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Acknowledgements

On behalf of ADEMSA, The Music Student Association, I would like to formally express my gratitude and extend congratulations to everyone who has participated in making the School of Music's first Undergraduate Journal a success. I am thrilled to have been able to provide this incredible opportunity for publication to the undergraduate students in the Music Department, with the help of ADEMSA. In addition, I believe this journal has created an outlet for student expression and a standard of academic excellence for the years to come. I would like to thank all the students who submitted their work to be included in the journal. I would like to give a special thanks to Dr. Paul Merkley for taking the time to write an Introduction which contextualizes the development of journal's various topics. Finally, I would like to give my sincerest gratitude to the editing and writing team for their fantastic cooperation throughout this project. Without their interest and dedication this project would have never been possible. I hope you all enjoy the fantastic assemblage of essays within this journal and I look forward to Volume II.

Sincerely,

Matthew Timmermans
Vice-President Anglophone of ADEMSA

Introduction

By: Dr. Paul Merkley

What a pleasure it is to read the four pieces in this volume! The temporal range of the subjects is very great, but running through them all is the intangible theme of energetic inquiry, with the willingness to push the history of music further. In each of the four subjects, questions are brought forward to place a sharp point on each discussion.

Deborah Qandah's contribution concerns two questions of considerable complexity: the authorship of a motet associated with and sometimes ascribed to Pierre de la Rue, and the tortuous circumlocutions of the Milanese genre the *motetti missales*, motets that were used to substitute for ordinary sections of the mass. Both questions present a bibliographic and conceptual thicket for anyone who ventures there; both of these subjects have engaged some of the most intrepid musical scholars. This paper probes the authorship of a motet by considering its style and its source transmission (especially CS 36) with respect to attributions. The possibility, reached in the conclusions, of motets written by someone else and added on to La Rue's mass (by someone else) is plausible and intriguing.

With the two papers on Ligeti's music, we come full circle in this volume. The first paper on Ligeti, titled "The Reception of Ligeti, Post 2001: A Space Odyssey" by Carolyne Sumner, is concerned with the reception of his music. The reader may wonder whether chaos theory took a hand in history when the music of an obscure young composer was heard on a radio broadcast by Stanley Kubrick's wife, then incorporated, legal entanglements and all, into the film 2001: A Space Odyssey, that brought this new music to the attention of a very wide audience, one that it would not otherwise have reached. The author notes some of the legal details—in fact, while this volume has been edited, these questions have been taken up in the *New Yorker* magazine. Is it

easier for an audience to accept challenging music while watching a film, and does this account in part for the tremendous diffusion of this innovative music? These and other questions are well considered in this paper.

In the second, "The Compositional Techniques and Influences behind Ligeti's 'Atmosphères" by Stephanie Mayville, it is demonstrated that the *Klangfarbenmelodie* of Webern (and Boulez) has set the stage for the micropolyphony of *Atmospheres*. Just as Webern was inspired in part by the music of Isaac, the author notes the influence of Ockeghem's counterpoint on Ligeti, and also traces the inception of Ligeti's new style for acoustic instruments through an early electronic piece. The paper follows the labyrinthine paths of influence and design through bifurcation and chaos theory. The accounting of musical techniques and the placement of these in a stylistic context is carried out to good purpose here.

Elsa Marshall's "20th-Century Discussions of Instrumentation and Timbre in Regards to Pierre Boulez and *Le marteau sans maître*" is particularly strong and finely nuanced in its careful explication of period texts. Her analysis of commentary on taped compositions is revealing, and the principles are well applied to *Le marteau*. If Boulez regarded timbres are more closely analogous to words than to sentences, and if individual timbres for him were not intended to have specific connotations, then his construction of timbral rows and implementation of them in his expanded serialism makes sense. Further, the explanation of commonalities or similarities in the timbres of that work could be compared to pitch invariance.

Together these papers make a marvellous group. They show the product of careful consideration and determined questioning by keen minds, taking past work into account and moving scholarship to new areas. They hold familiar subjects in a new light, and examine them from different angles. These questions are placed under a microscope and looked at through a kaleidoscope, and the results are well worth reading.

There can be little doubt of the exciting future of music history, if it is worked on by authors like these.

Part I: Contexts

Patronage and Profit: The Musical Life of Jean-Baptiste Lully

By: Deborah Qandah

The role of patronage in the work of musicians and composers has long been recognized as a powerful force in the shaping of music history. A quintessential example of this phenomenon is none other than the influence of King Louis XIV on the musical life of France during his reign, and particularly on the output of his chief musician, Jean-Baptiste Lully (1632-1687). Indeed, it is impossible to accurately represent Lully's career without mentioning the role that the king played in ensuring his success as a musician. For the purpose of this report, I will trace Lully's progression from humble beginnings to the highest musical position in France, and I will offer a brief analysis of his musical style in general with special attention given to the *ballet de cour*, the genre that first launched his career.

From the beginning of his career, Lully proved to be highly motivated and ambitious. Born a Florentine, he first moved to France as a language tutor to the cousin of King Louis XIV, Anne-Marie-Louise d'Orléans, in hopes of musical recognition and advancement[1]. Not limited to musical skill, Lully also demonstrated competency as a dancer, and it was not long before he managed to secure a position as a performer in several *ballet de cours.* He was fortunate to perform alongside the king himself for the first time in 1652 in the *Ballet royal de la nuit.* Louis XIV was young at this time, and Lully, being a few years older, was in a perfect position to befriend him and take advantage of the connection. As Lully was particularly talented in playing his roles, he

[1] Jérôme De La Gorce, "Lully," *Grove Music Online*, accessed November 8, 2013.

soon won the admiration of the young king and was appointed the post of *compositeur de la musique instumentale* in 1653[2].

It was not unusual for a participant in the *ballet de cours* to be promoted in this way at the time. The members of the royal court were constantly struggling for higher positions, and they knew that this was most quickly achieved by gaining the favour of the king who freely promoted and demoted as he pleased. As Louis XIV was a lover of dance and often performed in the ballet himself, the *ballet de cour* became a most effective way for performers to become recognized, not only by the king, but also by other wealthy patrons. Likewise, to gain a position as a dancer, one needed a connection to the royal family or the court. As Kettering notes, dancers were discovered and chosen through these connections, as was the case with Lully. Furthermore, those who pleased the king were rewarded in lavish ways, such as through household offices, provincial governments, marriages, pensions, publicities, and, in Lully's case, important musical positions and titles[3].

After achieving his first title, Lully continued to work toward further advancement. One of his earliest duties as a composer of instrumental music was to contribute to the music of the *ballet de cour* along with several other composers who usually specialized in either vocal or instrumental music. However, to work collaboratively was not Lully's ultimate aim. Instead, it appears that he wished to distinguish himself from the other musicians of the royal court. Whether this was his conscious goal or not, Lully did distinguish himself in a number of ways and was successful primarily because he had the favour of the king. Unsatisfied with the *24 Violons du Roi,* Lully requested his own ensemble of violins, over which he had full control to conduct as he pleased, and which he used in all of his musical performances. Predictably, the king soon became particularly fond of Lully's ensemble[4]. Lully seemed to have a singular talent for knowing the

[2] De La Gorce, "Lully."
[3] Sharon Kettering, "Favour and Patronage: Dancers in the Court Ballets of Early Seventeenth-Century France," *Canadian Journal of History* 43, no.3 (2008): 400-402.
[4] De La Gorce, "Lully."

musical tastes of the king and composing accordingly[5]. This gift succeeded in gaining for him the highest office of a musician, and in 1661 he was promoted to *surintendant de la musique de la chambre du roi*. Soon after, he married the daughter of the composer Michel Lambert, a decision that also secured his position and good reputation[6].

In 1672, Lully further solidified his own power by buying the privilege of the opera from Perrin and becoming the director of the *Académie Royale de Musique.* A year later when the Molière died, he gained control of the *Palais Royal* free of charge and forced Molière's troupe out. At this point, he was able to control the performances of his works by rival musicians, limiting their productions to no more than two voices and six violins. When a group of people wishing to oppose Lully's growing monopoly attacked a performance of his *tragédie en musique*, *Alceste* (1674), the king decided to move the performances to the court where they would be free from criticism and would be guaranteed better publicity[7].

