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Tonal-Serial Hybridity in the Works of Three Composers of the Walt Disney Studios with an Analysis of Patrick Gibson's Nexus-Music for a Shadow Animation for Chamber Orchestra

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UNIVERSITY OF CALIFORNIA  
RIVERSIDE

Tonal-Serial Hybridity in the Works of Three Composers of the Walt Disney Studios with  
an Analysis of Patrick Gibson's *Nexus - Music for a Shadow Animation* for Chamber  
Orchestra

A Dissertation submitted in partial satisfaction  
of the requirements for the degree of

Doctor of Philosophy

in

Music

by

Patrick Luprete Gibson

March 2020

Dissertation Committee:  
Dr. Ian Dicke, Chairperson  
Dr. Paulo C. Chagas  
Dr. Roger Hickman

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The Dissertation of Patrick Luprete Gibson is approved:

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Committee Chairperson

University of California, Riverside

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A project of this size cannot be done alone. I do not believe a project of any size ever can. I have had help from a great number of people, from across the country, who have generously given their time, talent, financial support, and enthusiasm to ensure that this dissertation was a success. No motivations can be attributed to these individuals and organizations other than their commitment to the creation of new music, and a love and appreciation of music, education, and the arts. Their passion for supporting artists and their desire to see our collective understanding of music grow is what made this paper, and the piece that accompanies it, possible.

The composition of my piece, *Nexus: Music for a Shadow Animation*, which marked the beginning of this journey for me, began around November of 2018. Reflecting back, and recalling the many amazing people who have stepped in and saved this project time and time again over the past 16 months, I feel a profound sense of gratitude. I also am deeply humbled that so many talented individuals contributed to it, helping me far surpass my wildest hopes for this dissertation. I am extremely proud to say that many of these people have either become my friends, were and still remain my friends, are respected and honored mentors, or are cherished members of my family. They are the inspiration for *Nexus*, and they are the reason for any insights this paper may reveal to the reader.

During the composition of *Nexus*, some portions of the music were performed or read publicly prior to the debut of the full piece, and these performances, readings, and

recordings, were very helpful to me, as they provided me with a strong sense of which elements worked and which needed changing or improvement. I was honored by performances or readings of *Nexus* by four people, in particular. Keith Kirchoff, a fine composer, excellent pianist, and a specialist in the performance of pieces for piano and electronics, gave the third and fourth movements of *Nexus* their first readings at the University of California, Riverside (UCR), in January 2019, and provided me with very insightful feedback on the piece, which shaped the direction I took as I continued the process of its composition and orchestration for chamber orchestra. I thank him for his beautiful performance and his generosity and encouragement.

The Phaze Ensemble, Gerardo Lopez, Matt Dearie, and Manuel Perez, gave a stunning first performance of the fifth movement at *Sound and Fury Presents: Ensembles HEX and PHAZE*, in June of 2019 (more about that amazing concert series, later), and then offered to record the piece professionally, which they did in August of that year. These interactions with Gerry, Matt, and Manny were so encouraging and so much fun, and I am honored to say that Phaze has asked me to orchestrate all five movements of *Nexus* for them. It will be my pleasure to do so, of course, and I know that I benefitted a great deal from their specific, practical, and very helpful feedback on the fifth movement. I am grateful and honored to have had my music played by musicians of such a high calibre, and I am certain that *Nexus*, as well as my compositional skills, are better for the time we spent together.

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I was working at the time as a full-time classroom teacher for the district and could not attend classes during my work day. To my great surprise, I was told by all of them to drop everything, accept the fellowship, and most importantly, to contact Human Resources, immediately.

I did so and was put in touch with the then Human Resources Department Director, Debra Ecung. It was her idea to apply for a sabbatical with the LBUSD, and she tirelessly shepherded the application through the entire process, spending hours with me explaining every detail and giving me sage advice. For this I am extremely grateful! I am grateful, too, to the Long Beach Board of Education for agreeing to provide me with this sabbatical, which made it possible for me to complete all of my coursework at UCR and to forge the relationships that I enjoy today with my professors and colleagues there and look forward to continuing in the future.

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I must also express my heartfelt thanks to the Music Department at UCR. I am so honored to be a student at UCR. I thank the Music Department for its financial support of



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I send special thanks to Dr. Christian Dubeau and Dr. Christine Lee, my colleagues at UCR, my great friends, and the directors of the best new music series in Los Angeles, *Sound and Fury Concerts*. I met Christian and Christine in 2015 at a local composers' networking event and we immediately took to each other. They have been my stalwart friends ever since, and I hope I have been able to be even half as good a friend to them as they have always been to me. They are the reason that I was able to meet Dr. Ian Dicke and take my first steps towards applying to the PhD Digital Composition program at UCR. They have programmed so many of my pieces and shown such faith in my abilities that I can never repay them. Because of them, I have had the chance to write for ensembles from around the nation and around the world. They have given me a musical home and a musical family. I can never say enough to thank them and can never do enough to show my true gratitude.

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abilities made them invaluable advisers to me during the composition of *Nexus*. It is my hope that they will honor me in the future with an original animation set to this piece.

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know and you are my hero. No small word of thanks that I can say here would be truly sufficient to express what I feel, and, so, I simply, say, I love you.

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## ABSTRACT OF THE DISSERTATION

Tonal-Serial Hybridity in the Works of Three Composers of the Walt Disney Studios with  
an Analysis of Patrick Gibson's *Nexus - Music for a Shadow Animation* for Chamber  
Orchestra

by

Patrick Luprete Gibson

Doctor of Philosophy, Graduate Program in Music  
University of California, Riverside, March 2020  
Dr. Ian Dicke, Chairperson

Film composers of the Modernist Era, by nature of their unique role occupying both a commercial and an aesthetic space, served two masters of necessity: the narrative needs of their client's or studio's film production, and their own need to create artistically satisfying music. They were free, however, of the need to justify their aesthetic choices and their choice of compositional methodologies for a given project to those in academia. This, I argue, proved to be compositionally advantageous for film composers, when one considers the imperative for academic justification experienced by their contemporaries in concert music, in that it allowed film composers greater freedom when considering a compositional methodology for a given score or section of a score. It is my contention

that this relative freedom, and the practical necessity of producing striking original film scores, played a role in film composers' adoption of some of the compositional techniques of modernist concert music composers and the integration of those techniques into their scores. This phenomenon can be readily observed in the film, television, and theme park music of three of the great Disney underscore composers of the era: Oliver Wallace, George Bruns, and Norman "Buddy" Baker.

Taking inspiration from the example of these groundbreaking composers, I composed *Nexus: Music for a Shadow Animation* (2019), in an attempt to realize the potential applications of some of my predecessors' compositional techniques for twenty-first century concert music. Employing analytical and semiotic research methodologies, this paper investigates revelatory passages within the works of the above-mentioned composers, discussed alongside analogous use of similar techniques by modernist concert music composers, such as, Igor Stravinsky, Frank Martin, Arnold Schoenberg, and Karel Husa. The paper further analyzes the application of these techniques within *Nexus*, thus demonstrating a means of using these materials.

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## **Part I: Tonal-Serial Hybridity in the Works of Three of the Film Composers of the Walt Disney Studios in the Post-World War II Era**

### **Introduction**

Film composers of the Modernist Era, by nature of their unique role occupying both a commercial and an aesthetic space, served two masters of necessity: the narrative needs of their client's or studio's film production, and their own need to create artistically satisfying music. They were free, however, of the need to justify their aesthetic choices and their choice of compositional methodologies for a given project to those in academia. This, I argue, proved to be compositionally advantageous for film composers, when one considers the imperative for academic justification experienced by their contemporaries in concert music, in that it allowed film composers greater freedom when considering a compositional methodology for a given score or section of a score. It is my contention that this relative freedom, and the practical necessity of producing striking original film scores that satisfied the specific programmatic needs of a given project, on time and on budget, played a role in film composers' adoption of some of the compositional techniques of modernist concert music composers and the integration of those techniques into scores that cannot exclusively be characterized as modernist. This phenomenon can be readily observed in the film, television, and theme park music of three of the great

Disney underscore composers of the era: Oliver Wallace, George Bruns, and Norman “Buddy” Baker.

## **Rationale**

Taking inspiration from the example of these groundbreaking composers, I composed *Nexus: Music for a Shadow Animation* (2019), in an attempt to realize the potential applications of some of my predecessors’ compositional techniques for twenty-first century concert music. I posit that the analysis of their scores will yield important discoveries that will advance the collective knowledge of twenty-first century composers by giving the professional practitioner many times the number of tools he or she currently has at their disposal. Employing analytical and semiotic research methodologies, this paper investigates revelatory passages within the works of the above-mentioned composers, discussed alongside analogous use of similar techniques by modernist concert music composers, such as their contemporaries, Igor Stravinsky, Frank Martin, Arnold Schoenberg, and Karel Husa. The paper further analyzes the application of these techniques within *Nexus*, thus demonstrating a means of using these materials.

These modernist concert music composers trod a path, in the decades after the Second World War, that suggested a means of combining serial procedures with tonality, as well as the expanded post-tonal harmonies present in the music of Debussy, especially



in his *Préludes pour le Piano, Livres première et deuxième*.<sup>1</sup> A palette that contains these elements offers a rich and dizzying array of potential musical outcomes for twenty-first century composers, and the results of such a combination are already available for our study in the media music of the above-mentioned Disney film composers, each of whom utilized both serial and tonal techniques in their scores, and whose comprehensibility is attested to by their success in communicating story elements (analogous to programmatic elements) in the films their music accompanied.

### **Analytical Methodology**

During the course of the composition of *Nexus: Music for a Shadow Animation*, I undertook careful analyses of scores by Wallace, Bruns, and Baker. These analyses, discussed below, utilize the analytical techniques of post-tonal musicologists, such as Allen Forte, Joseph N. Straus, Milton Babbitt, and Pieter van den Toorn. At the conclusion of these analyses, I found myself better equipped to compose *Nexus*, employing a wide range of materials to create something authentic to my composer's voice. It is my contention that twenty-first century composers now have the musicological perspective, thanks to the work of the aforementioned analysts, to examine twentieth century source materials, such as the scores of the Disney composers and their concert music contemporaries. Armed with a greater understanding of post-tonal academic vocabulary and theory, the twenty-first century composer can analyze

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<sup>1</sup> Claude Debussy, *Complete Preludes, Books One and Two [Préludes pour le Piano, Livres Première et Deuxième]* [New York: Dover Publications, 1989].

compositional methodologies that are, as of yet, untapped and little understood. It seems possible that this type of analysis may very well further the state of the musical art.

For this paper, a focus on the commonalities among the compositional methodologies and aesthetics observable in film and concert music of the post-World War II era will illuminate the above mentioned connection between the use of tonality and serialism by modernists. The modernist film and concert music composers discussed in this paper were, as my analyses will establish, proficient in both musical languages and used both, often within the same piece. I argue that this flexible application of tonality and serialism, employed based upon the programmatic needs of a given piece, is characteristic of modernist concert and film music.

### **Semiotic Methodology**

Proof of the potency of this hybrid compositional palette, herein called “tonal-serial hybridity,” is demonstrated by its effectiveness for advancing narratives in films of the era. One of the strengths of tonal-serial hybridity is that it has the potential to suggest the music of the nineteenth and twentieth centuries separately or simultaneously, depending upon the dramatic needs of a film. Scores featuring tonality and/or serialism imply, through their presence and use, certain programmatic settings in the context of a

film score, given their semiotic associations with audiences of the period.<sup>2</sup> Roger Hickman describes various styles in the context of their application to film music,<sup>3</sup> and we focus here on his analysis of the two genres most salient to our discussion of a tonal-serial hybridity: Romanticism and Modern Music.<sup>4</sup>

Hickman asserts that Romanticism, as a style that can be emulated or suggested by a film composer, “emphasizes melody, colorful orchestrations, and a wide range of emotions. Such qualities are ideally suited for the needs of film: Romanticism is powerful, flexible, and relatively unobtrusive. Composers of the late nineteenth and early twentieth centuries added more complex harmonies to their concert works, which exerted a strong influence on film composers.”<sup>5</sup> Thus, film composers’ familiarity with Romanticism and proficiency in suggesting its chromatic and melody-based textures aided them in their efforts to tell personal stories, driven by a character’s emotional journey. One must consider, though, this skill-set as forming only part of a modernist film composer’s arsenal in satisfying the twin needs of their clients and their own artistic integrity. The ability to write modern music (or music in the modernist style) forms yet

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<sup>2</sup> Mervyn Cooke, *A History of Film Music* [Cambridge, UK: Cambridge University Press, 2008], 189-190. See also, Roger Hickman on this subject, as relates to Miklós Rózsa’s score for *Ben-Hur* (1959), in Roger Hickman, *Miklós Rózsa’s Ben-Hur: A Film Score Guide*, Scarecrow Film Score Guides, No. 10 [Lanham, MD: The Scarecrow Press, 2011], 90. See also Hickman’s discussion of musical style and its applications in film music in Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 37-39.

<sup>3</sup> Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 37-39.

<sup>4</sup> *Ibid.*, 37-39.

<sup>5</sup> *Ibid.*, 37.

another large part of that arsenal and gives the modernist film composer a wider range of stylistic choices and possible narrative settings.<sup>6</sup>

Hickman's describes Modern Music as "a common way to refer to music predominantly by concert composers...that breaks away from the compositional techniques and styles of the eighteenth and nineteenth centuries."<sup>7</sup> Modernism in film music seen in this light demonstrates an important strength of tonal-serial hybridity - it is defined, in part, as a reaction to what it is not. It is not, per Hickman, intended to be a continuation of eighteenth and nineteenth century practice,<sup>8</sup> but is difficult to define without reference to the nineteenth century. This concept of difference as meaning relates, somewhat, to systems theory, as discussed by Paulo Chagas<sup>9</sup> and, so, has a semiotic function in film music, as well as concert music.

Per Chagas, "Meaning is created in the autopoietic network of the operations of the system. It exists only as a product of these operations (Luhmann 1998, 44). The difference system/environment emerges both as a difference produced by the system and

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<sup>6</sup> It must be mentioned here that Romanticism and Modern Music or modernism are not, of course, the only two genres that film composers of the era suggest in their scores, nor are drawing room dramas and science fiction, for example, the only two genres of film their music serves. For the purposes of this paper, we pass over popular music, historical music, and ethnic music - all of which Hickman discusses in his survey of film music genres. See Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 37-39. This paper is concerned with modernist composers' means of employing and integrating tonal-serial combinations in their scores and, thus, focuses on those two genres and instances where a tonal-serial hybridity is present.

<sup>7</sup> Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 38.

<sup>8</sup> *Ibid.*, 38.

<sup>9</sup> Paulo C. Chagas, *Unsayable Music: Six Reflections on Musical Semiotics, Electroacoustic and Digital Music* [Leuven, Belgium: Leuven University Press, 2014], 75.

a difference observed in the system. This is what characterizes the concept of ‘re-entry’ in Spencer-Brown’s terms. This recursive process that introduces the difference inside the difference makes the system incalculable; the system reaches a state of indetermination caused by itself.”<sup>10</sup>

As modernism is a changing of, at the very least, or rejection of, at the very most, Romanticism, the difference between them helps to define each and, per Chagas’s analysis of systems theory, this difference can give rise to new meanings (and musical possibilities) through a continual process of change and innovation.<sup>11</sup> As composers generate more musical solutions to the problems of communicating a program, through the process of differentiating their music from that which preceded it, they create new forms. One can see, then, how the concept of breaking with the earlier orthodoxy of maintaining strict serialism in a piece could have arisen and, given the relative freedom of expression of film composers of the era, how its adoption by composers may have been hastened.

### **The Importance of Reception in the Creation of Tonal-Serial Hybrid Works**

Evidence of film composers’ relative freedom from following the dictates of academic or commercial scrutiny, as compared to the pressure felt by their concert music composer colleagues, can be seen in the respective receptions of the National Broadcasting Company and its sponsors, upon the premiere of Schoenberg’s Piano

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<sup>10</sup> Ibid., 75.

<sup>11</sup> Ibid., 75.

Concerto, Op. 42, and Walt Disney's reception of new film music by his composers, George Bruns and Buddy Baker, during music production meetings and informal interactions at the Walt Disney Studios. We consider, first, the reception of Schoenberg's concerto.

Kenneth Marcus relates that Schoenberg benefitted from the strong and constant advocacy of the conductor, Leopold Stokowski, throughout his time in the United States and, indeed, even before Schoenberg emigrated to the U.S.<sup>12</sup> Per Marcus, "This concert [the premiere of the Piano Concerto, Op. 42, led and presented by Stokowski] formed one of several [radio] broadcasts [on the NBC Radio Network] that presented contemporary music, potentially driving away listeners and advertisers [due to the concerto's extensive use of serialism in the musical materials], including General Motors that sponsored the NBC Symphony broadcasts. As a result [of the performance and radio broadcast of the Piano Concerto], within a few months of the concerto's premiere, NBC decided not to renew Stokowski's contract, and contemporary composers 'lost their most forceful advocate.'"<sup>13</sup>

However, it must be noted that Schoenberg was hemmed in on two sides when considering the use of a tonal-serial hybridity in his music, as the Piano Concerto did.<sup>14</sup>

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<sup>12</sup> Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 201-202.

<sup>13</sup> Ibid, 13. The final portion of this quote is a quotation from Alex Ross, *The Rest Is Noise: Listening to the Twentieth Century* [New York: Farrar, Straus and Giroux, 2007], 265.

<sup>14</sup> See Marcus's discussion of the academic criticism of Schoenberg's use of tonality within this piece, especially the criticism of René Leibowitz, discussed further in this paper, below. Kenneth H Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 202-204.

Schoenberg's European champion, René Leibowitz, questioned his idol's use of tonality within the work - writing to Schoenberg and his students, such as Dika Newlin and Leonard Stein, several times on the subject - and, after some years' reflection, ascribed Schoenberg's use of tonality in the Piano Concerto to Schoenberg's drive to search out all of the possibilities of tonality and serialism.<sup>15</sup> Even Schoenberg, himself, then, was not free as a concert music composer to employ the earth-shaking compositional technique that he had invented in the manner in which he saw fit, without risking academic criticism.

For the Disney composers, there were no such considerations for two reasons. Firstly, their work was accompanied by a visual element which added greatly to its comprehensibility, and helped to justify the use of tonal-serial hybridity, provided that it supported the program of the television episode, film, or theme park attraction. Secondly, and even more significantly, the Disney composers had the support of the boss, himself.<sup>16</sup> In interviews recorded after Walt Disney's death, both Bruns and Baker separately

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<sup>15</sup> René Leibowitz, *Schoenberg and His School: The Contemporary Stage of the Language of Music*, Translated by Dika Newlin [New York: The Philosophical Library, 1949], 126.

<sup>16</sup> See, for example, Buddy Baker, interviewed by Jon Burlingame in Didier Ghez, ed., *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 127.

recounted the same experience with Disney when meeting with him on their music,<sup>17</sup> and more specifically, in Bruns's case, at least, when discussing their use of modern music.<sup>18</sup>

In his interview with musicologist, Jon Burlingame, Buddy Baker states that Walt Disney "got involved [in music] to the point of just making a comment about the type of music he thought [a film needed]. He never, ever, in all the years I was there, was on the stage when we recorded. He knew everybody tightened up when he came around. But it was uncanny how he knew what was right for a scene, what type of music."<sup>19</sup> Baker further elaborated, "He would never tell you what to write. Most of the time, he would put it [his suggestion for the music] in the form of a question."<sup>20</sup>

As it related to Disney's feelings about the use of modern music or modernism in his films, shows, and attractions, Bruns remembered, "He [Walt Disney] liked Tchaikovsky very much, and Beethoven was one of his favorites. I think he liked just about anything that was melodic. He didn't like the real modern music like Schoenberg,

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<sup>17</sup> See Buddy Baker, interviewed by Jon Burlingame in Didier Ghez, ed., *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 127, and George Bruns, interviewed by Richard Hubler in Didier Ghez, ed., *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 124.

<sup>18</sup> George Bruns, interviewed by Richard Hubler in Didier Ghez, ed., *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 124.

<sup>19</sup> Buddy Baker, interviewed by Jon Burlingame in Didier Ghez, ed., *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 127.

<sup>20</sup> *Ibid.*, 128.



or anything like that.”<sup>21</sup> Considering this, it is significant to note that Disney, nevertheless, trusted his composers implicitly and would back them on their choice of style, so long as it supported the picture.<sup>22</sup> Per Bruns, “I just did this big thing [for the Disney film, *Jack and Old Mac*],<sup>23</sup> and we finally made a short out of it. He [Disney] asked what kind of harmony that was [in the score that Bruns had composed for it] and I said it was the modern thing. He said he didn’t understand it, but, ‘If that’s what they’re buying now, let’s try it.’ He was always willing to go along with something like that. All in all, he had a very commercial approach to music. And he liked music.”<sup>24</sup>

As a result, evidence of tonal-serial hybridity in the scores of Disney films, television episodes, and theme park attractions can be found with some frequency, especially for projects that involved the establishment of a mysterious mood, suggested the unknown, or dealt chiefly with scientific themes, as my analyses, below, of three emblematic scores of the era will establish. The Disney composers made the most of the inherent flexibility of tonal-serial hybridity and planned their stylistic references within scores to aid their audience in following narratives that often shifted time and place over the the course of their unfolding. Apropos of this, tonal-serial scores possessed, by nature

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<sup>21</sup> George Bruns, interviewed by Richard Hubler in Didier Ghez, ed., *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 124.

<sup>22</sup> *Ibid.*, 124.

<sup>23</sup> “Jack and Old Mac - IMDB.” IMDB. <https://www.imdb.com/title/tt0049376/> [Accessed February 12, 2020]. This was a short film released theatrically on July 18, 1956.

<sup>24</sup> George Bruns, interviewed by Richard Hubler in Didier Ghez, ed., *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 124.

of their reflection of music of both the nineteenth and twentieth centuries, the potential to suggest both periods or styles simultaneously, as well as a number of moods. Through applying the above mentioned principle of difference as meaning,<sup>25</sup> as the appearance of one style indicates the absence of the other, Disney composers could draw the attention of their viewers to a change in the setting of the narrative through a change in the musical style.

#### **Analysis of George Bruns: *Man in Space* (1955)**

An excellent example of the manner in which this is achieved can be observed in George Bruns's score to the *Disneyland* anthology television show, *Man in Space*, which

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<sup>25</sup> Paulo C. Chagas, *Unsayable Music: Six Reflections on Musical Semiotics, Electroacoustic and Digital Music* [Leuven, Belgium: Leuven University Press, 2014], 75.

first aired March 9, 1955.<sup>26</sup> This pioneering television episode, which was later released theatrically,<sup>27</sup> drew on the expertise of Dr. Wernher von Braun, Dr. Willy Ley, and Dr. Heinz Haber for the creation of this influential documentary which dealt with the then-

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<sup>26</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955]. For airdate and other production details, see Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 133. Bruns, incidentally, was hired at the Walt Disney Studios through his connection to Ward Kimball, the director of the *Man in Space* trilogy. Kimball, in addition to being one of Disney's top animators, the Nine Old Men (see note on the Nine Old Men, below), was also the trombone player and co-leader, with fellow member of the Nine Old Men, Frank Thomas, of the Walt Disney Studios in-house Jazz band, The Firehouse Five, for whom Bruns often played tuba and/or double bass. Kimball was impressed by Bruns's abilities as a tuba player and, through this experience, Kimball offered Bruns the composer's job for the *Man in Space* series and, ultimately, Walt Disney offered Bruns the composer's job for his animated feature, *Sleeping Beauty*. Bruns also knew Kimball through his work at United Productions of America [UPA] Animation Studio. See "Buddy Baker (1918-2002)," in Didier Ghez, ed. *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 130. The UPA connection with Kimball could be vital in establishing where Bruns might have picked up knowledge of serialism, if not through his lessons with Baker directly. That Bruns may well have been introduced to serialism through colleagues at UPA and/or through his lessons with Baker is certainly a possibility. In the case of the former, film composer David Raksin, a student of Schoenberg's, did some work at UPA on *Mister Magoo*. For Raksin's comments on his animated film work and some of his comments on his work with Schoenberg, see Daniel Mangodt, "David Raksin: An Interview of David Raksin by Daniel Mangodt," *Soundtrack Magazine* 13, no. 49 [1994], <https://cnmsarchive.wordpress.com/2013/07/25/david-raksin/> [Accessed July 11, 2019]. In addition to this, Scott Bradley had publicized the fact that he was utilizing Schoenberg's twelve-tone techniques, as early as 1937. See, for example, Scott Bradley, "Music in Cartoons," in *The Cartoon Music Book*, Daniel Goldmark and Yuval Taylor, eds. [Chicago: A Capella, 2002], 118. Thus, the possibility of professional film composers', such as Bruns's, exposure to serialism, certainly existed. This area of tracing the influence of serialism on animated film composers seems a promising line of inquiry for future research in this area.

<sup>27</sup> Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 133.

future of space travel.<sup>28</sup> One of the most effective uses of tonal-serial hybridity in Bruns's score for this film, evidence of which can be found throughout the sections dealing with the first human-made satellite and the first orbit of the earth, is at its climax, upon the landing of the space shuttle-like craft, marked by the narration, "Mission completed!"<sup>29</sup>

On the surface, there appears to be no tonal center to this music and the texture is contrapuntal and, yet, as the space-plane touches down on the runway, the music glides into the Bb mixolydian mode as seamlessly as the plane, itself.<sup>30</sup> It is instructive to note, as well, that the Bb mixolydian mode {10,0,2,3,5,7,8} could be analyzed as a quasi-subset of the Bb Blue Scale {10,0,1,2,3,4,5,8,9}, with the exception of the inclusion of {7} in Bb mixolydian, and, thus, may also provide reassurance to the audience by referring, however, subtly, to popular music. This literal and figurative landing or arrival at the Bb level is achieved through a careful blending of the serial and tonal elements employed at this moment in the piece, achieved primarily through the use of pitch-classes common to both the predominant series employed (see Fig. 1, below) and the Bb mixolydian scale which follows it.

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<sup>28</sup> Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 64. Haber is the on-screen narrator, and off-screen writer [with the assistance of the Walt Disney Studios Story Department] of the book and film, *Our Friend the Atom* (1957), which served as the chief inspiration of my piece, *Nexus: Music for a Shadow Animation*, discussed below. *Man in Space* was seen as so important by President Eisenhower, upon viewing it, that he had a copy sent to the Pentagon the same day, according to Cotter. See the discussion of the audience for Disney television programs, below.

<sup>29</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955], from c. 46:20-48:39.

<sup>30</sup> *Ibid.*, c. 48:17.

Even more reflective of a tonal-serial compositional methodology, the music that precedes this moment, starting near 45:18, is based upon two transpositionally-related hexachordal sets, which are suggestive of a P series, {6,5,8,11,10,1,2,7,9,4,0,3}. This series can be derived from the order of each pitch-class's appearance within the various dyads, trichords, tetrachords, and pentachords in this cue.<sup>31</sup> (See Fig. 1) Indeed, this cue appears to be organized into two periods, each of which is based upon one of the two hexachords, whose pitches correspond to that of the adjacent hexachord at the T1 or T11 level, respectively. For our purposes, we will label the two hexachords at work in this cue as: Hexachord A {6,5,8,11,10,1}, (See Fig. 1), found throughout Period 1 (mm.1-8); and Hexachord B {7,6,9,0,11,2}, (See Fig. 1), which appears at the beginning (mm. 9-10) of Period 2 (mm. 9-14).

There is, however, a significant difference in Bruns's use of the two hexachords. In Period 1, Hexachord A is used *consistently* and *exclusively* throughout the entire period (mm. 1-8).<sup>32</sup> From a programmatic standpoint, this aids Bruns in accomplishing two narrative goals. First, by employing set or series-based material in these bars, he is able to create a setting that sounds mysterious, evokes the unknown, and suggests scientific and technical activity. Second, and in contrast, by employing Hexachord A consistently and exclusively in this period, Bruns suggests a musical and dramaturgical period of *stasis*.

The repetition of various dyads or sequences of pitch-class pairs from within the

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<sup>31</sup> Roger Hickman describes the term, "cue," in film music as "A passage of underscoring from its entrance to its end...". See Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 34.

<sup>32</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955], c. 45:18-45:42.

hexachord also establishes this stasis.<sup>33</sup> (See Fig. 1) The musical material is consistent and so, regardless of its inherent instability when compared to tonality, is still somewhat reassuring.

**Fig. 1 - George Bruns: *Man in Space*, "Tests and Observations"**

**Man in Space: "Tests and Observations"**  
*from the Disneyland Television Anthology Episode*  
 c. 45:18ff. George Bruns  
 Transcription by Patrick Gibson

Adagietto  
 ♩ = 84

"Space medicine will benefit from tests conducted..."

"Tests and observations by the crew..."

©1955 The Walt Disney Company

<sup>33</sup> Ibid., c. 45:18-45:42.

Un poco più adagio  $\text{♩} = 68$   
"...and will add to our knowledge of many sciences."

The musical score is arranged in five systems, each with a staff for a different instrument. The Flutes staff (top) begins with a *rit. un poco* marking and features a melodic line with a *rit.* marking at the end. The Bassoon staff (second) plays a rhythmic accompaniment of eighth notes, marked *p*. The Violin I staff (third) has a *pp* dynamic. The Violin II/Violas Divisi staff (fourth) also has a *pp* dynamic. The Harp staff (fifth) plays chords, marked *p* and *mp*. The Timpani staff (bottom) plays a staccato pattern, marked *mp* and *pp*. The score includes various musical notations such as slurs, accents, and dynamic markings.

"Instrument Rocket approaching from three o'clock high." [Cue continues after this bar]

13 *mf*

*mp*

13 **Horns**

**Trombones/Bass Trombone**

*sub.*  
***ff***

*sub.*  
***p***      *sub.*  
***p***      ***ff***      *sub.*  
***p***      ***ff***



One could argue, in addition, that the use of the series and its musical transcendence of a dominant tonal center in this section is meant to represent the feeling of weightlessness, since all of the activities in this portion of the film are carried out in a zero-gravity environment.<sup>34</sup> It is, thus, exceptionally well-suited to support the narrative at this moment in the film. Semiotically, the concept of transcendence brings to mind Tarasti's description of the act of transcending *dasein*<sup>35</sup> and moving into "the world of Nothingness and its unbearable lightness."<sup>36</sup> In discussing Umberto Eco's view of the semiotic implications of serial music and tonal music, Tarasti notes that Eco differentiates the two in terms put forward by Boulez: "In this connection [the connection between structuralism and serialism in music],<sup>37</sup> Eco refers to Boulez, who said that classical tonal thinking reflected a universe ruled by principles of gravitation, whereas serial thought

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<sup>34</sup> Ibid. This cue runs from c. 45:18-46:20, but the program continues under zero-gravity conditions for a good deal longer into the film.

<sup>35</sup> Eero Tarasti, *Existential Semiotics: Advances in Semiotics* [Bloomington, IN: Indiana University Press, 2000], 5 and 8ff. Tarasti seems to equate *dasein* with "everyday life." See Tarasti, page 8. See also Michael Wheeler, "Martin Heidegger," in *The Stanford Encyclopedia of Philosophy*, Winter 2018 Edition, Edward N. Zalta, Editor, <https://plato.stanford.edu/archives/win2018/entries/heidegger/> [Accessed February 16, 2020], page of 5 of 47 [of the article in pdf form]. *Dasein* is defined by Wheeler, in terms of the philosophy of Martin Heidegger, as follows: "...we might conceive of it [*dasein*] as Heidegger's term for the distinctive kind of *entity* that human beings as such, are." Wheeler goes on to clarify that "...Dasein is not to be understood as 'the biological human being.' Nor is it to be understood as 'the person.' Haugeland (2005, 423) argues that Dasein is 'a way of life shared by the members of some community.'" All emphases, above, Wheeler and Haugeland, respectively.

<sup>36</sup> Eero Tarasti, *Existential Semiotics: Advances in Semiotics* [Bloomington, IN: Indiana University Press, 2000], 103. This illustration of transcendence of *dasein* is made by a way of a parenthetical comment in Tarasti's analysis of Umberto Eco's position on structuralism and serial music.

<sup>37</sup> See Eero Tarasti, *Existential Semiotics: Advances in Semiotics* [Bloomington, IN: Indiana University Press, 2000], 102-103.

was based on a universe under continuous expansion.”<sup>38</sup> Bruns’s music, by nature of its serial quality, then, in this section establishes this new *dasein*, in which the actors carry out their duties in an unknown and dangerous setting, space, untethered by the force of gravity (associated here with tonality, in Boulez’s analysis and ratified by Eco)<sup>39</sup>, and poised to transcend it as the drama, attendant risks, and potential for new scientific discoveries of their activity heighten.<sup>40</sup>

Then, in Period 2, Hexachord B holds only for the first bar and a half of this period (mm. 9-10, beat 2), but, subsequently, opens up to the entire twelve-tone series for the remaining bars of the cue (mm. 10-14), since this second period functions programmatically as the climax to the “Tests and Observations” scene, with the Instrument Rocket flying overhead.<sup>41</sup> (see Fig. 1, above) Here, we have, transcendence of the original, unstable, *dasein*, set out in Period 1 by means of the exclusive use of Hexachord A, and movement into the “Nothingness” to which Tarasti refers,<sup>42</sup> by means of the use and almost immediate dissolution of Hexachord B in Period 2.<sup>43</sup>

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<sup>38</sup> Ibid., 103.

<sup>39</sup> Ibid., 103.

<sup>40</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955], c. 45:18-45:42, which roughly corresponds to Period 1 and the use of Hexachord A.

<sup>41</sup> Ibid., c. 45:58.

<sup>42</sup> Eero Tarasti, *Existential Semiotics: Advances in Semiotics* [Bloomington, IN: Indiana University Press, 2000], 103.

<sup>43</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955], c. 45:43-45:57, which roughly corresponds to Period 2 and the use of Hexachord B. Immediately following this is the C fully-diminished sonority, discussed below, which brings this cue to an end.

Lastly, it is instructive to note that Hexachord B is T1 of Hexachord A. This upward motion serves the purpose of heightening the musical tension, yet again, while also suggesting a sense of transcendence of the earlier Hexachord. This would seem to be supported by Tarasti's existential semiotic framework,<sup>44</sup> both in the sense of the weakening of gravity and the concept of transcendence: "I have come to a theory of existential signs. What kind of signs are they? They are signs unbound by gravity, floating upward from the world of *Dasein* to the state of Nothingness. This kind of sign 'levitation' is seen in paintings, in which things hover freely in the air."<sup>45</sup>

That this moment is the climax of the cue is clearly indicated musically through the use of orchestration, rhythm, and harmony. Bruns has, heretofore in this cue, held back the brass, but brings in French horns and trombones to emphasize the importance of this moment.<sup>46</sup> (See Fig. 1) The rhythm of the accented sonorities played by the brass represents a dramatic (and somewhat unexpected) syncopation, synchronized with the entrance of the Instrument Rocket.<sup>47</sup> (See Fig. 1) Though other entrances have similarly occurred in this cue on beat three, each of them has entered at a dynamic level consistent with or adjacent to the currently prevailing dynamic level.<sup>48</sup> (See Fig. 1) The brass

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<sup>44</sup> Ibid., 109.

