marking and an *a tempo* instruction. Dynamics include *f* and *sf*.
- Violin II:** Features a melodic line with dynamics *f* and *sf*.
- Viola:** Provides harmonic support with dynamics *f* and *sf*.
- Percussion:** Includes parts for Steel Drum (6" friction), Slit Drum, 4" soft yam mallets, 1" Timpani, Steel Drum, Boo-bams, Susp. Cymbal with timpani sticks, and Timpani. Dynamics range from *p* to *sf*.
- Cello:** Features a melodic line with dynamics *f* and *sf*, and a *Tutti unis* marking.
- Bass:** Features a melodic line with dynamics *f* and *sf*, and a *Tutti unis* marking.

Series B<sub>D</sub> stacked

**Violin I**  
Tutti  
*Div. a 3*  
*ff*  
pizz.

**Violin II**  
Tutti  
*Div. a 3*  
*ff*  
pizz.

**Viola**  
 $P_0(B_D)$   
*Div. a 2*  
*ff*  
pizz.

**Perc.**  
Slit Drum  
Susp. Cymbal  
Steel Drum  
Boo-bans

**Cello**  
*ff*  
*Div. a 2*  
*ff*  
pizz.

**Bass**  
*ff*  
*Div. a 2*  
*ff*  
pizz.

Series B<sub>D</sub> stacked

Violin I

Violin II

Viola

Perc.

Timpani

Cello

Bass

*colla percus.*

arco-div.

*ffz*

*pp*

*dim.*

*tutti express.*

*f*

H<sub>1</sub> of P<sub>0</sub>(B<sub>D</sub>)

Xylophone

R<sub>1</sub>(A)

P<sub>11</sub>(B)

R<sub>11</sub>(B)

first tetrachord of P<sub>11</sub>(B)

14

6

*p*



Subsection 2(a)

The musical score for Subsection 2(a) is arranged in a standard orchestral format with the following parts and markings:

- Violin I:** Starts at measure 27 with a dynamic of *f*. A transformation  $T_{11}I$  is indicated above the staff. The music concludes with a *pp* dynamic and a *Div. a 4* marking.
- Violin II:** Also starts at measure 27 with a dynamic of *f*. It concludes with a *pp* dynamic and a *Div. a 3* marking.
- Viola:** Starts at measure 27 with a dynamic of *f*. A transformation  $T_1I$  is indicated above the staff. It concludes with a *pp* dynamic and a *Div. a 2* marking.
- Percussion:** Features a *Vibraphone motor on slow* starting at measure 27. A *Lento* marking is present. A specific rhythmic pattern is boxed and labeled  $R_6(A)$ . The section concludes with the text "Series A stacked".
- Cello:** Starts at measure 27 with a dynamic of *f*. A *unis.* (unison) marking is present. It concludes with a *pp* dynamic and a *Div. a 2* marking.
- Bass:** Starts at measure 27 with a dynamic of *f*. It concludes with a *pp* dynamic.

Structural elements include vertical boxes labeled (0124) spanning measures 27-30, 31-34, and 35-38. A section labeled B is marked at the beginning of the final measure. The overall tempo is marked *Lento*.

Series A stacked

Violin I

Violin I staff with two systems of music. The first system contains two staves of music, and the second system contains two staves of music. The music consists of complex rhythmic patterns with many beamed notes and accents.

Violin II

Violin II staff with two systems of music. The first system contains two staves of music, and the second system contains two staves of music. The music consists of complex rhythmic patterns with many beamed notes and accents.

Viola

Viola staff with two systems of music. The first system contains two staves of music, and the second system contains two staves of music. The music consists of complex rhythmic patterns with many beamed notes and accents.

Perc.

Percussion staff with a graphic element. The staff contains a box labeled "Bossa Nova" on the left and "Rhythm" in the middle, with a diagonal line through it. To the right of the box is a double bar line and a fermata symbol.

Cello

Cello staff with two systems of music. The first system contains two staves of music, and the second system contains two staves of music. The music consists of complex rhythmic patterns with many beamed notes and accents.

Bass

Bass staff with two systems of music. The first system contains two staves of music, and the second system contains two staves of music. The music consists of complex rhythmic patterns with many beamed notes and accents.



## Subsection 2(b)

This musical score illustrates the transformation of a series (0124) across six instruments: Violin I, Violin II, Viola, Percussion, Cello, and Bass. The score is marked with *unis. cantabile* and *f*.