Lully's rivals did not succeed in dethroning him from his lofty position, but instead, he continued to increase in power. As he was not of noble birth, the composer wished to elevate his status by achieving nobility[8]. In 1681, his performance in *Le bourgeois gentilhomme* (1670) pleased the king so much that he allowed Lully to buy a secretarial office, enabling him to be ennobled[9]. With this and his other titles, there was little to stop Lully from a complete monopoly on secular music performances in Paris, Versailles, and in the surrounding provincial regions. No opera could be performed in France without his direct permission and he charged heavily for it. He was also able to control the establishment of new opera houses in provincial areas and, in this way, could minimize his competition[10]. Aside from this, Lully was receiving royalties from his printed music and from the librettos that were sold to the audience before

[5] James Parkinson Fairleigh, "Lully as Secretaire Du Roi," *Bach* 15, no. 4 (1984): 16.
[6] De La Gorce, "Lully."
[7] Ibid.
[8] Farleigh, "Lully as Secretaire Du Roi," 18.
[9] De La Gorce, "Lully."
[10] Farleigh, "Lully as Secretaire Du Roi," 19-20.

performances[11]. It is clear that Lully profited greatly from his friendship with Louis XIV to the point that the king's patronage ensured not only the security of his position and power, but also the popularity of his music. Opposition was not an option so long as he continued to secure the favour of the king. Whether his musical style is completely representative of the tastes of the French people at the time is difficult to know, since composers beside Lully were given little opportunity to thrive.

Lully's catering to the preferences of the king was characteristic of his musical compositions throughout his lifetime. As the king was a dancer, he showed a preference towards dramatic entertainments in which the music did not compete with the choreography and story. Strong melodies and complex harmonies were not his priority. Consequently, Lully composed many works for theatre and dance with *airs* that were short, formed of irregular measures, and broken into by many *récits*. Indeed, there was a precise number of measures prescribed for the *airs*[12]. To create diversity in the music, Lully created a musical language for the French *récits*, with rising and falling intervals and dissonances to underline the meaning of certain words. However, in contrast to Italian *recitativ*, there were few melismas or ornamentations, so that the text could still be properly understood[13].

The writing of Philippe Quinault, Lully's librettist for the majority of his operas, was perfectly suited to complement Lully's music. The vocabulary was relatively simple, making the text easy to understand, and the lines were short with odd numbers of syllables for his *airs* and lyrical passages[14]. Additionally, the plots for the dramatic works were far less complex than their Italian counterparts so that the audience would remain engaged throughout the entire performance[15]. There was a unity of action in Quinault's dramas, unlike many other

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[11] De La Gorce, "Lully."
[12] Sir John Hawkins, "Memoir of Giovanni-Battista Lully," *The Harmonicon* 8, no.12 (1830): 489.
[13] De La Gorce, "Lully."
[14] James R. Anthony, "Quinault, Philippe," *Grove Music Online*, accessed November 10, 2013.
[15] De La Gorce, "Lully."

operas of the day and the narratives were based either off of classical mythology or stories of chivalry[16]. The librettist took every opportunity to relate the storylines to the political successes of the king, often portraying him as the hero[17]. Both Lully and Quinault, wishing to maintain employment, astutely aligned their art to the king's wishes.

As Lully's first main genre of composition, the *ballet de cour* played a significant role in establishing him as the king's principal musician. It is interesting, then, to note that there are many gaps in the music that Lully composed in this style. This is largely a result of the fact that no original scores or parts exist for the ballets, and the only manuscripts of the music are copies from years after the original productions. This leaves us with no contemporaneous documents to guarantee Lully's authorship. To further complicate matters, some of the ballets have several different versions of the same works[18]. This is suspect, considering that there were only a few performances in a short period of time, which in most cases would leave little room for alteration. Scholars have few words to say on this subject, though some will admit the discrepancy. Yet, as the early ballets were collaborative works, the possibility remains that other composers were more involved in the writing process than is indicated in the manuscripts. Perhaps the variations are a result of the participation of multiple composers for a given ballet. As the king's favoured musician, Lully could certainly have been attributed music that was not entirely his. However, with so little evidence on the subject, the question cannot be answered either way as of yet.

The only surviving contemporaneous documents from the *ballet de cours* are the *livrets* (librettos). Thankfully, they provide a good amount of contextual information about the productions, though their musical material is limited. The *livrets* contain descriptions of each *entrée,* the names of the performers, the texts of the *airs*, as well as verses written in honour of some of the noble participants. They also

[16] Anthony, "Quinault, Philippe."
[17] Julie Anne Sadie, "Louis XIV, King of France," *Grove Music Online*, accessed November 8, 2013.
[18] De La Gorce, "Lully."

give information on some of the instruments that were played during performances, which included *violons, violes, basses à cordes de boyau, hautbois, flûtes, vielles, clavecins, guitars, castanettes*, and others. However, the *livrets* only mention the instruments that appeared on the stage. They do not indicate which performer was playing it or whether there were additional instrumentalists playing off-stage[19].

Despite these and other unanswered questions, we do have some knowledge on the nature of the genre itself. The ballet of the 17th century was not then as it is today. In addition to dance, it combined operatic singing, drama, poetry, pantomime[20], vocal *airs*, ensembles, and choruses[21]. As to be expected, all ballets were commissioned by the royal patron, who selected the composers, subject, poets, dancers, and the general distribution of labour[22]. Thus, the costumes were elaborate, the stage effects and machinery revolutionary, and the whole production entirely ostentatious[23].

The purpose for all of this excess was much more than entertainment. Though the royal court enjoyed their extravagance, much of the agenda behind it was political propaganda. The *ballet de cour* served the purpose of displaying the magnificence of the king and of intimidating anyone who may be in opposition to him. The plots themselves often carried political themes that corresponded with current events and placed the king as the hero of the story. In this way, the musicians and writers of the works were promoting nationalism along with an obvious message about the noble character of their monarch[24]. Lully's contribution to the 17th century *ballet de cour* appears to be quite significant, as he provided music for no less than sixteen of them from

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[19] Rebecca Harris-Warrick, "From Score into Sound: Questions of Scoring in Lully's Ballets," *Early Music* 21, no. 3 (1993): 355.
[20] Kettering, "Favour and Patronage: Dancers in the Court Ballets of Early Seventeenth-Century France," 394.
[21] James R. Anthony, "Ballet De Cour," *Grove Music Online*, accessed November 10, 2013.
[22] Ibid.
[23] Kettering, "Favour and Patronage: Dancers in the Court Ballets of Early Seventeenth-Century France," 394.
[24] Ibid., 400-401.

1654-1671[25]. As mentioned above, it is hard to ascertain the authorship of every instrumental passage, since Lully was a contributor among several musicians. However, scholars are quite certain that he composed many of the *entrées* in the *ballet de cours* as they contain compositional traits that resemble those of his later works. For example, Lully's idiomatic writing of rapid passages in the music to represent demons and divinities of the winds is evident in both the ballets and the operas[26]. Additionally, the use of chaconnes and other stately dances, such as the 'Chaconne des Maures' from *Ballet d'Alcidiane* (1658) is paralleled in Lully's later dramatic works[27]. The French overture in this ballet also foreshadows Lully's regular use of the genre. Though it seems Mollier was its inventor, Lully was responsible for making the overture popular. In 'Louchie,' at the end of *Ballet de la Raillerie* (1659), several of Lully's compositional characteristics are evident, such as its exceptional length, studied writing, rhythmic variety, syncopations, use of minor mode, along with other traits. Most noticeable is the fact that it is a minuet, another genre that Lully is known to have popularized[28].

A further argument towards Lullian authorship of the ballet *entrées* is the noticeable Italian influence in the music. Having been raised in Italy, Lully himself no doubt bore the influences of Italian compositional traits in his writing. However, he left his home country before he was exposed to the growing genre of Venetian opera, putting him in an opportune position to bring a new sound to France while still maintaining a distinctly French music[29]. From his native country, Lully adopted the Italian binary *air* in ABB'[30] form as well as the Italian *lament* with its slow tempos, descending chromaticisms, and dissonances to represent melancholy and grief[31]. Though his early works contained much more Italian text-setting, Lully eventually began to limit his use of his native

[25] Anthony, "Ballet De Cour."
[26] De La Gorce, "Lully."
[27] Anthony, "Ballet De Cour."
[28] De La Gorce, "Lully."
[29] Denis Arnold et al., "Opera," *The Oxford Companion to Music*, accessed November 13, 2013.
[30] Anthony, "Ballet de Cour."
[31] De La Gorce, "Lully."

language to humourous or highly emotional scenes and composed the majority of his music to French texts. His enjoyed much success with his first great French *air*, 'Sommes nous pas trop hereux' from *Ballet de l'Impatience* (1661)[32]. The marks of Italian influence in the ballets further support the Lullian authorship for at least the *entrées*.