<sup>45</sup> Ibid., 109.

<sup>46</sup> George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955], c. 45:58-46:20.

<sup>47</sup> Ibid., c. 45:58.

<sup>48</sup> Ibid., c. 45:18-45:58. See, for example, the entrance of the bass flute in m. 1 or the entrance of first and second violins in m. 1.

entrance takes full advantage of the tremendous volume of which brass instruments are capable, and this group enters on a subito ff level.<sup>49</sup>

The switch to tonal harmony, however, is the most important shift at this moment in the cue. It is here, for the first time in the cue, and in one of the rare instances in this section of the film, that Bruns allows the orchestra to play a sonority of three or more pitches, scored homophonically.<sup>50</sup> This sonority, {0,6,9,3,6}, as spelled from the bass to the soprano, repeated multiple times in various voicings over the course of the following twenty-plus seconds of the film, can be analyzed tonally as a C fully-diminished seventh chord.<sup>51</sup> (See Fig. 1) It functions as half of a sort of unrealized cadence to a sonority which never arrives after the last enunciation of the diminished seventh chord, at 46:20.<sup>52</sup> What does follow this sonority, made significant in the listener's mind by both the dramatic visual of the Instrument Rocket passing closely over the astronauts' heads and the numerous repetitions of the chord, is a return to the series {6,5,8,11,10,1,2,7,9,4,0,3}.<sup>53</sup>

It is the flexibility of the fully-diminished seventh sonority that makes its use indispensable here. Because there are so many possible target sonorities to complete the cadence, due to its inherent instability as a creature of two tritones, the fully-diminished dominant seventh chord can act as both an exclamation mark at the end of the musical

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<sup>49</sup> Ibid., c. 45:18.

<sup>50</sup> Ibid., 36:17-48:54.

<sup>51</sup> Ibid., 45:58.

<sup>52</sup> Ibid., c. 45:58-46:20.

<sup>53</sup> Ibid., c. 46:20.

period and as a pivot chord back out of tonality and into the realm of serialism, if the series that succeeds it contains common pitch-classes among the first few members of the row. The form of the series that follows this C fully-diminished seventh chord is not the P form, but is in fact, P6, which, of course, shares pitch-classes {0}, {3}, {6}, and {9} with the C fully-diminished seventh sonority, and, crucially, features {0} at the beginning of the row.<sup>54</sup> (See Fig. 1)

This facilitates the transition back to serialism by means of these common pitch-classes. The first three pitch-classes of the pentachord, {0,3,6,8,1},<sup>55</sup> which succeeds the C fully-diminished seventh, are also the first three members of the root position of the latter sonority.<sup>56</sup> (See Fig. 1) This provides the pentachord with some connective tissue with that which has preceded it, and yet signals to the audience that a new cue has begun, or more precisely that a new point in the narrative has been reached, through the reintroduction of serialism.<sup>57</sup> Thus, the fully diminished seventh chord, a tonal element, combined with the series, demonstrates some of the musical and programmatic potential of a tonal-serial hybridity.

The pentachord that is elaborated upon between 46:20-46:34 is, then, followed by a variation, in the flutes, of a whole-tone descending figure, which I term the “Zero Gravity Motive.”<sup>58</sup> (See Fig. 2, below) This motive appears in its prime form

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<sup>54</sup> Ibid., c. 46:20-46:34

<sup>55</sup> In order of their appearance in the cue at Ibid., c. 46:20.

<sup>56</sup> Ibid., c. 46:20

<sup>57</sup> Ibid., c. 46:20.

<sup>58</sup> Ibid., c. 46:35-46:53

immediately before the “Tests and Observations” cue, in an earlier part of this section of the film, which portrays the first manned-orbit of the earth.<sup>59</sup> (See Fig. 2) It appears, again, in the sequel to this episode of the *Disneyland* anthology television series, *Man and the Moon*, and functions as one of its principal themes.<sup>60</sup> It also appears in the first official souvenir album for Disneyland Park, *Walt Disney Takes You to Disneyland*,<sup>61</sup> in the selection, “Tomorrowland,” composed by Bruns.<sup>62</sup> In this manner, Bruns creates a sense of musical and programmatic unity across the series and the actual Tomorrowland

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<sup>59</sup> *Ibid.*, c. 45:10-45:17

<sup>60</sup> George Bruns, *Man and the Moon*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955].

<sup>61</sup> George Bruns, Oliver Wallace, and Salvador “Tutti” Camarata, *Walt Disney Takes You to Disneyland* [Burbank, CA: Disneyland Records, 1956]. For our purposes, research on the production and recording of this record illustrates some important connections between the Disney composers covered in our survey, and the manner in which they worked together on projects. For example, on this record, Bruns also composed the “Frontierland” section, based on his score for the *Disneyland* anthology television show’s *Davy Crockett* series of episodes, which formed the core of the first season’s *Frontierland* offerings. On the history of the Crockett episodes, see Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 63-64. For broadcast and production details for these episodes, see Cotter, 97-99. The orchestration of *Davy Crockett* was the initial assignment for Buddy Baker at the Walt Disney Studios. Bruns was taking private composition lessons with Baker at the time, and when he became overwhelmed with the job of scoring all of the *Disneyland* anthology television show episodes, as well as scoring *The Mickey Mouse Club*, Baker was brought in, on Bruns’s suggestion, to help. Baker would work for the company as a staff composer or composer for theme park attractions for the rest of his life. See Jon Burlingame’s interview of Buddy Baker, “Buddy Baker (1918-2002),” in Didier Ghez, ed. *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 130.

<sup>62</sup> Tim Hollis and Greg Ehrbar, *Mouse Tracks: The Story of Walt Disney Records* [Jackson, MI: University Press of Mississippi, 2006], 23.

area of Disneyland Park. One could even argue that this particular motive serves as a leitmotiv within the *Man in Space* series<sup>63</sup> of programs and the Park.

**Fig. 2 - George Bruns: *Man and the Moon*, “Zero Gravity Motive”**

Analysis of Tomorrowland: "Man in Space  
(Zero Gravity Motive)" by George Bruns

George Bruns

**Mysterious, ominous**  
♩ = 96

©1955 The Walt Disney Company

<sup>63</sup> The *Man in Space* Series consisted of three nearly hour-long episodes of the *Disneyland* anthology television show, *Man in Space* (1955); *Man and the Moon* (1955); and *Mars and Beyond* (1957). George Bruns, *Man in Space*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955]. George Bruns, *Man and the Moon*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1955]. George Bruns, *Mars and Beyond*, Directed by Ward Kimball [Burbank, CA: Walt Disney Studios, 1957]. For broadcast information on each of the three programs, listed alphabetically by title, see Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 132-134.

The use of serialism to depict the unknown was an idea which had currency in the modernist era and was even an advised approach to film composition at the time.<sup>64</sup> Per Mervyn Cooke, "...most subsequent composers [to Miklós Rózsa, apropos of his score of *Ben-Hur*, in 1959] made obvious attempts to relate the idiom of their scores to considerations of historical period and geographical locale. In a series of lectures on the craft of film composition at the University of California at Los Angeles in the early 1960s, Leith Stevens advocated a period-specific approach in all situations apart from films containing 'a dramatic problem of such universality that it is greater than the time and place,' in which eventuality he considered a contemporary or even serial idiom to be justified regardless of the apparent expressive dictates of the diegetic milieu."<sup>65</sup> Film

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<sup>64</sup> Mervyn Cooke, *A History of Film Music* [Cambridge, UK: Cambridge University Press, 2008], 189-190.

<sup>65</sup> Ibid., 189-190. Cooke is here paraphrasing Brill on Leith Stevens. See Mark Brill, *Leith Amadeus Stevens: A Festschrift, Journal of Film Music* 1, no. 4 [2006]. Cooke subscribes to Christopher Palmer's analysis "that, like Stravinsky, Rózsa's principal achievement was the absorption of a wide range of historical mannerisms into his own coherent personal style...he [Rózsa, per Palmer] tries 'merely to be himself, musically speaking, at a variety of points in times past.'" See Mervyn Cooke, *A History of Film Music* [Cambridge, UK: Cambridge University Press, 2008], 189. In the course of paraphrasing Palmer's argument, Cooke mentions "that the speciousness [per Palmer] of the music's [Rózsa's output as a film composer] purported authenticity (which Rózsa clearly overstated) is not at issue." I am uncertain as to whether it is Palmer or Cooke, in this paraphrase, who claims that Rózsa's attempt for authenticity is overstated. Cooke, himself, enumerates the lengths to which Rózsa went to generate period-authentic music (see Cooke, page 188) and Roger Hickman quotes Jon Solomon as saying: "No serious composer ever became more conscious of recreating ancient Greco-Roman music in this era than Miklós Rózsa...Rózsa's solution to the quest for musical authenticity might well be labelled the Rózsa synthesis, for he synthesized ancient musical fragments, theory, and instrumentation with melodic lines, harmonies, and orchestrations suitable to modern ears and able to evoke familiar responses from modern audiences." See Roger Hickman, *Miklós Rózsa's Ben-Hur: A Film Score Guide*, Scarecrow Film Score Guides, No. 10 [Lanham, MD: The Scarecrow Press, 2011], 90. Per Hickman, "Rózsa's synthesis evokes an ancient age, maintains a modern musical edge, and communicates to the general public of the late 1950s." See page 90, in Hickman.



music that employed the most avant-garde twentieth century compositional methodologies suggested a program that reflected the era in which it was composed. This music would have communicated to an audience the concept of modernity with its attendant scientific progress and technical complexity.<sup>66</sup>

### **The Inherent Comprehensibility of Tonal-Serial Hybridity for Listeners**

As mentioned above, one potential benefit of the application of tonal-serial hybridity is the potential for greater comprehensibility in this music. There are several examples of this compositional methodology in action in the concert music of the era, and a direct comparison to the film music of the Disney composers who are the focus of this paper yields an understanding of this compositional technique. For the purposes of this comparison, let us consider two modernist works, from each genre, Frank Martin's *Petite Symphonie Concertante* (1946)<sup>67</sup> and Oliver Wallace's score for the *Disneyland* anthology television show episode, *Our Friend the Atom*.<sup>68</sup>

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<sup>66</sup> I am indebted to Dr. Robin Cox for articulating the link between serialism and perceived technical complexity. Dr. Cox, in his graduate music theory seminar, attempted to clarify the reasons that views on serialism in academia became so divided in the twentieth century. He linked the technical complexity of the tone-row matrix with the technical complexity of the sciences and proposed that this surface resemblance between Science and Music may have made it easier for music department faculty in that era to justify funding, given society's focus on scientific progress at that time. Robin Cox, Class Lecture on Modernist Music: Serialism vs. Neo-Classicism [lecture in Graduate Music Theory Course at California State University Long Beach, Long Beach, CA, October 2012].

<sup>67</sup> Frank Martin, *Petite Symphonie Concertante: Pour Harpe, Clavecin, Piano, et Deux Orchestres à Cordes* [Vienna: Universal Edition, 1947].

<sup>68</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957].

In *Petit Symphonie Concertante*, Frank Martin, according to Byron Adams, employs Schoenberg's serial procedures in his own "idiosyncratic"<sup>69</sup> manner and creates a "synthesis"<sup>70</sup> between serialism and tonality, thus linking his musical interests and output at that time with his past output and his "disparate [musical] influences and researches."<sup>71</sup> Adams describes the unique compositional methodology at play: "...in adapting the essential concepts of the twelve-tone technique to his own sensibility, [Martin] renounced neither the use of tonality, which he believed to be essential for musical order, nor his concern for clearly articulated formal design, nor the rich and grave triads that formed the basis of his earliest habits."<sup>72</sup>

What I find most instructive here is Adams's mention of Martin's "sensibility," as it suggests that Martin discovered a pliability in his application of serialism, guided as Adams states by his own intuition and compositional voice, that was not widely agreed upon at the time.<sup>73</sup> Martin appears to, along with Schoenberg's earlier efforts at achieving this hybridity, and Stravinsky's post *Rake's Progress* output, open the door to the

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<sup>69</sup> Byron Adams, "Part I: *Concerto for Violin and Orchestra*. Part II: Frank Martin's *Petite Symphonie Concertante* - An Analysis," [DMA Diss., Cornell University, 1984], 9.

<sup>70</sup> *Ibid.*, 9.

<sup>71</sup> *Ibid.*, 9.

<sup>72</sup> *Ibid.*, 9.

<sup>73</sup> See, for example, René Leibowitz's remarks about Schoenberg's Piano Concerto, Op. 42, or Boulez's seminal argument for a more stringent application of serialism as a means of discovering its full potential and the attendant ramifications for the creation of new musical forms, both quoted above. For Leibowitz, see Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 203. For Boulez, see Pierre Boulez, "Schoenberg Is Dead," in *Notes of an Apprenticeship*, Translated by Herbert Weinstock [New York: A.A. Knopf, 1968]: 268-275.

“synthesis” Adams describes, above, for the composers who follow him. If expression and discretion are allowed into the application of the matrix, and not just into the creation of the materials of the matrix, as Schoenberg would argue had always been a part of composing with twelve-tones,<sup>74</sup> then composers gain greater flexibility in the development of their musical material and increase the potential points of connection between the series and any tonal material present.

Adams’s analysis of *Petite Symphonie Concertante* gives us a window into Martin’s methodology for achieving this hybridization. He highlights Martin’s manner of employing the row to generate material for the piece.<sup>75</sup> “Martin uses the row to generate motives from which the longer melodic material of the *Petite Symphonie Concertante* will be created.”<sup>76</sup> For this purpose, Adams demonstrates two possible divisions of the row that “demonstrate voice-leading”<sup>77</sup> and make clear the manner in which “this row... greatly lends itself to the development of row-derived motives into thematic figures.”<sup>78</sup>

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<sup>74</sup> Arnold Schoenberg, “Twelve-Tone Composition (1923),” in *Style and Idea: Selected Writings of Arnold Schoenberg*, Edited by Leonard Stein, Translated by Leo Black [Berkeley and Los Angeles: University of California Press, 1984], 213. See Schoenberg’s differentiation here between “a ‘system’” and “a ‘method.’” He states that he “considered it [the twelve-tone method] as a tool of composition...”. He advised his pupils in 1923, “‘You use the row and compose as you had done it previously.’ That means: ‘Use the same kind of form or expression, the same themes, melodies, sounds, rhythms as you used before [in tonal works].’”

<sup>75</sup> Byron Adams, “Part I: *Concerto for Violin and Orchestra*. Part II: Frank Martin’s *Petite Symphonie Concertante* - An Analysis,” [DMA Diss., Cornell University, 1984], 12.

<sup>76</sup> *Ibid.*, 12.

<sup>77</sup> *Ibid.*, 12. See Example 4 in Adams’s dissertation.

<sup>78</sup> *Ibid.*, 12.

Adams's divisions of the row show the inherent half step-based motion and suggestion of tonal relation between members within these subsets of the row.<sup>79</sup> Example 4 in Adams's dissertation shows two subsets identified in Schenkerian manner, beamed together and split into two pairs of pentachords and septachords, respectively: Pentachord 1 = {8,7,5,6,11}; Septachord 1 = {4,3,2,1,0,10,9}; and Pentachord 2 = {8,4,7,5,6}; Septachord 2 = {3,2,1,0,10,9,11}.<sup>80</sup> Split in these ways, such tonal relation is easily perceived.<sup>81</sup> Adams states that "the row is designed to end with a 'resolution' to the first pitch of a succeeding statement of the row's prime form transposed up a major third (P4)."<sup>82</sup> He also asserts that "The original transposition of the prime form of the row contains a suggestion of a tonal center of G, which is used as a tonic reference in the score."<sup>83</sup>

Even within the row, itself, one can grasp potential suggestions of tonal sonorities that are implicit in the row order. Consider the following adjacent pitch-classes, which bridge Pentachord 1 and Septachord 1, {6,11,4}, and their potential for implying an E Major or Minor ninth sonority without the third, or a B Major or Minor eleventh sonority,

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<sup>79</sup> Ibid., 12. See Example 4 in Adams's dissertation.

<sup>80</sup> Ibid., 12. See Example 4 in Adams's dissertation.

<sup>81</sup> Ibid., 11.

<sup>82</sup> Ibid., 11.

<sup>83</sup> Ibid., 11.

again without the third. This subset of a subset could, of course, be transposed and suggest the parallel harmonic movement Adams cites in his analysis.<sup>84</sup>

Analysis of a composer's material, then, aided by the use of a matrix, which so greatly aids in the perception of relations among the tones and rows, can derive connective tissue within the music that might at first seem obscure, but sounds logical to the listener, due to those relations.<sup>85</sup> In this way, hybridizing tonal and serial techniques can yield an expanded musical vocabulary for composers that contains the potential for following either an exclusively serial or tonal path in a piece, or a combination of both via the inherent logic of the tonally-related row.

It is significant that Adams states that this piece "is credited by all writers on Martin as being the first composition in his fully mature style."<sup>86</sup> *Petite Symphonie Concertante* is, thus, a watershed composition in the modernist era as it is, not simply the first of Martin's works to express these special qualities for which Martin is chiefly regarded, but also marks one of the earliest tonal-serial hybrid scores in our study. Stravinsky was not yet composing serial works - his first tentative efforts would not come

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<sup>84</sup> Ibid., 41. Adams compares here Martin's use of parallel sonorities at rehearsal 11 in *Petite Symphonie Concertante* to Debussy's use of the same in "the *Fêtes* movement of *Nocturnes*."

<sup>85</sup> See Schoenberg's comments regarding logic in composition to Leibowitz regarding the purpose of tone-rows in Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016] 13. "In explaining the method to French composer and conductor René Leibowitz, Schoenberg wrote that '[t]he main purpose of the "row" is to unify the motival [sic] material and to enhance the logic of simultaneous sounding tones.'" Per Marcus, to Schoenberg's "friend, Kurt List, [Schoenberg stated] '...the constant iteration of the row has the single goal of achieving logic through unity.'"

<sup>86</sup> Byron Adams, "Part I: *Concerto for Violin and Orchestra*. Part II: Frank Martin's *Petite Symphonie Concertante* - An Analysis," [DMA Diss., Cornell University, 1984], 8.

until 1952 with the selection from *Cantata* (1952), “Tomorrow Shall Be My Dancing Day.”<sup>87</sup> Though Stravinsky would later become a great master of tonal-serial hybridity, Martin’s efforts predate his works. Schoenberg, however, predates them both in the creation of tonal-serial hybrid works,<sup>88</sup> which befits the compositional activity of the man most associated with serialism.

Before considering Wallace’s piece, *Our Friend the Atom*, written eleven years after *Petite Symphonie Concertante*, a proper definition of musical modernism should be established and distinguished from musical postmodernism in order to provide a framework for our understanding of the former piece. *Petite Symphonie Concertante* (1946) was composed exclusively in what we identify, below, through a discussion of its pertinent characteristics, as the modernist era, whereas *Our Friend the Atom* (1957) contains elements of both a modernist and a postmodernist style. I, nevertheless, classify the latter score as modernist, but it is irrefutable that it presages some of the postmodern critical theory to come, especially as relates to advancing an anti-war mongering program, through musical means. Though *Man in Space*, composed in 1955, also

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<sup>87</sup> Joseph N. Straus, *Stravinsky’s Late Music* [Cambridge, UK: Cambridge University Press, 2001], 11. See also Vera Stravinsky and Robert Craft, *Stravinsky in Pictures and Documents* [New York: Simon and Schuster, 1978], 422, quoted by Straus at above location. Igor Stravinsky, *Cantata* [London: Boosey and Hawkes, 1952].

<sup>88</sup> Kenneth H Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 79. Here Marcus discusses the composition of Schoenberg’s American works and his evolving attitude on tonality’s place within his own music: “...to Schoenberg, to be modern meant that one could now write *both* forms of music [tonality and serialism] and not be restricted to only one type of composition.” Emphasis Marcus. See also Table 3.1 in Marcus, which enumerates Schoenberg’s works in Hollywood and lists *Ode to Napoleon Buonaparte*, Op. 41 and the Piano Concerto, Op. 42, as “Twelve-Tone,” but also has each asterisked with the annotation, “These works include frequent references to tonal chords.” See Marcus, 125. The date of composition given for both works is 1942. See Table 3.1, 125.

contains some potentially postmodernist elements in its use of satire and pastiche in sections of the score not covered by my analysis, above, it is less programmatically dependent, overall, on the critique of the status quo and, rather advances a narrative of positive scientific advancement with very little discussion of the ethicality of pursuing a space program. The following discussion, then, is more aptly placed here, prior to my analysis of *Our Friend the Atom*.

### **Modernism and Postmodernism**

Byron Adams discusses modernism's "salient features"<sup>89</sup> in the foreword to a "special issue"<sup>90</sup> on British Modernism in *The Musical Quarterly* in terms first demonstrated in the work of the French poet, Arthur Rimbaud. Adams describes the features of this style as that which "interrogates, indeed often mocks, conventional late nineteenth-century pieties...expresses a state of alienation from an uncomprehending bourgeois society...fractures narration by deploying the rapidly shifting viewpoints of unreliable narrators; requires 'close reading'; is unashamedly elitist, as the artist must be a 'voyant' (visionary) who leads the way for the rest of humanity; often employs the distancing effects of irony, paradox, and black humor; and revels in technical

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<sup>89</sup> Byron Adams, "Foreword," *The Musical Quarterly* 91, no. 1/2, British Modernism [Spring/Summer 2008]: 1.

<sup>90</sup> *Ibid.*, 6.

experimentation for its own sake...”.<sup>91</sup> Adams, thus, argues that Rimbaud is to “be considered a proto-modernist: a poet who evinced all of the aesthetic *topoi* of modernism decades before such signifiers became the *lingua franca* of artistic expression in France - always enamored of the avant-garde - and on the rest of the Continent. Not even Baudelaire, who was one of the first to use the term ‘modern’ as it is commonly understood today, was as determinedly iconoclastic as Rimbaud.”<sup>92</sup>

From Adams’s definition of modernism, writ large, it follows, then, that we can view musical modernism in the twentieth century as work which questions tradition; “expresses...alienation”<sup>93</sup> from the middle-brow; employs “unreliable narrators”;<sup>94</sup> may contain elements which are obscure to the listener; is somewhat removed from the listener via the use of “irony, paradox, and black humor”;<sup>95</sup> and betrays the composer’s fascination with technical depth and complexity.<sup>96</sup> The apt nature of Adams’s definition is easily established through its applicability to the music discussed in our study. When

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<sup>91</sup> Ibid., 1. I omitted Adams’s reference to the exploration of “unorthodox sexual practices” from his enumeration of the features of modernism, as it has no bearing on the scores of the Disney composers, though it is certainly a distinctive feature of modernist works by their contemporaries.

<sup>92</sup> Ibid., 1-2.

<sup>93</sup> Ibid., 1.

<sup>94</sup> Ibid., 1.

<sup>95</sup> Ibid., 1.

<sup>96</sup> Ibid., 1.



considering the latter feature of modernism, for example, one may recall Schoenberg's matrices or the film exposure sheets<sup>97</sup> of Wallace, Bruns, and Baker.

In his study of the late music of Schoenberg, Marcus lays out three criteria that "characterized early modernism in California."<sup>98</sup> The first of these three, in particular, applies to the composers whose work we explore in this paper: "[For Southern California modernist artists]...there was an interest in breaking away from the perceived limitations of the past, to use the boundaries of one's art form beyond its traditional limits."<sup>99</sup> By applying Marcus's characterization of this movement, one can then accurately describe Southern California modernists, among whose number we may include Wallace, Bruns, and Baker, as well as Stravinsky and Schoenberg, as iconoclastic and innovative in their attitudes towards the creation of their art.<sup>100</sup> Thus, Marcus deals at length with the manner

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<sup>97</sup> An exposure sheet is a device for tightly synchronizing music, sound, and on-screen action in a film. See Frank Thomas and Ollie Johnston, *The Illusion of Life: Disney Animation* [New York: Disney Editions, 1981], 230. Per Thomas and Johnston, "Each space between the lines of the 'exposure sheet' represents a frame of the film and tells the cameraman how to expose the drawings in the scene...The exposure sheet also shows the placement of the dialogue, the length of the scene, and any special instructions." This device made the musical technique of "mickey-mousing," which is especially prevalent in the scores of Oliver Wallace (as well as his colleague, Paul J. Smith), possible, and was used in the creation of my work, *Nexus: Music for a Shadow Animation*.

<sup>98</sup> Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 25.

<sup>99</sup> *Ibid.*, 25.

<sup>100</sup> *Ibid.*, 25. It must also be stated here that Marcus is careful to point out that, in the case of Schoenberg, this iconoclasm was tempered with a healthy respect for the compositional methods of the past and Schoenberg's desire to represent his music as a continuation of it. See, for example, the following: "Despite this radical break with past practice on the one hand, essential to Schoenberg's twelve-tone works is their constant reference to tradition on the other." See Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 13. This, of course, sets the stage for Boulez's criticism of Schoenberg after the latter's death. See below.

in which “experimentalism in Music”<sup>101</sup> is connected with “the development of these innovative [modernist] ideas.”<sup>102</sup>

In his attempt to define modernism, Marcus describes it as an “international aesthetic movement from roughly the 1880s through the 1950s in which artists sought a conscious break with the past through experimentation, debate, and confrontation.”<sup>103</sup> In a further elaboration of this aesthetic, Marcus quotes Carol Oja’s definition of musical modernism as standing “for one basic principle: iconoclastic, irreverent innovation, sometimes irreconcilable with the historic traditions that preceded it.”<sup>104</sup>

From these multiple perspectives, we may draw the conclusion that the composers that occupy our discussion belonged to a larger movement, by dint of the characteristics they share with the definitions given above, such as Bruns’s above-cited willingness to employ serialism and tonality alongside one another in *Man in Space*, certainly representing a break with the Classic Hollywood Score, as described by Hickman.<sup>105</sup> Modernism, for our purposes, was an aesthetic that prized iconoclasm, originality,

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<sup>101</sup> Ibid., 41.

<sup>102</sup> Ibid., 41.

<sup>103</sup> Ibid., 4.

<sup>104</sup> Carol Oja, quoted in Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 4. Oja’s original quote can be found in Carol J. Oja, *Making Music Modern: New York in the 1920s* [New York: Oxford University Press, 2000], 4.

<sup>105</sup> See Hickman’s definition of the Classic Hollywood Score in Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 124. Hickman describes the Classic Hollywood Score, here, as featuring, among other things, a “Reliance on the melody-dominated style of the late nineteenth century.”

technical complexity, and innovation, all of which depended on the context of the past to define it as modern.<sup>106</sup>

The distinction between modernism and postmodernism requires close examination, as the two aesthetics (and philosophical viewpoints) share some commonalities, such as their iconoclasm,<sup>107</sup> but significantly part ways on the matter of subjectivity.<sup>108</sup> As relates to the postmodernist view of the concept of the “subject,” Gary Aylesworth’s description of Michel Foucault’s “creat[ion] of a ‘counter-memory,’”<sup>109</sup> is instructive: “This entails dissolving identity for the subject in history by using the materials and techniques of modern historical research.”<sup>110</sup> This is but one example of the

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<sup>106</sup> I am indebted, here again, to Chagas’s description of difference as meaning. Paulo C. Chagas, *Unsayable Music: Six Reflections on Musical Semiotics, Electroacoustic and Digital Music* [Leuven, Belgium: Leuven University Press, 2014], 75. See, also, discussion above.

<sup>107</sup> Gary Aylesworth, “Postmodernism,” In *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], page 10 of 24 [of the article in pdf form]. As relates to iconoclasm within postmodernist thought, consider one example of many from Aylesworth’s discussion of subjectivity. Here Aylesworth explains Michel Foucault’s development of “a ‘counter-memory’ or ‘a transformation of history into a totally different [from the manner in which it was previously conceived] form of time’.” As cited in Aylesworth, Michel Foucault, *Language, Counter-Memory, Practice: Selected Essays and Interviews*, Edited by Donald F. Bouchard [Ithaca, NY: Cornell University Press, 1977]. Page number from original not cited in Aylesworth. Aylesworth does not describe the development and enunciation of new conceptions, such as these, with the term “iconoclastic,” though they very clearly are a rejection of previous philosophical schema.

<sup>108</sup> Gary Aylesworth, “Postmodernism,” In *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], See, for example, page 10 of 24 [of the article in pdf form].

<sup>109</sup> *Ibid.*, page 10 of 24 [of the article in pdf form].

<sup>110</sup> Gary Aylesworth, “Postmodernism,” In *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], page 10 of 24 [of the article in pdf form].

“dissolution” or deemphasis of the subject in Aylesworth’s review of the development of postmodernist thought over the past forty-plus years, which he describes as “postmodernism’s critical de-structuring or displacement of the signature concept of modern philosophy, the ‘subject,’ which is generally understood as consciousness, or its identity, ground, or unity, and designated as the ‘I.’”<sup>111</sup> Thus, both modernism and postmodernism represent a break with the past, but emphasize different points of view programmatically.

The modernist focus on the subject, and thus the establishment of the Disney composers as modernists, can be seen, in the context of this paper, in the character-driven music of the Disney composers and their characters’ struggle for achieving agency within the narratives of the films the Disney composers scored. This is not to assert that the overall narrative frame of the films and their accompanying scores fail to take in a point of view wider than that of the subject. On the contrary, the frequent use of satire and even indirect criticism of public policy within these films and their scores might suggest a gesture, however tentative, toward what would ultimately be termed critical theory. Let us consider both the presence of satire and indirect criticism of public policy in the scores of Oliver Wallace, Disney composer from 1936-1963.<sup>112</sup>

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<sup>111</sup> Ibid., page 6 of 24 [of the article in pdf form].

<sup>112</sup> James Bohn, *Music in Disney’s Animated Features: Snow White and the Seven Dwarfs to the Jungle Book* [Jackson, MS: University Press of Mississippi, 2017], e-book loc. 2904.

While there are strong satirical elements within Disney scores, such as Oliver Wallace's song, "Der Führer's Face," from 1942,<sup>113</sup> the aim of such satire appears to be to represent the struggles of the individual in the context of their community on behalf of freedom, rather than a "dissolution" of the subject or its agency, as mentioned by Aylesworth.<sup>114</sup> In the animated short, *Der Führer's Face*, based on Wallace's song and scored by Wallace, Donald Duck dreams that he wakes up in Nazi Germany and is forced to live under that tyrannical and murderous government.<sup>115</sup> The score for this film (as well as its fast-paced and sharply drawn visuals) presents a biting satiric and perfectly effective argument against Nazism and fascism, writ large. The focus of the film is, in contrast to a postmodernist deemphasized subject, the salvation of the modernist subject, Donald Duck, through the destruction of the Nazi regime. The animation is strikingly irreverent and lampoons the Nazis and their offensive assertions of being the "master race" deftly and mercilessly.<sup>116</sup>

Ward Kimball, later the director of the *Tomorrowland* television episodes and films for the *Disneyland* television anthology series (see, for example, our discussion of *Man in Space*, for which he was the director, above) and one of Walt Disney's legendary

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<sup>113</sup> Oliver Wallace, "Der Fuehrer's Face (From "Nuttsey Land)," in *Spike Jones Greatest Hits*, Spike Jones [New York: BMG Entertainment, 1999].

<sup>114</sup> Gary Aylesworth, "Postmodernism," In *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], page 6 of 24 [of the article in pdf form].

<sup>115</sup> Oliver Wallace, *Der Fuehrer's Face*, in *Walt Disney Treasures: On the Front Lines*, Directed by Jack Kinney [Burbank, CA: Walt Disney Studios, 2004].

<sup>116</sup> *Ibid.*

“Nine Old Men,”<sup>117</sup> was justly proud of his animation in this film. “I was lucky enough to get to work on the end of the film where Hitler and Germania do this opera thing. The big fat soprano [Germania] was a caricature of Hermann Goering and I had all the fun.”<sup>118</sup> There was, then, from the very early years of the Walt Disney Studios, a group of artists and musicians, in this case Wallace and Kimball, who contributed to many satirical and serious social commentaries in Disney’s television and film productions, and who relished the opportunity to use the medium of animation and live-action film for the purposes of examining important issues.

#### **Analysis of Oliver Wallace: *Our Friend the Atom* (1957)**

Criticism of government policies closer to home can also be found in modernist Disney films and television shows. This backdrop of criticism, for example, may be observed in the 1957 episode of the *Disneyland* television show, *Our Friend the Atom*, scored by Oliver Wallace.<sup>119</sup> The overarching theme of the episode is the peaceful use of knowledge and scientific discovery, and an implicit criticism of the tragically violent use

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<sup>117</sup> John Canemaker, *Walt Disney’s Nine Old Men and the Art of Animation* [New York: Disney Editions, 2001], vii. Canemaker explains here the origin of the name “nine old men” and their status within the history of both the Walt Disney Studio and Animation, as an art form. The “Nine Old Men” were and are considered Walt Disney’s finest animators and their work is the standard by which all subsequent Disney animation is judged.

<sup>118</sup> See Rick Shale’s interview of Ward Kimball in Didier Ghez, ed., *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 15.

<sup>119</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957].

of the atomic bomb at Hiroshima and Nagasaki runs throughout the program.<sup>120</sup>

Originally screened on January 23, 1957 in the third season of the anthology series, and featured in the *Tomorrowland* section of the show,<sup>121</sup> this episode was created during steadily increasing tensions in the Cold War<sup>122</sup> and moments in the film and its score reflect this.<sup>123</sup> Indeed, the sections of the film which argue against the misuse of advancements in nuclear science, and the subtext of the visuals and the accompanying music in those sections, are colored by terrifying Cold War milestones, such as the development of the hydrogen bomb, which by the time of the episode's airing had been achieved by both superpowers.<sup>124</sup>

Bill Cotter asserts that the science-based films of the *Disneyland* television anthology were uniquely placed to appeal to an audience with such matters on their

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<sup>120</sup> Ibid.

<sup>121</sup> The *Disneyland* anthology television show was themed to match the four projected and ultimately completed key areas, or "lands," in Disneyland, the park: Fantasyland, Tomorrowland, Frontierland, and Adventureland. The content of each episode related to the theme of one of the four lands and was identified as such, typically, in the title sequence of each episode. The Tomorrowland episodes started with Ward Kimball's film, *Man in Space*, which was scored by George Bruns, and which is analyzed above.

<sup>122</sup> For example, President Eisenhower announced a policy of containment of communist influence in the Middle East on January 5, 1956 and the launch of the Soviet satellite, *Sputnik*, occurred almost exactly a year and ten months later on October 4, 1957. Regarding the former, see History.com Authors. "President Eisenhower Proposes New Middle East Policy." History.com. <https://www.history.com/this-day-in-history/eisenhower-proposes-new-middle-east-policy> [Accessed February 2, 2020].

<sup>123</sup> Ibid.