The series (0124) is shown in boxed segments across the staves, with arrows indicating transformations:

- Violin I:** Starts with (0124) at measure 33. A transformation  $T_9$  leads to another (0124) segment.
- Violin II:** Features a segment labeled  $H_1$  of series  $B_D$  rot.  $B \rightarrow$ , which is a transformation of the (0124) series.
- Viola:** Contains a segment labeled  $H_2$  of series  $B_D$ , another transformation of the (0124) series.
- Perc.**: Shows a segment of the (0124) series.
- Cello:** Shows a segment of the (0124) series.
- Bass:** Shows a segment of the (0124) series.

Additional transformations are indicated by arrows:  $T_{11}$  from Violin I to Percussion,  $T_{7I}$  from Violin I to Viola,  $T_{0I}$  from Viola to Percussion, and  $T_{10}$  from Viola to Cello. A large transformation  $T_3$  is also shown, connecting the Percussion staff to the Cello staff.

Subsection 2(c)

This musical score, titled "Subsection 2(c)", is for a string ensemble consisting of Violin I, Violin II, Viola, Cello, and Bass. The score is divided into two main sections by a vertical line. The first section, from measure 36 to the line, features a "12 pitch-classes stacked" texture. The Violin I part begins with a  $b\flat$  and a dynamic of  $f$ . The Viola part is marked "Divisi a 10" and  $f$ . The Cello and Bass parts are marked "Divisi a 10" and  $ff$ . The second section, after the vertical line, continues the "12 pitch-classes stacked" texture. The Violin I part has a dynamic of  $p$ . The Viola part is marked "Divisi a 10" and  $pp$ . The Cello and Bass parts are marked "Divisi a 10" and  $pp$ . The score includes various musical notations such as slurs, accents, and dynamic markings.

12 pitch-classes stacked

*tutti unis.*

*H<sub>1</sub> of P<sub>0</sub>(B<sub>D</sub>)*

Violin I *Divisi a 12*

Violin II

*tutti unis.*

*ff*

*P<sub>11</sub>(B)*

*Divisi a 10*

Viola

1 2 3 4 5 6 7 8 9 10

*tutti unis.*

*ff*

*P<sub>1</sub>(A)*

*H<sub>2</sub> of R<sub>0</sub>(B<sub>D</sub>)*

Cello



Series B<sub>D</sub>  
stacked

Violin I

Violin II

Viola

Perc.

Cello

Bass

45

Snare Drum  
with fingers

Cowbells  
hard mallets

Hi-hat Drum  
soft mallets

Wood Chimes

Supr. Cymbal  
chain bow

Amplified  
Tam-tam

Metal Chimes

Cluster/Hanging  
Cowbells

Chrom. Piccolo  
Wood Blocks

Tam-tam

7

2

4

3

5

6

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9

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11

12

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132

Subsec. 2(d)

H<sub>2</sub> of R<sub>0</sub>(B<sub>D</sub>)

*unis.*

The musical score consists of six staves: Violin I, Violin II, Viola, Perc., Cello, and Bass. Measures 46-49 are shown. The Percussion staff includes detailed annotations for various instruments: Chromade Piccolo, West micle, Timp-toms, Susp. Cymbal, chain or trash, Bass Drum, chain, Boo-bams, medium sized mallets, Sup. Cymbal, hard mallets, Steel Drum, rubber mallets, Timporel, yare mallets, Steel Drum, and Boo-bams. The Violin I staff features a triplet of eighth notes in measure 49, marked with a piano (*p*) dynamic. The Cello and Bass staves also show a piano (*p*) dynamic in measure 49. The section concludes with the instruction *unis.* (unison).

Violin I  $H_2$  of  $R_0(B_D)$

Violin II  $(F^\sharp)$   $H_2$  of  $R_0(B_D)$  rotated starting on  $F^\sharp$   
*Divisi a 3*

Viola

Cello

Bass  $H_1$  of  $P_0(B_D)$  (0124) first tetrachord of  $H_2$  of  $P_0(B_D)$

The musical score is presented in five staves. The top staff is Violin I, followed by Violin II (divisi), Viola, Cello, and Bass. The Bass staff contains three distinct musical phrases enclosed in boxes, labeled with mathematical terms:  $H_1$  of  $P_0(B_D)$ , (0124), and the first tetrachord of  $H_2$  of  $P_0(B_D)$ . The score includes various musical notations such as treble and bass clefs, time signatures, accidentals, and dynamic markings.