We have seen that Lully's musical career was driven by a desire for power and renown. He was successful in his endeavours for most of his life because he was preferred by the king. Thus, his music and his name were spread and his fame was secured in France and in several other European countries. There are few historical cases that so obviously display the role of patronage in the life and work of a composer. If ever the work of a musician was influenced by his patron, so it was in the case of King Louis XIV and Jean-Baptiste Lully.

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[32] Ibid.

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The Reception of Ligeti, Post *2001: A Space Odyssey*

By: Carolyne Sumner

In regards to the composer Ligeti, it is fair to assume that his compositional style may not be for everyone. Moreover, his twentieth century compositional roots also pose a problem for those who are not accustomed to the complex and challenging structural and harmonic innovations which emerged during this time. Hence, Ligeti's notions of musical composition may not have been well received, not necessarily because of distaste for his music or style, but rather in response to a lack of knowledge of these evolving musical notions and compositional styles which arose during the twentieth century. Assuming that the greater audience and public of the time period in which Ligeti was most active were not all accustomed to his style, or well educated in terms of twentieth century harmony practices, it is not surprising that his music was perhaps not well received. This therefore brings our attention to the question of reception, and how the reception of Ligeti's music has truly changed and evolved over the years, from Ligeti's earlier compositions to his later ones, more notably his piece "*Atmosphères*". Made famous in Kubrick's 1968 release of his film, *2001: A Space Odyssey*, Ligeti's *Atmosphères*, previously chosen as a simple temporary track, was ultimately chosen (among some of his other compositions) to be an integral part of the music of this film. Hence, the following paper will attempt to map out the reception of Ligeti's music, and analyse why his music that was once perceived as too different or complex became of interest, and ultimately determine how his music eventually emerged into the film industry scene, gaining him a much greater and broader range of audience.

Arguably, Ligeti's style is quite complex and, as a composer, has challenged many ideas and compositional notions from the twentieth century, most notably that of serialism. Ligeti must therefore be perceived as an innovator of innovations. Rather than following or

accepting the notions and innovations created during this time period, Ligeti preferred to challenge these compositional structures. As mentioned in Jonathan W. Bernard's article "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution" Ligeti argued that serialism, in which elements such as pitch, duration, timbre, dynamics, mode of attack, are organised in a specific manner or structure, could be exhaustive in terms of creating new and interesting contrasts and textures[33]. Hence, Bernard stresses that "composers who had adopted serial methods discovered that it was becoming 'increasingly difficult to achieve contrast' - their music suffering an inevitable flattening"[34]. In order to prevent such problems in his own compositions, Ligeti had sought to stray away from this serialist method, and followed a new method of composition: "Ligeti's experiments with electronic tape composition germinated 'micropolyphony' and the intuitive ordering of his material using 'quasi-serial' means were the major innovations for Ligeti in the late 1950s. At this time Ligeti's style was far from polished, but he had discovered the necessary clues to perfect his unique brand of modern music"[35]. Accordingly, in relation to his interest in electronic music, this therefore led him to the use and creation of his micropolyphony, a calculated method of weaving simultaneous canons moving at different speeds, creating a thick orchestration or "cloud" of sound[36]. This canonic method used by Ligeti is consequently found in his piece *Atmosphères*[37]. By doing so, he also strays away from what could be considered as a popular method of composition, making his music even less relatable, seeing as serialism was one of the dominant compositional styles of the time. Again, this ties into the reception of his

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[33] Jonathan W. Bernard, "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution." *Music Analysis* Vol. 6, No. 3 (Oct., 1987): 207-208.
[34] Ibid, 208.
[35] Sean Rourke, "Ligeti's Early Years in the West," *The Musical Times*, Vol. 130, No. 1759 (Sep., 1989):535.
[36] Paul Griffiths. "Ligeti, György." Grove Music Online. Oxford Music Online. Oxford University Press, accessed November 5, 2013, http://www.oxfordmusiconline.com.proxy.bib.uottawa.ca/subscriber/article/grove/music/16642.
[37] Bernard, 209.

music, and by taking a different path than that of serialism, Ligeti's musical reception would ultimately be challenged, given that his micropolyphony was not considered the norm in twentieth century compositional practice.

However, the reception of Ligeti's music had changed over the years. In order to understand this change, we must trace how Ligeti's music was discovered, especially in accordance to his piece *Atmosphères* and Stanley Kubrick's film *2001: A Space Odyssey*. Why and how did Kubrick decide that Ligeti's *Atmosphères* was best suited for this film? Simply put, one must question how a composer such as Ligeti, one whose music was far too complex and harmonically challenging for the average listener, made its way to the forefront of film music of the time. Hence, Ligeti's public debut in *2001: A Space Odyssey* demonstrated how he ultimately became an undeniable force musically, but he also became a force in the film industry as well. As we will see, *2001: A Space Odyssey* was but a cornerstone in the usage of Ligeti's music as film music, and the beginnings of his popularity across the globe.

Originally chosen to be part of the temporary track for *2001: A Space Odyssey*, several of Ligeti's pieces, such as *Requiem, Lux Aeterna,* and *Atmosphères* would eventually become part of the official soundtrack for the film. Another of Ligeti's pieces, *Nouvelles Aventures,* had also made a small appearance as well, but was omitted from the credits of the general theatrical release[38]. Although this is somewhat surprising, this suggests that Kubrick had acquired a taste for Ligeti's music, and truly favoured Ligeti's compositional style.

What is quite remarkable about the use of Ligeti's music in this film is that his pieces, along with pieces from other prominent composers such as Strauss, were chosen over the commissioned work of Alexander North, who had been hired to compose original music for 2001: A Space

[38] Paul Merkley, "Stanley Hates This But I Like It!": North vs. Kubrick on the Music for 2001: A Space Odyssey", *Journal of Film Studies*, Vol. 2, No.1 (Fall 2007): 2.

Odyssey[39]. This consequently became a debated issue between Kubrick and North, and this decision to not use the music composed by North was the result of a very complex and even confusing series of events.

As mentioned in Paul Merkley's article, "Stanley Hates This But I Like It!": North vs. Kubrick on the Music for 2001: A Space Odyssey", Merkley stresses that the rejection of North's original compositions may have reflected Kubrick's creative and innovative intentions of moving away from this traditional practice of original compositions, and moving towards the practice of compilation scores instead[40]. Moreover, the article also suggests that the compositions created by North were not up to par, and did not meet Kubrick's standards and his overarching view of what would be an appropriate music for his film and the message he was striving to transmit to his audience. Although North had tried to compose very similar compositions to that of Ligeti and Strauss, his pieces never truly reflected or represented the scenes projected on screen. Strangely enough, Kubrick had been accustomed to working with North and had been very pleased with his work for his film Spartacus[41]. Given this already established relationship between Kubrick and North, why would Kubrick chose Ligeti over North?

As mentioned, Kubrick's decision upon choosing a compilation track rather than an original one was perhaps due to his desire to stray away from the tradition of creating an original composition for his score. However, what drove him to choose Ligeti over other composers? Although one could argue that his decision in choosing Ligeti had been merely coincidental, or out of just pure luck, one could also argue that Kubrick's artistic vision for *2001: A Space Odyssey* coincided well with Ligeti's own artistic visions and compositions. Perhaps, given Kubrick's desire to innovate and divert from film production norms and the traditional practice of original scoring, Ligeti's own desire to stray away from serialism and move towards micropolyphony demonstrated the

[39] Ibid, 3.
[40] Ibid, 6.
[41] Ibid, 8.

similarities between both artists. Both Kubrick and Ligeti desired to innovate and create something new and different, and this could perhaps justify why Kubrick had originally been so keen on keeping Ligeti's music as part of the soundtrack.