<sup>124</sup> History.com Authors, "Truman Announces Development of H-Bomb." History.com. <https://www.history.com/this-day-in-history/truman-announces-development-of-h-bomb> [Accessed February 2, 2020].

minds.<sup>125</sup> “With the Cold War in full swing there was tremendous interest in space travel, and *Man in Space* [the first of the *Tomorrowland* section episodes of the *Disneyland* anthology television show] fit the public’s needs perfectly. The ratings were so high that it was rerun just three months after the first broadcast. The repeat airing was just as successful, and it attracted a very important viewer. Impressed by the vision of Disney’s experts [Werner von Braun, Willy Ley, and Heinz Haber], President Eisenhower called the Studio the same day and borrowed a print of the show to screen for his space experts at the Pentagon.”<sup>126</sup> Statements such as these attest to the tremendous cultural impact of the *Disneyland* anthology television show.

As mentioned above, looming as an even greater shadow over the contemplation of the development of nuclear power in *Our Friend the Atom* were the tragedies at Hiroshima and Nagasaki, which ended the Second World War.<sup>127</sup> In the film’s narration, the Walt Disney Studios Science Consultant and physicist, Heinz Haber, who both hosts the lion’s share of the episode and wrote the book upon which it is based, states in voiceover over footage of an atomic explosion meant to represent that moment of

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<sup>125</sup> Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 64.

<sup>126</sup> *Ibid.*, 64.

<sup>127</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957]. See especially c. 36:50-37:03. The reflection on the destructive power of the atomic bomb and the argument for a reversal of course towards the beneficial use of atomic energy and the fruits of scientific inquiry, more broadly, provides the dramatic tension in the film, in my estimation. Though Hiroshima and Nagasaki are not explicitly mentioned in the film, given that they were the only uses of the bomb in history, and the historical proximity of the event to the production date of the film, I believe that it is safe to assume that Dr. Heinz Haber, the film’s head writer and narrator, refers to those tragedies here when he mentions “devastating force.”



destruction: “The Atomic Genie was freed and his devastating force posed a fearful threat.”<sup>128</sup>

The music by Wallace, which precedes this quote, spoken near the Golden Section of the running time of the film,<sup>129</sup> is, appropriately, tense, dynamic, and slightly chaotic, thanks to syncopation in the accompaniment figure played by strings and french horns, and harmonically unstable due to the simultaneous presence of both forms of diminished seventh chords in this section.<sup>130</sup> (See Fig. 3) In mm. 1-2 of Fig. 3, Wallace employs a C# fully-diminished seventh chord, {1,4,7,10}, in the left hand (the accompanimental material, mentioned above), against an ostinato that is based on the C# half-diminished seventh chord with an added F#, {1,4,6,7,11} in the right hand, played in the score by flutes and xylophone.<sup>131</sup> Taken together, these two sonorities suggest the hexachord, {1,4,6,7,10,11}. (See Fig. 3) The half-step dissonance between two pairs of pitch-classes, {6,7} and {10,11}, within the hexachord are the source of the harmonic instability in the cue.

There are two potential paths to an analysis of this cue: tonal and post-tonal. Arguing for a tonal analysis is the use of the two tonal sonorities, C# fully-diminished and C# half-diminished seventh chords, and the progression of those harmonies to a B fully diminished seventh chord, with an added G {7}, or a G dominant seventh, with an added minor ninth, in bars 3-5. Wallace adds to the already unstable diminished seventh

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<sup>128</sup> *Ibid.*, c. 36:50-37:03.

<sup>129</sup> *Ibid.*, c. 36:29.

<sup>130</sup> *Ibid.*, c. 36:29-36:35.

<sup>131</sup> *Ibid.*, c. 36:29-36:35.

sonorities in bars 1-2 through the above mentioned addition of F# {6}. This addition of {6} compounds the tension found in the half-step dissonance between the corresponding fourth members of the two forms of the diminished seventh chord, {10,} and {11}, respectively.

Echoing the practice of tonal voice leading, Wallace prepares the listener for the addition of F# to the half-diminished seventh in bars 1 and 2 via the F# in the trill between F# and G {6 and 7}, which occurs in the pickup bar to this cue. One might, in this light, view the F# in the half-diminished chord as an accented passing tone which resolves up to G {7} in the right hand trill in bars 3-5. Furthermore, the clear division of the two musical ideas in this cue, the accompaniment in the left hand and the ostinato in the right hand, argues for the analysis of this section as an example of a polytonality, comprised of two nearly identical sonorities whose unique pitch-classes reside a half-step apart and who articulate their own distinct material.

**Fig. 3**  
**Oliver Wallace: *Our Friend the Atom*, "Nuclear Chain Reaction"**

Our Friend the Atom: "Nuclear Chain Reaction" Scene

Oliver Wallace  
Transcribed by Patrick Gibson

Allegro ♩ = 126

"One neutron is enough to start it..."

Flutes

Xylophone, Flutes

Piano

*f*

Strings, Bb Clarinet

Presto ♩ = 152

Pno.

*ff*

Trombones (Wah Mute)

[Atomic Explosion]

Pno.

©1957 The Walt Disney Studios

The addition of the F# {6} to the half-diminished seventh chord accompaniment, however, along with the resultant harmonic ambiguity of the simultaneously present forms of a similar sonority, argues more persuasively for a post-tonal analysis of bars 1 and 2. Widening our analysis to encompass the sum of all of the pitch-classes present in these bars, we may classify the above mentioned hexachord, {1,4,6,7,10,11}, as the Forte Set Class 6-Z29. (See Derivation of Normal Order of this Set Class in Analysis 1, below ). Moreover, when the meter shifts to 6/8 in bar 3, the hexachord 6-Z29 is transposed T10, but drops a pitch-class and is presented as the pentachord, {11,2,5,7,8}, which can almost be classified as Forte Set Class 5-31,<sup>132</sup> if we, once again, include all pitch-classes present in bars 3-5. (See Analysis 4, below)

Focusing on the intervallic relations between pitch-classes, sonorities, and the transposition of this material in bars 3-5, one may note that minor second (m2) transposition of the trill figure in the flutes from bars 1-2. Also significant to the establishment of significant intervallic relations in this cue, we may observe the rendition of the half-step interval between {7} and {8} in this sonority, transposed up an m2, as well.

Yet, the transposition of the sonority at the major second (M2) level keeps the voice leading in the transposition from being strictly parallel. The right hand figure moves up a half step, while the left hand figure moves down a major second. This creates

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<sup>132</sup> This set class contains {2} in normal order, instead of {1}. If {1} were present instead of {2}, the set class could be classified as 5-31. This may, however, be an instance of tonal-serial hybridity, where set class 6-Z29 is followed by a G dominant seventh minor ninth sonority in the harmonic progression of the cue, which also aptly describes the sum of the pitch-classes present in bars 3-5. Please see “Derivation of Quasi-Forte Set Class 5-31” in the Appendix.

harmonic tension in the progression, while providing some depth in the voice leading. The half-step relationships between pitches, sonorities, and transposition levels argue that the most significant interval in this cue is the minor second, but the variety of intervals at play - major seconds and even major thirds - provides contrast and interest in this brief but harmonically rich cue. Lastly, when considering the appropriateness of a post-tonal analysis of this cue, one may note that the combination of the hexachord and pentachord present in bars 1-5 (omitting the chromatic scale in the pickup bar) implies a larger set, the nonachord, {1,2,4,5,6,7,8,10,11}, Forte Set Class 9-10, which is, of course, three members shy of a complete twelve-tone row. (See Analysis 3, below) The potential of adopting a tonal or a post-tonal analysis of this cue, argues for the presence of a tonal-serial hybrid compositional methodology in Wallace's work and bolsters the argument for the potential of its presence in the work of his colleagues.

## Analysis 1

### Derivation of Set Class 6-Z29<sup>133</sup>

#### **Analysis of Set Class Employed in “Nuclear Chain Reaction” Scene in *Our Friend the Atom* (1957) by Oliver Wallace {1,4,6,7,10,11}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {4,6,7,10,11,1}	9	7
B: {6,7,10,11,1,4}	10	7
C: {7,10,11,1,4,6}	11	9
D: {10,11,1,4,6,7}	9	8
E: {11,1,4,6,7,10}	11	8
F: {1,4,6,7,10,11}	10	9

#### Calculation of the Normal Form, Transposed to T8

**A: T8 {0,2,3,6,7,9}** 7

D: T2 {0,1,3,6,8,9} 8

A is Normal Form of Set Class

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<sup>133</sup> These analyses use the methodology for determining the normal form of a post-tonal set class, referred to here as a Forte Set Class, as described by Joseph Straus in his seminal book on Post-Tonal Music Theory. See Joseph N. Straus, *Introduction to Post-Tonal Theory*, 3rd ed. [Upper Saddle River, NJ: Pearson/Prentice Hall, 2005], 35-38 and 261-264. For the calculation of the normal form, per Straus, the set class is transposed by a value that renders its initial pitch-class as equal to 0. This aids in identifying it in a Forte Set Class chart.

## Analysis 2

### Derivation of Forte Set Class 6-Z4

**Analysis of Set Class Employed in “The Atomic Genie”  
Scene (mm. 1-2) in *Our Friend the Atom* (1957) by Oliver  
Wallace {11,0,1,3,4,5}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {0,1,3,4,5,11}	11	5
B: {1,3,4,5,11,0} 11	10	
C: {3,4,5,11,0,1} 10	9	
D: {4,5,11,0,1,3} 11	9	
E: {5,11,0,1,3,4} 11	10	
F: {11,0,1,3,4,5} 6	5	

Calculation of the Normal Form, Transposed to T1

**F: T1 {0,1,2,4,5,6} 5**

F is Normal Form of Set Class

### Analysis 3

#### Derivation of Forte Set Class 9-10

**Analysis of Complete Set Class Employed over the course of “The Atomic Genie” Scene, (mm. 1-5, omitting the pickup bar) in *Our Friend the Atom* (1957) by Oliver Wallace {1,2,4,5,6,7,8,10,11}**

<u>Rotations</u>	<u>Span</u>	<u>Intvl (PC1 - 5)</u>
A: {2,4,5,6,7,8,10,11,1}	11	9
B: {4,5,6,7,8,10,11,1,2}	10	9
C: {5,6,7,8,10,11,1,2,4}	11	9
D: {6,7,8,10,11,1,2,4,5}	11	10
E: {7,8,10,11,1,2,4,5,6}	11	10
F: {8,10,11,1,2,4,5,6,7}	11	10
G: {10,11,1,2,4,5,6,7,8}	10	9
H: {11,1,2,4,5,6,7,8,10}	11	9
I: {1,2,4,5,6,7,8,10,11}	10	9

#### Calculation of the Normal Form, Transposed to T8

<b>B: T8 {0,1,2,3,4,6,7,9,10}</b>	<b>9</b>
G: T2 {0,1,3,4,6,7,8,9,10}	9
I: T11 {0,1,3,4,5,6,7,9,10}	9

B is Normal Form of Set Class



## Analysis 4

### Derivation of Quasi-Forte Set Class 5-31\*

#### **Analysis of Set Class Employed in “The Atomic Genie” Scene, (mm. 3-5) in *Our Friend the Atom* (1957) by Oliver Wallace {11,2,5,7,8}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {2,5,7,8,11}	9	6
B: {5,7,8,11,2}	9	6
C: {7,8,11,2,5}	10	7
D: {8,11,2,5,7}	11	9
E: {11,2,5,7,8}	9	8

#### Calculation of the Normal Form, Transposed to T10

<b>A: T10 {0,3,5,6,9}</b>	<b>6</b>
G: T7 {0,2,3,6,9}	6

\*This set class contains {2} in normal form, instead of {1}. If {1} were present instead of {2}, the set class could be classified as 5-31. This may, however, be an instance of tonal-serial hybridity, where set class 6-Z29 is followed by a G dominant seventh minor ninth sonority in the harmonic progression of the cue, which also aptly describes the sum of the pitch-classes present in bars 3-5.

B is Normal Form of Set Class, due to tighter intervallic grouping on left side of the set.

This cue is followed, by the orchestra going starkly silent, with the only sound accompanying the image of the exploding atomic bomb being that of the explosion, itself.<sup>134</sup> The peeling of the explosion's sound complex decaying into oblivion stands alone for ten seconds, allowing a full enunciation of its ADSR cycle, and the orchestra returns only with Haber's narration at 36:50, and that solely in the form of a timpani roll on a low B-flat, as he makes the above statement. The screen fades to black in a final dramatic effect.<sup>135</sup>

This fade-to-black was ostensibly placed at this moment in the film to allow for a commercial break in the program.<sup>136</sup> Despite its intended purpose, it provides one of the most dramatically intense moments in the episode, and leaves no doubt in the viewer's mind about the episode's acknowledgment of the devastation and tragedy which followed this scientific discovery. Upon resumption of the episode after the break, the viewer is confronted, yet again, with more than twenty seconds of un-scored footage of atomic test explosions (possibly from the Manhattan Project), to underscore the point and to remind

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<sup>134</sup> Ibid., from c. 36:40 to 36:50.

<sup>135</sup> Ibid.

<sup>136</sup> See Jérémie Noyer's interview with Baker in Didier Ghez, ed., "Buddy Baker (1918-2002)," in *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 131. In response to Noyer's question regarding whether or not Baker and his colleagues would anticipate that a feature film they are scoring might later be broadcast on the anthology series (and I suggest, by implication, whether television episodes they scored would later be theatrically released, which did happen with *Our Friend the Atom* [see below]), Baker responds: "I always had a reel of about 900 feet of film and we knew where the commercial breaks would come if they made a television show out of it. I used to plan it. I think George [Bruns] did, too. I would tailor the music so that it could tail off, and they could pop in a commercial, and then pick up on the other side of the commercial. The way I wrote the cue they could break it."

television viewers of their place in the narrative.<sup>137</sup> Here we find a powerful example of the type of criticism in which the Walt Disney Studios sometimes engaged imbedded in the narrative of *Our Friend the Atom*, placed at a structurally significant moment in the film.<sup>138</sup>

Lastly, in pursuit of this potential postmodernist current of societal criticism in Disney films and scores of the era, the question of the audience to whom these shows and films were directed should be considered. Originally, *Our Friend the Atom* was broadcast on network television to a wide domestic audience, which at that time, numbered in the tens of millions in a nation with a population of 172 million.<sup>139</sup> Bill Cotter states that “*Disneyland* finished the first season as the number sixth rated series on the air, attracting an average of 39 percent of viewers each week.”<sup>140</sup> That *Our Friend the Atom* and the other *Tomorrowland* episodes of the anthology were intended for the largest possible American television audience is clear. These shows were also often released in the form

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<sup>137</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957]. This moment occurs from c. 37:04 - 37:26.

<sup>138</sup> Roy Howat, *Debussy in Proportion: A Musical Analysis* [Cambridge, UK and New York: Cambridge University Press, 1983], 1-10, especially 1-4. Howat sums up the potential significance of the Golden Section to the creation of aesthetically pleasing musical forms by posing the following: “Whatever the whole truth is about GS [the Golden Section] in art and psychology (and the field has not been one monopolized by the most objective of investigations), if GS is seen to be consistently present, and above all influential, in the musical forms analysed here, it calls for study, whether it came about through instinct, design or both.” *Ibid.*, 4.

<sup>139</sup> Steve Allen and Robert J. Thompson, “Television in the United States: The Golden Age: 1948-1959,” *Encyclopedia Britannica*, <https://www.britannica.com/art/television-in-the-United-States/The-late-Golden-Age> [Accessed February 2, 2020]. Per Allen and Thompson, “..by 1959 that figure [the number of American households with televisions] had increased [from 9 percent in 1950] to 85.9 percent.”

<sup>140</sup> Bill Cotter, *The Wonderful World of Disney Television: A Complete History* [New York: Hyperion, 1997], 65.

of documentary shorts and features, both domestically and in foreign markets,<sup>141</sup> which suggests that the artists and Studio had an even larger and more diverse audience in mind.

*Our Friend the Atom*, for example, was subsequently “released theatrically overseas in 1958,” according to Cotter.<sup>142</sup> The debut science-based episode of the anthology, *Man in Space*, was released to theaters in the U.S., as well as overseas,<sup>143</sup> in 1956, while its sequel episode, *Man and the Moon*, “was released theatrically overseas,” according to Cotter.<sup>144</sup> The idea of which audiences were deemed appropriate for theatrical releases of these landmark television episodes and the reasoning behind such decisions suggests a fertile area for future scholarship, specifically relating to this strain of criticism within Walt Disney and his artists’ creative output. That said, the idea of humankind’s ability to solve problems and better its quality of life for everyone on the planet is shot through each of the episodes discussed here and, in fact, could be seen as a sort of meta-narrative of the entire Walt Disney-led era of the anthology series.<sup>145</sup>

This criticism, albeit encapsulated within a modernist message of progress through science and the efforts of humankind, lends emotional weight to the film and score, as well. In the most poignant moment of *Our Friend the Atom*, Haber states on screen, looking into the camera with what can only be described as a world-wearied and

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<sup>141</sup> Ibid., See chapter 4, “Anthology Series Episode Descriptions,” 75-180.

<sup>142</sup> Ibid., 145.

<sup>143</sup> Ibid., 133.

<sup>144</sup> Ibid., 132.

<sup>145</sup> The anthology series, which has changed names several times over the course of its run, is still ongoing in the form of occasional television specials and is now known as *The Wonderful World of Disney*.

saddened face: “The world was deeply shocked by the first atomic explosion. We all wondered if atomic energy had better remained a secret forever.”<sup>146</sup> At this point (c. 37:27), Wallace brings the orchestra back, with cellos and double basses playing unmeasured tremolo on a low D in imitation of the dying reverberations of the last of the series of atomic explosions that greet the viewer upon resumption of the show after the commercial, and then at c. 37:29, Wallace begins layering violas and violins atop the cellos and double basses, with the former group playing a set in octaves, starting on the pitch B, {11,0,3,1} and followed by the set class {0,1,3,4,5}.<sup>147</sup>

The aggregate of these set classes is {11,0,1,3,4,5}, whose normal order is {0,1,2,4,5,6}, notated as Forte Set Class 6-Z4. (See Analysis 2, above) This becomes significant when one considers that, according to Straus, Forte Set Class 6-Z29 is very nearly complementary with 6-Z4. (See Analyses 1 and 2, above) For the latter to be truly complementary the former would require only the addition of two pitch-classes, {7} and {9}, at the proper transposition. While 6-Z4, if {7} and {9} were added would still have some overlap in terms of the pitch-classes present, the closeness to complementarity suggests that, allowing for transpositions, Wallace is dealing with two somewhat related set classes that suggest, if not complete, a twelve-tone row.

More important than this revelation is the strong similarity of this material to an octatonic scale, something with which Wallace was possibly more likely to be familiar. Omitting the pitch-class {5} from {11,0,1,3,4,5}, we observe that the other five pitch-

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<sup>146</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957]. This moment occurs from c. 37:27 - c. 37:40.

<sup>147</sup> *Ibid.*, 37:29-37:40.

classes form the majority of a 1/2 octatonic scale.<sup>148</sup> The addition of the pitch-class {5} comes only after Haber finishes his statement above and accompanies the image of a friendly fisherman (the metaphorical stand-in for humanity in the film) attempting to open the vessel which contains the genie (the metaphorical representation for atomic energy).<sup>149</sup> Here we observe the manner in which Wallace effectuates the criticism of improper use of scientific knowledge via his underscore: octatonicism, in this section, represents the lurking unforeseen consequences of such carelessness, and the resolution to a perceived tonality, in the form of suggestion of a cadence between pitch-classes {4} and {5}, is associated with the friendly image of the innocent seeker of knowledge, the fisherman.<sup>150</sup> Whether Wallace employed a set theory-based, serial, or expanded tonal compositional methodology, the net effect of his use of harmony in this section of the film is a clear communication of the program of the scene and film.

As will be discussed below, this film, *Our Friend the Atom*, provided a crucial inspiration for my piece, *Nexus: Music for a Shadow Animation*, and segments of this film were closely analyzed in my efforts to generate material for the piece. Please see my analysis of *Nexus: Music for a Shadow Animation*, in Part II of this paper.

Of further importance in establishing the aesthetic movement to which these Disney composers belonged, one may also consider the date of the introduction of the term, *postmodernism*. The output of the Disney composers discussed here, with the

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<sup>148</sup> Ibid., 37:29-37:40.

<sup>149</sup> Ibid., 37:29-37:40.

<sup>150</sup> Ibid., 37:29-37:40.

exception of the second half of Baker's career, all fall within the modernist period, if we are to take Aylesworth's demarcation, given by Lyotard's coining of the term, *postmodernism*, in 1979, as a point of departure.<sup>151</sup> This date is, admittedly, somewhat arbitrary for the purposes of fixing these aesthetic changes in music, and it could be argued that a shift toward postmodernism in music started a great deal earlier - possibly with the publication of Boulez's famous criticism of Schoenberg, "Schoenberg Is Dead"<sup>152</sup> or even earlier with the disappointment in Schoenberg's Hollywood-era music

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<sup>151</sup> See Gary Aylesworth, "Postmodernism," In *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], page 1 of 24 [of the article in pdf form]. Aylesworth states, "The term 'postmodernism' first entered the philosophical lexicon in 1979, with the publication of *The Postmodern Condition* by Jean-François Lyotard." Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge* [Minneapolis, MN: University of Minnesota Press, 1984].

<sup>152</sup> Pierre Boulez, "Schoenberg Is Dead," in *Notes of an Apprenticeship*, Translated by Herbert Weinstock [New York: A.A. Knopf, 1968]: 268-275. Boulez's criticism, of course, is that Schoenberg failed to grasp the meaning and potential of his great musical discovery, serialism. See comments by Boulez, such as, "[For Schoenberg] Dodecaphonism, then, consists of only a rigorous law for controlling chromatic writing; playing only the role of regulating instrument, the serial phenomenon itself was not, so to speak, perceived by Schoenberg." See pages 271-272. Though Boulez ultimately advocates total serialism, which is, itself, a sort of *uber* structuralism that would not have fit into the postmodernist schema of some postmodernist philosophers, such as Deleuze and Guattari (See Gary Aylesworth, "Postmodernism," in *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], pages 12-13 of 24 [in the pdf form of the article]), his advocacy of a break with Romantic and modernist thinking (the latter represented by Schoenberg) as a means of bringing music to its potential apogee, suggests that total serialism may belong to postmodernism, as opposed to modernism, as it attempts to distinguish itself from the latter in a more rigorous and meaningful (per Boulez) serial practice. I am indebted to Dr. Ian Dicke for our discussion of Boulez's article and its implications for postmodernism in music.

expressed by his European acolytes, such as René Leibowitz.<sup>153</sup> The structure of Aylesworth's survey of postmodernism would seem also to suggest that postmodernist currents in philosophy predate Lyotard's coining of the term, as he starts his investigation of postmodernism with "Precursors."<sup>154</sup> All this said, Lyotard's assignation of the term *postmodernism* to that school of thought indicates a self-awareness of the philosophical movement in 1979 and, thus, provides a clear historical date by which one may consider modernism to be generally passé in the minds of philosophers and creators.

The Disney composers discussed herein can generally be considered modernist, then, given their dates and the adherence of their style to the features Adams, Marcus, and Oja enumerate in their definitions of modernism. Only Baker remains active as a

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<sup>153</sup> See Leibowitz's letter to Schoenberg, concerning the latter's Piano Concerto, Op. 42, "which along with some of the finest passages that I have ever read and heard, uses 'Octaven Verdopplungen' [octave doublings] practically all the way through." Cited in Kenneth H. Marcus, *Schoenberg and Hollywood Modernism* [Cambridge, UK: Cambridge University Press, 2016], 203. Per Marcus, "Leibowitz then offered one of his most serious concerns: by mixing in tonality, 'the principle of "reale Stimmen" [literally "real voices," or clearly-defined musical parts] is partly given up.'" As quoted in Marcus, René Leibowitz, *Schoenberg and His School: The Contemporary Stage of the Language of Music*. Translated by Dika Newlin [New York: The Philosophical Library, 1949]. Conversely, Leibowitz's criticism of Schoenberg could simply be seen as his advocacy of a path back towards the ideals of modernism, rather than as a means of breaking with Schoenberg, and thus a continuation of modernism, as opposed to the first steps towards postmodernism. Leibowitz is very supportive, in *Schoenberg and His School*, of what he sees as Schoenberg's investigations of the potential of "a tonality expanded to its furthest limits," (see page 126), which Leibowitz terms "*monotonicity*." See page 126. He is equally supportive of Schoenberg's synthesis or hybridization of serialism and tonality. On Schoenberg's use of tonality, Leibowitz asserts, "there is a systematic effort [on Schoenberg's part] not to let a single possibility of such tonal relationship go unused." See page 126. As relates to the hybrid form, Leibowitz states, "...these works bind the tonal system to the twelve-tone technique, which enriches tonality with innumerable new elements." See page 127.

<sup>154</sup> Gary Aylesworth, "Postmodernism," in *Stanford Encyclopedia of Philosophy*, Stanford Encyclopedia of Philosophy, <https://plato.stanford.edu/entries/postmodernism/> [Accessed December 26, 2019], page 2 of 24 [in the pdf form of the article].



composer long enough to create music during the postmodernist era, and his scores from this period, from roughly 1979 to his death in 2002,<sup>155</sup> do employ some elements of pastiche, such as his big band orchestrations for the 1940's section of the various iterations of the Disneyland and, subsequently, Walt Disney World Magic Kingdom attraction, *The Carousel of Progress*.<sup>156</sup>

### **Analysis of Norman “Buddy” Baker: *Universe of Energy* (1982)**

An argument can be made that elements of pastiche in Baker's later works, such as these, contain a sort of gentle postmodern critique of a style that the composer, himself, used at the start of his career and that influenced many of his subsequent compositions. It could further be argued that these elements betray some postmodern self-awareness, although it can be equally argued that the concept of self-awareness is

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<sup>155</sup> Baker was still composing Disney theme park scores very close to the time of his death in 2002. See Jérémie Noyer's interview with Baker in Didier Ghez, ed., “Buddy Baker (1918-2002),” in *Walt's People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 145. The interview was conducted “on July 19, 2001 and January 26, 2002,” about six months prior to Baker's death. In the interview Baker states, “My most recent productions were *Journey to the Center of the Earth* and *Sinbad's Seven Voyages* for Tokyo Disney Sea. In conjunction with that, there is a new show at Walt Disney World on *Winnie the Pooh*...Then, at Disneyland, there's a new show called *Innoventions*, and I did that, too.”

<sup>156</sup> Norman “Buddy” Baker, “Carousel of Progress,” in *Walt Disney and the 1964 World's Fair*, mp3 [Burbank, CA: Walt Disney Records, 2009]. This is especially true of the version that Baker composed for the 1994 revision of the attraction at Magic Kingdom at Walt Disney World. See Norman “Buddy” Baker, “There's a Great Big Beautiful Tomorrow” Arrangement, in *Four Parks: One World (Walt Disney World Official Album)*, mp3 [Burbank, CA: 2008].

somewhat disjunct with the schema of postmodernism. It seems more likely that Baker's historiographical arrangement of the music in this section and, in fact, all of the sections in *the Carousel of Progress*, from its earliest versions onward,<sup>157</sup> were intended to provide setting in the form of time period, rather than as a critique of compositional methodologies employed in the Jazz of the 1940s. That Baker was asked on numerous occasions to create music that evoked a specific era was a fact of life for him as a film, television, and theme park composer and, in that capacity, he definitely used the technique of pastiche. In those works, however, Baker does not seem to criticize those earlier styles of music as much as celebrate their quaintness.

When the EPCOT Center theme park was being developed, Buddy Baker was tapped to be its musical director.<sup>158</sup> This meant, as Jeff Kurtti puts it, Baker "was charged with overseeing its musical development."<sup>159</sup> In this role, Baker had other composers working under his supervision on some of the attractions, such as the composer George Wilkins.<sup>160</sup> For certain attractions, such as the *Universe of Energy*, Baker composed the

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<sup>157</sup> Dating from 1964. See Norman "Buddy" Baker, "Carousel of Progress," in *Walt Disney and the 1964 World's Fair*, mp3 [Burbank, CA: Walt Disney Records, 2009].

<sup>158</sup> Jeff Kurtti, *Walt Disney's Imagineering Legends and the Genesis of the Disney Theme Park* [New York: Disney Editions, 2008], 114.

<sup>159</sup> *Ibid.*, 114.

<sup>160</sup> Michael Sprout, interview with the author, November 21, 2019, and Tammy Tuckey, "TTTS: Interview with George Wilkins, Disney Theme Park Composer." *The Tiara Talk Show*. [https://www.youtube.com/watch?v=\\_\\_RfsjnDdE8](https://www.youtube.com/watch?v=__RfsjnDdE8) [accessed July 6, 2019]. Some of Wilkins's scores for EPCOT Center are in the Norman "Buddy" Baker Collection at Fales Library and Special Collections at New York University.

score himself.<sup>161</sup> The *Universe of Energy* is significant in Baker's output in that it presents a rather stark example of tonal-serial hybridity in his work, though it is far from the only score that exhibits this technique.<sup>162</sup> This employment of tonal-serial hybridity carries out a very clear programmatic purpose in the attraction, and serves as a great example of how the imagineers went about using the tools of their trade to tell stories.

In order to understand the musical form of this attraction, one must understand its script (program) and even a little bit of the geography of the Universe of Energy Pavilion at EPCOT Center. The program of the attraction was "a journey through the history of fossil fuels and alternative sources of energy...".<sup>163</sup> Guests saw "how the development of these tremendous sources of energy has shaped our past, and how they will continue to shape our future."<sup>164</sup> The story led guests from a pre-show area to a loading area containing six massive ninety-seven passenger cars,<sup>165</sup> which featured a second pre-show, and then were driven in these wire-guided cars into a cavernous space containing a gigantic "primeval diorama" of audio-animatronic dinosaurs "that teaches guests about the origins and future of energy."<sup>166</sup> Following the diorama presentation, guests were

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<sup>161</sup> Jeff Kurtti, *Walt Disney's Imagineering Legends and the Genesis of the Disney Theme Park* [New York: Disney Editions, 2008], 114.

<sup>162</sup> Norman "Buddy" Baker, *Universe of Energy* [Burbank, CA: Walt Disney Company, 1982], Unpublished audio of partial score. [https://www.youtube.com/watch?v=mZN7b\\_mipt8](https://www.youtube.com/watch?v=mZN7b_mipt8) [Accessed July 27, 2019].

<sup>163</sup> Alex Wright and the Imagineers, *The Imagineering Field Guide to Epcot at Walt Disney World: An Imagineer's-Eye Tour* [New York: Disney Editions, 2010], 42.

<sup>164</sup> *Ibid.*, 42.

<sup>165</sup> *Ibid.*, 43.

<sup>166</sup> The Imagineers, *Walt Disney Imagineering: A Behind the Dreams Look at Making the Magic Real* [New York: Disney Editions, 1996], 173.

returned to loading area for a post-show and then exited the attraction. The entire attraction took about forty to forty-five minutes to experience, with quite a significant portion of it scored. This was, of course, a massive job for Baker, done in addition to the six other scores he composed for different EPCOT Center attractions,<sup>167</sup> all prior to the park's opening on October 1, 1982.<sup>168</sup>

As the reader can see, based on the description above, the attraction lends itself to the ternary form that Baker employs for it. Guests spent the A Section of the piece in the pre-show areas, and during this time a light contemporary pop song, "Universe of Energy," played under the narration describing the global demand for fossil fuels and setting up the premise of the main scene within the diorama.<sup>169</sup> The song, "Universe of Energy," is scored for pop group (vocalist, electric guitar, electric bass, synthesizer, and drums) and is in the key of G, although the melody and chord progression suggest G mixolydian.<sup>170</sup>

Once guests embarked on their journey into the diorama, the music changed to represent the change in setting, the primeval world, and perhaps to suggest the mystery of

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<sup>167</sup> Jeff Kurtti, *Walt Disney's Imagineering Legends and the Genesis of the Disney Theme Park* [New York: Disney Editions, 2008], 114.

<sup>168</sup> Alex Wright and the Imagineers, *The Imagineering Field Guide to Epcot at Walt Disney World: An Imagineer's-Eye Tour* [New York: Disney Editions, 2010], 16.

<sup>169</sup> Norman "Buddy" Baker, arr., "Universe of Energy," in *Disney Classics*, mp3 [Burbank, CA: Walt Disney Records, 2013].

<sup>170</sup> *Ibid.*

time travel back into the distant past.<sup>171</sup> The row for the serial portion of the piece, its B Section, begins on the pitch-class D {2}, which helps to connect the series to the tonal material that has preceded it.<sup>172</sup> The first articulation of the row is in the glockenspiel which both serves to provide a timbral change from the pop group, suggests some magical force which has allowed the time travel, while softening any frightening edges this journey in the dark may have for children in the vehicles.<sup>173</sup> The series starts with a tetrachord that describes a descending chromatic scale, which is then diverted in the fifth member of the series, G# {8}, a tritone away from the first pitch-class of the series.<sup>174</sup> The series stops here and the harp plays the following three dyads in sequence: {0,2}, {6,8}, {0,2}.<sup>175</sup> The third dyad, which is an octave-equivalent repetition of the first dyad, is played an octave below the first.<sup>176</sup> In so doing, Baker has already “broken” two of the supposed rules of Twelve-Tone orthodoxy: he has doubled a pitch-class at the octave, though not simultaneously, and he has repeated a pitch-class in the series before

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<sup>171</sup> Norman “Buddy” Baker, *Universe of Energy* [Burbank, CA: Walt Disney Company, 1982], Unpublished audio of partial score, [https://www.youtube.com/watch?v=mZN7b\\_mipt8](https://www.youtube.com/watch?v=mZN7b_mipt8) [Accessed July 27, 2019], c. 2:12ff. The recording of the original attraction score is not available commercially and so I have had to rely on this bootlegged copy, found at the web address, above.

<sup>172</sup> *Ibid.*, c. 2:12.

<sup>173</sup> *Ibid.*, c. 2:12.

<sup>174</sup> *Ibid.*, c. 2:12-2:23.

<sup>175</sup> *Ibid.*, c. 2:23.

<sup>176</sup> *Ibid.*, c. 2:23.

enunciating every other pitch-class.<sup>177</sup> This, of course, is of no concern to him and he employs his serial materials in the way he sees best fit to advance the narrative. In so doing, Baker has also added two additional pitch-classes to the series, {0} and {6}.<sup>178</sup> Note the tritone relation between corresponding members of the dyads {0,2} and {6,8}. This pair of dyads could also be analyzed as a sort of arpeggiation of a French augmented sixth chord. This tonal connection is key to the employment of tonal-serial hybridity in this score. Baker is straddling both worlds very subtly: he is recognizably using a series and yet the series is comprised of tonal materials and intervals and so bridges the gap between both compositional techniques.<sup>179</sup> The series is, as of this moment, a septachord, {2,1,0,11,8,0,6}.

When he starts the second statement of the series, Baker adds flute to the orchestration to give the sound a thicker and rounder timbre.<sup>180</sup> The series stops at F# {6} this time and then breaks off for a set played in sequence {2,3,2,11}, by the double basses and cellos.<sup>181</sup> Baker follows these with sonorities based on the series, which now includes

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<sup>177</sup> See our discussion of René Leibowitz's criticism of Schoenberg's octave doubling, above. See also Schoenberg's clarifications about the repetition of tones in his essay, "Hauer's Theories." Arnold Schoenberg, "Hauer's Theories (1923)," In *Style and Idea: Selected Writings of Arnold Schoenberg*, Edited by Leonard Stein, Translated by Leo Black [Berkeley and Los Angeles: University of California Press, 1984], 211. Schoenberg argues for more subtlety and flexibility in one's use of tones and avoidance of repetition the Hauer does.