**H<sub>1</sub> of Series B<sub>D</sub> stacked**

Violin I *ff*

Violin II *ff*

Viola *ff*

Perc. *ff*

Cello *ff*

Bass *ff* with 8<sup>th</sup>

Large Tam-tam

Susp. Cymbal

**R<sub>11</sub>(B)** *longa* Bells

**P<sub>11</sub>(B)** Vibraphone motor on

Susp. Cymbal hard mallet

triangle beater

Triangle

Temple Blocks

Chrom. Pic. Wood-Blocks

Wood Chimes

Bass Drum 10

Subsection 3(a)

**C** Allegro Moderato  
♩ = 60

Series A stacked

Violin I  
*Divisi a 6*  
*sfz mf*

Violin II  
*Divisi a 6*  
*sfz mf*

Viola  
*Divisi a 3*  
*sfz mf*

Perc.  
(Bass Drum)  
*fff*

Bass  
*Divisi a 2*  
*sfz mf*

The score is for Subsection 3(a) of a piece, marked 'Allegro Moderato' with a tempo of 60 beats per minute. It features five parts: Violin I, Violin II, Viola, Percussion (Bass Drum), and Bass. The Violin I and II parts are divided into six parts each ('Divisi a 6'), and the Viola part is divided into three parts ('Divisi a 3'). The Bass part is divided into two parts ('Divisi a 2'). A 'Series A stacked' box highlights a specific musical phrase across the string parts, starting at measure 30. The score includes dynamic markings such as *sfz* (sforzando) and *mf* (mezzo-forte). The Percussion part features a *fff* (fortissimo) marking. The score is written in a key signature of one flat and a 4/4 time signature.

54

Violin I

Violin II

Viola

Cello

Bass

*mf*

*tutti*

$H_1$  of  $P_0(B_D)$

$H_1$  of  $P_0(B_D)$

$H_2$  of  $P_0(B_D)$

$H_2$  of  $P_0(B_D)$  with omission of the 5<sup>th</sup> member ( $B^{\flat}$ )

1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> members of  $H_1$  of  $P_0(B_D)$

*unis.*

12 pitch-classes stacked

The score consists of five staves, each with two parts. The top part of each staff is in treble clef and the bottom part is in bass clef. The music is a rhythmic exercise with 12 stacked pitch classes. The dynamics are marked as follows: *fff*, *ff*, *f*, *mf*, *mp*, *p*, and *pp*. The measure numbers 58, 59, and 60 are indicated at the beginning of the first, second, and third staves respectively.

Violin I

Violin II

Viola

Cello

Bass

12 pitch-classes stacked

The score is for a chamber ensemble and includes the following parts:

- Violin I:** Treble clef, *ppp* dynamic, starting at measure 61. Features a complex rhythmic pattern with many slurs and accents.
- Violin II:** Treble clef, *ppp* dynamic, starting at measure 61. Features a complex rhythmic pattern with many slurs and accents.
- Viola:** Alto clef, *ppp* dynamic, starting at measure 61. Features a complex rhythmic pattern with many slurs and accents.
- Perc.**: Percussion part starting at measure 5. Includes:
  - Amplified Tam-tam (bow)
  - Tambourine (shake)
  - Susp. Cymbal (drum stick)
  - Talking Drum (thin stick)
  - Flexatone (6)
- Cello:** Bass clef, *ppp* dynamic, starting at measure 61. Features a complex rhythmic pattern with many slurs and accents.
- Bass:** Bass clef, *ppp* dynamic, starting at measure 61. Features a complex rhythmic pattern with many slurs and accents.

The score is marked with *ppp* (pianissimo) throughout. The percussion part includes specific instructions for playing various instruments: Amplified Tam-tam (bow), Tambourine (shake), Susp. Cymbal (drum stick), Talking Drum (thin stick), and Flexatone (6). The score is divided into measures, with a box highlighting measures 61-65 for the string parts.