Given Ligeti's very distinct and unique style, it is therefore not surprising that Kubrick would have been attracted to the twentieth century composer, and favoured him over North. It is also important to take into consideration the ultimate purpose of *2001: A Space Odyssey*, and its overall message and overarching storyline in regards to the chosen music. Ultimately, Kubrick wanted a music that perfectly represented the purpose and message of his film, using music as vehicle for dialogue in this film. Therefore, not only was this a breakthrough for Ligeti in terms of the greater discovery and transmission of his pieces, but the fact that his music was used instead of a spoken dialogue also means that his music was given more interest, and could arguably have been easily appreciated given this fact: "In all three cases the depiction of the transformational elements is carried out not by dialogue but by the images on the screen and the articulation of the works in the musical score"[42]. This suggests that Ligeti's music was well suited for this scene, and regardless of its complexity, Ligeti's compositions truly evoked philosophical and psychological journeys within each audience member, igniting a purpose or giving sense to the scene at hand. Therefore, people could have come to appreciate and credit Ligeti's work for having ignited these inner psychological journeys. Furthermore, the decision to use Ligeti's *Atmospheres* as the first piece presented and to be heard in the opening scene of the film also portrays how much Kubrick valued this piece from Ligeti, enough to make it the opening attraction for his film, once again shining an even brighter light on this once unknown composer.[43]

Another important question one must ask in regards to the reception of Ligeti's music is that of the impact of Kubrick's influences

[42]Ibid, 2
[43] Ibid.

and decisions had on Ligeti's career as a composer. Accordingly, it is possible that if Ligeti's compositions had not been chosen to be part of the music for *2001: A Space Odyssey*, his music would have been uncelebrated for the remainder of his life: "Although the score is compiled, audience members came to know striking music by Ligeti, a composer hidden for the most part from western ears, whose works they would not otherwise have heard, and who came to be regarded as a major composer partly or largely as a result of Kubrick's films"[44]. Hence, Kubricks ultimate decision to keep the pieces he had chosen as his temp track had truly impacted the reception and transmission of Ligeti's works such as his *Requiem, Lux Aeterna, Atmosphères* and *Nouvelles Aventures*.

However, it is also important to shift our attention to the legal problems that accompanied the use of Ligeti's pieces in Kubrick's film. Interestingly, and somewhat shocking is the fact that Kubrick never asked Ligeti's permission to use his pieces in 2001. Ligeti never approved the use of his pieces, and when the film was released, he had never received his royalties. Furthermore, he was not definitely not pleased at the overall extensive use of 32 minutes of his pieces either[45]. This culminated into yet another complicated and complex legal journey in which Ligeti finally settled for far less than he should have, a grand total of $3,000[46]. In her article "An effort to decide": More Research into Kubrick's Music Choices for 2001: A Space Odyssey", Kate McQuiston writes:

> "In the soundtrack for 2001, Kubrick validated the practice of not just borrowing, but reinventing existing works in new contexts. Borrowing existing music is a commonplace in musical multimedia in the later twentieth and early twenty-first centuries that, for the informed listener, inevitably makes for a

[44]Ibid, 6.
[45] Julia Heimerdinger, "I have been compromised. I am now fighting against it": Ligeti vs. Kubrick and the music for 2001: A Space Odyssey", *Journal of Film Music*, Vol. 3, No. 2 (2011):134.
[46] Ibid, 129.

> rich collision of cross-references and meanings that depend on shared cultural knowledge"[47].

This suggests that Kubrick had felt that by using Ligeti's music in such a manner justified his position, and the fact that he did use Ligeti's music without permission. This therefore leads us to ask ourselves, although wrong in practice, does this truly justify using Ligeti's music without consent? Once could argue that, even though Kubrick wrongfully "borrowed" Ligeti's music, he did in fact give the composer something more valuable than money itself. This practice of "borrowing music" could also be linked to the use of Ligeti's *Nouvelle Aventures*. As mentioned, although used in the film, this piece had not been properly credited in the general theatrical release. Perhaps Kubrick, by this time, realised that with this new "practice" of his, he was perhaps pushing his limits. Although Kubrick did credit the piece in the DVD release of *2001*, by not listing *Nouvelles Aventures* in the credits of the theatrical release, perhaps Kubrick felt that this would go unnoticed by the general public, and by Ligeti as well, seeing as the piece was seldom used[48]. Regardless, by using Ligeti's music, and choosing such a complex and different genre of music, as well as an unknown composer in North American eyes, Kubrick ultimately repaid Ligeti by gaining him his first real audience. That being said, Kubrick had put Ligeti's music on the world map, and one could argue that the result of such an act is considerably more valuable in the long for Ligeti.

It is also important to discuss the fact that since *2001*, not only had Ligeti made his musical world debut, but he had also made his presence known in the cinematographic world as well, and arguably, with little effort. Since his "contribution" to *2001: A Space Odyssey*, Ligeti's music had been used in several other Kubrick films such as *Eyes Wide Shut* (1953) and *The Shining* (1980). Once again, in both films, the use of a compilation track was preferred over the traditional original

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[47] Kate McQuiston, "An effort to decide": More Research into Kubrick's Music Choices for 2001: A Space Odyssey", *Journal of Film Music* Vol. 3, No.2 (2011), 153.
[48] Merkley, 3.

soundtrack. As Kubrick continued down this path of musical cinematographic innovation, it seems that Ligeti had somehow joined along for the ride.

In *Eyes Wide Shut*, Ligeti's *Musica Ricercarta* was yet another set of pieces of his that would be featured in Kubrick's film, and would also garner Ligeti a much greater audience after the film's release in 1953[49]. *Musica Ricercarta* is a set of piano pieces composed by Ligeti in 1951-1953, which are nowadays considered as one of the most important works of this period according to pianists and analyst alike[50]. Hence, one can assume that perhaps the gaining popularity of this Ligeti piece could be attributed to the fact that it was highlighted in Kubrick's film, once again suggesting that Kubrick was really the one who put Ligeti's fame and fortune into motion.

Unlike *2001: A Space Odyssey*, Kubrick's *The Shining* strays away from the science fiction genre. *The Shining* was Kubrick's first official horror film, and one could assume that his choice in music would reflect this change of genre as well. Hence, it goes without saying that the music used in *The Shining* was extremely important in terms of setting the perfect horror atmosphere, and once again, Ligeti's music seems to fit this bill. In *The Shining*, Ligeti's *Lontano* seemed to reflect the main characters (Jack) madness and the Isolation of the "Overlook Hotel", the hotel in which *The Shining* takes place.[51] Consequently, seeing as this film diverts from Kubrick's science fictional roots towards the horror genre, we could argue that Ligeti's music is very accommodating and flexible in terms of suiting different film genres, making him and his composition multidisciplinary in terms of film music. More so, this also suggest that Ligeti would not only be known as

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[49] Leonard Lionnet, "Music Unveiled: Mysteries of the Overlook: Unraveling Stanley Kubrick's Soundtrack for "the Shining," *Film Score Monthly* Vol. 9, No. 1 (Jan 2004): 44.

[50] Robin Halloway. "Ligeti's Half-Century," *Musical Times* Vol. 145, (Winter 2004): 54.

[51]Christine Lee Gengaro, *Listening to Stanley Kubrick* (Plymouth, UK: Scarecrow Press, Inc., 2013), 179.

the composer of "that one piece used in *2001: A Space Odyssey*", but as an actual force in the film industry, as well as multi dimensional composer whocaught the attention of many since *2001, Eyes Wide Open,* and *The Shining*.

Moreover, we could also argue that Ligeti had also set the bar high for composers who wished , or were commissioned, to compose horror film music. More so, perhaps Ligeti's compositions in *The Shinning* created a whole new wave and method of horror film compositions. As mentioned in Jeremy Barham's article "Music as Context, Character and Construction in Kubricks *The Shining*": The Shining exemplifies a level of both sophisticated interaction of music and moving image, and general reliance on music for contextual, characterization and narrative purposes, rarely equalled in his output"[52]. We can therefore assume that Ligeti's contribution to *The Shining* could have forever changed how horror film music has been composed since. As also mentioned by Russel Plat in his article "Ears Wide Open,": "In the midst of a dislocated life in a misbegotten century, Ligeti has created a body of music that, with a few exceptions, maintains an underlying serenity of purpose even while it indulges a taste for the ghoulish and the macabre"[53]. Regardless the genre, it seems that Ligeti's music suits many different types of films, and the overarching meaning of his pieces seem to morph as to accommodate the directors overall artistic view for the film in question.

Although *2001: A Space Odyssey* had been the breaking out point of Ligeti's career, it would also be important to understand how the American public received, conceived and understood modernist music, and how this could have affected Ligeti's reception prior to *2001: A Space Odyssey*. As mentioned in Bjorn Heile's article "Darmstadt as

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[52] Jeremy Barham "Incorporating Monsters: Music as Context, Character and Construction in Kubrick's *The Shining*" in *Terror Tracks: Music, Sound and Horror Cinema, ed. Philip Hayward* (London,UK: Equinox Publishing Ltd, 2009), 137.

[53] Russell Platt, "Ears Wide Open," *The Nation* , Vol. 27, No. 19 (December 2003): 54.