<sup>178</sup> Norman "Buddy" Baker, *Universe of Energy* [Burbank, CA: Walt Disney Company, 1982], Unpublished audio of partial score, [https://www.youtube.com/watch?v=mZN7b\\_mipt8](https://www.youtube.com/watch?v=mZN7b_mipt8) [Accessed July 27, 2019], c. 2:43.

<sup>179</sup> *Ibid.*, c. 2:12-2:23.

<sup>180</sup> *Ibid.*, 2:24.

<sup>181</sup> *Ibid.*, 2:35-2:38.

pitch-classes {3} and {11}, enunciated in the figure for double basses and cellos. The current portion of the series revealed to the listener up to this point is {2,1,0,11,8,0,6,3,11}. It is also noteworthy that the double bass and cello sequence is actually half of an octatonic scale, which gives the music a sense of mystery.<sup>182</sup> (See Fig. 4, below)

**Fig. 4 - Norman “Buddy” Baker: *Universe of Energy*, “Primeval Diorama”**

Universe of Energy: "Primeval Diorama"

Norman "Buddy" Baker  
Transcribed by Patrick Gibson

Adagio ♩ = 40  
c. 2:12

©1982 Walt Disney Company

<sup>182</sup> Baker described Stravinsky as one of his favorite composers and one whom he studied closely to discover compositional methodologies. See Jérémie Noyer’s interview of Baker, “Buddy Baker (1918-2002),” in Didier Ghez, ed., *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 145. On his study of Stravinsky, see Ben Ohmart, *Buddy Baker: Big Band Arranger, Disney Legend, and Musical Genius* [Albany, GA: Bear Manor Media, 2016], e-book loc. 166. We may be able to deduce that Baker gathered some awareness of the octatonic scale through his study of Stravinsky or possibly through his experience as a Jazz arranger in the 1940s.

When the ride vehicle finally arrives back in the loading area, the theme song for the attraction, played by the pop group, returns and its way is smoothed by a glissando on the synthesizer from the last pitch-class of the serial section, G {7}, which is, of course, the tonic pitch of the song.<sup>183</sup> The penultimate pitch-class is D {2} and so, even at the end of the row, a sort of cadence from dominant pitch-class to tonic pitch-class is effected.<sup>184</sup> This is prepared by the D appearing as a pedal point in unmeasured tremolo in the double basses under the final statement in the vibraphone of a sequence of rotations, beginning with the pitch-classes, {2,9,8,5,9,8}, derived from the series.<sup>185</sup> The four unique pitch-classes in this set can be analyzed as the tetrachord, {2,9,5,8}, which suggests a D minor sonority, but with an added diminished fifth, as well as a Quasi-Forte Set Class, 4-28.<sup>186</sup> (See Analysis 9, below)

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<sup>183</sup> Norman “Buddy” Baker, *Universe of Energy* [Burbank, CA: Walt Disney Company, 1982], Unpublished audio of partial score, [https://www.youtube.com/watch?v=mZN7b\\_mipt8](https://www.youtube.com/watch?v=mZN7b_mipt8) [Accessed July 27, 2019], c. 7:14-7:22.

<sup>184</sup> *Ibid.*, c. 7:04-7:13.

<sup>185</sup> *Ibid.*, c. 7:04.

<sup>186</sup> See Derivation of Quasi-Forte Set Class 4-28 in the appendices, below.



## Analysis 9

### Derivation of Quasi-Forte Set Class 4-28\*

**Analysis of Set Class Employed in *Universe of Energy* (c. 7:04-7:13) by Norman “Buddy” Baker {2,9,5,8}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {8,9,2,5}	9	6
B: {9,2,5,8}	11	6
C: {2,5,8,9}	7	6
D: {5,8,9,2}	9	4

Calculation of the Normal Form, Transposed to T10

**C: T10 {0,3,6,7}      9**

\*This set class contains {7} instead of {9}. As a result, this set class is not truly 4-28, but resembles it in three of pitch-classes and contains the diminished triad in 4-28.

C is Normal Order of Set Class.

It is clear, from this analysis, that Baker repeatedly and consistently integrates tonal sonorities, intervals, and sequences into his serial music in *Universe of Energy*, and that he transitions from one technique to another through the use of common pitch-classes. He employs serial music for the mysterious primeval word section of the attraction, while using very accessible pop music for the pre and post-show presentations. By the time *Universe of Energy* was composed, both of Buddy Baker's contemporaries whose works are analyzed herein had either retired or passed away. Baker was, when he retired from the Walt Disney Studios in 1983, the last of the contract film composers in Hollywood.<sup>187</sup> He continued to work for Disney, as mentioned above, until his death in 2002 as a freelance composer. Baker, thus, carried on the tradition of tonal-serial hybridity long after his contemporaries had stopped composing, and it is for this reason that he has one of the largest outputs among his colleagues, and why his music spans so many different stylistic movements in music. The study of Baker's music, not least an

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<sup>187</sup> Ben Ohmart, *Buddy Baker: Big Band Arranger, Disney Legend, and Musical Genius* [Albany, GA: Bear Manor Media, 2016], e-book loc. 865-878.

exploration of his harmonic theory, said to be of interest to Nadia Boulanger,<sup>188</sup> is an area ripe for scholarship.

Naturally, the modernist musical philosophy manifested itself in each Disney composer's output in as many different ways as there were individual composers. Within that collective output, however, investigation focused on similarities across their work helps to clarify the general contours of the modernist aesthetic.

For another example of the influence of modernist musical aesthetics on the output of the Disney composers discussed here, we may turn to a phenomenon described by Morton Feldman in his brief discussion of "disproportionate symmetry" in the music

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<sup>188</sup> Ibid., e-book loc. 166. According to Ohmart, Baker "developed his own system of harmony...It was a poly chordal system, in which every tonic chord had its own scale." Baker, himself, confirms the existence of this system in his interview with Jon Burlingame for the Television Academy. See Jon Burlingame and Norman "Buddy" Baker. "Buddy Baker Interview." In *Emmy TV Legends.Org*. Television Academy. <https://interviews.televisionacademy.com/interviews/buddy-baker#interview-clips> [accessed August 13, 2018]. This discussion is in Part 2 of the Interview, from c. 2:07- 4:54. Per Baker, "It's based on a theory that every type [of] chord has its own scale instead of the major or minor scales that you get in traditional [Western] music...It enables me to write polychordal sounds instead of polytonal sounds...I can't teach it in a classroom. It has to be taught to individual students, I think, but it works. It's a good system. It works fine." Baker indicates that Alan Oldfield, who was a student of Nadia Boulanger's in Paris, had studied Baker's system privately with Baker. Oldfield showed the system to Boulanger and she expressed interest in learning about it, but passed away before she could meet with Baker.

of Stravinsky, Varèse, Reich, Satie, and Schoenberg.<sup>189</sup> Feldman sees a through line in the treatment of rhythmic patterns and their effect on the overall structure of a piece by the above-mentioned composers, which he describes as follows: “If we examine asymmetric phrasing - whether in Stravinsky’s ‘hard-edged’ *Sacre*, Satie’s ‘soft-edged’ *Socrate*, or in Schoenberg’s duplication of the irregular prose of *Ewartung* - we find that the partitioning is concentrated enough in time to hear the mosaic-like process of the grid at work.

Apropos of these pieces, Feldman goes on to assert that “We also recognize a historically reminiscent ‘conversation’ between the phrases. In this regard, these three early twentieth century asymmetric masterpieces were an outgrowth of the symmetrical antecedent/consequence building blocks of the Classical era.”<sup>190</sup> This demonstrates Feldman’s conviction or conclusion that modernism and even that which preceded it, i.e. Primitivism/Late Romanticism, is predicated on the Classical models laid down by Stravinsky, Satie, and Schoenberg’s predecessors.<sup>191</sup> As discussed above, modernist

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<sup>189</sup> Morton Feldman, “Crippled Symmetry,” *RES: Anthropology and Aesthetics*, no. 2 [Autumn 1981], 91. It is a stretch to describe Reich’s *Four Organs* (1970), given the dates discussed above, as a modernist piece. It can more accurately be described as a minimalist piece, certainly, and Feldman does not use the term, modernist, to describe Reich’s work. He does, however, draw examples of the compositional precedent for his own works mostly from composers of the modernist era and for this reason I see his discussion of the compositional practices in evidence in these pieces as relevant to our effort to define musical modernism. Thus, apart from occupying a subsequent historical period to those of Stravinsky and Varèse, Feldman asserts that the “additive” metrical practice he outlines in *Four Organs* bears resemblance to similar practices in Stravinsky’s *Requiem Canticles* (1966) and Varèse’s *Intégrales* (1925).

<sup>190</sup> *Ibid.*, 91.

<sup>191</sup> *Ibid.*, 91.

music, grounded in the context of past and, yet, developing new musical materials by simultaneously contrasting itself with the music of the past is a feature of the film music of this period and, particularly, the film music of the Disney composers upon which our study focuses.

This conception of the necessity of prior knowledge of the past as context for creation in the present can also be observed in Derrida's insistence on the existence and foundation of traditional modes of thinking as essential in the formation of deconstructionism in modern thought and writing.<sup>192</sup> The present relies on the past to give it context and explain itself to the observer, and this conversation is carried out in metaphors, according to Derrida, since there is no way to explain a fully exterior truth without comparison to something comprehensible by the listener or reader. Per Derrida:<sup>193</sup>

The semiological "science" or, more clearly, linguistic, cannot thus retain the difference between signifier and signified - the same with the idea of the sign - without the difference between the perceivable and the intelligible, certainly, but without retaining also at the same time, more profoundly and more implicitly, the reference to a signified that can take place, within our intelligibility, before its "fall," before all expulsion to the exteriority from the sensible here and now. In so

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<sup>192</sup> Jacques Derrida, *De la Grammatologie*, Paris: Éditions de Minuit, 1967, ebook loc. 351.

<sup>193</sup> Ibid., e-book loc. 346. Here is the quotation, in the original French: "La 'science' sémiologique ou, plus étroitement, linguistique, ne peut donc retenir la différence entre signifiant et signifié - l'idée même de signe - sans la différence entre le sensible et l'intelligible, certes, mais sans retenir aussi du même coup, plus profondément et plus implicitement, la référence à un signifié pouvant 'avoir lieu,' dans son intelligibilité, avant sa 'chute,' avant toute expulsion dans l'extériorité de l'ici-bas sensible. En tant que face d'intelligibilité pure, il renvoie à un logos absolu auquel il est immédiatement uni. Ce logos absolu était dans la théologie médiévale une subjectivité créatrice infinie: la face intelligible du signe reste tournée du côté du verbe et de la face de Dieu."

much that it is a face of pure intelligibility, it returns to an absolute logos which is immediately united. This absolute logos was in Medieval Theology an endless creative subjectivity: the intelligible face of the concept of the sign remains turned to the side of the action and face of God.<sup>194</sup>

Adjacent sections of music cited within Feldman's discussion, such as

“Stravinsky's characteristic juxtaposition of A and B [within the context of a musical pattern that features repeating elements, A and B, which are divergent in nature],”<sup>195</sup>

suggest also a connection to Luhmann's description of systems theory as the concept of meaning derived within a system in the form of difference or noise introduced into that system by itself.<sup>196</sup> This relates, of course, to the concept of difference as meaning in the discussion of the genre of modernism in film music, above.

What Derrida, Chagas, and Feldman all seem to suggest is that our conception of modernism - or any other stylistic distinction within music - is wholly dependent on its historical context, that is, it is recognizable by its difference from that which has gone before it. Chagas takes this further by asserting that “The purpose of art, as viewed by Luhmann (and also by Wittgenstein), is to introduce *surprise* into the world. Art explores possibilities to relate perception to communication by creating objects that cause surprise

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<sup>194</sup> Ibid., ebook loc. 346. Translation by author.

<sup>195</sup> Morton Feldman, “Crippled Symmetry,” 91.

<sup>196</sup> See Paulo C. Chagas's discussion of the work of Luhmann and Spencer-Brown in Paulo C. Chagas, “Communication and Meaning: Music as a Social System,” in *Unsayable Music: Six Reflections on Musical Semiotics, Electroacoustic and Digital Music* [Leuven, Belgium: Leuven University Press, 2014], 65-102.

and admiration. If we translate the concept of surprise with creativity, we can say that art produces and reproduces creativity as a form of communication.”<sup>197</sup>

This implies a useful equation in describing the modernist and postmodernist approach to creativity. Difference *is* surprise which, in turn, *is* creativity. If this equation is true in the creation of art, then it is possible to understand the role of art as a carrier of meaning within the larger social system.<sup>198</sup> *Le Sacre du Printemps*, *Socrate*, and *Ewartung* are meaningful precisely because they differ from that which preceded them, but they differ as a result of their creativity, which causes, as Chagas suggests, the admiration of those pieces of music. However, their creativity can only be fully appreciated in the context of the music that predates them. This “recursive process,” cited by Chagas in the excerpt above, is meaningful to listeners, and, I posit, to composers especially, in that the introduction of related but unique musical material, which is, in itself, a variation of the material which previously helped to define the borders of the musical system, demonstrates the further “possibilities” of art to which Chagas refers.<sup>199</sup>

Indeed, Chagas states that “The work of art is a chain of recursive operations that constructs its own reality.”<sup>200</sup> This reflects Feldman’s view that asymmetries in patterns,

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<sup>197</sup> Ibid., 73. Emphases Chagas.

<sup>198</sup> Ibid., 73.

<sup>199</sup> Ibid., 73.

<sup>200</sup> Ibid., 73.

whether they be discovered in Turkish rugs or twentieth century music, as he explains, can act as the locus of the creation of a new musical form.<sup>201</sup>

Feldman states, “There are musical examples where the juxtaposition of asymmetric proportions (all additive) becomes the form of the composition.”<sup>202</sup> In other words, in some twentieth century music, it is sum of the little differences or variations from phrase to phrase that create the musical meaning of the piece - its form.<sup>203</sup> This observation can be made in Feldman’s *oeuvre*, as well, in pieces such as *Triadic Memories*,<sup>204</sup> where slight deviations in the pattern played by the pianist with each reintroduction of said pattern provides the forward motion of the piece, as well as its comprehensibility. Since the music can be said to inhabit its own system and slowly

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<sup>201</sup> Morton Feldman, “Crippled Symmetry,” 91.

<sup>202</sup> *Ibid.*, 91.

<sup>203</sup> *Ibid.*, 91.

<sup>204</sup> Morton Feldman, *Triadic Memories* [Vienna: Universal Edition, 1981].



bloom outward, through the introduction of difference in the *Derridien* sense, it creates meaning along the way.<sup>205</sup>

### **Tonal-Serial Hybrid Methodology: Byron Adams's Analysis of Karel Husa's *Music for Prague 1968***

Byron Adams states, "*Music for Prague 1968*...is the first of Husa's scores to combine an existing traditional melody with the personal and experimental serial procedures found in such works as the *Poem* (1959) for viola and chamber orchestra and *Mosaïques* (1961) for orchestra. Every thematic element in *Music for Prague 1968* can be

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<sup>205</sup> Jacques Derrida, *De la Grammatologie*, e-book loc. 214, ff. Derrida's conception of "différance" [with an "a"] forms a fundamental part of his discussion of the distinction between "writing" and "language" in *De la Grammatologie*, and a fundamental part of his explanation of deconstruction. Gary Aylesworth describes Derrida's concept of "différance" as "the spacing of difference." Aylesworth discusses "différance" in the context of Derrida's view, as opposed to Heidegger's view, of Nietzsche's role "within the metaphysics of presence" where Derrida's view of Nietzsche as "the closure of metaphysics" does not indicate its "disappearance" but instead defines it as "one side of a difference, and where the mark of deletion is itself a trace of the difference that joins and separates this mark and what crosses it out." See Gary Aylesworth, "Postmodernism," in *Stanford Encyclopedia of Philosophy*, <https://plato.stanford.edu/entries/postmodernism/>, [Accessed December 26, 2019].

Derrida clarifies the distinction between "difference" and "différance" by defining it, in the negative, as follows, in *De la Grammatologie*, as translated by Aylesworth and quoted in the *Stanford Encyclopedia of Philosophy*: "There cannot be a science of *différance* itself in its operation, [any more than] it is [possible] to have a science of the origin of presence itself, that is to say of a certain non-origin." Clarifications in Aylesworth's translation by the author. Please refer to the quote in *De la Grammatologie*, e-book loc. 1637, in the original French, as follows: "Il ne peut y avoir de science de la différence elle-même en son opération, non plus que de l'origine de la présence elle-même, c'est-à-dire d'une certaine non-origine." Aylesworth goes on to explain that Derrida is indicating, through this definition of "difference" stated in terms of what it is *not*, that it *is* in fact only perceptible as "the marking of the trace of difference, that is, deconstruction."

traced to to the first four bars of ‘Ye Warriors of God.’”<sup>206</sup> Adams seems to suggest here that Husa’s use of serial techniques, beginning with *Poem* and *Mosaïques*, continued to be employed in his subsequent works. Furthermore, the combination of serial procedures with a tonal traditional melody provides yet another example of modernist composers using serial techniques within the larger context of tonality, as well as another means of using a hybrid serial-tonal compositional methodology.

According to Adams, through the creation of variations based on the “Ye Warriors of God” melody, Husa generates sufficient material to create two twelve tone rows “that contain between them all of the score’s basic motives.”<sup>207</sup> Husa also, per Adams’s analysis, generates his sonorities from this same material, specifically from Set or Row II. “Set II also contains the origin of the most important recurring harmonic ideas in *Music for Prague 1968*: three chords that Husa refers to as the chorale chords”: {4,8,9}, {3,6,1}, and {8,4,5}.<sup>208</sup>

Adams also asserts that “Husa never employs these 12-note sets in a rigid manner; rather, he uses serial procedures to promote the greatest possible thematic unity through motivic interrelation. He does not allow serial procedures to become merely systematic.”<sup>209</sup> This marks an important distinction between Husa’s output and that of

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<sup>206</sup> Byron Adams, “Karel Husa’s *Music for Prague 1968*: An Interpretive Analysis,” *The Instrumentalist* 42 [October 1987], 20.

<sup>207</sup> *Ibid.*, 20.

<sup>208</sup> *Ibid.*, 20.

<sup>209</sup> *Ibid.*, 20.

strictly serial composers, such as Boulez.<sup>210</sup> Husa allows himself the flexibility to make the serial material work for his purposes, which are not to obscure the tonal nature of the folksong material, but rather to explore their musical potential. I argue that this also demonstrates a manner of breaking away from an interpretation of serial music as belonging entirely to a systems-theory based semiotics and one more closely aligned with a humanistic focus on the agency of subjects.

It has been my experience that a serial analysis of a melody or motive can provide the composer with a wider perspective on the potential of his or her material and, at the conclusion of the analysis, a greater control over their material as it reveals, through its somewhat objective mathematical procedures, source material for variations that can add variety through their remoteness from the original material, and yet are naturally linked to it and may even be seen as its natural consequence due to its relationship with the melody, in the form of a shared musical DNA.

This practice, as has been remarked elsewhere in this dissertation, aligns with some of Schoenberg's statements on twelve-tone music.<sup>211</sup> Schoenberg writes, "In twelve-tone composition consonances (major and minor triads) and also the simpler dissonances (diminished triads and seventh chords) - in fact almost everything that **is** used to make up the ebb and flow of harmony - are, as far as possible, avoided. But this is

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<sup>210</sup> Pierre Boulez, "Schoenberg Is Dead," In *Notes of an Apprenticeship*, Translated by Herbert Weinstock [New York: A.A. Knopf, 1968].

<sup>211</sup> See Arnold Schoenberg, *Style and Idea: Selected Writings of Arnold Schoenberg*, ed. Leonard Stein, trans. Leo Black [Berkeley, CA and Los Angeles: University of California Press, 1975]: 207-250.

not because of any natural law of the new art...At the root of all this is the unconscious urge to try out new resources independently...".<sup>212</sup>

Here Schoenberg accurately describes the then-current practice of composition employing twelve-tone techniques, and acknowledges the historical context of those compositions. He also makes two important observations, significant given his status as the creator of the technique of serialism. He first suggests that the impulse away from the sonorities most associated with tonality is, in fact, "one manifestation of a reaction, one that does not have its own special causes but derives from another manifestation - which it tries to contradict, and whose laws are therefore the same, basically as its own."<sup>213</sup> This implies something that Schoenberg argued frequently, which was his belief that composition with twelve-tone rows was a natural consequence of the musical tradition of innovation in Western Art Music,<sup>214</sup> and suggests, possibly, that twelve-tone rows inhabit a space governed by the same "laws" as the previous system of tonality.

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<sup>212</sup> Arnold Schoenberg, "Twelve-Tone Composition [1923]," in *Style and Idea: Selected Writings of Arnold Schoenberg*, ed. Leonard Stein, trans. Leo Black [Berkeley, CA and Los Angeles: University of California Press, 1975], 207.

<sup>213</sup> *Ibid.*, 207.

<sup>214</sup> c.f. Arnold Schoenberg, "Composition with Twelve Tones (1) [1936]," in *Style and Idea: Selected Writings of Arnold Schoenberg*, ed. Leonard Stein, trans. Leo Black [Berkeley, CA and Los Angeles: University of California Press, 1975], 216ff., in which Schoenberg lays out, from an historical perspective, the evolution of twelve-tone technique, rooted in what he terms, "the *emancipation of the dissonance*," starting with Wagner's "harmony" which "promoted a change in the logic and constructive power of harmony," and its influence on Debussy, straight through to the music of Schoenberg's students, Webern and Berg, in the early twentieth century.

The second observation can be found in Schoenberg's later discussion of the evolution of an “*extended tonality*”<sup>215</sup> and “the *emancipation of dissonance*,”<sup>216</sup> leading, in his view, to the creation of a twelve tone technique. He states at the outset of his historical description of the supplanting of tonality with this “*emancipation of dissonance*” that, “The method of composing with twelve tones grew out of a necessity.”<sup>217</sup> Schoenberg asserts that, as a result of the “*emancipation of dissonance*,” he required as a composer “a new procedure in musical construction which seemed fitted to replace those structural differentiations provided formally by tonal harmonies.”<sup>218</sup> This compelling history serves as a powerful argument for an evolutionary connection between tonality and twelve-tone composition.

In an earlier essay, Schoenberg even suggests that twelve-tone techniques might be combined in the future with tonality, given a different historical context.<sup>219</sup> “A later time will perhaps (!) be allowed to use both kinds of resources in the same way, one alongside the other...”<sup>220</sup>

Given these connections between tonality and serial techniques, it can be argued that Husa, in 1968, seventeen years after the death of Schoenberg, and just two years after

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<sup>215</sup> *Ibid.*, 216.

<sup>216</sup> *Ibid.*, 216.

<sup>217</sup> *Ibid.*, 216.

<sup>218</sup> *Ibid.*, 218.

<sup>219</sup> Arnold Schoenberg, “Twelve-Tone Composition [1923],” in *Style and Idea: Selected Writings of Arnold Schoenberg*, ed. Leonard Stein, trans. Leo Black [Berkeley, CA and Los Angeles: University of California Press, 1975], 207.

<sup>220</sup> *Ibid.*, 207.

Igor Stravinsky's final orchestral composition, *Requiem Canticles* (1966), some of whose earlier serial compositions had employed repetition of pitch-classes within a set and suggested a tonal context,<sup>221</sup> quite naturally adapted the serial language he had been using for nearly ten years at that point in his career to the tonal material in the traditional melody, "Ye Warriors of God," for *Music for Prague 1968*,<sup>222</sup> and in so doing, was

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<sup>221</sup> See my analysis of Stravinsky's *Agon* (1957) in this paper. The emphasis placed on the pitch-class C in the piece, most especially at the beginning and ending movements of the work, "I. Pas de Quatre" and "XVI. Four Trios," suggests that pitch-class as a "tonic," as do the sonorities in the final bars of the latter, which spell a C Major Seventh sonority. This analysis is based on suggestions of the potential existence of a serial-tonal hybrid methodology in Stravinsky's serial pieces from 1952 forward by Dr. Byron Adams, in the author's discussion with him on this topic, as well as by the work of Joseph N. Straus in *Stravinsky's Late Music*. See Joseph N. Straus, *Stravinsky's Late Music*, Cambridge Studies in Music Theory and Analysis [Cambridge, UK: Cambridge University Press, 2001]. The reader is, no doubt, aware that although Stravinsky's first completely serial piece is *Threni* (1958), he began to employ serial techniques to a limited extent in some of the sections and movements of his works from the early 1950s, such as the *Septet* (1953), as well as the *Cantata* (1952). In this way, long before *Music for Prague 1968*, elements of serial technique had already been enfolded into tonal pieces of music by a leading composer. This latter point can even more strongly be asserted as relates to the much earlier serial-tonal hybrid works of Frank Martin, from 1933, with the First Piano Concerto, forward. Please see Bernhard Billeter, "Martin, Frank," in *Oxford Music Online*, <http://www.oxfordmusiconline.com/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000017895> [accessed January 23, 2018]. I am indebted Dr. Adams for my knowledge of the serial work of Martin. Please see my analysis of Martin's *Petite Symphonie Concertante* (1946) elsewhere in this paper. Of Martin's use of serialism, Bernhard Billeter says, "[Martin's] application of 12-note technique is unorthodox, and Martin rejected Schoenberg's aesthetics. For in the future too, [from 1933, onward] harmony remained the determining factor for Martin: harmony within an extended tonality, with a strong personal stamp." It is instructive to note that Billeter describes Martin's use of a serial-tonal hybrid methodology as "extended tonality," virtually the same term Schoenberg himself used in his description of the music of the late nineteenth century in his essay, "Composition with Twelve Tones" (see above). I view my own application of serialism within a tonal framework in the same light, as an extension of the potentialities of a tonal harmonic language and, in this way, see a connection between my music and the music of my predecessors. Please see my discussion and analysis of my dissertation piece, *Nexus: Music for a Shadow Animation*, in this paper.

<sup>222</sup> Adams, "Karel Husa's *Music for Prague 1968*," 20.

composing within the latter-day historical context suggested by Schoenberg some 45 years before.

**Creating Underscore Music for Theme Park Attractions: Walt Disney Imagineering, *The Twilight Zone Tower of Terror* at Disney's Hollywood Studios at Walt Disney World**

Reflective of our analysis of Buddy Baker's score for the EPCOT Center at Walt Disney World attraction, *Universe of Energy*, and illustrative of the process of creating music for Disney Theme Parks, is the following exploration of the history of the Disney's Hollywood Studios attraction, *The Twilight Zone Tower of Terror*, at Walt Disney World Resort in Orlando, Florida, and a discussion of the creation of its music.

In a 1994 interview with the *Orlando Sentinel*, Disney Imagineer Michael Sprout, Show Writer<sup>223</sup> for the attraction, describes the importance of the *Twilight Zone* theme music<sup>224</sup> to both the Disney imagineers' ability to ultimately sell their idea of a "haunted hotel" to top management at the company, as well as to the more significant goal of establishing the attraction's cultural relevance to its guests and to the theme park in which it would be situated.<sup>225</sup> Per Sprout, "I think it's the music that sold that idea, because the music...means *The Twilight Zone*...All you have to do is hum that tune and everybody knows what it is!"<sup>226</sup> Creating an attraction with this sort of cultural relevance was one of the chief concerns of the Walt Disney Company's then-CEO, Michael Eisner, who, according to Craig Dezern, insisted that Disney's Hollywood Studios [at that time called

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<sup>223</sup> A show writer for a Disney Theme Park Attraction is an individual, an employee of Walt Disney Imagineering [WDI, formerly WED Enterprises], who "develops the stories we want to tell in the parks, as well as any nomenclature that is required." See Alex Wright and the Imagineers, *The Imagineering Field Guide to Disneyland: An Imagineer's-Eye Tour* [New York: Disney Editions, 2008], 8. Show writers may be the sole author of the script for an attraction, but often work in teams that include not only other show writers, but also engineers, animators, concept artists, and sound designers, to name a few of the disciplines potentially involved in the creation of attractions at WDI. Sprout mentions in his interview with this author that, "For *Tower of Terror*, for instance, it starts with a team of like ten people." Teams meet frequently and exchange feedback on the constituent parts of a project, as they are developed, and groups within teams get feedback from management throughout the process. Each of these team members (employees of WDI) are known as imagineers and are expected to work across disciplines to execute the completion of a given project so that it meets Disney's rigorous standards for safety, quality, and artistry. This description of the Imagineering project development process was gleaned through my interview with Michael Sprout, given in-person at his home on November 21, 2019.

<sup>224</sup> Marius Constant, "The *Twilight Zone* Main Theme," Directed by Geek Music, mp3, Geek Music, 2008.

<sup>225</sup> Craig Dezern, "Tower of Terror," *The Orlando Sentinel*, June 12, 1994.

<sup>226</sup> Michael Sprout, Interview with the author, November 21, 2019.



Disney-MGM Studios] “needed a thrill ride, something with special appeal for teenagers.”<sup>227</sup>

From the outset, the Imagineers faced some difficulty in finding a suitable subject matter for the attraction, but ultimately, the classic television series, *The Twilight Zone*,<sup>228</sup> was chosen for a number of reasons related to context and comprehensibility.<sup>229</sup> The starting point for the Imagineers in this process was to identify a culturally relevant story and use it as the foundation of every element of the narrative to be told.<sup>230</sup> This would provide consistency throughout the attraction and eliminate any elements that distracted from the story.<sup>231</sup>

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<sup>227</sup> Craig Dezern, “Tower of Terror,” *The Orlando Sentinel*, June 12, 1994. Page 2 of 6.

<sup>228</sup> Rod Serling, *The Twilight Zone*, CBS, 1959-1964.

<sup>229</sup> Michael Sprout, Interview with the author, November 21, 2019. Sprout believes that the Imagineer who first suggested *The Twilight Zone* TV Series as a theme for the attraction was Kevin Rafferty, Creative Director at WDI.

<sup>230</sup> Michael Sprout, Interview with the author, November 21, 2019.

<sup>231</sup> The imagineer John Hench describes the importance of consistency in telling stories within Disney theme park attractions and the environments within the Disney theme parks, themselves, using these terms. Hench explains the “danger of contradictions” in advancing a program in a theme park, as follows: “If the visual details disagree, guests experience active clutter, which has the same effect on the eye as a cacophony of noise has on the ear. Mixed messages set up conflicts, create tension, and may feel threatening.” John Hench and Peggy Van Pelt, *Designing Disney: Imagineering and the Art of the Show* [New York: Disney Editions, 2003], 79. John Hench was one of highest regarded imagineers in the history of WDI, and was its creative executive for many years. Hench is responsible for the design of the Tomorrowland area in Disneyland (1967), as well as many other features of the various Disney parks throughout the globe. Before his time at WDI, Hench was a background and layout artist, as well as an art director, for the Walt Disney Studios on films including *Cinderella* (1950) and *Peter Pan* (1953), among others. He collaborated, at Walt Disney’s direction, with Salvador Dalí on their animated film, *Destino* (1946, 2003). The John C. Hench School of Animation at the University of Southern California is named for him.

The lengths to which the imagineers went to find the perfect organizing program for their new attraction is exemplified by their rejection of a promising concept, early in its development. In that iteration of the proposed attraction, Sprout “tried a script that played like the *Phantom of the Opera* meets *Singin’ in the Rain*,”<sup>232</sup> wherein an embittered former silent-movie director “haunts the guests of a Hollywood Hotel,” by “cut[ting] the elevator cables, sending guests plunging to their doom.”<sup>233</sup> Even this concept, as clear as it is to the reader, would not be, in the minds of the imagineers on the team, familiar enough to guests, in that it would require them to have knowledge of the backstory of a heretofore unknown character in order to process his motivation and actions.<sup>234</sup>

Sprout explains his goal for creating a culturally relevant, clear program for an attraction: “...I never like to put too much of a backstory into an attraction, because I don’t want the guests to have to learn anything to enjoy it. You know? It’s fine if you want to go in and see the details, but you don’t have to know that much other than, ‘This is *The Twilight Zone*. It’s weird.’ And then we did a story.”<sup>235</sup> The strength of such a clear

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<sup>232</sup> Craig Dezern, “Tower of Terror,” *The Orlando Sentinel*, page 3 of 6.

<sup>233</sup> Craig Dezern, “Tower of Terror,” *The Orlando Sentinel*, page 3 of 6.

<sup>234</sup> Michael Sprout, Interview with the author, November 21, 2019.

<sup>235</sup> *Ibid.*

cultural reference is that it creates an “atmosphere.”<sup>236</sup> According to Sprout, “That’s what a ride is: mainly atmosphere and setting and action.”<sup>237</sup>

It is noteworthy that these three parameters for developing a theme park attraction are also among the most vital aspects of film composition. Roger Hickman describes the importance of the elements of film music to film composers, as follows: “Filmmakers, theater owners, and musicians [in the Silent Film Era]...recognized the ability of music to support the emotions of each scene. Moreover, filmmakers began to recognize music’s ability to build a sense of character, to mirror physical gestures on the screen, and to create a sense of time or place - especially useful for exotic settings.”<sup>238</sup> Hickman also lists, among, “the general characteristics of the classical film score...Musical support for dramatic moods, settings, characters, and action.”<sup>239</sup>

These are the very same elements of film music employed by composers of Disney theme park attractions, such as Buddy Baker and George Bruns (a demonstration of and methodology for which will be established, below), and their presence would seem

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<sup>236</sup> *Ibid.*

<sup>237</sup> *Ibid.*

<sup>238</sup> Roger Hickman, *Reel Music: Exploring 100 Years of Film Music*, 2nd Ed. [New York: W.W. Norton and Company, 2017], 78.

<sup>239</sup> *Ibid.*, 124.

to suggest that Baker and Bruns applied their knowledge of film composition<sup>240</sup> to this new field of expression. It can be argued reasonably, then, that the composer Richard Bellis, who composed the underscore for *The Twilight Zone Tower of Terror*, might have been influenced by this method of working, since it was the template set up for attraction music by Baker and Bruns back in the 1950s at the inception of Disneyland. Further investigation of the effect of the institutional memory for music at WDI on the work of second and third generation Disney theme park composers could profitably, I assert, be undertaken in future scholarship focused on this area.