12 pitch-classes stacked

The score is divided into six systems, each with a vertical bar on the left side. The instruments are arranged as follows:

- Violin I:** Treble clef, starting at measure 65. The first staff shows a rhythmic pattern of eighth notes with accents. The second staff shows a similar pattern with a key signature change to one sharp (F#).
- Violin II:** Treble clef, starting at measure 65. The first staff shows a rhythmic pattern of eighth notes with accents. The second staff shows a similar pattern with a key signature change to one flat (Bb).
- Viola:** Alto clef, starting at measure 65. The first staff shows a rhythmic pattern of eighth notes with accents. The second staff shows a similar pattern with a key signature change to one flat (Bb).
- Perc.** Percussion part starting at measure 65. It includes:
  - Slit Drum 2:** Represented by a wavy line.
  - wood stick:** Represented by a series of eighth notes.
  - Susp. Cymbal drum stick:** Represented by a series of eighth notes.
  - Tambourine:** Represented by a series of eighth notes with a '5' below the staff.
  - Temple Blocks:** Represented by a series of eighth notes.
- Cello:** Bass clef, starting at measure 65. The first staff shows a rhythmic pattern of eighth notes with accents. The second staff shows a similar pattern with a key signature change to one flat (Bb).
- Bass:** Bass clef, starting at measure 65. The first staff shows a rhythmic pattern of eighth notes with accents. The second staff shows a similar pattern with a key signature change to one flat (Bb).

## Subsection 4(a)

Violin I

Doppio Presto  $\text{♩} = 120$

**D**

$P_{11}(B)$   $R_{11}(B_D)$   $H_2$  of  $P_{11}(B)$   $H_1$  of  $P_{11}(B)$

*ff* *f* *mf*

*Divisi a 4* *ff* *f*

Perc.

Cello

Bass

Violin I

$H_2$  of  $R_{11}(B)$   $H_1$  of  $R_{11}(B)$   $P_{11}(B)$  rotated to start on G→

*mp* *p* *mf* *mp* *p*

*mf* *mf* *mf*

*f* *f* *mf*

*ff* *f* *mf*

Violin II

*ff* *f* *ff*

*Divisi a 3*

<p>1<sup>st</sup> tetrachord of P<sub>1</sub>(A)</p>	<p>P<sub>11</sub> (B) rotated to start on E<math>\flat</math> →</p>	<p>Permutation of series (B) with omission of members 1 and t:</p> <p>e 0 2 3 4 5 6 7 8 9</p>	<p>Permutation of series (B):</p> <p>9 e 0 1 3</p>
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Violin I

Musical notation for Violin I, consisting of three staves. The first staff begins with a dynamic marking of *p*. The second staff has a *pp* marking. The third staff has a *mp* marking. The notation includes various rhythmic values and accidentals.

Violin II

Musical notation for Violin II, consisting of three staves. The first staff has a *mf* marking. The second staff has a *f* marking. The third staff has a *ff* marking. The notation includes various rhythmic values and accidentals.

Viola

Musical notation for Viola, consisting of two staves. The first staff has a *ff* marking. The second staff has a *f* marking. The notation includes various rhythmic values and accidentals.

Divisi a 2

	Permutation of series (B): 4 6 8 t 2 5 7	Permutation of series (B): t 0 1 4 5 7 8 9 e 2 3 6	Permutation of series (B): 1 2 4 5 6 8 9 0 3 7 e t 2 3
Violin I			
Violin II			
Viola			
Cello			
Bass			

Permutation of series (B):

5 6 4 9 0 t 1 e 7 8

Permutation of series (B):

3 6 7 t 9 1 2 e 4 5

Violin I

Violin II

Viola

Perc. Xylophone

Cello

Bass

94

*ppp*

*pp*

*pp*

*p*

*p*

*mp*

*mp*

*ff*

*f*

*mf*

*mf*

*f*

*mf*

Detailed description: This page contains a musical score for six instruments: Violin I, Violin II, Viola, Percussion (Xylophone), Cello, and Bass. The score begins at measure 94. Above the first staff, two permutations of series (B) are provided: '5 6 4 9 0 t 1 e 7 8' and '3 6 7 t 9 1 2 e 4 5'. The Violin I part features a melodic line with dynamics ranging from *ppp* to *pp*. The Violin II part has dynamics from *pp* to *p*. The Viola part uses dynamics from *p* to *mp*. The Percussion part (Xylophone) has dynamics from *ff* to *f*. The Cello part has dynamics from *mf* to *mp*. The Bass part has dynamics from *f* to *mf*. The score includes various musical notations such as slurs, ties, and accidentals.