Other: British and American Responses to Musical Modernism", in view of modern music, they ultimately adopted an "outsider point of view[54]". In other words, Heile's suggests that modern music was perhaps a continental phenomenon, rather than a global one. Although there are some modern composers in America, these composers are still stylistically different from their European counterparts. Consequently, as also mentioned in Heiles article, many of the composers of the Darmstadt school, including Ligeti, seem to have been overlooked as merely "marginal" composers, not worth discussing or listening to. Other composers deemed as marginal include John Cage as well, which is rather surprising seeing as he is an American composer[55]. Consequently, by contrast, by using compositions written by Ligeti and Cage in films, these pieces had become "public friendly". All of a sudden, these composers are deemed worthy of American attention. By using these pieces in film, one could argue that, regardless of the complexity, these pieces become more accessible and relatable seeing as it accompanies a narrative or storyline in which the greater society can understand. As mentioned earlier, Ligeti's pieces in *2001: A Space Odyssey* had been used as medium of dialogue. Therefore, one could also argue that the scenes depicted on screen act as a script which accompanies the music, making it easier to understand the piece at hand through a cinematographic lens. Consequently, given this information, it is not truly surprising that Ligeti did receive such grandiose attention later on in his compositional career.

Although Ligeti's compositional style may still not suit everyone's musical tastes, one cannot deny his musical and compositional genius in the sphere of twentieth century period. Ligeti's music may be an acquired taste, it is also apparent that his music, when presented in the right context, can be appreciated by a much wider and broader audience. Hence, given his rather unusual and dysfunctional relationship with Kubrick, Ligeti had not only become a world renown

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[54] Bjorn Heile,"Darmstadt as Other: British and American Responses to Musical Modernism," *Twentieth Century Music* 1, no. 2 (2004): 169.
[55] Ibid, 166.

twentieth century musical composer, but he had ultimately emerged as a film music composer as well. Although this was perhaps not what Ligeti had envisioned for himself further along his musical career, through the unrequested help of Kubrick and his film, *2001: A Space Odyssey*, Ligeti's pieces such as *Atmosphères*, *Requiem*, *Lux Aterna* and *Nouvelles Aventures* were ultimately given new life, and were repurposed for the better. Consequently, Ligeti had been transformed from an unknown composer into an international film music icon for years to come, and although he may have never predicted such a future for himself, his music ultimately changed film music in all cinematographic genres for generations to come.

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Part II: Composition and Analysis

The Compositional Techniques and Influences behind Ligeti's 'Atmosphères

By: Stephanie Mayville

György Ligeti is one of the most prominent and important composers of the twentieth century. Despite his reputation as an avant-garde composer, his music reaches a wide audience[56]. This is partly due to the appearance of his works in the science fiction movie *2001: A Space Odyssey*[57], one of which is his infamous piece for orchestra, *Atmosphères.* Of all the works by Ligeti that are part of the movie's soundtrack, this is the only one heard in its entirety. Some scholars wonder if an experimental work such as this is serious music or if it can only make sense in the context of a film[58]. However, the ingenuity and radicalness of the compositional techniques employed by Ligeti in *Atmosphères* becomes apparent when it is analyzed in depth. In this paper, I will discuss these techniques as well as various inspirations and influences behind *Atmosphères.* The modern composer was impacted by those before him, particularly the Renaissance composer Johannes Ockeghem. Ligeti also musically represented mathematical concepts in his piece and used them as a basis for formal organization. Through analysis, we will see that Ligeti's compositions are highly sophisticated and do not need to rely on film to be understood.

Some critics, particularly Everett Helm who critiqued *Atmosphères* in 1961 when it premiered, believe that because Ligeti abandons conventions such as motivic development in favour of sustained texture that his music is not serious or challenging for the listener[59]. Yet, that is simply not true and a narrow-minded view of

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[56] John Dewitt Van Der Slice, "An Analysis of Gyorgy Ligeti's 'Atmospheres' (Austria, Hungary)," (DMA thesis University of Illinois at Urbana-Champaign, 1980), iii.
[57] Ibid., iii.
[58] Ibid., iii.
[59] Ibid., 42-43.

Ligeti's works. As we will see below, Ligeti based his piece off of very complex techniques inspired by one of the most serious composers in music history. *Atmosphères* is not challenging if one only considers it in the context of melody or motives. It is, however, extremely radical and sophisticated when its techniques; use of harmony, timbre and individual instruments; and formal organization are studied.

György Ligeti lived in Hungary and studied at the Conservatory in Kolozsvar from 1941 to 1949[60]. During this time, there was a lot of artistic control and Ligeti was not aware of the musical advances happening in the West[61]. Bartok and some Stravinsky were the extent of his musical knowledge during the start of his career[62]. Yet, Ligeti yearned to write more complex, seemingly shapeless music[63]. As a result of his situation, he produced the folk-based songs that were in demand at the time while composing more experimental works "for his desk drawer"[64]. In 1956, when the restraints on artists were loosened, Ligeti left Budapest where he was living and settled in Cologne, Germany[65]. Here, he reinvented himself as a "radical contemporary composer"[66]. He was able to learn what his contemporaries were working on[67], and was introduced to post-Webern techniques and electronic music, the latter two greatly influenced *Atmosphères*, composed in 1961[68].

The progression in music history towards music that is concerned more with sound than melody manifests itself in *Atmosphères*. The nineteenth and beginning of the twentieth centuries saw a growing fascination with the concept of sound, including innovations to the manufacturing of instruments which allowed composers to explore the

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[60] Paul Griffiths, "Ligeti, György (Sándor)," *Grove Music Online,* accessed November 12, 2013, *Oxford Music Online.*
[61] Ibid.
[62] Ibid.
[63] Ibid.
[64] Griffiths, "Ligeti, Gyorgy."
[65] Ibid.
[66] Michael D. Searby, *Ligeti's Stylistic Crisis: Transformation in His Musical Style 1974-1985,* (Lanham: Scarecrow Press, Inc., 2010), 4.
[67] Griffiths, "Ligeti, Gyorgy."
[68] Van Der Slice, "Analysis of 'Atmospheres,'" 8.

various sounds these new technologies could produce[69]. The progression from Berlioz to Mahler to Debussy to Webern saw timbre and sound being treated more and more radically[70]. The concept of *Klangfarbenmelodie* placed timbre on the same level of importance as pitch and its duration[71]. As composers were more enthralled with pitch and timbre, melody and harmony faded in importance. Ligeti's *Atmosphères* focuses on timbre and textures with little to no concern for conventional melody, harmony or rhythm[72]. It is important to note that though these elements are not the centre of his composition, they do play a crucial role in producing the dense sounds.

Atmosphères is arguably Ligeti's most famous work in his entire *œuvre*[73]. Upon first listening, the piece does not appear to have much substance, sounding like a large mass of sound devoid of melody and conventional harmony. Yet, that is exactly the effect Ligeti intended to produce. He was interested in creating such dense sonorities that the "individual interwoven instrumental voices are absorbed into the general texture and lose their identity"[74]. This work, for large orchestra without percussion instruments, can be considered as the next stage in music that seeks to emancipate dissonance[75]. Once pitches lose the distinction of dissonant and consonant, it would follow that they be freed from any definition. Ligeti creates his dense, chromatic sound clouds in two ways and both are surprisingly simple. The static sonorities are produced when each member of the orchestra is playing a single note or specific interval. The opening cluster in *Atmosphères* has the strings playing individual notes while the brass and woodwinds play intervals ranging from a major

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[69] Van Der Slice, "Analysis of 'Atmospheres,'" 1.
[70] Ibid., 1.
[71] Ibid., 1.
[72] Searby, *Ligeti's Stylistic Crisis,* 6.
[73] Brian J. Lefresne, "Applications of Chaos Theory and Fractal Geometry in the Music of Gyorgy Ligeti," (MA thesis University of Ottawa, 2005), 100.
[74] Joseph Auner, *Music in the Twentieth and Twenty-First Centuries*, (New York: W.W. Norton & Company, Inc., 2013), 238.
[75] Van Der Slice, "Analysis of 'Atmospheres,'" 2.

second to a perfect fifth[76]. Ligeti uses basic music principals to create something complex. Furthermore, the layering of diatonically unrelated pitches and intervals result in a heavily chromatic sound cluster and the inability to distinguish its individual parts[77]. The employment of this technique is simply one example of many that demonstrate the sophistication of Ligeti's music.