To achieve the necessary clarity in their program for the “haunted hotel” attraction, the imagineers now turned to *The Twilight Zone* television series. By using *The Twilight Zone* as the theme of the project, according to Sprout, “...you don’t need a story. All you need to say [is], ‘It’s *The Twilight Zone*.’ And, that’s weird!”<sup>241</sup>

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<sup>240</sup> Both Buddy Baker and George Bruns composed songs and underscore music for Disney films and television shows, as well as theme park attractions. In his interview for the Television Academy with Buddy Baker, musicologist Jon Burlingame states that Baker “indicated [to him] that you [Baker] and George Bruns wrote all of the music for the first few years of Disneyland,” and to this Baker responds, on camera, “Right.” For further evidence of this, see Jérémie Noyer’s interview with Baker in Didier Ghez, ed., “Buddy Baker (1918-2002)” in *Walt’s People, Volume 5: Talking Disney with the Artists Who Knew Him* [New York (?): Theme Park Press, 2007], 143. Here Baker states, “George Bruns and I were the only composers there [in Disneyland] for the first ten years of the park.” As a result, their imprint on the music of Disneyland, and the music of Disney theme parks, in general, is both recognizable and pervasive. Many of their scores for attractions, such as Baker’s score for *Great Moments with Mr. Lincoln* (1965) and Bruns’s score for *The Pirates of the Caribbean* (1967) are still extant in the park and heard by thousands of guests each day. See Jon Burlingame and Norman “Buddy” Baker. “Buddy Baker Interview.” In *Emmy TV Legends.Org*. Television Academy. <https://interviews.televisionacademy.com/interviews/buddy-baker#interview-clips> [accessed August 13, 2018].

<sup>241</sup> Michael Sprout, Interview with the author, November 21, 2019.

This selection of *The Twilight Zone* as the theme further aided the imagineers in creating a *raison d'être* for the attraction at Disney's Hollywood Studios. This was critical because Eisner had, in addition to its cultural relevance, insisted on the appropriateness of placing the Haunted Hotel within the setting of Disney's Hollywood Studios, by setting down a marker: "And you've got to tell me why it's at the Studios, and not at Disneyland or Epcot."<sup>242</sup>

The design of Disney's Hollywood Studios is meant to immerse its audience in the Golden Age of Hollywood, i.e. the 1930s-1940s, via careful theming of its architecture, costumes, music, lighting, signage, and many other elements devised by the Imagineering team.<sup>243</sup> For Sprout, the directive from Eisner and the pre-existing programmatic setting of the park helped him to zero in on a very specific time period for the backstory of the Haunted Hotel attraction.<sup>244</sup> "[It takes place in] '39, which was a big year in Hollywood. This, again, [came from] various other people that we worked with. It was *Wizard of Oz*. It was big, big, movies that year. So, we said, 'That's the height of Hollywood. You know? 1939.' And then we said, 'Halloween. It's got to be Halloween.' So, that's Halloween night."<sup>245</sup>

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<sup>242</sup> Craig Dezern, "Tower of Terror," *The Orlando Sentinel*, page 2 of 6.

<sup>243</sup> *Ibid.*, page 2 of 6.

<sup>244</sup> Michael Sprout, Interview with the author, November 21, 2019.

<sup>245</sup> *Ibid.*

According to Sprout, “We couldn’t defend the silent movie idea, but anybody knows the theme to the *Twilight Zone*.”<sup>246</sup> Bellis’s underscore for the attraction, based on the theme for the television show by Marius Constant, employs many modernist compositional techniques in providing support to the mood and action of the story, while also perfectly setting the time period and place of the story.<sup>247</sup> The most prominent of these techniques is a tutti orchestral glissando (performed on synthesizer) at the moment of the elevator’s drop (at approximately 1:24 into the recording),<sup>248</sup> which resembles both Ligeti’s *Atmosphères* (1961)<sup>249</sup> and Wendy Carlos’s “Wormhole,” from her score to the film, *Tron* (1982).<sup>250</sup> In addition to the glissando, Bellis also employs col legno and an aleatory pizzicato section in the strings, and combines, as does Carlos in her score for *Tron*, synthesizer with live orchestra for maximum expressive capabilities. These extended techniques contrast the time period setting of the elevator drop section of the

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<sup>246</sup> Michael Sprout, as quoted in Craig Dezern, “Tower of Terror,” *The Orlando Sentinel*, June 12, 1994.

<sup>247</sup> Richard Bellis and Marius Constant, “Twilight Zone Tower of Terror,” *Walt Disney World Official Album* [Burbank, CA: Walt Disney Records, 2013].

<sup>248</sup> Richard Bellis and Marius Constant, “The Twilight Zone Tower of Terror Theme,” in *Walt Disney World Official Album*, Walt Disney Records, 2013. This recording is an excerpt of the attraction score. The timing given here refers to this excerpt.

<sup>249</sup> György Ligeti, *Atmosphères* [Vienna: Universal Edition, 1961].

<sup>250</sup> Wendy Carlos, *Tron*, Wendy Carlos and the London Philharmonic Orchestra, Walt Disney Records, 1982.

attraction with the time period depicted in the hotel lobby, established by the songs from 1939, played over loudspeakers, that Sprout selected for the queue area (see below).<sup>251</sup>

To further justify the inclusion of *The Twilight Zone Tower of Terror* in Disney's Hollywood Studios, according to Sprout, who met with Michael Eisner personally during the approval and development process of this attraction, he and the team drew upon Eisner's very specific original directive. Sprout recalls, "Michael Eisner said, 'I want a thrill ride, but it's got to be themed to movies or television,' because it was a studio tour in Florida. So, we pitched a lot of different ideas."<sup>252</sup> Thus, by harmonizing the concept of the attraction with both the overall theme of Disney's Hollywood Studios and the then-

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<sup>251</sup> Michael Sprout, Interview with the author, November 21, 2019. In this interview, Sprout relates that this orchestral glissando correlates to the exact moment that the guests travel into "the fifth dimension." He seemed, also, in this part of our discussion, to accept my comparison of this section of Bellis's score with Carlos's "Wormhole" music from *Tron*.

<sup>252</sup> Michael Sprout, Interview with the author, November 21, 2019. The studio tour Sprout alludes to here is the now-defunct Studio Backlot Tour at Disney's Hollywood Studios, which was, both at the time of the park's opening as well as at the time of the debut of *The Twilight Zone Tower of Terror* attraction at Disney's Hollywood Studios, considered by WDI to be "one of the core attractions of the park." See Alex Wright and the Imagineers, *The Imagineering Field Guide to Disney's Hollywood Studios at Walt Disney World* [New York: Disney Editions, 2010], 114. The necessity of carefully integrating the prospective *Twilight Zone Tower of Terror* attraction into the programmatic context of this particular park, the overall theme of which was based on Hollywood and its creative output, helps explain Eisner's evocation of the Studio Backlot Tour in his guidance to Sprout and his colleagues regarding their development of the concept of the *Tower of Terror*. See Wright, et al., "Disney's Hollywood Studios Overview" in *The Imagineering Field Guide to Disney's Hollywood Studios*, 18. The centrality of Hollywood's "Golden Age" as the park's setting is certainly evidenced by the nature and existence of one of its most important attractions, the Studio Backlot Tour. The overall theme of the park is, according to Wright et al., as follows: "Disney's Hollywood Studios - the third theme park to join the lineup at Walt Disney World, in 1989 - is the Imagineer's stage to showcase for our guests the world of creativity that produces the film, television, and music that make up so much of our pop-culture landscape.....It takes us backstage to show us how the ideas are brought to life, and it celebrates those efforts and the place that has inspired so many to chase their dreams." *Imagineering Field Guide to Disney's Hollywood Studios*, 18.

popular and extant Studio Backlot Tour attraction, the imagineers could assure management that *the Twilight Zone Tower of Terror's* place in the park would not create a visual or thematic distraction, as Hench describes it, above. A formula for the creation of attraction programs at WDI, emerges in this description: the attraction's setting is established through a well-known theme, as well as through well-known songs from the historical period evoked by the setting and played via loudspeakers in the lobby area<sup>253</sup> of the attraction queue.

Here, Sprout details his thought-process while selecting the various songs meant to provide the musical setting of 1939 in the queue area, which is designed to look like the lobby area of the haunted hotel. Per Sprout, "...I got to choose the area music, which I really [liked]. In Florida [Disney's Hollywood Studios at Walt Disney World], there's more landscape, and so, I went through and I found all of these songs that I really liked

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<sup>253</sup> "Area" is a term of art for imagineers, who have, over the course of sixty-plus years creating attractions and immersive environments for Walt Disney Imagineering, developed their own vocabulary or short-hand for the extremely complex systems and techniques that may be called upon during the creative process and construction of a given project. For more on the terminology and working processes of the Disney Imagineers, see Alex Wright and the Imagineers, *The Imagineering Field Guide to Disneyland: An Imagineer's-Eye Tour* [New York: Disney Editions, 2008], especially pp. 8-13, with pp. 12-13 focusing on "Imagineering Lingo" and the foregoing pages focused on the various "WDI Disciplines." This book is part of a six-book series in paperback, each of which focuses on a different Disney Theme Park, covering all of their American parks. Per Wright et al., the term, "area" or "area development," as it relates to Imagineering, encompasses "The interstitial spaces between the attractions, restaurants, and shops. This includes landscape architecture, propping, show elements, and special enhancements intended to expand the experience." *The Imagineering Field Guide to Disneyland*, 12. Within this category of story-telling devices can be found "BGM" or background music, which is defined as "The musical selections that fill in the audio landscape as you make your way around the Park. Each BGM track is carefully selected, arranged, and recorded to enhance the story being told, or the area you have entered." These activities, per Wright et al., fall under the WDI discipline of Sound Design, whose "designers work to develop the auditory backdrop for everything you see and experience." *The Imagineering Field Guide to Disneyland*, 12.



from the thirties, Jazz and Pop, and that I thought sort of had a haunting quality to them. you know? And there's 'Bunny' Berigan, "We'll Meet Again," and, since I like Fats Waller, I found a Fats Waller song that...it's called, 'Inside.' And the, we had them treat it. Put as much reverb in it as you can and make it echoey. And that's what you hear as you go through the queue."<sup>254</sup> The processing of the audio, coupled with the careful selections of songs with a "haunting quality" that evoke the sense of time past centers park guests in the narrative and provides the setup for the gradual, but ultimately dramatic transition to the the late 1950s/early 1960s era of the *Twilight Zone* television show.<sup>255</sup>

Sprout explains the narrative transition and the moment of entry for both the *Twilight Zone* episode portion of the narrative and the attendant music based on Constant's score for the show. "And when you come into the library, that's where there's a television set. And we learned that in the World's Fair in the thirties, there was a T.V. demonstration. So, we go that far. This is 1939, but there is a T.V.! And the T.V. comes on and the *Twilight Zone* episode starts. So you're set...you watched the opening of the *Twilight Zone*. And, then at the end of that, the bookcase slides open and you go into... the boiler room and the backstage area. Because the story is that when lightning hits the Tower, the elevators were knocked out of service, but there's a service elevator that you can ride...if you want to take a chance...So, they get in the service elevator, and then the

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<sup>254</sup> Michael Sprout, Interview with the author, November 21, 2019.

<sup>255</sup> Rod Serling, *The Twilight Zone*, CBS, 1959-1964.

episode starts. You are now in an episode of *The Twilight Zone*. So, of course it starts with the music and it's all, you know, reminiscent. It's all *Twilight Zone*-style soundtrack music that...Richard Bellis has put together."<sup>256</sup>

More generally, the overall musical schema of *The Twilight Zone Tower of Terror* can be described as a large, lopsided, binary form, where A is the Lobby-Area Music (which is comprised of a series of period recordings of popular songs from the year of the setting of the attraction, 1939, played via loudspeakers on a loop and distorted with reverb and other effects) and B is the underscoring for the attraction (which, itself, follows a theme and variation structure and runs slightly less than 2 minutes). The A Section of the music enhances the comprehensibility of the narrative, as does the very beginning of the B Section (with its prominent quotation of *The Twilight Zone* Television theme),<sup>257</sup> through the presentation of recognizable material. The remainder of the B Section, however, is comprised of more challenging material, developed through the employment of modernist compositional and extended instrumental techniques. This latter section fulfills two important roles: 1) it elaborates on the new story being told; and 2) it reflects the major dynamic changes in the narrative, specifically as they relate to setting, mood, and, most especially, action.

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<sup>256</sup> Michael Sprout, Interview with the author, November 21, 2019.

<sup>257</sup> Marius Constant, "The *Twilight Zone* Main Theme," Directed by Geek Music, mp3, Geek Music, 2008.

## Part II

### Analysis of Gibson: *Nexus - Music for a Shadow Animation* (2019)

#### Rationale and Programmatic Intent

This portion of the paper will attempt to explain the rationale for the creation of *Nexus: Music for a Shadow Animation* for chamber orchestra. It must be stated plainly at the outset that this work is an attempt to use materials from the past – specifically materials that came to the fore or were developed largely in the Post World War II era - and explore their musical potential programmatically and theoretically.

From the standpoint of program, I composed *Nexus* both to serve as an alternate original score to the film, *Our Friend the Atom* (1957),<sup>258</sup> and to simultaneously suggest a separate, metanarrative expressed via the tools of musical semiotics. I achieved this by studying and attempting to apply the technical innovations in the Music Theory of the Post War period. I focused on the application of this theory for a specific reason. Namely, it is my contention that, in our search for that which is new or novel over the course of the past 75 years, those of us in the concert music community have at times orphaned, or at the very least left fallow, many ideas that could bear fruit in our continual search to expand the technical powers of music. This has, it can be argued, at times left a deficit in our expressive capabilities.

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<sup>258</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957].

This is not to say that, in the composition of *Nexus*, I intended to abandon or restrain myself from using any of the materials that have been developed since that period. I suggest, however, that many innovations of the modernist period were not as thoroughly explored as their potential warrants and that these innovations may yet yield even greater achievements should such an exploration be rejoined.

In the preparatory phase of composing *Nexus*, Dr. Ian Dicke and I had a series of conversations concerning my inspiration for the piece. In those talks, we discussed the potential ramifications of using older source material on both the reception and the composition of *Nexus*. We recognized that drawing on source materials from the past might present some difficulties, chief among them the production of a score that was merely pastiche or taken to be a “period piece.” As this was the opposite of my intention, we concluded that it would be incumbent upon me to carefully define my terms of engagement with these materials before setting out on the composition of the piece.<sup>259</sup>

As a result of these conversations, I determined that I would analyze the musical and programmatic material from both a modernist and a postmodernist framework. This would enable me to immerse myself in the compositional methodologies of the period, while maintaining a connection to the present. Rather than attempting to create a piece of music that is merely a response to a period animation, I would try instead to create new

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<sup>259</sup> I am greatly indebted to Dr. Ian Dicke for this and for so many other conversations about the art of Composition, in general. Dr. Dicke’s questions and openness to my ideas facilitated the creation of this piece, of which I am very proud. His encouragement of my compositional efforts kept me steadfastly focused on its completion at the highest possible level of artistry and quality.

music using the innovations of the Post-War period, while simultaneously providing comment or criticism in the music and program of *Nexus*, where necessary.

### **Intellectual and Emotional Programs of *Nexus: Music for a Shadow Animation***

This piece is, to me, an attempt to speak on behalf of an optimism and belief in collective power that has been deeply unfashionable since the ascension of post-modernism. Dr. Byron Adams's and Dr. Paulo C. Chagas's questions at my Qualifying Exams Defense in the spring of 2018 concerning the meaning and purpose of my then-proposed piece helped move me in the direction of a programmatic examination of my source material and inspiration, along with Dr. Dicke's questions and discussions with me on the potential of *Our Friend the Atom* as source material.<sup>260</sup> In my exploration of these concepts, I have hit upon two related tracks to follow musically and philosophically. One is intellectual and the other emotional.

From the standpoint of the intellectual framework of the piece, I wish to engage in a discussion of the potential dangers of scientific positivism and the desire for cultural and political hegemony that modernism espoused, while simultaneously arguing for the merits of some of the accomplishments and concepts of modernism, which were thrown out of our cultural and political discourse with the advent of post-modernism. I don't wish to deny the tendencies towards colonialism and patriarchy and white-washing,

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<sup>260</sup> I am greatly indebted to both Dr. Adams and Dr. Chagas for focusing on this area and offering me many helpful suggestions for clarifying my nascent program. I am also indebted to both of them for their consistent encouragement of my work and the many opportunities they opened up for me as a graduate student.

among other things, that were part and parcel of that period, but I do wish to show that we have lost, and seriously and quickly need to regain, the ability to think big again, as a society. By avoiding it, we are ceding space to a totalitarianism across the globe that masquerades as collective action because its centralized power brooks no opposition to its policies, thus keeping silent the people it purports to serve.

My bias in the program of *Nexus*, which I hope remains much less directly stated than the manner in which I am now describing it, is that we must start debating each other again and through that activity find sufficiently common ground to work towards solutions to big problems, such as climate change, the rise of authoritarianism, poverty, and many other great challenges that we face as a global society. Once upon a time we *kind of* did this - I recognize that I am romanticizing the past - or we at least asked ourselves to *try* to do this. I think that, once again, we must try. Our world and survival as a species, I believe, depends upon it.

The desired programmatic message to audiences of *Nexus* is to have the confidence to think big and to work hard to get the details right. The music I that I composed for *Nexus*, coming from this intellectual space, reflects both the sense of loss we feel over our ever disintegrating public discourse as well as, even more importantly, the optimism that once bound us together and the hope that it may yet be regained, stripped of the bigotry and fear-mongering that attended its first iteration. In *Our Friend the Atom* (1957), Heinz Haber and Walt Disney argue for using a scientific breakthrough for the common good and respect their audience enough to ask for their consideration, rather

than proselytize without evidence and demand their rhetorical obeisance.<sup>261</sup>

They were, of course, unavoidably ignorant of the negative effects on health and the environment that nuclear power would have in the future at places like Three Mile Island and Fukushima.<sup>262</sup> My focus, however, was on what useful ideas could be extracted from their exploration. Chief among them is this sense of optimism, in which the film suggests we can find solutions to our common problems, a modernist idea to be sure, even if those solutions are not those originally envisioned by us, nor even suggested or discovered by us. This is never explicitly stated because it is the subtext of the film. I maintain that it may well have been the subtext of the modernist period in American History and would have simply been understood without further articulation by its original audience.

The theme of the film, and indeed of Haber's book, is the pursuit of knowledge and its ethical use.<sup>263</sup> He speaks, in its conclusion (both book and film), of the "heritage" of "the great thinkers of the past" and argues the importance of following their example

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<sup>261</sup> Oliver Wallace, *Our Friend the Atom*. Directed by Hamilton Luske. Burbank, CA: Walt Disney Studios, 1957.

<sup>262</sup> Leonard Maltin, Introduction to Disc Two, *Walt Disney Treasures - Tomorrowland: Disney in Space and Beyond*. DVD (2-Disc Set) [Burbank, CA: Walt Disney Studios Home Entertainment, 2004]. The second disc in this set contains the original, restored film, *Our Friend the Atom*, and features the best available presentation of the film and its soundtrack and score.

<sup>263</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 47:03-48:38. For Haber's eponymous book, see Heinz Haber and Walt Disney Productions, *The Walt Disney Story of Our Friend the Atom* [New York: Simon and Schuster, 1956].

by avoiding the use of that heritage for the purposes of “destruction.”<sup>264</sup> The question of why and how knowledge is used, and the importance of connectivity and collectivity in ethical decision-making is the intellectual message of the piece. It was my intention to write music that takes us to a place where we might contemplate the implications of regaining a self-confidence which coexists with humility and fosters a belief in each other and our ability to work together. This, such as it is, was my intellectual frame-work for viewing and using *Our Friend the Atom* as source material, as well as my intellectual program for *Nexus*.

Within this discussion, a word should also be said about the emotional inspiration of this piece. *Nexus* is an attempt to raise a sort of personal ghost. This ghost is a feeling of security and assurance that I remember from childhood, derived from people, places, and relationships in my life - some of which exist now only in my memory. My connection to *Our Friend the Atom* and, more broadly, to the music of the Post-War Disney Composers and the assurance I have always felt watching the films and listening to them dates, somewhat ironically, from my childhood - a peripatetic period in my life when my family and I moved every year on average. By the time I was eighteen, I had lived in twenty-one houses.

That unstable aspect of my childhood, in some ways, strengthened my sense of connection to places that remained constant in my life. One of those places was and is

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<sup>264</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 47:03-48:38. For Haber’s eponymous book, see Heinz Haber and Walt Disney Productions, *The Walt Disney Story of Our Friend the Atom* [New York: Simon and Schuster, 1956].



Disneyland. We always went to Disneyland as a family, every year, like clockwork and, while there, we were free from whatever outside stressors assailed us. My very hard-working and busy parents could disconnect from their demanding schedules and spend some time with us in the way they most desired. At Disneyland, my siblings and I were devoted to doing as much as we could together and, over time, we became devoted to carrying out the family rituals of being there.

During those cherished times, I was surrounded by the music of the Disney composers, the very men I am studying - music written on the the same manuscript pages I have analyzed. And throughout the years, I have been able to mentally reset and focus on what can be positively done in my own life by listening to their works. Over time, I discovered that they also wrote the music for the movies and television shows my family loved. When I, myself, became a composer, I started to recognize the quality and artistry of their compositions and began to look to them for inspiration and as potential models for the development of my own composer's voice. In my work, I have often benefitted from the lessons I have learned studying their works in an effort to identify their compositional methodologies. The more closely I have examined their scores, the more evidence I have found of these same Disney composers using the tools of their modernist concert music colleagues to achieve their programmatic goals.

Key to the aesthetic continuity of these composers, their devotion to innovation in their music, and its strength in communicating a program, is the fact that they were led by creative artists who shared their artistic vision of enhancing the positivity of their

audience and creating reassurance. This is described in sharp detail, with a clearly enunciated methodology (from the standpoint of design), in John Hench's book, *Designing Disney: Imagineering and the Art of the Show*, written with Peggy Van Pelt.<sup>265</sup> Hench was the Creative Vice President for Walt Disney Imagineering for many years and afterward continued to work in Imagineering as its "design guru" until his death in 2004.<sup>266</sup>

Hench strongly believed that visiting Disneyland was good for your health, since it was designed (by him, among others) to have positive and beneficial effects on guests' mental outlook.<sup>267</sup> He did live to be 95 and was the longest serving employee of the Walt Disney Company (at 65 years), which seems to suggest that there may be something to his philosophy.<sup>268</sup> Hench, incidentally, also did color styling on many of the films and television shows that the composers I am focusing on scored, and so provides a nice connection to *Nexus*, *Our Friend the Atom*, *Man in Space*, and *The Universe of Energy*

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<sup>265</sup> John Hench and Peggy Van Pelt, *Designing Disney: Imagineering and the Art of the Show* [New York: Disney Editions, 2003].

<sup>266</sup> "John Hench - D23." D23 The Official Disney Fan Club. <https://d23.com/walt-disney-legend/john-hench/> [accessed November 25, 2018].

<sup>267</sup> John Hench and Peggy Van Pelt, *Designing Disney: Imagineering and the Art of the Show* [New York: Disney Editions, 2003], v. Here Disney Legend Marty Sklar, former Vice Chairman and Principal Creative Executive of WDI, whom I had the great pleasure of meeting and talking with at the 2017 D23 Expo, mentions Hench's belief in Disneyland's restorative powers, and Hench's intent to effectuate this through his work on the parks. This is a theme throughout this wonderful book which describes Hench's design philosophy, the Art of Reassurance.

<sup>268</sup> "John Hench - D23." D23 The Official Disney Fan Club. <https://d23.com/walt-disney-legend/john-hench/> [accessed November 25, 2018].

attraction at Epcot, as all are works featuring music derived from the visual.<sup>269</sup> He was also the Disney artist who collaborated with Salvador Dalí on his one and only Disney film, *Destino*.<sup>270</sup> As testament to his influence and importance in the world of Animation, USC's Animation School is named after Hench.

*Nexus* is, thus, an examination of the musical means employed in the production of these emotions, with the goal of potentially fostering a similarly positive and reassuring experience for my audience, and, somehow, musically immortalizing those times and feelings within my family. If this music gives comfort or courage to any listener, then it has performed its intended purpose. If it urges any listener to re-examine the past, musically or other wise, then it has fulfilled my hopes for it.

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<sup>269</sup> "John Hench - D23." D23 The Official Disney Fan Club. <https://d23.com/walt-disney-legend/john-hench/> [accessed November 25, 2018]. For a partial list of the productions on which he served as Art Director, see "John Hench - IMDB." <https://www.imdb.com/name/nm0376245/> [accessed November 25, 2018]. Hench did some of the Art Direction for *Universe of Energy*, and supervised, with Marty Sklar, the design and installation of the EPCOT Center Theme Park, in which it was located until 2017, today known simply as Epcot. See "John Hench - D23."

<sup>270</sup> John Hench and Peggy Van Pelt, *Designing Disney: Imagineering and the Art of the Show* [New York: Disney Editions, 2003], 138-139. I had the pleasure of seeing and hearing the Hollywood Bowl Premiere of *Destino* under the baton of John Mauceri guiding the Hollywood Bowl Orchestra in a performance of the movie, *Fantasia* (1940), with picture. *Destino* was screened and Mauceri and the Hollywood Bowl Orchestra played to picture for that film, as well. Hench worked very closely with Dalí on this film and was instrumental in completing it in the early 2000s when it was revived for Walt Disney Feature Animation under the leadership of Roy E. Disney.

## **Discussion of Modernist versus Postmodernist Elements within the Piece and Program**

The postmodern viewpoint I take from time to time in *Nexus* is not meant to be an overly negative critique of *Our Friend the Atom*, but rather one which balances the programmatic viewpoint of the film with present historical perspectives, and is, thus, able to encompass both positive and negative aspects from the narrative being generated within the film. I cannot, of course, as an artist avoid my twenty-first century perspective, specifically as relates to nuclear energy and nuclear physics. This postmodern perspective is tempered, in turn, by my feelings concerning the potential for the ethical the use of this knowledge, and knowledge in general, for the benefit of humankind.

Of course, as it relates to the beneficial potential of scientific discovery, I am in agreement with the program articulated by Haber and Disney in *Our Friend the Atom*. I do, however, simultaneously develop a postmodern critique of this narrative within *Nexus*, which enables me to maintain sufficient distance from *Our Friend the Atom* and possibly provides my program with some relevance to the present. In this manner, I establish a postmodernist *metanarrative*<sup>271</sup> from which I can view both present and past and express the program of the piece.

The postmodern perspective employed in *Nexus* is a reflection of the historiographical aspect of *Our Friend the Atom*. It is apparent to a modern viewer of the film that it had an intended audience which had its own perspectives about Science and

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<sup>271</sup> Per [collinsdictionary.com](https://www.collinsdictionary.com), a metanarrative is “(in postmodernist literary theory) a narrative about a narrative or narratives.” See “Metanarrative” at Collins Dictionary, <https://www.collinsdictionary.com/us/dictionary/english/metanarrative> [Accessed February 23, 2020].

progress, and that Haber and Disney viewed the history of Science in a way that was unique to that time period. The historiographical perspective employed by Haber et al. in *Our Friend the Atom* colored its visual elements, which, in turn, had an impact on the score that I composed for it in *Nexus*, as the music of the latter is the result of my reaction to that narrative. Thus, for me, making a historiographical examination of the elements of the film prompted the composition of an accompaniment to *Our Friend the Atom* from the perspective of my own time and based upon my own experiences and those of contemporary society.

My contemporary perspective influenced other aspects of the compositional process for *Nexus*, as well. The music was affected by the manner in which I altered and re-cut portions of *Our Friend the Atom*, based upon the musical and programmatic needs of *Nexus*, as I saw them. Those edits were made to assist me in the early stages of the composition of the piece to make a statement about my contemporary reception of *Our Friend the Atom*<sup>272</sup> and the newly re-constituted film then generated new music.

Alternately, and as often as not, the new music required the cutting of the film to fit it.

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<sup>272</sup> I do not have permission from the Walt Disney Company to display the film elements of *Our Friend the Atom*, which do not belong to me, and so I may not perform *Nexus* using any of the visual elements from the film. See <https://www.disneystudiolicensing.com/who-do-i-contact-regarding-licensing-of-disney-intellectual-property-for-use-in-stage-productions-themed-parties-or-on-hand-made-products-etc/> [Accessed February 24, 2020] for the Company's procedure for requesting the use of intellectual property. A future original animation based on the music I composed for *Nexus* is being planned and will likely accompany future performances of *Nexus*. I do discuss my analysis of *Our Friend the Atom* during the compositional process using an exposure sheet, below, and try to demonstrate the manner in which edits were made to the film as the music grew independently of its role as a support for the film.

This fluid process of composition, where one element affected the other and vice-versa, helped add a postmodernist programmatic tone to the score.<sup>273</sup>

The reflection of this historiographical perspective can be observed in the orchestration of *Nexus*, as well. For instance, I chose to use digital reproductions of analog synthesizers in the instrumentation,<sup>274</sup> and tailored each of the synthesizers specifically for each movement, as that instrument recalls for me the Disney science-fiction films of the 1950s, 60s, and 70s. As a demonstration of my commitment to the replication of this sound and the implementation of this instrumentation, consider the process I followed for the creation of the synthesizers, below.

### **Early Compositional Process, the Development of the Synthesizer Sounds for *Nexus*, and the Intent of the Chamber Orchestra with Synthesizer Instrumentation**

I started by improvising to picture with a Moog Mother 32 analog synthesizer, which features a very limited one octave keyboard-like series of small buttons to instantiate pitches and recorded the various improvisations in Logic X on separate tracks. With each track I recorded, I made adjustments to the parameters on the Moog in an effort to create a set of timbres for the piece. In this phase, then, I essentially assembled

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<sup>273</sup> This is especially true of the first movement of *Nexus*. See Patrick Gibson, *Nexus: Music for a Shadow Animation*, I. "Fiction Often Has a Way of Becoming Fact."

<sup>274</sup> I determined early in the process that digital synthesizers would facilitate the synthesizer player's performance with the chamber group, help me to control the sound balance onstage, and afford me maximum flexibility in terms of storage of multiple synthesizer sounds, as well as sending those sounds to my player so that she could rehearse at home and prepare for our group rehearsals and performance.

the sound palette for the larger work and developed some of its themes from the improvisations.<sup>275</sup>

I then tried to find sounds analogous to those of the Moog in Logic X. The use of synthesizers in Logic X facilitated the notation of the synthesizer parts in Finale, from which I could export the MIDI of the entire ensemble (including synthesizers), and run the synthesizers and digital samples of the acoustic instruments in the ensemble (from EastWest's Play VST) simultaneously in Logic. This worked well for the demos for my players, but I knew that I would need to give the synthesizer player the ability to change synths seamlessly during the performance, which Logic X cannot smoothly do.

I, thus, painstakingly replicated each of the synthesizers I selected in Logic X in Ableton Live Suites 9 and 10,<sup>276</sup> starting with an Operator object and working with one parameter at a time. I was able to see some of the Logic synthesizer parameters' values by opening each synthesizer's control dialog in the Logic mixer, which made some of the replication, initially, relatively simple. For many of the parameters, though, I had to trust my ear, and I realized, as I went about this process, that I was improving upon the Logic synthesizers and customizing them, or even creating new synthesizers out of whole cloth, for my piece. Even those parameters that I initially copied over from Logic, one parameter at a time, were changed to fit the sound world of the piece, as well as out of

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<sup>275</sup> This is especially true of the thematic material of the first, third, and fourth movements. See Patrick Gibson, *Nexus: Music for a Shadow Animation*, I. "Fiction Often Has a Way of Becoming Fact;" III. "Heat through an Atomic Eye;" and IV. Curie's Discovery of Radium.

<sup>276</sup> Ableton released an upgrade from Live Suite 9 to Live Suite 10, during the course of the composition of *Nexus*.

necessity, since the units used on the various dials in Logic were often not the same as those in Ableton.

The use of synthesizers, then, in *Nexus* can be attributed to two important motivations. The first was personal. The use of chamber orchestra and synthesizer, and its potential for replicating the “Disney sound”<sup>277</sup> of the 1950s-1970s, was intended to connect me personally back to my past, and revitalize and possibly revivify the sounds that I experienced as a child.

The second motivation for using this instrumentation was to place the postmodernist musical and programmatic perspectives of *Nexus* in a comprehensible modernist location for the audience. Through the use of an aggregation of modernist musical techniques, such as an instrumentation using analog synthesizers alongside an orchestra, I was able to evoke the historiographical manner in which the subjects of the 1950s viewed their own work for a twenty-first century audience. I was also simultaneously able, through the use of this instrumentation, to give the audience just the slightest hint of distance from the film in order to allow for some objectivity in our thinking about this fraught subject - the discoveries that led to the atomic bomb and the nuclear reactor. From this aggregate perspective (a combination of the two viewpoints),

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<sup>277</sup> Jon Burlingame and Norman “Buddy” Baker. “Buddy Baker Interview.” In *Emmy TV legends.Org*, Television Academy, <https://interviews.televisionacademy.com/interviews/buddy-baker#interview-clips> [accessed August 13, 2018]. See Buddy Baker’s comments on the “Disney Sound” he and his colleagues, Oliver Wallace, Paul J. Smith, George Bruns, and Joseph Dubin created and its characteristics in Part 3 of the interview, c. 8:23-11:11. Here Burlingame asks Baker why he stayed at Disney for so long, instead of leaving for another studio or freelance work. Baker’s answer is that he appreciated the financial stability of the Walt Disney Studios, but that he was also proud of and felt connected to the “Disney Sound” that he and his colleagues created.



we would, I felt, be able to evaluate the program of *Our Friend the Atom* in a way that is relevant to us.

### **Determination of and Rationale for Selection of Appropriate Visual Source Material**

I knew from the outset that I wanted to create an original film score for one of the *Tomorrowland* episodes of the *Disneyland* anthology television show,<sup>278</sup> and I allowed myself to intuitively settle on the episode whose visual elements most inspired me. I had already viewed all of the episodes of the show that were under consideration and was familiar with their scores, and so I subsequently re-screened them without their scores or dialogue to see what kinds of musical gestures the visuals of each suggested. *Our Friend the Atom* struck the deepest chord with me, when viewed without sound, because it seemed to hold the most musical and programmatic potential. Due to its poetic illustrations and somewhat melancholy tone, its exquisite animation of scientific and technical concepts, and its programmatic relevance to twenty-first century audiences - with its discussion of the proper and improper uses of scientific knowledge - *Our Friend the Atom* provided an excellent point of departure for the creation of *Nexus: Music for a Shadow Animation*.

Once the film was selected, I began the process of analyzing it by creating an exposure sheet that would catalog and describe all of the action and imagery in the

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<sup>278</sup> This series is discussed at length, above.

film.<sup>279</sup> This device, developed by the Walt Disney Studios in 1920s for the early Mickey Mouse sound cartoons,<sup>280</sup> contains a running total of the SMPTE code for the film, and lists all of the pertinent information for each moment in the film across from the SMPTE code at its entrance. When creating my exposure sheet, I decided to include the following parameters, which were pertinent to my compositional process: SMPTE code, scene, description of action, notes, follow-through action, elapsed seconds and frames, elapsed frames, elapsed time (seconds), elapsed time (minutes), and bars.

Using Numbers for Mac, I programmed the spread sheet to calculate time in seconds and minutes and, using a tempo of approximately 92 beats per second, determine the number of bars I would need to write for each cue or action within the cue. I determined this tempo by, first, improvising to picture on a midi controller assigned to a piano patch and conducted at the tempo that I used in my initial improvisation using a stop watch to measure the time elapsed per one bar of 4/4. Once I had the tempo I wanted for a given scene, I would plug that into the spreadsheet and get the number of bars I would need for each. This was enormously helpful in as it gave me a framework for the music I was composing, as well as provided a benchmark for my productivity.