Subsection 4(b)

8 0 *marcato* first and second tetrachord of P<sub>11</sub>(B)

Violin I *ff marcato*

Violin II *ppp marcato* *pp marcato* *ff marcato*

Viola *ff marcato*

Perc. *ff marcato*

Cello *ff marcato*

Bass *ff marcato*

Vibraphone

Perc. *ff* P<sub>11</sub>(B) *f* R<sub>11</sub>(B) *mf* *p* *pp* *ppp*

Small Tam-tam *f*

Susp. Cymb. High *mf*

Susp. Cymb. Low *p*

Susp. Cymb. Medium *pp*

Large Tam-tam *ppp*



Talking Drum 92" thin stick

Flexatone 6

Slit Drum 2 wood stick

Susp. Cymbal 105" hard mallet

triangle beater Triangle

Wood Chimes

Chrom. Pic. Wood-Blocks beater/brush

Temple Blocks

Bass Drum 6

Susp. Cymbal drum stick

Tambourine

Subsection (e)

Slit Drum soft mallets

Boo-Bams

Cowbells

Timp-toms

Chrom. Pic. Wood-blocks

Susp. Cymbal 131" beater/brush

Steel Drum 1 rubber mallets

Timp-toms rubber mallets

Bass Drum 7 triangle beater center

near rim

Temple Blocks 7

soft yarn mallets

Subsection (f)

Talking Drum hard mallet

Cowbells brush

Steel Drum 2 metal beater

Timpani

Bass Drum

Chrom. Pic. Wood-blocks hard mallets

Cowbells

Wood Chimes 5

3/4 hard mallets

Tuilis

Cowbells metal mallets

Timpani soft mallets

Bass Drum

rim

## Subsection 5(a)

Moderato  
♩ = 80

Violin II

110

solo  
*p*

Cello

110

solo  
*p*

$P_1(A)$

$R_1(A)$

Bass

110

solo  
*p*

$P_1(A)$

## Subsec. 5(b)

Violin I

116

solo  
*p*

$P_0(B)$

tutti  
Pont.  
*p*

Violin II

$P_0(B)$

Pont.

sempre Pont.

tutti  
Pont.  
*p*

Viola

116

solo  
*p*

$H_2$  of  $R_3(A)$

$H_1$  of  $R_3(A)$

Pont.

tutti  
Pont.  
*p*

Cello

116

$H_1$  of  $P_0(A)$

$H_2$  of  $R_3(A)$

$H_1$  of  $R_3(A)$

tutti  
Pont.  
*p*

Bass

116

$R_8(A)$

tutti  
Pont.  
*p*



12 pitch-classes stacked

The musical score is divided into five systems, each with two staves. The systems are labeled on the left as Violin I, Violin II, Viola, Cello, and Bass. The score begins at measure 127. The first system (Violin I) features a complex texture with multiple voices. The top staff has a melodic line with a wavy line above it, followed by a series of chords. The second staff has a similar texture. The third and fourth staves have rhythmic patterns with fingerings (6, 8, 6, 6, 6) and articulation markings (stacc., simile). The second system (Violin II) has a melodic line with fingerings (4, 4, 4) and articulation markings (stacc., simile). The third system (Viola) has a melodic line with fingerings (3, 3, 3, 3) and articulation markings (stacc., simile). The fourth system (Cello) has a melodic line with fingerings (6, 6, 6, 6) and articulation markings (stacc., simile). The fifth system (Bass) has a melodic line with fingerings (8, 8, 8) and articulation markings (stacc., simile). The score is characterized by dense textures and complex rhythmic patterns, with frequent use of staccato and simile markings.

12 pitch-classes stacked

The score is divided into five systems, each with two staves. The first system is for Violin I, the second for Violin II, the third for Viola, the fourth for Cello, and the fifth for Bass. The title '12 pitch-classes stacked' is centered at the top. The first measure of each system is marked with the number 131. The Violin I part features a melodic line with triplets and a final chord. The Violin II part consists of sustained chords. The Viola part also consists of sustained chords. The Cello part features a melodic line with quarter notes and a final chord. The Bass part features a melodic line with triplets and a final chord. The notation includes various accidentals and articulation marks.

Violin I

Violin II

Viola

Cello

Bass

## Subsection 5(c)

All instruments repeat the bar several times and *poco a poco alla corda* with an overall *diminuendo* to *pppp* until the *fermata* of each group.

134

Violin I *Divisi a 6*

Violin II *Divisi a 6*

Viola *Divisi a 4*

Cello *Divisi a 4*

Bass

12 pitch-classes stacked





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