Another way in which Ligeti creates his dense sonorities is through a technique he called "micropolyphony." This technique is a variation of a canon: each voice is playing the same set of ordered pitches, yet to a separate rhythmic pattern[78]. It can be thought of as stretching the musical line horizontally by varying rates instead of using imitation. In *Atmosphères*, particularly at rehearsal letter C, the rhythmic patterns played by different voices increase from a quarter note to a twenty-tuplets at varying rates[79]. The resulting rhythmic complexity is astounding and makes it impossible for a conductor to cue everyone[80]. Ligeti's technique was partly inspired by layering used in electronic music[81]. In fact, *Atmosphères* has its origins in another work called *Piece electronique No. 3*[82]. In this composition, Ligeti was interested in creating sound masses by layering sound waves that were resonating at various frequencies[83]. He abandoned this work though because he realized acoustic instruments would be more effective in creating a sustained texture within which "composite sounds would emerge and recede like shadows"[84]. Although micropolyphony produces a more

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[76] Lefresne, "Applications of Chaos Theory," 102.
[77] Ibid., 102.
[78] Searby, *Ligeti's Stylistic Crisis,* 5.
[79] Lefresne, "Applications of Chaos Theory," 102.
[80] Zachary Lewis, "Close Up: Ligeti's "Atmospheres" a work of shimmering, groundbreaking complexity," Cleveland OH Local News, published February 26, 2012, http://www.cleveland.com/musicdance/index.ssf/2012/02/close_
[80]up_ligetis_atmospheres_a.html.
[81] Carson Kievman, "Ockeghem and Ligeti: The Music of Transcendence," (PhD Princeton University, 2003), 15.
[82] Lefresne, "Applications of Chaos Theory," 101.
[83] Lefresne, "Applications of Chaos Theory," 102.
[84] Lefresne, "Applications of Chaos Theory," 102.

rhythmically active cluster than before, when the instruments are holding notes, the effect is virtually the same: a chromatic, impenetrable, interwoven mass of sound.

Ligeti's micropolyphony was also inspired by the canons and polyphony employed by Renaissance composers, particularly Palestrina and Ockeghem[85]. His technique is essentially an atonal version of their canons[86]. Ligeti familiarized himself with these composers while he was teaching counterpoint at the Franz Liszt Academy in the years before he left Budapest[87]. He has spoken too of his admiration of Ockeghem[88]. Not surprising, it was when he was teaching counterpoint that his interest in building something from nothing, or from basic musical elements such as a single pitch, began to flourish[89]. In fact, the music of the twentieth century is closer to that of the fifteenth century than any other era in Western classical music history[90]. In the case of Ockeghem and Ligeti, they both created music based on a sophisticated, imperceptible framework whose contrapuntal progressions are indistinguishable[91]. Furthermore, Ockeghem avoided conventional means of closure such as cadences in order to create a free flowing, endless line of music spread evenly over each voice[92]. This could be a description of *Atmosphères*, which has a constant texture against which the various sonorities of the orchestra ebb and flow seamlessly. This continuous progression of sound clusters, which are difficult to differentiate unlike the clear sections of sonata form, for example, inhibits the listener to perceive change in time[93], which adds to the free floating characteristic of *Atmosphères*.

Ligeti's technique of micropolyphony elevates the piece's complexity because the rhythms become so intricate, as mentioned

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[85] Searby, *Ligeti's Stylistic Crisis,* 5.
[86] Ibid., 6.
[87] Ibid., 5.
[88] Kievman, "Ockeghem and Ligeti," 1.
[89] Van Der Slice, "Analysis of 'Atmospheres,'" 7.
[90] Kievman, "Ockeghem and Ligeti," iii.
[91] Ibid., iii.
[92] Kievman, "Ockeghem and Ligeti," 2-3.
[93] Van Der Slice, "Analysis of 'Atmospheres,'" 39.

above[94]. Harmony is revolutionized by the employment of this technique as well. The sonorities that come out of all the layering are unlike anything that can be analyzed by conventional harmonies. Yet there are still ties to conventional sonorous schemes. Ligeti organizes the work by three main sonorities: chromatic, pentatonic and diatonic[95]. The main focus of *Atmosphères* is on timbre, texture and sonority[96]. The way in which Ligeti treats the orchestra to bring out the dense clusters of sound revolutionizes the way we think of music[97]. One critic wrote, "instead of clear and transparent, *Atmosphères* strives to be hazy and indefinite, a vast, intricate blur where every musician plays a distinct role but few individuals can actually be heard"[98]. What Ligeti desires for each player is laid out in great detail with very specific dynamics, rhythmic markings and even playing techniques[99]. He even differentiates between the members of each instrumental section of the orchestra, requiring fourteen separate lines for both the first and second violins, ten for both viola and cello and eight for double-bass[100]. The importance placed on each individual member of the orchestra in *Atmosphères* is like the next step in the progression from Wagner's treatment of the orchestra and Webern's *Klangfarbenmelodie.*

The formal structure of *Atmosphères* is one of the most sophisticated aspects of the piece, largely because it is inspired by mathematics. Many composers base their works off of some form of extra-musical medium, most often other arts such as literature or paintings. Ligeti, however, found inspiration from the sciences and mathematics[101]. While *Atmosphères* is not normally thought of as having connections to mathematics, particularly fractal geometry and chaos

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[94] Lewis, "Close Up."
[95] Van Der Slice, "Analysis of Atmospheres,'" 16.
[96] Searby, *Ligeti's Stylistic Crisis,* 6.
[97] Lewis, "Close Up."
[98] Ibid.
[99] Van Der Slice, "Analysis of 'Atmospheres,'" 30-31.
[100] Lewis, "Close Up."
[101] Lefresne, "Applications of Chaos Theory," 1.

theory like some of his other compositions[102], placing it in such a context helps us better understand the piece overall[103].

In the score, *Atmosphères* is divided into twenty two rehearsal letters, starting with X, then going alphabetically from A to U[104]. Within the individual sections, marked by the rehearsal letters, there are instances of inspiration from mathematical concepts such as elements of chaos theory, which is very basically the study of systems whose outcomes are extremely sensitive to their initial conditions. At rehearsal letter E, the music appears to be ascending and descending from a specific pitch[105]. This section in the score is a visual representation of a bifurcation tree[106]: a point that splits in two, with each new point dividing into two and so on. Another instance of this idea is in rehearsal letter H, in which all the strings are playing and the focus slowly narrows to two pitches[107]. In this case, the music could be viewed as a reverse bifurcation tree[108]. Before the compositions of *Atmosphères*, Ligeti was interested in mathematical concepts as well as building something from nothing[109]. Further proof that this piece contains bifurcation trees is found in the sketches for the work. On one of the pages for *Atmosphères* at the Sacher Foundation in Basel, Ligeti wrote out a musical representation of a bifurcation tree: he starts with a single note, D above middle C, and each measure is a diverging of the notes until almost five octaves are spanned across the treble and bass clefs[110].

Ligeti did not limit his use of mathematical concepts to pitches. Each section is its own cluster of sound, with some being very similar to the ones before or preceding it and others quite different. The piece looks and sounds as if it is following a specific path, but sections with

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[102] Ibid., 101.
[103] Ibid., 111.
[104] Van Der Slice, "Analysis of 'Atmospheres,'" 38.
[105] Lefresne, "Applications of Chaos Theory," 103.
[106] Ibid., 103.
[107] Lefresne, "Applications of Chaos Theory," 103.
[108] Ibid., 104.
[109] Ibid., 106.
[110] Ibid., 110.

unrelated musical material interrupt that flow[111]. The disruptive sections cause the music to alter its trajectory and go in a new direction[112]. It appears that Ligeti was composing the overarching sections of *Atmosphères* in the form of a bifurcation tree[113]. The large scale form of the piece can also be viewed as a sine wave, if considered by pitch and range[114]. A sine wave starts from a point, increases then decreases and continues to oscillate in that manner. *Atmosphères* begins by encompassing a wide ranges of pitches, then a narrow range and back to wide again[115]. Also, the second half of the work focuses on register or, more specifically, sounds oscillating between high and low registers[116]. Even though there are fairly convincing instances of Ligeti's employment of elements of chaos theory in his composition, he did not use a formula[117]. That being said, analyzing *Atmosphères* in mathematical terms instead of musical ones helps us to better understand the overall scheme of the work[118]. For example, unrelated sections of music that seem to disrupt the flow of the piece are actually part of large scale patterns[119]. Ligeti was interested in redefining structure by creating music that is not dependant on melody, harmony, or motivic development[120]. Using mathematical elements allows him to write free-flowing, non-linear music and focus on sonority.