A few of the parameters might require some explanation. The SMPTE code, of course, allowed me to get a very close synchronization of my music to the onscreen

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<sup>279</sup> See Appendix E: Patrick Gibson - Exposure Sheet for the Walt Disney Studios' *Our Friend the Atom* (1957), Directed by Hamilton Luske, below. See also the discussion of Exposure Sheets in Frank Thomas and Ollie Johnston, *The Illusion of Life: Disney Animation* [New York: Disney Editions, 1981], 230.

<sup>280</sup> Frank Thomas and Ollie Johnston, *The Illusion of Life: Disney Animation* [New York: Disney Editions, 1981], 230.

action, which was, of course, one of the the initial purposes of the exposure sheet, upon its development.<sup>281</sup> The various action annotations in the exposure sheet provided me with a series of signposts that helped me to shape the music for a given scene and develop its overall structure. The follow-through action, if present, alerted me to the presence of additional significant visual elements that might be addressed in a given scene, and which, often, provided me with the inspiration for some of the contrapuntal musical material.<sup>282</sup> The elapsed minutes, seconds, and frames annotations guided me in the composition of my score for *Our Friend the Atom* by indicating an approximate length, in time, for each of the musical gestures I created.

With the framework that the exposure sheet provided, I began the process of creating the above mentioned improvisations on the Moog Mother 32. After these improvisations were transcribed by hand onto my manuscript score, I next analyzed the

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<sup>281</sup> See the discussion of mickey-mousing in James Bohn, *Music in Disney's Animated Features: Snow White and the Seven Dwarfs to the Jungle Book* [Jackson, MS: University Press of Mississippi, 2017], e-book loc. 344. See also, Frank Thomas and Ollie Johnston, *The Illusion of Life: Disney Animation* [New York: Disney Editions, 1981], 230. See also, Norman "Buddy" Baker, Buddy Baker. Interview by Richard ?, [Date Needed], DB Reel #002, CR B10, Scene 104, TK 1; DB Reel #003, CR B11, Scene 104, TK 2; DB Reel #003, CR B12, Scene 104, TK 3; DB Reel #003, CR B13, Scene 104, TK 4, Transcribed by Tara Peterson [The Walt Disney Family Museum, San Francisco, CA], 13 [of the pdf form].

<sup>282</sup> See, for example, the Bb clarinet ostinato, starting at rehearsal 1, and which is picked up by the violin in mm. 12-15, and taken over by the double basses at m. 16 in the second movement of *Nexus*, "Democritus and the Lost Concept of *Atomos*." See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 8-22. This eighth-note figure was meant to represent the breeze blowing across the water in the Democritus Scene in Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 8:56-9:06. See also Appendix E: Patrick Gibson - Exposure Sheet for the Walt Disney Studios' *Our Friend the Atom* (1957), Directed by Hamilton Luske, below.

material by creating matrices, rotations, and rhythmic transformations based upon it, which has been my working method for a number of years.<sup>283</sup>

From these investigations, I then began to unfold my ideas and expand the music through variation and other formal devices that very often ran much longer than the film element upon which it was based. For some of these expanded sections of music, I went back to them and edited it to sync with the new expanded music.<sup>284</sup> This “recursive process,”<sup>285</sup> similar to the systems theory process of developing meaning, discussed above, creates a new meaning for the visuals in the film, *Our Friend the Atom*, and, even though it was not used in the performance of *Nexus*, their presence affected the overall shape of the music.<sup>286</sup>

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<sup>283</sup> See Appendix C: Images - Pre-Compositional Materials for *Nexus: Music for a Shadow Animation* - Matrices 1 and 2 with Rhythmic Transformations. I was first taught this excellent method of examining my musical ideas from multiple viewpoints by Dr. Alan Shockley, Director of Composition, Bob Cole Conservatory of Music (BCCM), California State University Long Beach, with whom it was my great honor, privilege, and pleasure to study Composition privately, as well as later as a graduate student, for several years. Alan is a wonderful composer and teacher and a great champion and friend of new music. He directs the New Music Ensemble at the BCCM, which has premiered many exciting new works by eminent composers, such as Pauline Oliveros and Christian Wolff.

<sup>284</sup> See my discussion of the “re-cut portions of the film” of the film within the section, “Discussion of Modernist versus Postmodernist Elements within the Piece and Program,” above.

<sup>285</sup> Paulo C. Chagas, *Unsayable Music: Six Reflections on Musical Semiotics, Electroacoustic and Digital Music*, Leuven [Belgium: Leuven University Press, 2014], 73.

<sup>286</sup> *Ibid.*, 73.

## **Use and Integration of Whole-Tone Scale and Tonality in *Nexus: Music for a Shadow***

### ***Animation, IV. Curie's Discovery of Radium***

It was apparent to me that the poetic, even impressionistic, nature of the illustrations presented the potential for the use of some expanded tonality, special non-diatonic scales, and post-tonal sonorities. The first two of these elements can, for example, be observed in the fourth movement of *Nexus*, “Curie’s Discovery of Radium,”<sup>287</sup> which was inspired by and runs roughly in sync with the corresponding scene in *Our Friend the Atom*.<sup>288</sup> Though my music for this scene was composed to synchronize, for the most part, with this section of the original film, in the course of its composition I slowed down the images to sync with my slight expansion of the music. The impetus of this expansion of the music was a change to a slower tempo that I felt helped express a sense of desolation and loneliness.

For this movement, I intended to make a comment on scientific discovery from both a postmodernist point of view and a modernist point of view. From the standpoint of the former, I sought to express the devastating and unintended consequences of the discovery of the expulsion of sub atomic particles from Radium. From the modernist point of view, I wished to musically represent the loneliness of the process of scientific

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<sup>287</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation, IV. Curie's Discovery of Radium*.

<sup>288</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 21:00-22:09.

and creative inquiry, as well as the dynamism of the moment of discovery, which was the program of this scene in *Our Friend the Atom*.<sup>289</sup>

To achieve this, I orchestrated the first twelve bars for solo piano, playing rubato, to represent that loneliness, as well as the calm before a devastating storm of activity.<sup>290</sup> The solo piano, playing in the whole-tone scale, also obliquely suggests the Piano Preludes of Debussy,<sup>291</sup> and so fits the visuals of the film in this scene.<sup>292</sup> In the thirteenth bar, the music moves to a steady tempo, *Andantino*, quarter note = 72, and the harp makes its entrance at bar 14 on harmonics, gently adding to the timbre of the piano, and slowly expanding the orchestral timbre outward.<sup>293</sup> This is the overall sweep of the movement: a progression from a singular sound world, that of the piano, to the involvement of all of the instruments in a crescendo via orchestration.<sup>294</sup> The movement is binary, then, with the piano solo forming the A Section (mm. 1-12), and the orchestral crescendo comprising the B Section (mm. 13-36).<sup>295</sup> This movement from a solo instrument to the tutti ensemble is meant to symbolize the proliferation of a scientific

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<sup>289</sup> *Ibid.*, c. 21:00-22:09.

<sup>290</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, IV. Curie's Discovery of Radium, mm. 1-12

<sup>291</sup> Claude Debussy, *Complete Preludes, Books One and Two [Préludes pour le Piano, Livres Première et Deuxième]*. New York: Dover Publications, 1989. See especially, VI. De pas sur la neige.

<sup>292</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], See c. 21:00-21:39, for the corresponding moments in the film.

<sup>293</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, IV. Curie's Discovery of Radium, mm. 1-14, et seq.

<sup>294</sup> *Ibid.*, mm. 1-36.

<sup>295</sup> *Ibid.*, mm. 1-36.

discovery, in this case the means of producing a nuclear bomb, to the outermost limits of human influence.

To connect the material in the A Section with the B Section, I employ the whole-tone scale in both sections.<sup>296</sup> The whole-tone scale remains the source of all material in the B Section through bar 28, but at rehearsal 3 (bar 29), the scale in play changes slightly to {0,2,4,5,8,10}, which is an incomplete F minor scale.<sup>297</sup> (See Fig. 5) By changing only the F# in the whole-tone collection to F natural, I am able to suggest tonality, as well as to give some interest to the motive that ends the piece by building in melodic movement from F {5} to F# {6}.<sup>298</sup> (See Fig. 5) The two scales alternate in bars 29-32, and settle on the whole-tone scale for the final bar of the piece (m. 33).<sup>299</sup> (See Fig. 5)

This oscillation between tonality and a whole-tone collection is solidified in mm. 31ff. with the addition of the major third above the F natural in the synthesizer,<sup>300</sup> an interval which is characteristic of the scale, as well as the melody of this movement.<sup>301</sup> (See Fig. 5) The synthesizer moves in parallel thirds with the F - F# motion by playing A-A#, ending on the latter pitch-class.<sup>302</sup> (See Fig. 5) The shift from tonality to a set class is

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<sup>296</sup> *Ibid.*, mm. 1-28.

<sup>297</sup> *Ibid.*, m. 29

<sup>298</sup> *Ibid.*, mm. 29ff.

<sup>299</sup> *Ibid.*, mm. 29-33.

<sup>300</sup> *Ibid.*, mm. 31ff.

<sup>301</sup> *Ibid.*, mm. 1-36.

<sup>302</sup> *Ibid.*, mm. 31-33.

reminiscent of Wallace's own score for *Our Friend the Atom*, as discussed in our analysis of that piece, above.<sup>303</sup>

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<sup>303</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957]., c 36:29-36:35.



**Fig. 5 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, IV. Curie's  
Discovery of Radium (MM. 29-36)**

IV. Curie's Discovery of Radium

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The musical score is arranged in a vertical stack of staves. At the top left, a circled number '3' indicates a third ending. The instruments and their parts are as follows:

- Ob.** (Oboe): Treble clef, marked *plus doucement*. It plays a melodic line with a slur over the first two measures.
- B> Cl.** (Bass Clarinet): Treble clef, marked *plus doucement*. It plays a similar melodic line to the oboe.
- Pno.** (Piano): Grand staff (treble and bass clefs), marked *plus doucement et L.V.*. The right hand plays chords and the left hand plays a bass line.
- Synth** (Synthesizer): Grand staff, marked *doucement* and *mf*. It plays a melodic line in the treble clef.
- F.M.** (F.M. - likely Fagott/Mellophone): Grand staff, marked *mp*. It plays a complex, rhythmic texture in both hands.
- Hp.** (Harp): Grand staff, marked *plus doucement et L.V.*. It plays a melodic line in the treble clef.
- Vln.** (Violin): Treble clef, marked *mf*. It plays a melodic line in the second measure.
- D.B.** (Double Bass): Bass clef, marked *mf*. It plays a bass line with a *mf* dynamic marking.

The score spans measures 29 to 36. The key signature has one sharp (F#). The tempo and dynamics are indicated by the markings above.

Ob. *p*

B♭ Cl. *p*

Pno. *p* *avec un peu plus d'intensité*

Synth.

F.M.

Hp. *gliss.* *pp*

Vln. *pp*

D.B. *pp*

Detailed description of the musical score: The score is for a multi-instrumental piece. It features eight staves. The Oboe and B♭ Clarinet parts are simple, each with a single note and a dynamic marking of *p*. The Piano part consists of two staves with a complex, rhythmic accompaniment of eighth notes, starting with a dynamic of *p* and becoming *avec un peu plus d'intensité* in the second measure. The Synth part also consists of two staves with a similar rhythmic accompaniment. The F.M. part consists of two staves with a complex, rhythmic accompaniment of eighth notes. The Harp part consists of two staves with a glissando in the first measure and a *pp* dynamic marking in the second measure. The Violin part consists of a single staff with a complex, rhythmic accompaniment of eighth notes and a *pp* dynamic marking. The Double Bass part consists of a single staff with a simple accompaniment of eighth notes and a *pp* dynamic marking.

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Pno. *molto leggero*  
L.V.  
sub.  
**mp**

Synth

F.M.

Vln. *molto leggero*  
sub.  
**mp** *pp*

Detailed description: This page of a musical score contains four staves. The first staff is for Piano (Pno.), the second for Synthesizer (Synth), the third for F.M. (likely a harpsichord or similar keyboard), and the fourth for Violin (Vln.). The score begins at measure 33. The Pno. part features a melody in the right hand and a bass line in the left hand, with dynamics *molto leggero*, *L.V.*, *sub.*, and **mp**. The Synth part has a sustained chord in the right hand and a bass line in the left hand. The F.M. part has a complex rhythmic pattern in the right hand and a sustained bass line in the left hand. The Vln. part has a melody in the right hand with dynamics *molto leggero*, *sub.*, **mp**, and *pp*.

The musical score consists of three systems, each with two staves. The first system is labeled 'Pno.' and contains two empty staves with a fermata above the first measure. The second system is labeled 'Synth' and also contains two empty staves with a fermata above the first measure. The third system is labeled 'F.M.' and contains two staves with musical notation. The upper staff has a treble clef and a key signature of one sharp (F#), starting at measure 35. It features a complex rhythmic pattern of eighth and sixteenth notes. The lower staff has a bass clef and contains a long, sustained note with a fermata. The notation includes dynamic markings such as *n.* and *mf*.

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When originally viewing *Our Friend the Atom* without score, I was also struck by the beauty and clarity of the technical animations depicting scientific concepts, and thought that the motion of the animation onscreen would aid in developing dynamic musical material with gestures that provide interest for the listener. In the fourth movement, for example, the thirty-second notes in the Fixed Media track, instantiated on the synthesizer by pressing a pad with the appropriate sample assigned to it,<sup>304</sup> are meant to convey the rapid motion of the radium fragments escaping the nucleus of the radium atoms.<sup>305</sup> In this way, the visual of the film helped to suggest a rhythm that could be

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<sup>304</sup> This was done via Ableton Live Suite 10, where each synthesizer or combination of synthesizers was assigned to a pad on the Novation LaunchKey 49 midi controller. This facilitated the easy movement from one sound to another for the synthesizer player. Pads that featured more than one synthesizer simultaneously used the map function in the instrument group in Ableton that allows individual synthesizers in a group to be assigned to a range of keys. In this movement, IV. Curie's Discovery of Radium, the Mellotron samples were assigned to B3 and below, and the Analog synthesizer sound for this movement was assigned to C4 and above. See Patrick Gibson, *Nexus: Music for a Shadow Animation*, IV. Curie's Discovery of Radium.

<sup>305</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, m. 18, beat 3ff. For the sync point of this action, See Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 21:52-22:09. Wallace also appears to use a whole-tone scale here with, of course, a different motive, at a slower rhythmic value, and employing pizzicato strings on a syncopated rhythmic figure.

mickey-moused<sup>306</sup> in my original music and provide some contrast as well as carry out the semiotic purpose of describing the motion of the sub-atomic particles.

### **Influence of Imagery on the Creation of Motivic Material in *Nexus: Music for a Shadow Animation*, III. “Heat through an Atomic Eye”**

This beautiful technical imagery is also the source of the motor rhythm ostinato in the third movement, “Heat through an Atomic Eye.”<sup>307</sup> From the very first bar, a sixteenth note motor rhythm, based on the G mixolydian scale, plays throughout the entire piece, shifting to match the harmonic progression (see mm. 7-8, for example) and moving back and forth between the instruments of the ensemble (see mm. 12-13 in the oboe and Bb clarinet, for example) to provide some timbral variation, as well as enhance the playability of the figure.<sup>308</sup> This motive, which is the motive upon which the entire movement is based, was originally composed to sync with the “Heat through an Atomic Eye” scene in *Our Friend the Atom*, and mirrors the motion of the molecules as the heat is increased, finally synchronizing with the motion of the sequence of steam-powered

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<sup>306</sup> James Bohn, *Music in Disney’s Animated Features: Snow White and the Seven Dwarfs to the Jungle Book* [Jackson, MS: University Press of Mississippi, 2017], e-book loc. 344. Bohn defines “mickey-mousing” as the “high degree of synchronization” of onscreen action to the score. Bohn relates the manner in which Walt Disney and Wilfred Jackson, an animator at the Walt Disney Studios, “devised a technique allowing for this close synchronization.” e-book loc. 344.

<sup>307</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, III. “Heat through an Atomic Eye,” see mm. 1ff.

<sup>308</sup> *Ibid.*, m. 1, mm. 7-8, mm. 12-13.

machines that follows in the film.<sup>309</sup> (See Fig. 6, below) Here again, the synchronization of music to image aided in the development of the musical materials.

Similarly, the entire first portion of the second movement of *Nexus*<sup>310</sup> is synchronized to the animation, and especially the action and changes in mood, in the “Democritus” scene in *Our Friend the Atom*.<sup>311</sup> The harp rolls on the opening sonority are meant to establish the setting, and at the closing of the scene, are synchronized with the motion of the waves receding and taking the sand pillar out to sea.<sup>312</sup> The sixteenth note figure in the left hand of the piano at m. 6 is synchronized to the appearance of a background illustration of a gust of wind, animated in beautifully stylized spiral figures.<sup>313</sup> (See Fig. 6 ) Finally, the eighth note ostinato in octaves in the double basses in mm. 20-22, signal the appearance of Aristotle in the film, interrupting Democritus’s class

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<sup>309</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, mm. 1-56. For the sync point, See Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 17:14-19:53.

<sup>310</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*.

<sup>311</sup> Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 8:32-10:02.

<sup>312</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 1-11 and mm. 31-33. For point of synchronization, see Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 9:48-10:03.

<sup>313</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 6-7. For point of synchronization, see Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 8:56-9:05.

refuting the latter's theory of *atomos*, on the beach.<sup>314</sup> (See Fig. 6) Examples of this practice of synchronization, and even mickey-mousing, can be found throughout *Nexus*, and are the reason for the subtitle, *Music for a Shadow Animation*. It was my desire, from the earliest stages of the conception of this piece, to use the action of a beautifully wrought animation, such as *Our Friend the Atom*, to drive dynamic gestures in the music of the piece.<sup>315</sup>

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<sup>314</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 20-22. For point of synchronization, see Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957], c. 9:30-9:47.

<sup>315</sup> See Patrick Gibson, "Dissertation Prospectus," May 2018.



**Fig. 6 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, III. "Heat through an Atomic Eye"  
MM. 1-22**

Performance Note for Synthesizer:  
MIDI Mapped Track Fader 4 on MIDI Controller Used to Effect Dynamics  
Track Fader 4 = Volume  
Saw/Leather

III. "Heat through an Atomic Eye"

Moto perpetuo: Agitato  
♩ = 80

Patrick Gibson

The musical score is for the piece "Heat through an Atomic Eye" by Patrick Gibson. It is in 4/4 time and features a tempo of 80 beats per minute. The score is marked "Moto perpetuo: Agitato". The instrumentation includes Oboe, Clarinet in Bb, Piano, Synthesizer, Harp, Violin, and Double Bass. The Synthesizer part is marked with a piano (*p*) dynamic and features a continuous eighth-note melody in the right hand and a sustained bass line in the left hand. The Oboe and Clarinet in Bb parts enter in the third measure with a melody marked mezzo-piano (*mp*). The Piano, Harp, Violin, and Double Bass parts are silent throughout the first three measures.

Ob.

B♭ Cl.

Pno. *mf*

Synth.

pitch wheel up to pitch in next meas.

vib. vibrato with mod wheel

MIDI Mapped Volume Control Fader 4

Hp. *mp*

D.B. *mp*

Detailed description: This page of a musical score features six staves. The top two staves are for Oboe (Ob.) and B-flat Clarinet (B♭ Cl.), both playing eighth-note patterns with slurs. The Piano (Pno.) staff has a dynamic marking of *mf* and plays a complex rhythmic pattern. The Synthesizer (Synth.) staff has a long note with a vibrato line and includes three text boxes: 'pitch wheel up to pitch in next meas.', 'vib. vibrato with mod wheel', and 'MIDI Mapped Volume Control Fader 4'. The Harp (Hp.) staff has a dynamic marking of *mp* and plays a rhythmic pattern. The Double Bass (D.B.) staff has a dynamic marking of *mp* and plays a long note.



Ob. *mf* *f* *mp* *mf*

B♭ Cl. *mf* *sub. f* *mp* *mf*

Pno. *mf* *sub. f* *mp*

Synth. *mp* *sub. mf* *pp* *mp*

Hp. *mf* *sub. f* *p* *p* *mf*  
E Eb

Vln. *mf* *sub. f* *p* *mf*

D.B. *mf* *sub. f* *Unis. p*

Performance markings include *mf*, *f*, *mp*, *pp*, *sub.*, *Unis.*, and dynamic hairpins. The score is in 4/4 time with a key signature of one flat.

②  
(♩=♩)

The musical score consists of seven staves: Oboe (Ob.), Bass Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.).

- Ob.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *mf*. At measure 17, the dynamic changes to *ff*.
- B♭ Cl.:** Starts at measure 15 with a rest. At measure 16, it begins a rhythmic accompaniment with a dynamic of *f*. At measure 17, the dynamic changes to *ff*.
- Pno.:** Starts at measure 15 with a rest. At measure 16, it begins a rhythmic accompaniment with a dynamic of *ff*.
- Synth.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *mp*. At measure 17, the dynamic changes to *f*.
- Hp.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *mf*. At measure 17, the dynamic changes to *ff*. A performance instruction reads: "Execute staccato with L.H." Above the staff, there are vertical lines indicating staccato marks.
- Vln.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *mf*. At measure 17, the dynamic changes to *f*. A performance instruction reads: "spicc." above the staff.
- D.B.:** Starts at measure 15 with a rest. At measure 16, it begins a rhythmic accompaniment with a dynamic of *f*. At measure 17, the dynamic changes to *ff*. A performance instruction reads: "Div." above the staff. At measure 18, it begins a melodic line with a dynamic of *ff*. A performance instruction reads: "spicc." above the staff.

③ (♩=♩)

Ob. *pp* *p*

B♭ Cl. *legato e cantabile* *p*

Pno. *8va* *sub. pp*

Hp. *ord.* *sub. pp* *ord.*

Vln. *ord. solo legato e cantabile* *sub. p*

D.B. *Div. ord. pizz.* *sub. p* *arco*

## **Tonal-Serial Hybridity in *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos***

As stated at the outset of this paper, it was always my intention to apply the theoretical innovations of the modernist period in the composition of *Nexus*, most especially the technique that has been most focused upon in this paper: tonal-serial hybridity. For all of the above-stated reasons, I knew that this hybrid technique would facilitate comprehensibility and evoke the historical period of the film. After careful study and analysis and by integrating my own unique compositional methodology to the pre-composition of *Nexus*, I feel that I was able to achieve this synthesis of the tonal and serial worlds.

Within *Nexus*, there are numerous instances of tonal-serial hybridity, most especially in the second and fifth movements, although some serial procedures (such as rotation) are used throughout. For a closer look at how this was achieved, we focus here on the second movement, “Democritus and the Lost Concept of *Atomos*,” in the transition to and from its largely serial section.<sup>316</sup> As a means of preparing the listener for the serial material starting at m. 53, I employ a series of Forte Set Classes, based on rotations of the series in Matrix 1, as well as on the row, itself.<sup>317</sup> (See Fig. 7, below)

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<sup>316</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*. For the transition, upon which we focus here, see mm. 49-52. For the serial-based section mentioned above, see the music starting at rehearsal 3, mm. 53-60.

<sup>317</sup> See Analyses 5-8, in Appendix B, below, as well as Matrix 1 in Matrices 1 and 2 image in Appendix C, below.





50 *marcato*

Ob.

50 *marcato*

B♭ Cl.

50 *marcato*

Pno.

50 *marcato*

Hp.

50 *marcato*

Vln.

D.B.

*rit. ord.*

*p*

*R.H. ancora marcato*

*legato*

*simile*

*detaché*

*f*

*detaché*

*marcato*

*f*

F#  
C#  
Ab  
F  
A

The series in Matrix 1, as well as in Matrix 2, was developed from the ostinato found at the beginning of the third movement, which was a prevalent feature of my initial improvisations on the Moog.<sup>318</sup> The remainder of the row, after the first three unique pitch-classes of the ostinato, was derived from transpositions of the ostinato, as well as their complimentary pitch-classes.<sup>319</sup> The main melodic motive of the second movement was derived from this ostinato and, therefore, retains a strong connection to the third movement, as well as the larger piece.<sup>320</sup> Furthermore, the last four pitch-classes of the row are linked via the interval class, M3.<sup>321</sup> The interval between each of these last four pitch-classes and those that succeed them in the row order is a major third and is, thus, reminiscent of the whole-tone based improvisations that I performed on the Moog, and which form such an important part of the fourth movement, “Curie’s Discovery of Radium” (Please see the discussion of this movement, above).<sup>322</sup> In this way, I am able to link all of the serial material to that ostinato, and link the movements to one another.

Although most of the Forte Set Classes in the transition in mm. 49-52 are played by the ensemble, a study of the sonorities played in these measures by the harp is most

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<sup>318</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, III. “Heat through an Atomic Eye,” m. 1. See, also, Matrix 1 in Matrices 1 and 2 image in Appendix C, below.

<sup>319</sup> See Matrix 1 in Matrices 1 and 2 image in Appendix C, below.

<sup>320</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 5-8.

<sup>321</sup> See Matrix 1 in Matrices 1 and 2 image in Appendix C, below.

<sup>322</sup> See Matrix 1 in Matrices 1 and 2 image in Appendix C, below, as well as Patrick Gibson, *Nexus: Music for a Shadow Animation*, IV. Curie’s Discovery of Radium.

instructive.<sup>323</sup> (See Fig. 7, above) The harmonic rhythm of this transition is essentially one sonority per bar, and the progression is an attempt to deliver the listener to the serial section beginning at m. 53 as smoothly as possible.<sup>324</sup> In m. 48, the harp is already playing transpositions and rotations of the main motive of the piece (and, thus, foreshadowing the ostinato from the third moment, as well), which prepares the listener for the transition and the move away from tonality.<sup>325</sup> (See Fig. 7, above) Then, starting at m. 49 and continuing through m. 52, the harp plays the following Forte Set Classes: 4-23 {5,7,10,0}; 4-10 {1,3,4,6}; 4-10 {5,7,8,10}, which is T4 of the previous 4-10; and 5-23 {0,2,3,5,7}.<sup>326</sup> (See Fig. 7, above)

Note that the first three set classes are tetrachords, which is significant, as the ostinato to come in the third movement, from which this material is based, is also a tetrachord, and these tetrachords can claim lineage from this ostinato. That these set classes are tetrachords also stems, more prosaically, from the fact that harpists play up to a maximum of four pitches at a time in each hand.<sup>327</sup> Even though these sonorities are not

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<sup>323</sup> See Analyses 5-8, in Appendix B, below.

<sup>324</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 49-53ff.

<sup>325</sup> *Ibid.*, m. 48.

<sup>326</sup> See Analyses 5-8, in Appendix B, below.

<sup>327</sup> Technically, of course, the harp may play up to seven unique pitch-classes between the two hands, but only four may be played by any one hand, as the little finger is not used. I am indebted to Gracie Sprout, harpist for the Martians, for her kind and patient instruction in composing for the harp over the course of many years. *Nexus* certainly benefitted from her instruction and feedback, as has every other piece I have composed for harp.

doubled in their entirety in each hand of the harp, composing four-pitch sonorities for the harp helps to ensure playability. The pitches here were placed in each hand with voice-leading in mind.<sup>328</sup>

It should also be noted that the second and third tetrachords are related by transposition.<sup>329</sup> This is intended to facilitate a connection between these two sonorities in the listener's mind, as well as a loose connection to the larger series.<sup>330</sup> As each of these sonorities is derived from a loose rotation of the pitch-classes within the main motive, it is hoped that the sonorities in this transition section relate back to the main motive and will be perceived as belonging to the overall musical material of the movement and the piece.<sup>331</sup>

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<sup>328</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 49-52.

<sup>329</sup> See Analyses 6 and 7, in Appendix B, below.

<sup>330</sup> See Matrix 1 in Matrices 1 and 2 image in Appendix C, below.

<sup>331</sup> See Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 5-8.

**Fig. 8 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos* (MM. 53-64)**

35 Nexus: Music for a Shadow Animation

Plaintively  $\text{♩} = 72$

3

Ob.

B♭ Cl.

Pno.

Hp.

Vln.

D.B.

*mf* *p* *mf* *p* *mf* *p* *mf* *p* *mf* *p*

*legato appassionato*

*8va*

Db F# E G# Eb

Unis.

Ob. *mf*

B $\flat$  Cl. *mp* — *pp*

Pno. *mf*

Hp. *mf* *p*

Vln. *mf* — *pp* *pp*

D.B. *mf* — *p*

*doucement*  
8<sup>va</sup>-

4 *a loco*<sup>10</sup> *p* *mf* *8va*-----

Pno.

*loco*

59 *8va*----- *mf* *8va*-----

Hp.

*8va*-----

59 *8va*-----

Vln.

*pppp*

62 *8va*----- *loco* *p* *sub. ppp* *Ab* *E#*

Pno.

*loco*

62 *loco* *p* *loco*

Hp.

*8va*-----

When the serial material enters at m. 53, then, the listener is prepared to hear a section no longer rooted to the descending members of the C Melodic Minor scale, {0,10,8,7,5,3,2}, suggested by the main motive of the movement.<sup>332</sup> (See Fig. 8, above) In mm. 53-54 (through the second half of beat two), rehearsal 3, the row is stated in the left hand of the piano part (and almost completely in the right hand of the piano part and the violin part), {7,5,2,4,1,11,9,3,6,10,0,8}.<sup>333</sup> (See Fig. 8, above) The woodwinds begin, almost immediately in these same bars, to double the sections of the row, while the harp plays set classes based upon the row and its rotations.<sup>334</sup> (See Fig. 8, above) The double basses join at m. 55 with a pedal point based on a major transposition {4,6} of the third and fourth members of the row order {2,4}.<sup>335</sup> (See Fig. 8, above) These opening bars are emblematic of the manner in which the series is employed in the section, which ends at m. 60.<sup>336</sup> (See Fig. 8, above)

When tonality returns in mm. 61, it is via a diminished seventh chord in the right hand of the piano, in a manner similar to that employed by Oliver Wallace in *Our Friend the Atom*.<sup>337</sup> (See fig. 8, above) In bar 61 of the second movement of *Nexus*, the

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<sup>332</sup> Ibid., mm. 5-8.

<sup>333</sup> Ibid., mm. 53-54 (second half of beat two).

<sup>334</sup> Ibid., mm. 53-55.

<sup>335</sup> Ibid., m. 55. See also See Matrix 1 in Matrices 1 and 2 image in Appendix C, below.

<sup>336</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, mm. 53-60.

<sup>337</sup> Ibid., m. 61, piano right hand. See also our discussion of Oliver Wallace's score for *Our Friend the Atom*, above. Oliver Wallace, *Our Friend the Atom*, Directed by Hamilton Luske [Burbank, CA: Walt Disney Studios, 1957].



diminished seventh chord is played simultaneously with a rotation of the series, {1,7,3}, in the left hand of the piano and in the right hand of the harp.<sup>338</sup> (See Fig. 8, above)

Following this, in bar 62, the piano and harp play a B minor harmony with an added minor ninth, {11,2,6,0}, to ease the listener into the harmonic material that follows in bar 63, which is comprised of a continual shift from B minor to B fully-diminished seventh, over a half note harmonic rhythm, placing the chord changes on beats one and three of mm. 63 and 64.<sup>339</sup> (See Fig. 8, above) The latter harmony, the B fully-diminished seventh, then leads the listener to the material in mm. 65ff., starting at rehearsal 5, which suggests a C major seventh harmony, with an added tritone.<sup>340</sup> (See Fig. 8, above)

Thus, just as Wallace, Bruns, and Baker had done before me, and using their time-tested techniques, I am able, in this manner, to blend serial and tonal elements within the same movement, by carefully examining and employing the connections within the musical material created for my piece.

## **Conclusion**

It is my hope that *Nexus*, a piece that includes compositional methodologies that straddle the twentieth and twenty-first centuries, will encourage audiences to recall that we are also currently living in a fraught historic moment and are viewing it from our own

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<sup>338</sup> Patrick Gibson, *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos*, m 60.

<sup>339</sup> *Ibid.*, mm. 62-64.

<sup>340</sup> *Ibid.*, mm. 65ff.

historiographical perspective, which will change with time and experience. May this encourage us to become more mindful of the manner in which we characterize or evaluate certain works of art or certain ideas, or at the very least make us aware of the fact that we are fallible creatures. Our current era will doubtless be viewed very differently from the way in which we view it ourselves. Some awareness of posterity, then, may make for thoughtful decision-making on our parts.

Tonal-serial hybridity, as it turns out, is something that is much more familiar to our ears than we may, at first, have guessed. It has been present, as has been shown in this paper, for quite a long time, and it deserves study. It rewards the musician who takes the time to dive deeply and investigate the scores in which it is employed. Its hopeful message to composers of the twenty-first century is: nothing is lost to you. The conversation between the great composers of the past and the aspiring composers of today continues along yet another stream of creative thought, thanks to its discovery. Here is yet another part of our musical inheritance. It is ours to fashion as we please. Indeed, it is critical that we, and all who follow us, do just that.

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Annotation: Inclusion of this text in this list relates to its being used to determine a method for keeping the shadow visual material obscured in the manner in which Elgar treated his shadow material (the identities of his friends and family) obscured in the *Enigma Variations*, both musically and programmatically.
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- \_\_\_\_\_. "Mickey Mouse Club, Alma Mater [Orchestral Arrangement based on Song by Jimmy Dodd]." Burbank, CA: Walt Disney Records, 2005.
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\_\_\_\_\_. *Universe of Energy*. Burbank, CA: Walt Disney Company, 1982. Unpublished audio of partial score. [https://www.youtube.com/watch?v=mZN7b\\_mipt8](https://www.youtube.com/watch?v=mZN7b_mipt8) [Accessed July 27, 2019].

**Annotation:** The audio of this score, save the individual theme song, “Universe of Energy,” cited below, is unavailable to the public. There are bootlegs of the audio on YouTube, such as that listed here, which was used for the source material for my analysis of this attraction’s score.

\_\_\_\_\_. *Walt Disney World Show: The New Mickey Mouse Club*. Norman “Buddy” Baker Collection. Box 35. The Fales Library and Special Collections, New York, NY.