As we have seen, the inspirations for *Atmosphères* are many and diverse. The compositional techniques he employed, specifically micropolyphony, are radical and highly sophisticated. The canons and counterpoint of Renaissance composers, such as Ockeghem, influenced the complex relationships between voices in Ligeti's music. The

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[111] Ibid., 107.
[112] Ibid., 107.
[113] Ibid., 107.
[114] Ibid., 101.
[115] Ibid., 101.
[116] Lefresne, "Applications of Chaos Theory," 101.
[117] Ibid., 107.
[118] Ibid., 111.
[119] Ibid., 111.
[120] Van Der Slice, "Analysis of 'Atmospheres,'" 43.

Hungarian artist also found compositional techniques and a basis for formal structure from mathematical concepts. All of these elements allow Ligeti to create a new structure for his music that focuses on dense, intricate, chromatic sound clusters never heard before.

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20th Century Discussions on Instrumentation and Timbre in Regards to Pierre Boulez and *Le marteau sans maître*

By: Elsa Marshall

As elements of music, including tonality, rhythm, and form, became more and more unfamiliar in modern compositions of the 20th century, the instrumentation of a piece sometimes provided the only link to the familiarity of Western art music. The use of unconventional timbres in other pieces further weakened relations to what was conventionally understood to be music and lead to intellectual debates on what is sound and what is music. The role of electronic instruments and machines in composition, as well as the inclusion of non-Western instruments beyond the role of sound effects, were new considerations for composers of the time. For some, the inclusion of these new sounds was necessary to the development of new music.

In this paper I will first discuss composers John Cage, Edgard Varèse, and Pierre Boulez's ideas about instruments and timbres. I will then examine Boulez's ideas more specifically and how these relate to the aforementioned ideas. Finally, I will study various analyses of his instrumentation in *Le marteau sans maître* (1952-55) in relation to these modern debates.

Discussions of Technology and Sound in Compositions and Writings of Boulez, Varèse, and Cage

A large part of the discussions about defining music in the writings and interviews of Cage, Varèse, and Boulez consists of the analysis of timbres used in musical composition. More specifically, there are debates over the role of timbre in composition and the distinction or lack thereof between an object that produces sound and a musical instrument.

One idea that these composers agreed upon was the need for music to develop alongside the world. Varèse explained this as a

necessity, for focusing on the past makes us "less able [...] to face the future and to determine the new values which can be created in it."[121] Moreover, each composer had his own experiments with new technologies.

John Cage incorporated new technology in his 1939 piece, *Imaginary Landscape No. 1*, using "turntables playing test tone recordings at different and changing speeds," alongside piano and cymbals.[122] Cage was expanding the idea of what an instrument could be. The new turntables are shown as continuations of previous instrumental developments, and as a possible inclusion in compositions alongside older instruments. It is interesting to see in such an early use of an electronic technology that the turntables are not treated as a sound effect or novelty, but they are instead treated as instruments of equal importance and ability as traditional ones.

Edgard Varèse composed several electronic pieces including *Déserts* (1954) and *Poème électronique* (1957-8), which both incorporate tape-recorded sounds, and he discussed the future possibilities of technological advances and their effect on music in his lectures.[123] In his 1939 lecture, Music as an Art-Science, Varèse imagined "a sound-*producing* machine" which would allow the communication between composer and listener to be "unadulterated by "interpretation.""[124] It would work by a composer collaborating with a sound engineer to transfer a score to the machine, which would then turn the score into music. He continued to suggest the benefits of such technology in terms

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121 Edgard Varèse, "New Instruments and New Music," in *Contemporary Composers on Contemporary Music*, ed. Elliott Schwartz and Barney Childs with Jim Fox (New York: Da Capo Press, 1998), 196. This text is from a lecture Varèse gave at Mary Austin House, Santa Fe in 1936.

122 James Pritchett et al., "Cage, John," *Grove Music Online*, accessed November 20, 2013, *Oxford Music Online.*

123 Paul Griffiths, "Varèse, Edgard," *Grove Music Online*, accessed November 20, 2013, *Oxford Music Online.*

124 Edgard Varèse, "Music as an Art-Science," in *Contemporary Composers on Contemporary Music*, ed. Elliott Schwartz and Barney Childs with Jim Fox (New York: Da Capo Press, 1998), 200-201. This lecture was given at the University of South Carolina.

of the wealth of new acoustic, harmonic, and timbral possibilities afforded to composers. What Varèse envisioned seems similar to current computer programs that utilize and alter MIDI files such as *Garage Band* and *Cubase*. Such programs are increasingly used in the music industry for their range of possibilities and their ability to produce music resembling that of a recorded performance. Whereas this only appealed to Varèse because he would have been able to make sure his composition was "unadulterated" in the process of performance, the omission of human performers is also a cost and time efficient benefit for music producers (though a growing problem for performers).

Although Boulez's *Le marteau sans maître* does not include electronic instruments, he did compose two *Etudes* using magnetic tape in 1951 at Pierre Schaeffer's studio. This compositional technique allowed him to create precise timbres, durations and intensities. Later, he also worked with digital sound manipulation.[125] He also established l'Institut de Recherche et Coordination Acoustique/ Musique (IRCAM) in 1970 with the intention of advancing the research of "new music and associated technologies."[126]

Technological advances provided composers with more control over the sound produced at a performance and the ability to diminish the role of the performer, as with Boulez's and Varèse's compositions. However, Cage's piece showed how traditional classical instruments could coincide with new electronic instruments. Furthermore, the concept of relatively standard ensembles and timbres began to change drastically with modern composers. The concept of what could be considered a musical timbre and what was mere noise was being challenged and arguably evolving.

Jonathan Goldman's book, *The Musical Language of Pierre Boulez: Writings and Compositions*, states that Boulez believed that sounds that are, "too loaded with anecdotal connotation," such as the

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[125] G.W. Hopkins, and Paul Griffiths, "Boulez, Pierre," *Grove Music Online*, accessed November 20, 2013, *Oxford Music Online.*

[126] Peter Manning, "Institut de Recherche et Coordination Acoustique/Musique," *Grove Music Online*, accessed November 20, 2013, *Oxford Music Online.*

[126]

sirens in some of Varèse's compositions, are not usable.[127] What the difference is between an anecdotal connotation and any other sort of significance or meaning attached to a timbre is unclear. This could be a flaw in Boulez's opinion, but the secondary source may be misrepresenting what Boulez actually said on the matter.[128] Oddly enough, this possible issue of interpretation by an extra person between a primary source and a reader parallels the worries Boulez and Varèse had about a performer not providing an accurate communication from the composer to the listener. Perhaps this explains the multiple primary sources (lectures, articles, letters, and interviews) of Boulez that are available to the public.

Goldman then states that Boulez believed the distinction between sound and music should be maintained to avoid confusion and that some unpredictable sounds could potentially disrupt the flow of music. This later opinion coincides with a letter from Boulez to Cage from July 1954. Boulez mentions their disagreement on the use of chance operations when discussing a recent article of his on serialism and his expansion of it in *Le marteau*. He writes, "Obviously we disagree as far as that goes - I do not admit - and I believe I never will admit - chance as a component of a completed work. I am widening the possibilities of strict or free music (constrained or not). But as for chance, the thought of it is unbearable!"[129]

Around the early 1950s Cage, influenced by *I Ching* and Morton Feldman, began leaving the order of events in some compositions up to chance. In 1952, his piece *4" 33"* focused on the degree of control a

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[127] Jonathan Goldman, *The Musical Language of Pierre Boulez: Writings and Compositions* (New York: Cambridge University Press, 2011), 69.

[128] The text cites Boulez's 1980s writings that appear in the 2005 book *Points de repère: Leçons de musique*, edited by Jean-Jacques Nattiez, but does not quote them in this section. I have not yet had the chance to look at this book. Goldman's earlier use of somewhat extravagant language in the text (the "Boulezian instrumentarium" on page 9 for example) suggests that the phrase "anecdotal connotation" is his own.

[129] Pierre Boulez, and John Cage, *The Boulez-Cage Correspondence*, ed. Jean-Jacque Nattiez (Cambridge: Cambridge University Press, 1993), 149-150.

composer has over a composition.[130] The entire piece includes no action or intended sound from a performer. Instead, the lack of intended sound draws the audience's focus to other sounds in the performance venue, the unintended sounds which the composer and the performer have no control over. Whereas Boulez went towards total serialism and having total control over his compositions, Cage was demonstrating what happens when a composer relinquishes control of one or more elements of music, including timbre, and suggesting that there is music to be found by just listening to everyday sounds.

Boulez's Writing on Timbre

In his 1987 article, "Timbre and Composition", Boulez discusses various understandings of timbre and their relevance to modern composition.[131] In the section on Hector Berlioz's influential orchestration treatise, Boulez expresses the view that certain timbres and keys have extramusical meaning. For example, Berlioz associates the low register of the clarinet with "anguish, and sombre feelings," and the French horn with enchantment. Boulez suggests that although these associations are true of the works of Beethoven and composers that followed him, such a strong general definition of a timbre cannot be used to analyze all music.

From my understanding, Boulez prefers to view timbre as the equivalent of a word in musical language as opposed to a sentence with a set understanding, but he also acknowledges that some composers utilize timbres for their pre-existing meanings. He later emphasizes in the article that timbre is solitary in its meaning, explaining that "The instrumental timbre has stability and a single function: it defines a world which refers uniquely to itself..," Here, Goldman's "loaded anecdotal connotation"

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[130] Pritchett, et al., "Cage, John."

[131] Pierre Boulez, "Timbre and composition - timbre and language," *Contemporary Music Review* 2, no. 1 (January 1987), accessed November 19, 2013, *Scholars Portal: Journals*.

[131]Boulez on Berlioz, p. 163; Function of timbre, p. 164; Role of an instruments in an Ensemble, p. 164-165.

may now make sense. Sirens, alarm clocks, kettles, and many other everyday sounds are currently associated closely with specific reactions and emotions. Using them in a piece of music would be like using an existing word instead of creating one and can be seen as being too direct and obvious. Whether or not it is possible to alter, through musical composition, the emotions and reactions that are strongly linked to these sounds would be an interesting topic for further research.

Boulez continues in his article to discuss the different characteristics between a solo instrument and an instrument in an ensemble. He explains that the individual timbral traits of a given instrument are lost in a group in exchange for "its potential for fusion." Nonetheless the need for new timbres in orchestral writing, in order to develop music and not stay in the past, has lead to the inclusion of instruments that do not fit into the usual blend of standard classical ensembles. Boulez argues that the use of "imported instruments" (he seems to be referring to non-Western instruments) in these ensembles removes them from their original roles and into newly created ones. This also happens to "traditional instruments" when they are used in new contexts.

In many classical compositions that use non-Western instruments, their use is only as an element of exoticism or as a special effect. They are rid of their possible specific associations and importance from the culture they originated from, and they become a symbol of their originating culture in its entirety. Arguably, this simplifying of the role of an instrument can make the complex culture it originates from seem simplistic. How then are Western composers meant use these instruments? One could research how the instrument is used in its originating culture and attempt a similar use of it. This option is likely the most respectful to a culture's history, but it focuses on replication of a past use rather than creating a new one. As Boulez demonstrates with *Le marteau*, it is perhaps through creating new ensembles that include non-Western and Western sounds or instruments as equal collaborators that both sets of timbres can not only be respected, but also evolve. This idea is not unlike Cage's incorporation of the turntable as an equal instrument to the piano and the cymbal in *Imaginary Landscape No. 1*.

Instrumental Ideas in Le marteau sans maître

Boulez's *Le marteau sans maître* is one of his most famous works. It is one of a few of his based on the surrealist poetry of René Char and it is considered as the piece where "serial principles reached its most sophisticated form," according to Arnold Whittall in the *Cambridge Introduction to Serialism*.[132]

In regards to the instrumentation, scholars have differing interpretations of Boulez's own explanation of *Le marteau*. The piece includes an alto flute; a xylorimba; a vibraphone; a range of percussion instruments including bongos, maracas, a gong, and others; a guitar; a viola; and an alto voice in different combinations for each of the nine movements. Goldman notes how the exotic instrumentation "[occupies] the middle of the register" and how, other than the viola (he is likely only referring to the bowed viola) and the flute, all the instruments are resonating ones, "which the musician relinquishes control over the sound once the note is attacked."[133] James McCalla, in his book *Twentieth-Century Chamber Music*, provides a thorough analysis of the instrumentation of the piece, discusses its "timbral spectrum," and associates it with "the twentieth century's love for the "exotic" or non-European (in this case, the Far East) and a concomitant expansion of Western usages."[134]

Both these descriptions appear to be drawing from Boulez's own in his essay *Dire, jouer, chanter*.[135] Boulez links all the instruments in *Le*

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[132] Arnold Whittall, *The Cambridge Introduction to Serialism*, (New York: Cambridge University Press, 2008), 176.
[133] Goldman, *The Musical Language of Pierre Boulez*, 9.
[134] James McCalla, *Twentieth-Century Chamber Music*, Second Edition, (New York: Routledge, 2003), 2 & 23 accessed November 19, 2013, *Taylor & Francis eBooks*. McCalla's analysis of *le Marteau* begins on p. 21.
[135] Pierre Boulez, *Le marteau sans maître*, (Wein: Universal Edition, 1964), p. IV-VI. Part of an English translation of this text is used as the preface to this score. A footnote on page VI explains "The text comes from the essay *Dire, jouer, chanter*, published in *La musique et ses problème: contemporains 1953-1963* (Cahiers de la Compagnie Madeleine Renaud - Jean-Louis Barrault, Julliard, Paris). *Dire, jouer, chanter* is a lecture that Boulez gave in Basle on the occasion of a concer[t] in which he conducted *Pierrot lunaire* and *Le Marteau*

marteau by explaining the shared characteristics of one to another, depicting the "timbral spectrum" that McCalla describes. For example he explains that, "On the viola, the notes can be 'rubbed' or plucked: in the latter case, it connects with the guitar, also a plucked string instrument, but one with a longer resonance time. Considered as a resonating instrument, the guitar connects with the vibraphone, which is based on the prolonged vibrations of struck metal keys." The choice of instruments initially seems random as it abandons any resemblance to traditional classical ensembles, but this is not the case. By approaching instrumentation from a completely new angle, Boulez decisively created a new way to unify the ensemble through clear timbral connections, leaving traditional ideas of balance and creating ensembles based on the notion of instrumental families behind.

Boulez then writes about the perceived "'exotic' associations" of his piece: the "xylophone, vibraphone, guitar and percussion are clearly far removed from the models for chamber music offered by the Western tradition, but come much closer to the sound of Far-Eastern music, in particular, though without having any relation to the musical vocabulary of the latter." He further explains that although his choice of instrumentation was influenced by non-Western cultures, their use is not related to the traditions of these cultures. The piece's outcome seems to show that Boulez achieved his goals for *Le marteau*, which he stated in the 1954 letter to Cage: "I am trying to go ever further and deeper, and also to widen my outlook... I am trying to rid myself of my thumbprints and taboos..."[136] In *Le marteau*, Boulez integrated the sounds of other cultures by creating them on instruments that had already been accepted in the Western art music tradition. The sounds are not treated as effects or novelties, but they are instead used as equal materials to the traditional sounds of other instruments such as the viola and alto flute.

In regards to the music's relation to the text in *Le marteau*, Whittall praises Boulez's "fierce concentration of Char's verse" despite a "less rich ... interaction between words and music, voice and

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sans maître."

[136] Boulez and Cage, *The Boulez-Cage Correspondence*, 149.

instruments..."[137] He also discusses the "interaction between fixity and freedom" in the work and how it reflects how the poem is "a surreal rejection of conventional meanings... set against relatively straightforward poetic forms." This rejection of conventional meanings while retaining an attachment of sorts to tradition is also seen in Boulez's article on timbre and his letter to Cage. His application of this in his treatment of ensemble instrumentation and non-Western sounds in *le marteau* was innovative at the time of its premier in 1955, but Boulez later stated the uniqueness of the piece has dissipated since. In his 1972 interview with Célestin Deliège, he remarks that "the ensemble it uses... now seems banal because it, or at any rate something like it (for it coloured all the ensembles that followed), has been used thousands of times; but it was the first of its kind."[138]

In conclusion, Boulez's concentration was continually on developing the possibilities of musical composition as his works (such as *Le marteau sans maître* and the *Etudes*), his writings, and his letters with Cage demonstrate. Although Boulez's development of music in *Le marteau* is significant and provided solutions to some problems, it is not a point at which to stop. Boulez's statement implies that what makes a piece remarkable is when it provides a new perspective or idea, not when it focuses on, or replicates, works of the past. In this paper I have only discussed how the need for new developments influenced concepts of instrumentation in the 20th century. How this notion has affected other elements of music would also be interesting to examine.

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[137] Whittall, *The Cambridge Introduction to Serialism*, 178.
[138] Pierre Boulez, and Célestin Deliège, *Pierre Boulez: Conversations with Célestin Deliège*, (London: Eulenburg Books, 1976), 67-68.

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