**Annotation:** This is possibly the score to the “Mouseketeers at Walt Disney World” episode of *The Wonderful World of Disney*, originally aired November 20, 1977. These materials, which include the autograph score, music breakdown (Exposure sheet?), and orchestra recording schedules, are marked October 10-13, 1972. There is no record of an attraction called the New Mickey Mouse Club in Walt Disney World. There was a Mickey Mouse Club Theatre, and Baker composed the score for this attraction. The scores for the latter are in Box 87 and are marked November 9-13, 1970. It is, thus, my contention that the materials from Box 35 are misdated (they could have been misread, as October 10-13, 1977 make more sense for a recording session date for the above-cited television program) and are the score for this program and, therefore, merits their inclusion in this bibliography as an example of a Baker score that I consulted for this dissertation. Baker is cited as the composer of “nearly a hundred episodes of” the *Disneyland* television program, which was called the *Wonderful World of Disney* in 1977 (see Kurtti, *Imagineering Legends*, page 113, listed below). Interestingly, Baker was the score composer and music director for the original *Mickey Mouse Club* television program from 1955-1958, and so it may have been felt to be appropriate that Baker score this episode of *The Wonderful World of Disney*. Baker was also one of the chief composers of attraction scores for the Walt Disney World Resort at this time and would later become the music director for Epcot at Walt Disney World (see Kurt, page 114. See also the interview with Baker in *Walt’s People, Vol. 5*, ed. Didier Ghez, below). Lastly, in Bill Cotter’s book, *The Wonderful World of Disney Television* (cited in this bibliography, below), Baker is listed as a composer, admittedly one among many, on *The New Mickey Mouse Club* in Chapter 7 of the Appendices. In light of this, the possibility that Baker composed this episode would seem to be increased.

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## **Appendices**

### **Appendix A: Score**

*Nexus: Music for a Shadow Animation*



Performance Note for  
 Synthesizer:  
 MIDI Mapped Track Faders 1 and 2  
 on MIDI Controller  
 Used to Effect Dynamics  
 Track Fader 1 = Volume Anthemic Synth Lead  
 Track Fader 2 = Volume Nightlife Lead

# Nexus: Music for a Shadow Animation

## I. "Fiction Often Has a Way of Becoming Fact"

Patrick Gibson

**Grave e  
 leggiero**  
 ♩ = 56

Oboe

Clarinet in B $\flat$

Piano  
*pppp*  
*Atmospheric, distant, and quietly building in intensity*

Synthesizer  
 Anthemic Synth Lead Patch Logic X  
 MIDI Mapped Volume Control Fader 1  
*n.*  
*Atmospheric, distant, and quietly building in intensity*  
*pp*

Harp  
*ppp*  
*Atmospheric, distant, and quietly building in intensity*  
*sub. fp ord.*  
*fp*

Violin  
*Atmospheric, distant, and quietly building in intensity*  
 Div.  
*fp*  
*pizz.*  
*fp*

Double Bass I,II  
*pppp*  
*pppp*  
*pp*  
*pizz.*  
*arco leggiero pp*

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Nexus: Music for a Shadow Animation

6 *leggiero*  
*p*

6 *8<sup>va</sup>* *loco*  
*fp*  
*8<sup>va</sup>*

6 *vib.*  
with mod wheel  
*n.*

6 *8<sup>va</sup>* *L.V.* *fp* *L.V.* *loco* *fp*

6 *arco sul tasto*  
*fp* *sub. ppp* *p*  
*Unis. arco*

6 *p*

Nexus: Music for a Shadow Animation

①

Ob. *mp* *f* *mp*

B> Cl. *mf* *mp* *mf*

Pno. *fp* *mp* *loco*

Synth. *mf* *ord.*

Hp. *loco* *fp* *fp*

Vln. *ord.* *fp* *fp*

D.B. I, II *Div. louré* *legato*

*mf* *mp* *mp* *f* *mp*

Nexus: Music for a Shadow Animation

*rit. un poco* -----

Ob. *mf* *f* *mf*

B♭ Cl. *ff* *mf* *f* *mf*

Pno. *f* *mp* *f* *mf*  
Ped. throughout  
come sopra

Synth. MIDI Mapped  
Volume Control  
Fader 1 *mp* *mf* *mp*  
vib. with mod wheel

Hp. *mp* *f* *mf*  
leggiere  
8va  
A# C  
A

D.B. I, II *f* *mp* *f* *mf*  
Unis.

Nexus: Music for a Shadow Animation

② **Lento**  
♩ = 44 *molto leggero*

Ob.

Pno.

17 *sub.*  
*pp*

*(p)*

*p*

Hp.

17 *sostenuto*

*pp*

*p*

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Ob. *mf* *n.*

B♭ Cl. *molto leggiero* *pp* *mp*

Pno. *f* *pp* *(pp)* *mp*

Synth. *molto leggiero* *p* *<*

Hp. *mf*

MIDI Mapped  
Volume Control  
Fader 1

Nexus: Music for a Shadow Animation

3

B♭ Cl.

Pno.

Synth.

Hp.

Vln.

*mp* < *f*

*n.*

*f*

*n.*

*f*

*molto leggiero*

*mp* ————— *f* ————— *p*

Nexus: Music for a Shadow Animation

25 *molto leggero*

Pno.

25 *Clock-like* *molto leggero*

Hp. *mf* *p* *pp*

25 *loco* *Clock-like* *pizz.* *molto leggero* *arco*

Vln. *sub.* *mf* *p* *pp*



Nexus: Music for a Shadow Animation

Musical score for measures 27-30, featuring Pno., Hp., Vln., and D.B. I, II. The score includes dynamic markings such as *ppp*, *con forza*, *sub. f*, *sul pont.*, *solo pizz.*, and *tutti arco con forza*. The Pno. part has a *ppp* dynamic. The Hp. part has *ppp* and *con forza* markings, with a *sub. f* marking in the right hand. The Vln. part has *ppp* and *con forza* markings, with a *sub. f* marking. The D.B. I, II part has *ppp* and *sub. f* markings. A *C* marking is present above the Hp. part in measure 29.

Musical score for measures 28-30, featuring Ob., Vln., and D.B. I, II. The score includes dynamic markings such as *f*, *ff*, *mf*, *mf*, *ff*, and *mf*. The Ob. part has *f*, *ff*, and *mf* markings. The Vln. part has *mf* and *ff* markings, with a *sul pont.* marking. The D.B. I, II part has *f*, *ff*, and *mf* markings. The Vln. part includes the instruction *Div. spicc. aggressively* and a *3* marking above the staff in measure 28.

Nexus: Music for a Shadow Animation

32

Ob. *f* *mp* *mf* *p* *f* *sub. mp* *mf* *come solo*

B♭ Cl. *mp* *mf* *p* *f* *sub. mp* *f* *ord. secco, staccatissimo*

Vln. *f* *mp* *f* *come sopra*

D.B. I,II *f* *mp* *mf* *p* *f* *sub. mp* *mf* *f*

36

B♭ Cl. *ff* *f* *ff* *mf*

Synth. MIDI Mapped Volume Control Fader 1 *f* *ff* *mf*

Vln. *ff* *f* *ff* *mf* *portato, ma ancora secco*

D.B. I,II *ff* *f* *ff* *mf*

Nexus: Music for a Shadow Animation

39

Ob. *f* *mp* *mf* *p* *sub. f* *sub. mp* *mf*

B♭ Cl. *f* *mp* *mp* *<mf* *p* *sub. f* *sub. mp* *mf*

Synth. *f* *mp* *f* *mp* *sub. f* *sub. mp* *mf*

Hp. *mp* *<mf* *p* *sub. f* *sub. mp* *mf* B

Vln. *sub. f* *mp* *ord. mp* *<mf* *p* *f* *sub. mp* *mf*

D.B. I, II *sub. f* *mp* *mf* *p* *f* *sub. mp*

*ord. legato*

Nexus: Music for a Shadow Animation

5

Ob.

Pno.

Synth.

Hp.

Vln.

D.B. I, II

*mp*

*legato*

*sub. p*

*mp*

*mp*

*mp*

*sub. p*

*p*

spicc. staccatissimo, ord. con intensità legato

spicc. come sopra ord.

spicc. ord.

Nexus: Music for a Shadow Animation

45 *come sopra*

Ob. *f* *mf* *f*

B♭ Cl. *mf* *f* *mp*

Pno. *f* *mf* *f* *legato*

Synth. *f*

Hp. *f* *mp* *mf* *f*  
A G# C C#

Vln. *spicc.* *ord.* *f* *mf* *f*

D.B. I, II *Unis. pizz.* *arco* *f* *mp* *mf* *f*

Nexus: Music for a Shadow Animation

48

Ob.

B♭ Cl.

Pno.

Synth.

Hp.

Vln.

D.B. I, II

6

*mf* *f*

*mf* *mp*

*mf* *f*

*f* *mp* *mf* *f*

*mp* *mf* *f*

*mp* *mf* *f*

loco

MIDI Mapped Volume Control  
Fader 1

C

C#

pizz.

Nexus: Music for a Shadow Animation

51

Ob. *mp* *mp* *mf*

B♭ Cl. *mf* *mp* *mp* *mf*

Pno. *mp* *mf* loco

Synth. *mp* *mp* *mf*

Hp. *mp* *mp* *mf* *mp*  
C C# C Bb

Vln. *mf* *mp* *mf* *mp*

D.B. I, II *mp* *mp* *mf*

Nexus: Music for a Shadow Animation

7

Ob. *p* *mf*

Bb. Cl. *p* *sub. mf* *f*

Pno. *p*

Synth. *p* Nightlife Lead Patch Logic X MIDI Mapped Volume Control Fader 2

Hp. *mp* *p* *sub. mf*  
Fb C# G Eb C Gb G Ab Gb C

Vln. *pizz.* *mp* *p* *sub. mf*

D.B. I, II *p*



Nexus: Music for a Shadow Animation

8

56

Ob.

*f* *sub. p* *mp*

B♭ Cl.

*sub. p* *mp*

Pno.

*mf* *sub. p*

Synth.

*f* *sub. p* *mp*

Hp.

*sub. p* *cantabile* *mp*

Vln.

*sub. p*

D.B. I, II

*solo* *p*

Nexus: Music for a Shadow Animation

58

Pno.

Hp.

D.B. I,II

*mp*

*f*

*f*

B F

tutti

61

Pno.

Hp.

Vln.

D.B. I,II

arco

*f*

arco

arco cantabile

Nexus: Music for a Shadow Animation

*rit. poco a poco* -----

Ob.

B♭ Cl.

Pno.

Synth.

Hp.

Vln.

D.B. I,II

*ff* *p*

*ff* *p*

*ff* *p*

*mp* *p*

pitch wheel  
+50%  
(=1X 8va.)

MIDI Mapped Volume Control  
Fader 2

L.V.

L.V.

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

Nexus: Music for a Shadow Animation

9 **Tempo Primo**  
♩ = 56

Pno. *sub. pppp*  
*come sopra*

Synth. *n.*  
*come sopra*  
MIDI Mapped Volume Control Fader 1  
Anthem Synth Lead Patch Logic X

Hp. *ppp*  
*come sopra*  
*sub. fp*  
ord.

Vln. *come sopra*  
Div.  
*fp*  
pizz.

D.B. I,II *sub. pppp*

Nexus: Music for a Shadow Animation

69 (8<sup>va</sup>)

Pno.

Synth.

Hp.

Vln.

D.B. I, II

L.V.

*pp*

*n.*

*vib.*  
with mod wheel

*fp*

*fp*

*sfz*

arco  
sul tasto

*pp*

*ppp*

Unis.  
arco

snap  
pizz.

*pp*

*ppp*

*sfz*

arco  
leggero

*pp*

*ppp*

Performance Note for  
Synthesizer:  
MIDI Mapped Track Fader 3  
on MIDI Controller Used to  
Effect Dynamics  
Track Fader 3 = Volume  
Mellotron/Analog Synthesizer

## II. Democritus and the Lost Concept of Atomos

Patrick Gibson

Adagietto: Un peu triste  
en pensée des anciens

♩ = 92

*un poco rubato*

The musical score is arranged in a vertical stack of staves. The top four staves are for Oboe, Clarinet in Bb, Piano, and Synthesizer, each with a treble and bass clef. The Harp part is shown with a grand staff (treble and bass clefs) and includes a fingerings diagram above it. The Violin and Double Bass parts are at the bottom, each with a single staff. The Harp part begins with a *ppp* dynamic and a *très doucement* marking. The Synthesizer part is indicated to be played on Track Fader 3 of a MIDI controller.

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Nexus: Music for a Shadow Animation

5 *a tempo* ①

B♭ Cl. *pp*

5 *très doucement*  
*p* *mp* *pp*

Pno. *L.H.: a little more aggressively, in contrast to R.H.*

5 *pp* *pp* *p* *sub. pp*

Hp.

9 *doucement*  
*mf*

Ob.

9 *leggiero*  
*mp*

B♭ Cl.

9 *mp*  
*R.H./L.H. ord.*

Pno.

9 *mp*

Hp.

9 *legato, espress., e un poco vib.* *con un poco più intensità*  
*pp* *mp*

Vln.

Nexus: Music for a Shadow Animation

13

Ob.

B♭ Cl.

Pno.

Vln.

D.B.

*mf* *f* *mp* *sub. p*

*f* *p*

*f* *mp* *p*

*sub. pp*

8<sup>va</sup> 8<sup>va</sup>

pizz.

Div. 2.



Nexus: Music for a Shadow Animation

17

Ob. *mp*

B♭ Cl. *mp*

(8<sup>va</sup>)

Pno.

Hp. *ppp* *f*

arco  
vib. e poco a poco  
con più intensità

ord. → sul pont.

Vln. *mp* *p* *f*

sub. *p* *f*

D.B. 1. 2.

Nexus: Music for a Shadow Animation

20

Ob. *mf* *mp* *mp* *p*

B♭ Cl. *mf*

Pno. *f* *p* *sub. mf*

Hp. *f* *sub. mf*

ord. *cantabile* *8va*

Vln. *f* *p* *sub. mf*

D.B. *f* *(p)* Unis. *p*



Nexus: Music for a Shadow Animation

26

Ob. *mf*

B $\flat$  Cl. *< mf > mp* *mf*

Pno. *mf*

Hp.

Vln. *mp* loco

D.B. *mf*

Nexus: Music for a Shadow Animation

29 *rit.* **2** **Andante** ♩ = 100 *leger et très doucement*

Ob. *pp* *leger et très doucement*

B♭ Cl. *ppp* *pp* *leger et très doucement*

Pno. *ppp*

Hp. *p* *pp* *ord.* *pp* *ord.* *pp* *leger et très doucement*  
C# F# E C#Ab

Vln. *ppp* *pp* *leger et très doucement*  
Div. *leger et très doucement* *pp*

D.B. *pp* *leger et très doucement*

*pp*

Nexus: Music for a Shadow Animation

Musical score for Nexus: Music for a Shadow Animation, measures 35-40. The score is arranged in five systems, each with two staves. The instruments are Oboe (Ob.), B♭ Clarinet (B♭ Cl.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.).

Measure 35: The key signature changes to B-flat major. The time signature is 2/4. The Oboe and B♭ Clarinet parts begin with a half note B♭. The Harp part has a chord of F and C. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Measure 36: The time signature changes to 4/4. The Oboe and B♭ Clarinet parts have a half note B♭. The Harp part has a chord of E♭. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Measure 37: The time signature changes to 7/8. The Oboe and B♭ Clarinet parts have a half note B♭. The Harp part has a chord of E and C#. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Measure 38: The time signature changes to 4/4. The Oboe and B♭ Clarinet parts have a half note B♭. The Harp part has a chord of E and C#. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Measure 39: The time signature changes to 4/4. The Oboe and B♭ Clarinet parts have a half note B♭. The Harp part has a chord of E and C#. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Measure 40: The time signature changes to 4/4. The Oboe and B♭ Clarinet parts have a half note B♭. The Harp part has a chord of E and C#. The Violin part has a half note B♭. The Double Bass part has a half note B♭.

Dynamic markings: *ppp* (pianissimo) is indicated in measures 37, 38, 39, and 40 for the Oboe, B♭ Clarinet, Harp, Violin, and Double Bass parts. The Harp part also has a *ppp* marking in measure 37. The Violin and Double Bass parts have a *portato* marking in measures 36 and 37.

Nexus: Music for a Shadow Animation

39

Ob. *sub. mf* *p* *leggiero* *p*

B♭ Cl. *sub. mf* *p* *leggiero* *p*

Pno. *sub. mf* *p* *sub. mf* *mf* *p* *leggiero loco*

Hp. *sub. mf* *p* *sub. mf* *mf* *p*  
A C F# Eb Db Ab F

Vln. *sub. mf* *p* *sub. mf* *mf* *p* *cantabile e leggiero*

D.B. *sub. mf* *p* *sub. mf* *p*

Nexus: Music for a Shadow Animation

Ob. *mf* *p* *mf*

B♭ Cl. *mf* *p* *mf*

Pno. *mf*

Hp. *mf* *p* *mf*  
F# B D E C#

Vln. *mf* *p* *mf*  
*detaché*  
Div. (*mf*)

D.B. *mf*

Detailed description: This page of a musical score covers measures 43 to 46. It features six staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music is in 2/4 time and features a key signature of one flat (B-flat major or D minor). The Oboe and Clarinet parts are marked with dynamics *mf*, *p*, and *mf* across the measures. The Piano part has a *mf* dynamic. The Harp part includes specific chord voicings: F# and B in measure 43, D in measure 44, E in measure 45, and C# in measure 46. The Violin part is marked with *mf*, *p*, and *mf*, with a *detaché* instruction and a *Div. (mf)* instruction in measure 46. The Double Bass part is marked with *mf*. The score includes various musical notations such as slurs, ties, and dynamic hairpins.



Nexus: Music for a Shadow Animation

47

Ob. *pp* *sub. f*

B♭ Cl. *pp* *sub. f* Solo

Pno.

47

Hp. *p* *sub. f*  
A C Eb E F Eb Bb

47

Vln. ord. *p* *sub. f*  
Unis. (*p*)

D.B. *p* *sub. f*

Nexus: Music for a Shadow Animation

50 *marcato* *rit. ord.*

Ob.

B♭ Cl.

*p*

*p*

50 *marcato* *R.H. ancora marcato*

Pno.

*marcato* *legato*

50 *simile*

Hp.

F#  
C#      Ab      F      A

50 *marcato* *detaché*

Vln.

*f*

*detaché*

D.B.

*marcato*  
*f*

Nexus: Music for a Shadow Animation

Plaintively  $\text{♩} = 72$

3

Ob. *mp* *p*

B♭ Cl. *mf* *p*

Pno. *mf* *p* *8va*

Hp. *mf* *p*  
Db F# E G# Eb

Vln. *mf* *p* *legato appassionato*

D.B. *p* *Unis.*

Detailed description: This page of a musical score is for the piece 'Nexus: Music for a Shadow Animation'. It features six staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score is marked 'Plaintively' with a tempo of quarter note = 72. A circled '3' indicates a third ending. The music is in 3/4 time and consists of three measures. The Oboe part starts with a rest, then plays a melodic line with dynamics *mp* and *p*. The B-flat Clarinet part starts with a rest, then plays a melodic line with dynamics *mf* and *p*. The Piano part has two staves; the upper staff plays a melodic line with dynamics *mf* and *p*, and the lower staff plays a rhythmic accompaniment with dynamics *mf* and *p*. The Harp part has two staves; the upper staff plays a melodic line with dynamics *mf* and *p*, and the lower staff plays a bass line with notes Db, F#, E, G#, and Eb. The Violin part plays a melodic line with dynamics *mf* and *p*, and the instruction 'legato appassionato'. The Double Bass part has a rest in the first two measures and then plays a rhythmic accompaniment with dynamics *p* and the instruction 'Unis.'.

Nexus: Music for a Shadow Animation

56

Ob. *mf*

B♭ Cl. *mp* — *pp*

Pno. *mf*

Hp. *mf* — *p*

Vln. *mf* — *pp* — *pp*

D.B. *mf* — *p*

*8<sup>va</sup>*

*8<sup>va</sup>*

*8<sup>va</sup>*

*8<sup>va</sup>*

*doucement*

L.V.

B D

Nexus: Music for a Shadow Animation

4 *a loco*<sup>10</sup> *p* *mf* *8<sup>va</sup>*

Pno.

*loco*

59 *8<sup>va</sup>* *L.V.* *mf* *8<sup>va</sup>*

Hp.

59 *8<sup>va</sup>* *pppp*

Vln.

62 *8<sup>va</sup>* *loco* *p* *sub. ppp* *Ab* *E#*

Pno.

*(loco)*

62 *loco* *p* *loco* *8<sup>va</sup>*

Hp.

Nexus: Music for a Shadow Animation

5

Ob. *f* *mp*

B♭ Cl. *sub.* *f* *mp*

Pno. *sub.* *f* *mp*

Hp. *sub.* *f* *gliss.* *mp*  
G E A#

Vln. *gliss.* *f* *mp*

D.B. *Div.* *sub.* *f* *mp*

Nexus: Music for a Shadow Animation

67

Ob. *mf* *p*

B♭ Cl. *sub. mf* *p*

Pno. *sub. mf* *p*

Hp. *sub. mf* (ord.) *p*  
Eb Ab

Vln. *mf* *mp*

D.B. *sub. mf* *p*

Nexus: Music for a Shadow Animation

6  $(\text{♩}=\text{♩})$   
*cantabile*  
Ob. *detaché, like a telephone's busy signal*

B. Cl. *cantabile*  
*detaché, like a telephone's busy signal*

Pno. *detaché, like a telephone's busy signal*

Synth. *pppp*  
*pp*  
Mellotron/Analog Synthesizer  
MIDI Mapped Volume Control  
Fader 3

Hp. *detaché, like a telephone's busy signal*  
*shimmering*

Vln. *detaché, like a telephone's busy signal*

D. B.



Nexus: Music for a Shadow Animation

72 *come sopra*

Ob.

B♭ Cl.

Pno.

Synth.

Hp.

Vln.

D.B.

*mf*

*come sopra*

*pizz.*

*arco*

*Unis.*

Detailed description: This page of a musical score contains measures 72, 73, and 74. The score is for a 7/8 time signature. The instruments are Oboe (Ob.), B♭ Clarinet (B♭ Cl.), Piano (Pno.), Synth., Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The Oboe and B♭ Clarinet parts are marked *come sopra* and feature melodic lines with slurs and accents. The Piano part has a rhythmic accompaniment of eighth notes. The Synth. part has a sustained chord in the right hand and a bass line in the left hand, marked *mf*. The Harp part has a rhythmic accompaniment of eighth notes. The Violin part starts with *pizz.* and then *arco*. The Double Bass part has a rhythmic accompaniment of eighth notes, marked *Unis.* (Unison).

Nexus: Music for a Shadow Animation

75

Ob. *ff* *mp*

B♭ Cl. *ff* *mp*

Pno. *ff* *mp* *loco*

Synth. *mf* *p*

Hp. *ff* *mp*

Vln. *ff* *mf* *come sopra* *un poco legato*

D.B. *ff* *mp*

Nexus: Music for a Shadow Animation

8

Ob.

B $\flat$  Cl.

Pno.

Synth.

Hp.

Vln.

D.B.

*mp*

*mp*

*mp*

*p*  
*un poco leggero,  
ma con intensità*

*mp*

*mp*

*un poco leggero,  
ma con intensità*

*come sopra*

E  
C

B $\flat$

F#  
A

Nexus: Music for a Shadow Animation

81

Ob. *f*

B♭ Cl. *f* *mp*

Pno. *f*

Synth.

Hp. *f*

Vln. *f* *mf*

D.B. *f*

Div.

Nexus: Music for a Shadow Animation

84 *rit. poco a poco*

Ob. *p*

Pno. *pp*

Synth. *ppp*

Hp. *mp* *Ab* *pp*

Vln. *mp* *pp*

87 *ppp*

Nexus: Music for a Shadow Animation

90

*legato e poco a poco più leggero*

**mp**

**pp**

**9**

**Adagio** ♩ = 68

Pno.

90

*sub. mp*

*loco*

**pp**

A Eb Bb G Ab

Hp.

90

*detaché, ma poco a poco più leggero*

*vib.*

*sub. mp*

**pp**

Vln.

93

Hp.

Nexus: Music for a Shadow Animation

8<sup>va</sup>-----

96

Pno. *p* *mp*

Hp. *mp* *sub. p*

D.B. Unis. *sub. p*

99

Pno. *p* loco

Hp.

D.B.

Nexus: Music for a Shadow Animation

102 *molto rit.* *sempre molto leggiero* , , *ppp*

Ob.

102 *molto leggiero* , , *ppp*

B<sup>b</sup> Cl.

102 *molto leggiero* , , *ppp*

Pno.

102 *come sopra e sempre molto leggiero* , , *ppp*

Hp.

102 *molto leggiero sul tasto* , *pp* *ppp*

Vln.

102 *molto leggiero* , , Div. *ppp*

D.B.



Performance Note for  
Synthesizer:  
MIDI Mapped Track Fader 4  
on MIDI Controller Used to  
Effect Dynamics  
Track Fader 4 = Volume  
Saw/Leather

### III. "Heat through an Atomic Eye"

Moto perpetuo: Agitato  
♩ = 80

Patrick Gibson

The musical score is for a piece titled "III. 'Heat through an Atomic Eye'" by Patrick Gibson. It is in 4/4 time and features a tempo of 80 beats per minute. The score is for a full orchestra and includes a synthesizer part. The instruments are Oboe, Clarinet in Bb, Piano, Synthesizer, Harp, Violin, and Double Bass. The key signature is Bb major. The score is divided into three measures. The Oboe and Clarinet in Bb parts enter in the third measure with a melody marked *mp*. The Synthesizer part has a melody in the treble clef marked *p* and a bass line in the bass clef. The Harp, Violin, and Double Bass parts are silent throughout the piece.

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III. "Heat through an Atomic Eye"

Ob.

B♭ Cl.

Pno. *mf*

Synth.

pitch wheel up to pitch in next meas.

vib. with mod wheel

MIDI Mapped Volume Control Fader 4

Hp. *mp*

D.B. *mp*

The musical score is for the third movement, "Heat through an Atomic Eye". It features six staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), and Double Bass (D.B.). The key signature has two flats (B-flat and E-flat), and the time signature is 4/4. The score begins with a four-measure rest for all instruments. The Oboe and B-flat Clarinet play a rhythmic eighth-note pattern starting in the fifth measure. The Piano enters in the fifth measure with a melody marked *mf*. The Synthesizer plays a sustained note with a vibrato effect, with performance instructions: "pitch wheel up to pitch in next meas.", "vib. with mod wheel", and "MIDI Mapped Volume Control Fader 4". The Harp and Double Bass enter in the fifth measure with a melody marked *mp*. The Double Bass part consists of a single note held for the duration of the piece.

III. "Heat through an Atomic Eye"

①

Ob.  $(\text{♩}=\text{♩})$   $(\text{♩}=\text{♩})$   
B♭ Cl.  $mp$   $f$   $mp$   $mf$   
Pno.  $f$   $mp$   
Synth.  $p$   $mp$   $p$   $p$   
Hp.  $f$   $mp$   
Vln.  $mp$   $f$   $mp$   
D.B.  $spicc.$   $ord.$   $Div.$   $f$   $mp$

Detailed description: This page of a musical score is for the third movement, "Heat through an Atomic Eye". It features seven staves: Oboe (Ob.), Bass Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score is divided into three measures. The first measure is in 6/8 time, the second in 8/8, and the third in 4/4. The Oboe part starts with a circled '1' above it. Dynamics range from piano (*p*) to fortissimo (*f*). The Piano part has a *8va* marking. The Harp part has a *F#* marking. The Double Bass part has *spicc.*, *ord.*, and *Div.* markings. There are also some vertical tick marks above the Harp staff in the second measure.

III. "Heat through an Atomic Eye"

Ob. *mf* *f* *mp* *mf*

B♭ Cl. *mf* *sub. f* *mp* *mf*

Pno. *mf* *sub. f* *mp*

Synth. *mp* *sub. mf* *pp* *mp*

Hp. *mf* *sub. f* *p* *p* *mf*  
E Eb

Vln. *mf* *sub. f* *p* *mf*

D.B. *mf* *sub. f* *Unis. p*

Performance markings include *mf*, *f*, *mp*, *pp*, *sub.*, *Unis.*, and dynamic hairpins. The score is in 4/4 time with a key signature of one flat.

III. "Heat through an Atomic Eye"

②  
(♩=♩)

Ob. *mf* *ff*

B♭ Cl. *f* *ff*

Pno. *ff*

Synth. *mp* *f*

Hp. *mf* *ff*  
Execute staccato with L.H.

Vln. *mf* *f*  
spicc.

D.B. *f* *ff*  
Div. spicc.

*f* *ff*

III. "Heat through an Atomic Eye"

③ (♩=♩)

Ob. *pp* *p*

B♭ Cl. *legato e cantabile* *p*

Pno. *sub. pp* *8va*

Hp. *ord.* *sub. pp* *ord.*

Vln. *ord. solo legato e cantabile* *sub. p*

D.B. *Div. ord. pizz.* *sub. p* *arco*

III. "Heat through an Atomic Eye"

④

The musical score consists of seven staves: Ob. (Oboe), B. Cl. (Bass Clarinet), Pno. (Piano), Synth. (Synthesizer), Hp. (Harp), Vln. (Violin), and D.B. (Double Bass). Measure 23 begins with a circled number 4. The Oboe and Bass Clarinet parts start with a *p* dynamic, which changes to *mf* by measure 24. The Piano part features a dense texture of sixteenth-note chords, with a *mf* dynamic. The Synthesizer part is marked *pp* and includes a MIDI control box for 'MIDI Mapped Volume Control Fader 4'. The Harp part has a tremolo effect indicated by vertical lines above the staff. The Violin part is marked *mf* and includes a *vib.* (vibrato) marking. The Double Bass part is marked *mf* and includes a *sub. mp* (subito mezzo-piano) marking. The score concludes with a *sub. mp* marking in the final measure.

Ob. *p* *mf* *sub. mp*

B. Cl. *mf* *sub. mp*

Pno. *mf* *sub. mp*

Synth. *pp* *mp* *sub. p*

Hp. *vib.*

Vln. *mf* *vib.*

D.B. *mf* *sub. mp*

MIDI Mapped Volume Control Fader 4

III. "Heat through an Atomic Eye"

Ob. *mp*

Pno. *loco*

Synth.

D.B. *Unis.*

The musical score consists of four staves. The Ob. staff (top) is in treble clef with a key signature of two flats and a common time signature. It begins at measure 26 with a melodic line featuring accents and a dynamic marking of *mp*. The Pno. staff (second) is in grand staff (treble and bass clefs) with a key signature of two flats and a common time signature. It features a fast, rhythmic accompaniment in the left hand and a melodic line in the right hand, marked *loco*. The Synth. staff (third) is in grand staff with a key signature of two flats and a common time signature, mirroring the Ob. staff's melody. The D.B. staff (bottom) is in bass clef with a key signature of two flats and a common time signature, playing a sustained low note marked *Unis.*



III. "Heat through an Atomic Eye"

5

Ob. *sub.* *f*

B♭ Cl. *sub.* *f*

Pno. *sub.* *f*

Synth. *sub.* *mf*

Vln. *sub.* *f*

D.B. *sub.* *f* Unis. Div.

Detailed description: This page of a musical score is for the third movement, "Heat through an Atomic Eye". It features six staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Violin (Vln.), and Double Bass (D.B.). The score begins at measure 5, indicated by a circled number. The Oboe and B-flat Clarinet parts start with a *sub.* *f* dynamic. The Piano part has a *sub.* *f* dynamic and includes a fermata over the first measure. The Synthesizer part has a *sub.* *mf* dynamic and features a complex, rhythmic pattern. The Violin part has a *sub.* *f* dynamic. The Double Bass part has a *sub.* *f* dynamic and includes a *Unis.* (unison) marking and a *Div.* (divisi) marking. The score is written in a key signature of two flats and a 4/4 time signature.

III. "Heat through an Atomic Eye"

(♩=♩)

6

Ob.

B♭ Cl.

Pno.

Synth.

Vln.

D.B.

32

8va

sub. mp

sub. mp

spicc.

sub. mp

sub. mp

The image shows a page of a musical score for a piece titled "III. 'Heat through an Atomic Eye'". The score is for measures 32-34. It features six staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Violin (Vln.), and Double Bass (D.B.). The key signature has two flats (B-flat and E-flat), and the time signature is 6/8. The Oboe and B-flat Clarinet parts are mostly rests. The Piano part has a complex rhythmic pattern with many accents and a dynamic marking of *sub. mp*. The Synthesizer part has a similar rhythmic pattern with accents and a dynamic marking of *sub. mp*. The Violin part has a rhythmic pattern with accents, a dynamic marking of *sub. mp*, and a *spicc.* (spiccato) marking. The Double Bass part has a simple rhythmic pattern with accents and a dynamic marking of *sub. mp*. There are some performance markings like *8va* (8va) and *sub.* (suboctave) in the Piano and Synthesizer parts. A circled number "6" is at the top left of the score.

III. "Heat through an Atomic Eye"

35

Ob. *p* *sub. mf*

B♭ Cl. *p* *sub. mf*

Pno. *p* *pp* *loco*

Synth. *p* *pp*

Hp. *p* *8va* *loco* F C# F#

Vln. *p* *ord. pizz.*

D.B.

Detailed description: This page of a musical score, numbered 237, contains the third movement, "Heat through an Atomic Eye". The score is for a chamber ensemble consisting of Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music begins at measure 35. The Oboe and Clarinet parts feature a rhythmic pattern of eighth notes with accents, starting in a 6/8 time signature and moving to 7/8. The Piano and Synthesizer parts play a similar eighth-note pattern in the right hand, while the left hand is mostly silent. The Harp part provides harmonic support with chords, including F major, C# minor, and F# major, and includes an 8va (octave) marking. The Violin part plays a melodic line with accents, and the Double Bass part is mostly silent. Dynamics range from piano (*p*) to pianissimo (*pp*) and mezzo-forte (*mf*). Performance instructions include *loco* (loco) and *ord. pizz.* (orderly pizzicato).

III. "Heat through an Atomic Eye"

7

(♩=♩)

Ob. *sub. pp*

B♭ Cl. *sub. pp*

Pno. *sub. mf* *8va*

Synth. MIDI Mapped Volume Control Fader 4 *sub. ppp*

Hp. *sub. mf* *sub. pp* *8va*

Vln. *arco* *sub. pp*

D.B. *sub. pp*

III. "Heat through an Atomic Eye"

41

Ob. *ppp*

B♭ Cl. *ppp*

Pno. *ppp*

Synth. *pppp*

Hp. *ppp*

Vln. *ppp*

D.B. Unis. *pppp*

Detailed description: This page of a musical score, numbered 239, contains the third movement, "Heat through an Atomic Eye". The score is arranged for a chamber ensemble consisting of Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music begins at measure 41. The Oboe and B-flat Clarinet parts are marked *ppp* (pianissimo) and feature a long, gradual crescendo line. The Piano part includes a section marked *ppp* with complex chordal textures and some melodic lines. The Synthesizer part is marked *pppp* (pianississimo) and features a dense, rhythmic texture of sixteenth notes. The Harp part is marked *ppp* and includes a section marked *ppp* with complex chordal textures. The Violin part is marked *ppp* and features a long, gradual crescendo line. The Double Bass part includes a section marked *pppp* and features a long, gradual crescendo line. The score is written in a key signature of one flat (B-flat major or D minor) and a common time signature (C). The notation includes various dynamics, performance markings, and a section marked *pppp* in the Double Bass part.

III. "Heat through an Atomic Eye"

8

Pno. *sub. pp* *mp* *pp* *mp*  
*loco*

Synth. *leggiere*

9

Pno. *mp* *f*

Synth. *sub. mp* *f* *mp* *f*

Hp. *sub. p*  
E  
C  
*loco*

Vln. *mp* *f*

D.B. *sub. p*

III. "Heat through an Atomic Eye"

50

Pno. *f* *pp*

Synth. *sub. mp* *f* *mp* *f*

Hp. *mp* *pp*  
*sub. p*

Vln. *mp* *f* *mp* *f*

D.B.

Detailed description: This page of a musical score, numbered 241, contains five systems of staves for different instruments. The music begins at measure 50. The Piano (Pno.) part features a complex rhythmic pattern in the bass clef, starting with a forte (*f*) dynamic and ending with a pianissimo (*pp*) dynamic. The Synth. part has a melodic line in the treble clef with dynamics ranging from mezzo-piano (*mp*) to forte (*f*), including a 'sub.' (sub-octave) marking. The Harp (Hp.) part consists of a steady eighth-note accompaniment in the treble clef, with dynamics of mezzo-piano (*mp*) and pianissimo (*pp*), and a 'sub. p' marking in the bass clef. The Violin (Vln.) part has a melodic line in the treble clef with dynamics of mezzo-piano (*mp*) and forte (*f*). The Double Bass (D.B.) part provides a simple harmonic accompaniment in the bass clef.

III. "Heat through an Atomic Eye"

53

Ob. *pp* *mp* *vib.* *n.*

B♭ Cl. *pp* *mp* *vib.* *n.*

Pno. *sub. mp* *L.V.* *8va*

Synth. *pp* *mp* *vib.* *n.*

Hp. *sub. mp* *L.V.* *8va*

Vln. *mp* *pppp*

D.B. *sub. mp* *pppp*

Detailed description: This page of a musical score, numbered 242, contains the third movement, "Heat through an Atomic Eye". It features seven staves for different instruments: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score begins at measure 53. The Oboe and B-flat Clarinet parts are written in treble clef and feature a melodic line that starts with a piano (*pp*) dynamic, gradually increases to mezzo-piano (*mp*), and then concludes with a fortissimo (*n.*) dynamic. Both parts include a vibrato (*vib.*) marking. The Piano and Harp parts are written in grand staff (treble and bass clefs). They feature a complex texture with chords and arpeggios. The Piano part includes a sub-octave (*sub.*) marking and a mezzo-piano (*mp*) dynamic. The Harp part also includes a sub-octave (*sub.*) marking and a mezzo-piano (*mp*) dynamic. Both parts have a first-violin-like (*L.V.*) marking and an octave transposition (*8va*) marking. The Synthesizer part is written in treble clef and features a melodic line that starts with a piano (*pp*) dynamic, increases to mezzo-piano (*mp*), and concludes with a fortissimo (*n.*) dynamic. It includes a vibrato (*vib.*) marking. The Violin part is written in treble clef and features a melodic line that starts with a mezzo-piano (*mp*) dynamic and concludes with a fortissimo (*pppp*) dynamic. The Double Bass part is written in bass clef and features a melodic line that starts with a sub-octave (*sub.*) marking and a mezzo-piano (*mp*) dynamic, and concludes with a fortissimo (*pppp*) dynamic.



Performance Note for  
Synthesizer:  
MIDI Mapped Track Fader 5  
on MIDI Controller Used to  
Effect Dynamics  
Track Fader 5 = Volume  
Classic Pulse/Mellotron  
Clips on Tracks 5 and 6

## IV. Curie's Discovery of Radium

Patrick Gibson

Adagio:  
Molto Leggiero  
e con Rubato  
♩ = 56

The musical score is arranged in a grand staff format with the following parts from top to bottom:

- Oboe
- Clarinet in B $\flat$
- Piano: Features a melodic line in the right hand and a bass line in the left hand. Dynamics include *ppp*, *cresc. un poco*, and *pp*. Performance markings include *solo*, *L.V.*, and *Ped. throughout*.
- Synthesizer
- Fixed Media
- Harp: Includes a graphic notation for a chord sequence.
- Violin
- Double Bass

The score is divided into four measures, with time signatures changing from 3/4 to 3/4 to 4/4 to 4/4.

IV. Curie's Discovery of Radium

Pno.

5

*p*

*come sopra*

Pno.

9

*mf*

L.V.

①

Pno.

12

*dreamy*

*pp*

*mp*

Anadantino

♩ = 72

Hp.

12

*p*

*mp*

IV. Curie's Discovery of Radium

Ob. *mp*

B♭ Cl. *mp*

Pno.

F.M. *sempre staccatissimo*  
*n.*

Hp.

Classic Pulse/Mellotron  
MIDI Mapped Volume Control  
Fader 5

Instantiate  
Clip, Track 5

Detailed description: This page of a musical score is for the piece 'IV. Curie's Discovery of Radium'. It features five staves: Oboe (Ob.), B-flat Clarinet (B♭ Cl.), Piano (Pno.), F.M. (likely a MIDI instrument), and Harp (Hp.). The score begins at measure 17. The Oboe and B-flat Clarinet parts are marked *mp* (mezzo-piano). The Piano part consists of a complex, rhythmic accompaniment. The F.M. part features a dense, staccatissimo texture starting in measure 19, marked *sempre staccatissimo* and *n.* (forte). MIDI annotations are present: 'Classic Pulse/Mellotron' and 'MIDI Mapped Volume Control Fader 5' are associated with the F.M. part, and 'Instantiate Clip, Track 5' is associated with the Harp part.

IV. Curie's Discovery of Radium

20

Ob.  $(\text{♩}=\text{♩})$   $(\text{♩}=\text{♩})$   
*mp* *mf*

B♭ Cl. *mp* *mf*

Pno. *mf*

F.M. Instantiate Clip, Track 6  
*n.*

Hp. *mp*

Vln. *leggiero* *mp* *mf* *pizz.*

D.B. *mf*

Detailed description: This page of a musical score is for the fourth movement, 'IV. Curie's Discovery of Radium'. It features seven staves: Oboe (Ob.), Bass Clarinet (B♭ Cl.), Piano (Pno.), F.M. (likely a digital instrument), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score begins at measure 20. The Oboe and Bass Clarinet parts have a melodic line with dynamics *mp* and *mf*. The Piano part has a complex accompaniment with a *mf* dynamic. The F.M. part includes a box labeled 'Instantiate Clip, Track 6' and a *n.* marking. The Harp part has a *mp* dynamic. The Violin part has a *leggiero* marking and dynamics *mp* and *mf*. The Double Bass part has a *mf* dynamic. The score includes various performance markings such as *mp*, *mf*, *leggiero*, and *pizz.*, as well as dynamic hairpins and articulation marks.

IV. Curie's Discovery of Radium

23

Ob. *mf* *f* <sup>2</sup> *sub. mp* *f*

B $\flat$  Cl. *mf* *f* *sub. mp*

F.M.

Hp. *f*

Vln. *f* arco sul pont.

D.B.

The musical score is arranged in a standard orchestral format. It begins at measure 23, which is marked with a fermata. The woodwinds (Oboe and Bass Clarinet) play a melodic line with dynamics ranging from mezzo-forte (mf) to fortissimo (f). The Oboe part includes a second ending marked with a circled '2' and a repeat sign, starting in 6/8 time. The strings (Violins and Double Bass) play a rhythmic accompaniment of eighth notes, with the Violins marked fortissimo (f). The piano accompaniment (F.M.) features a complex texture of sixteenth-note chords in the right hand and sustained chords in the left hand. The Harp (Hp.) plays a sustained chord. The Violins (Vln.) play a melodic line with a fermata at the end of measure 23, marked fortissimo (f) and arco sul ponticello. The Double Bass (D.B.) plays a single note with a fermata, marked fortissimo (f).

IV. Curie's Discovery of Radium

26

Ob. *sub. mp* *f* *sub. mp* *f*

B♭ Cl. *f* *sub. mp* *f* *sub. mp* *f*

Pno. *f*

F.M.

Hp. *f* *8va* *8va*

Vln. *ord. solo* *f*

D.B. *f*

*f*

Detailed description: This page of a musical score is for the fourth movement, 'IV. Curie's Discovery of Radium'. It features seven staves: Oboe (Ob.), Bass Clarinet (B♭ Cl.), Piano (Pno.), French Horns (F.M.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music begins at measure 26. The Oboe and Bass Clarinet parts are characterized by a rhythmic pattern of eighth notes, with dynamic markings alternating between *sub. mp* and *f*. The Piano part has a rest until measure 28, where it enters with a *f* dynamic. The French Horns play a sustained chord with a tremolo effect. The Harp part features a *f* dynamic and includes an *8va* marking. The Violin part has an *ord. solo* marking and a *f* dynamic. The Double Bass part plays a steady eighth-note accompaniment with a *f* dynamic.

IV. Curie's Discovery of Radium

3

Ob. *plus doucement*

B. Cl. *plus doucement*

Pno. *plus doucement et L.V.*

Synth. *doucement*  
*mf*

F.M. *mp*  
*> mp*

Hp. *plus doucement et L.V.*

Vin. *mf*

D.B.

The musical score is arranged in a standard orchestral format. It begins with a rehearsal mark '3' in a circle. The Oboe and Bass Clarinet parts play a melodic line with the instruction 'plus doucement'. The Piano part features a complex texture with the instruction 'plus doucement et L.V.'. The Synthesizer part plays a rhythmic accompaniment marked 'doucement' and 'mf'. The F.M. part provides a steady accompaniment with 'mp' and 'mf' dynamics. The Harp part has a similar texture to the Piano, marked 'plus doucement et L.V.'. The Violin part plays a melodic line marked 'mf'. The Double Bass part provides a harmonic foundation with a few notes.

IV. Curie's Discovery of Radium

Ob. *p*

B♭ Cl. *p*

Pno. *p* *avec un peu plus d'intensité*

Synth.

F.M.

Hp. *gliss.* *pp*

Vln. *pp*

D.B. *pp*





IV. Curie's Discovery of Radium

The musical score is divided into three systems, each starting at measure 35. The first system, labeled 'Pno.', consists of two staves (treble and bass clef) with rests in both. The second system, labeled 'Synth', also consists of two staves with rests. The third system, labeled 'F.M.', features a complex texture. The upper staff has a rapid sixteenth-note melody in G major, marked with a forte 'f' dynamic. The lower staff has a sustained, tremolo-like texture in the bass clef, also marked with a forte 'f' dynamic. A horizontal line with an upward-pointing triangle is positioned between the Pno. and Synth systems, and another horizontal line is below the F.M. system.

Performance Note for  
Synthesizer:  
MIDI Mapped Track Fader 1  
on MIDI Controller Used to  
Effect Dynamics  
Track Fader 1 = Volume  
Anthemic Synth Lead

# V. The Promenade of Elements: "A Fascinating Study in Numbers"

Patrick Gibson

Con anima ♩ = 104

The musical score is written for a 4/4 time signature with a key signature of three flats (B-flat major or D-flat minor). The tempo is marked 'Con anima' with a quarter note equal to 104 beats per minute. The score includes parts for Oboe, Clarinet in B-flat, Piano, Synthesizer, Harp, Violin, and Double Bass. The Oboe and Clarinet in B-flat parts are mostly rests, with the Clarinet in B-flat playing a rhythmic pattern of eighth notes starting in the second measure, marked with a *p* dynamic. The Piano part features a *pp* dynamic with a melodic line in the right hand and a sustained chord in the left hand. The Synthesizer part is mostly rests, with a MIDI controller mapping note for the Anthemic Synth Lead. The Harp part is mostly rests. The Violin part starts with a *vib.* marking and a *p* dynamic, playing a melodic line that includes a *come sopra* marking. The Double Bass part is mostly rests.

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V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

5

Ob.

Bb Cl.

Pno.

Synth

Hp.

Vln.

*mf*

*f*

*f*

*mf*

*mp*

*f*

*f*

*vib.*

Mod Wheel for Vibrato

MIDI Mapped Volume Control Fader 1

(8va)

Detailed description: This page of a musical score is for the fifth movement, 'The Promenade of Elements: "A Fascinating Study in Numbers"'. It features six staves: Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Synthesizer (Synth), Harp (Hp.), and Violin (Vln.). The key signature has three flats (B-flat major or D-flat minor), and the time signature is 4/4. The score begins at measure 5. The Oboe and B-flat Clarinet parts play a rhythmic eighth-note pattern, with dynamics ranging from mezzo-forte (mf) to forte (f). The Piano part features sustained chords in the right hand, with a forte (f) dynamic. The Synthesizer part has a melodic line in the right hand that includes a vibrato effect (vib.) and a dynamic of mezzo-forte (mf). A MIDI control box is present, indicating that the Mod Wheel is mapped for vibrato and the Volume Control Fader 1 is mapped for volume. The Harp part plays sustained chords, with dynamics of mezzo-piano (mp) and forte (f). The Violin part plays a melodic line with a forte (f) dynamic. The score includes various musical notations such as slurs, accents, and dynamic markings.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

9

Ob. *solo*  
*mf*

9

Pno. *(8<sup>va</sup>)*  
*sub. mp*

9

Synth *p*

9

Hp. *sub. mp*

Detailed description: This page of a musical score features four staves. The first staff is for the Oboe (Ob.), marked 'solo' and 'mf', with a measure number '9'. The second staff is for the Piano (Pno.), marked '(8<sup>va</sup>)' and 'sub. mp', with a measure number '9'. The third staff is for the Synthesizer (Synth), marked 'p', with a measure number '9'. The fourth staff is for the Harp (Hp.), marked 'sub. mp', with a measure number '9'. The key signature is three flats (B-flat, E-flat, A-flat), and the time signature is 4/4. The score shows melodic lines for the Oboe and Synthesizer, and sustained chords for the Piano and Harp.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

①

Ob.

Bb Cl.

Pno.

Synth

Hp.

D.B.

13 (8<sup>va</sup>)

13

1. Solo

*mp*

A B Ab D Bb E

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

16

Ob. *mf*

Bb Cl. *mf*

Pno. *mf*

Synth *mp*  
MIDI Mapped  
Volume Control  
Fader 1

Hp. *mf*  
G Db A Gb Eb D G B E

D.B. *mf*

Detailed description: This page of a musical score is for the piece "V. The Promenade of Elements: 'A Fascinating Study in Numbers'". It features six staves: Oboe (Ob.), Bb Clarinet (Bb Cl.), Piano (Pno.), Synthesizer (Synth), Harp (Hp.), and Double Bass (D.B.). The music is in a key with three flats and a 4/4 time signature. The score begins at measure 16. The Oboe and Bb Clarinet parts have a dynamic marking of *mf*. The Piano part also has a dynamic marking of *mf*. The Synthesizer part has a dynamic marking of *mp* and includes a MIDI mapping instruction: "MIDI Mapped Volume Control Fader 1". The Harp part has a dynamic marking of *mf* and includes chord diagrams: G Db, A, Gb Eb, and D G B E. The Double Bass part has a dynamic marking of *mf*. The score is written in a single system with a repeat sign at the end of the first measure of each staff.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

19

Ob.

Bb Cl.

Pno.

Synth

Hp.

Vln.

D.B.

*f*

*f*

*f*

*mf*

*n.*

*f*

*f*

*mf*

*f*

*tutti*

*solo*

*portato*

Bb F# C# B A#



V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

The musical score consists of four staves: Pno., Synth, Vln., and D.B. The key signature is three flats (B-flat, E-flat, A-flat) and the time signature is 4/4. Measure 22 is marked with a '22' above the first staff. The Pno. staff features a piano (*pp*) accompaniment with a complex rhythmic pattern in the right hand and sustained chords in the left hand. The Synth staff is mostly silent, with a *ppp* dynamic marking and a MIDI control box labeled 'MIDI Mapped Volume Control Fader 1' appearing in the third measure. The Vln. staff has a piano (*pp*) dynamic marking and features a melodic line with a long note in the first measure. The D.B. staff also has a piano (*pp*) dynamic marking and provides a bass line with a long note in the first measure.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

25

Ob. *mp*

Bb Cl. *mp*

Pno. *mp*

Synth

Vln. *mp*

D.B. Div.

3

Detailed description: This page of a musical score, numbered 25, features six staves. The top staff is for Oboe (Ob.), the second for B-flat Clarinet (Bb Cl.), the third and fourth for Piano (Pno.), the fifth for Synthesizer (Synth), the sixth for Violin (Vln.), and the seventh for Double Bass (D.B.). The key signature is three flats (B-flat major or D-flat minor). The Oboe and Violin parts have a dynamic marking of *mp* (mezzo-piano). The Piano part also has a *mp* marking. The Double Bass part includes a 'Div.' (divisi) marking. The score shows musical notation for measures 25 through 27, with a triplet of eighth notes in the final measure of each staff.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

28

Ob.

Bb Cl.

Synth

Hp.

Vln.

D.B.

*mf*

*f*

*mp*

*f*

Bb Db A Eb C D E

Unis.

*f*

2

solo

*pp*

*p*

*p*

31

Hp.

*p*

Db

31

come sopra

sub.

*p*

Detailed description: This page of a musical score contains two systems of staves. The first system (measures 28-30) features five staves: Oboe (Ob.), Bb Clarinet (Bb Cl.), Synth, Harp (Hp.), and Violin (Vln.) with Double Bass (D.B.). The Oboe and Bb Clarinet parts are marked with a forte (*f*) dynamic. The Synth part is marked mezzo-piano (*mp*). The Harp part is marked mezzo-forte (*mf*) and includes a chord chart with notes Bb, Db, A, Eb, C, D, and E. The Violin and Double Bass parts are marked forte (*f*), with the Double Bass part also marked 'Unis.'. The second system (measures 31-33) features four staves: Oboe (Ob.), Bb Clarinet (Bb Cl.), Harp (Hp.), and Violin (Vln.). The Oboe part is marked 'solo' and mezzo-piano (*pp*). The Bb Clarinet part is marked piano (*p*). The Harp part is marked piano (*p*) and includes a chord chart with the note Db. The Violin part is marked 'come sopra' and piano (*p*), with a 'sub.' marking below the staff.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Ob. *mf* *mf* *f* flz.

Bb Cl. *mf*

Pno. *mp*

Hp. *sub. p* Ab

Vln. *pizz.*

D.B. *mf*

Detailed description: This page of a musical score covers measures 34, 35, and 36. The key signature is three flats (B-flat major or D-flat minor). The score is arranged in five systems. The first system contains the Oboe (Ob.) and B-flat Clarinet (Bb Cl.) parts. The Oboe part starts with a sixteenth-note triplet in measure 34, followed by a half-note in measure 35, and a half-note in measure 36. The Bb Cl. part plays a rhythmic pattern of eighth notes in measure 34, followed by a half-note in measure 35, and a half-note in measure 36. The second system contains the Piano (Pno.) part, which has a right-hand part starting in measure 35 and a left-hand part starting in measure 34. The third system contains the Harp (Hp.) part, which has a left-hand part starting in measure 34 and a right-hand part starting in measure 35. The fourth system contains the Violin (Vln.) part, which has a half-note in measure 34 and a half-note in measure 35. The fifth system contains the Double Bass (D.B.) part, which has a half-note in measure 34 and a half-note in measure 35. Dynamics include *mf*, *f*, *mp*, *sub. p*, and *pizz.*. Performance markings include *flz.* (flautando) for the Oboe and *pizz.* (pizzicato) for the Double Bass.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Ob. *mf* *mp* 3

Bb Cl. *mf* *mp* *sub. p*

Pno. *f* *mp* *sub. p*

Hp. *f* *mp* *sub. p*

Chord Chart:  
B Bb A Ab Cb Gb C Eb Fb

Vln. *f* *mp* arco

D.B. *f* *mp* *sub. p*

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

40

Ob.

*mf*  $\longleftarrow$  *f* *f* *agitato*

Bb Cl.

*f*

Pno.

*f*

Hp.

*f* *agitato*

A Ab E B G#

D.B.

*f*

Detailed description: This is a page of a musical score for five instruments: Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), and Double Bass (D.B.). The score is in 4/4 time and begins at measure 40. The Oboe part starts with a dynamic of mezzo-forte (mf) and increases to forte (f) by measure 42, where it becomes agitato. The Bb Clarinet, Piano, and Double Bass parts all play a sustained chord of F major (F, A, C) in the left hand and a melodic line in the right hand, with dynamics of forte (f). The Harp part has a similar accompaniment but includes specific chord voicings: A, Ab, E, B, and G# in the right hand. The tempo/mood marking 'agitato' appears above the Oboe and Harp parts in measure 42.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

43

Ob. *sub.* *mp*

Bb Cl. *sub.* *mp*

Pno. *mp* *mf*

Synth *sub.* *p*  
MIDI Mapped  
Volume Control  
Fader 1

Hp. *sub.* *mp* *mf*  
F# A E B

Vln.

D.B. *sub.* *mp*

Detailed description: This page of a musical score, numbered 43, features seven staves. The top two staves are for Oboe (Ob.) and B-flat Clarinet (Bb Cl.), both marked *sub.* and *mp*. The piano (Pno.) part is in the middle, with dynamics *mp* and *mf*. The synthesizer (Synth) part is marked *sub.* and *p*, with a box indicating it is MIDI Mapped to Volume Control Fader 1. The harp (Hp.) part is marked *sub.* and *mp*, with *mf* dynamics and chord markings F#, A, E, and B. The violin (Vln.) and double bass (D.B.) parts are at the bottom, with the D.B. marked *sub.* and *mp*. The score is in 4/4 time and includes various musical notations such as slurs, accents, and dynamic markings.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

46 *agitato* ( $\text{♩} = \text{♩}$ )

Ob. *f*

Bb Cl. *f*

8<sup>va</sup>

Pno. *mf* *f*

Synth *mp* *mf*

Hp. *mf* *f*

Bb B Eb D F Gb Ab A

Vln. *mf* *f*

D.B. *f*

Detailed description: This page of a musical score is for the fifth movement, 'The Promenade of Elements: "A Fascinating Study in Numbers"'. It features seven staves: Oboe (Ob.), Bb Clarinet (Bb Cl.), Piano (Pno.), Synthesizer (Synth), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music begins at measure 46 in a 3/4 time signature with a key signature of three flats. The Oboe and Bb Clarinet parts are marked 'agitato' and 'f' (forte). The Piano part has a 'mf' (mezzo-forte) dynamic. The Synthesizer part starts with 'mp' (mezzo-piano) and moves to 'mf'. The Harp part includes a '8<sup>va</sup>' (octave) marking and has dynamics of 'mf' and 'f'. The Violin part starts with 'mf' and moves to 'f'. The Double Bass part is marked 'f'. The score includes various articulations such as accents and slurs, and a tempo change to 3/8 time indicated by a double bar line with a '3/8' below it. The Harp part includes chord diagrams: Bb, B, Eb, D, F, Gb, Ab, and A.



V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

49

Ob. *sub. mp* *pp* 4

Bb Cl. *sub. mp* *pp* solo

Hp. *p*

Vln. *sub. mp* *pp*

52

Ob. *mp* 3 3

Bb Cl.

Hp. Bb B G Db E Ab

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

55

Ob.

Bb Cl.

Hp.

56

Ob.

Bb Cl.

Hp.

Vln.

*f*

*sub. mp*

*pizz.*

*mp* *mf*

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

57

Ob. *mf*

Bb Cl. *mf*

Harp. Eb

Vln. *mf* *f*

58

Ob. *f*

Bb Cl. *f* *sub. mp*

Harp. *f* E *gliss.* *solo* *sub. mp*

Vln. *f* arco

Detailed description: This page contains two systems of musical notation for measures 57 and 58. The first system (measures 57-58) features four staves: Oboe (Ob.), Bb Clarinet (Bb Cl.), Harp (Hp.), and Violin (Vln.). In measure 57, the Oboe plays a half note with a dynamic of *mf*. The Bb Clarinet plays a triplet of eighth notes. The Harp plays a half note Eb. The Violin plays a half note with a dynamic of *mf*. In measure 58, the Oboe plays a half note with a dynamic of *f*. The Bb Clarinet plays a half note with a dynamic of *f*, followed by a triplet of eighth notes with a dynamic of *sub. mp*. The Harp plays a half note with a dynamic of *f*, including a glissando (gliss.) and a solo section with a dynamic of *sub. mp*. The Violin plays a half note with a dynamic of *f* and is marked *arco*. The second system (measures 58-59) features the same four staves. In measure 58, the Oboe plays a half note with a dynamic of *f*. The Bb Clarinet plays a half note with a dynamic of *f*, followed by a triplet of eighth notes with a dynamic of *sub. mp*. The Harp plays a half note with a dynamic of *f*, including a glissando (gliss.) and a solo section with a dynamic of *sub. mp*. The Violin plays a half note with a dynamic of *f* and is marked *arco*. In measure 59, the Oboe plays a half note with a dynamic of *f*. The Bb Clarinet plays a half note with a dynamic of *f*, followed by a triplet of eighth notes with a dynamic of *sub. mp*. The Harp plays a half note with a dynamic of *f*, including a glissando (gliss.) and a solo section with a dynamic of *sub. mp*. The Violin plays a half note with a dynamic of *f* and is marked *arco*.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

59

Hp.

60

Bb Cl.

*mf*

60

Pno.

*mf*

60

Hp.

*mf*

*gliss.*

*gliss.*

60

Vln.

*arpeggiando*

*mf*

Detailed description: This page of a musical score covers measures 59 and 60. It features four staves: Harp (Hp.), Bb Clarinet (Bb Cl.), Piano (Pno.), and Violin (Vln.). Measure 59 is primarily a Harp part with a series of six triplet eighth notes in the right hand, while the left hand is silent. Measure 60 is more complex, with the Bb Clarinet playing a triplet eighth-note figure in the right hand and a triplet eighth-note figure in the left hand, both marked *mf*. The Piano part has a triplet eighth-note figure in the right hand and a triplet eighth-note figure in the left hand, also marked *mf*. The Harp part features a glissando in the right hand, marked *mf*, with a triplet eighth-note figure in the left hand. The Violin part has an arpeggiando figure in the right hand, marked *mf*. The score includes various musical notations such as triplets, glissandos, and dynamic markings.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

61

Ob. *mf*

Bb Cl. *mf*

Pno. *mf*

Hp. *mf* *gliss.*

Vln. *come sopra*

62

63

64

Detailed description: This page of a musical score covers measures 61 to 64. The score is for five instruments: Oboe (Ob.), Bass Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), and Violin (Vln.). The key signature has three flats (B-flat, E-flat, A-flat) and the time signature is 3/4. Measure 61: The Oboe plays a melodic line of eighth notes in groups of three (triplets), marked *mf*. The Bass Clarinet has a whole rest. The Piano and Harp have whole rests. The Violin plays a melodic line of eighth notes, marked *come sopra*. Measure 62: The Oboe has a whole rest. The Bass Clarinet plays a half note chord, marked *mf*. The Piano and Harp have whole rests. The Violin has a whole rest. Measure 63: The Oboe has a whole rest. The Bass Clarinet has a whole rest. The Piano and Harp play a triplet of eighth notes, marked *mf*. The Violin has a whole rest. Measure 64: The Oboe has a whole rest. The Bass Clarinet has a whole rest. The Piano and Harp play a glissando (marked *gliss.*) over a series of notes, marked *mf*. The Violin has a whole rest.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

62

Ob. *mf* *f*

Bb Cl. *f*

Pno. *mf* *f*

Hp. *gliss.* *f*

Vln. *f*

D.B. *mf* *f*

Detailed description: This page of a musical score is for the fifth movement, 'The Promenade of Elements: "A Fascinating Study in Numbers"'. It features six staves: Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The music is in 3/4 time and begins at measure 62. The Oboe part starts with a half note G4, followed by a half note A4, and then a series of triplet eighth notes (G4, A4, B4) that increase in volume from mezzo-forte (mf) to forte (f). The Bb Clarinet part has a half rest followed by a half note G4. The Piano part has a half note G4, followed by a half note A4, and then a series of triplet eighth notes (G4, A4, B4) that increase in volume from mf to f. The Harp part features a glissando (gliss.) over a series of notes, starting with a half note G4 and ending with a half note A4, with a forte (f) dynamic. The Violin part has a half note G4, followed by a half note A4, and then a series of triplet eighth notes (G4, A4, B4) that increase in volume from mf to f. The Double Bass part has a half note G4, followed by a half note A4, and then a series of triplet eighth notes (G4, A4, B4) that increase in volume from mf to f.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

63

Ob. *sub.* *ff*

Bb Cl. *sub.* *ff*

Pno. *sub.* *ff*

Synth *sub.* *ff*

Hp. *sub.* *ff* *gliss.* *gliss.*

Vln. *sub.* *ff*

D.B. *sfz* *sfz* *sfz*

Detailed description: This page of a musical score, numbered 273, contains seven staves of music for different instruments. The music is in a key with two flats and a 3/4 time signature. The score begins at measure 63. The Oboe (Ob.) and Bass Clarinet (Bb Cl.) parts feature triplets of eighth notes, marked with a 'sub.' dynamic and fortissimo (ff). The Piano (Pno.) and Synthesizer (Synth) parts also play triplets of eighth notes, similarly marked. The Harp (Hp.) part has a complex texture with triplets and glissandos, also marked with 'sub.' and 'ff'. The Violin (Vln.) part plays a triplet of eighth notes, marked with 'sub.' and 'ff'. The Double Bass (D.B.) part plays a triplet of eighth notes, marked with sfz. The score concludes with a double bar line at the end of the page.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Pensively

♩ = 58

64 *leggiero*  
Ob. *pp* *p* *sfz* *f* *sub. mp*

64 *leggiero*  
Bb Cl. *pp* *p* *sfz* *f* *sub. mp*

64 *leggiero e vibrato* *come sopra*  
Vln. *pp* *p* *sfz* *f* *sub. mp*

67 *mf*  
Ob. *mf*

67 *mf*  
Bb Cl. *mf*

67 *mf*  
Vln. *mf*



V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

70

Ob. *sfz* *f* *sub. mp*

Bb Cl. *sfz* *f* *sub. mp*

Pno. *sfz* *f* *sub. mp*

Hp. *Ped. throughout* L.V. *sub. mp*

Vln. *sfz* *f* *sub. mp* *sul pont.*

D.B. *snap pizz.* *sub. mp*

Detailed description: This page of a musical score covers measures 70 to 72. It features six staves: Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score is in 2/4 time, with a key signature of one sharp (F#). At measure 70, the Oboe and Bb Clarinet play a melodic line starting with a half note G4 (marked with a *b* and *v* above it) and a quarter note A4. The Piano accompaniment consists of a half note chord of G4 and Bb4. The Harp part shows a chord diagram for G and Bb in the right hand, and a half note chord of D#4 and F#4 in the left hand. The Violin plays a half note G4 and a quarter note A4. The Double Bass plays a half note G2 and a quarter note A2. Dynamics include *sfz* and *f* for the initial notes, and *sub. mp* for the sustained notes. Performance instructions include *Ped. throughout* for the harp and *sul pont.* for the violin. The Double Bass part includes *snap pizz.* for the initial notes.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

73

Ob. *mf* *f*

Bb Cl. *mf* *f*

Pno. L.V. *mf*

Synth *n.* *mp*  
MIDI Mapped  
Volume Control  
Fader 1

Hp. *mf* A#  
B

Vln. *mf* *f* ord.

D.B. *sub.* *mp* *f* ord. pizz. arco



V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

79

Ob. *p*

Bb Cl. *sub. p*

Pno. *sub. p*

Synth *sub. pp*

Hp. *f* G# *sub. p* A#

Vln. *sub. p*

D.B. *sub. p*

Detailed description: This page of a musical score covers measures 79, 80, and 81. The score is for a full orchestra and includes parts for Oboe (Ob.), Bb Clarinet (Bb Cl.), Piano (Pno.), Synthesizer (Synth), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The key signature is one sharp (F#) and the time signature is 4/4. Measure 79 begins with a forte (*f*) dynamic for the Harp, which plays a series of chords (G#). The Oboe and Bb Clarinet parts enter in measure 80 with a piano (*p*) dynamic. The Piano, Synthesizer, and Violin parts also enter in measure 80 with a *sub. p* dynamic. The Double Bass part enters in measure 80 with a *sub. p* dynamic. In measure 81, the Harp continues with a *sub. p* dynamic, playing chords (A#). The Oboe, Bb Clarinet, Piano, Synthesizer, and Violin parts continue with their respective dynamics.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

82 *leggiero* *pp* *p* *sfz* *f* *come sopra* *sub. pp*

Ob.

82 *leggiero* *pp* *p* *sfz* *f* *come sopra* *sub. pp*

Bb Cl.

82 *leggiero* *pp* *p* *sfz* *f* *come sopra* *sub. pp*

Pno.

82 *leggiero* *ppp* *pp* *sfz* *f* *come sopra* *sub. pp*

Synth

MIDI Mapped  
Volume Control  
Fader 1

82 *leggiero* *ppp* *pp* *sfz* *f* *come sopra* *sub. pp*

Hp.

L.V. *leggiero* *pp* *sub. pp*

G  
Bb

82 *leggiero* *pp* *p* *sfz* *f* *come sopra* *sub. pp*

Vln.

sul pont. *pp* *pp*

D.B.



V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

6 **Tempo Primo**  
♩ = 104

Ob. *pp*

Bb Cl. *pp*

Hp. *pp* A

Pno. *pp* *mf*

Synth *ppp* *mp* *n.*  
MIDI Mapped  
Volume Control  
Fader 1

Hp. *p* A L.V.

Vln. *p* *mf*

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Musical score for V. The Promenade of Elements: "A Fascinating Study in Numbers". The score is for measures 92-93 and includes parts for Oboe (Ob.), Bb Clarinet (Bb Cl.), Piano (Pno.), Synthesizer (Synth), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.).

**Ob.:** Measure 92 is a whole rest. Measure 93 features a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *f*.

**Bb Cl.:** Measure 92 is a whole rest. Measure 93 features a melodic line starting on G#3, moving to A3, B3, C#4, and D4, with a dynamic marking of *f*.

**Pno.:** Measure 92 has a right-hand part with a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *mf*. The left hand has a bass line starting on G#2, moving to A2, B2, C#3, and D3, with a dynamic marking of *f*. Measure 93 continues the right-hand part with a dynamic marking of *f* and the left hand with a dynamic marking of *f*.

**Synth:** Measure 92 has a right-hand part with a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *p*. The left hand has a bass line starting on G#2, moving to A2, B2, C#3, and D3, with a dynamic marking of *mf*. A box labeled "MIDI Mapped Volume Control Fader 1" is present in the right-hand part. Measure 93 has a whole rest in both hands.

**Hp.:** Measure 92 is a whole rest. Measure 93 features a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *f*. The left hand has a bass line starting on G#2, moving to A2, B2, C#3, and D3, with a dynamic marking of *f*.

**Vln.:** Measure 92 has a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *mf*. Measure 93 features a melodic line starting on G#4, moving to A4, B4, C#5, and D5, with a dynamic marking of *f* and the instruction *detaché*.

**D.B.:** Measure 92 is a whole rest. Measure 93 features a melodic line starting on G#2, moving to A2, B2, C#3, and D3, with a dynamic marking of *f* and the instruction *ord. detaché*.





V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Tempo Primo  
♩ = 104

7

Ob. *p* *mf* *p* *molto leggiero*

Bb Cl. *p* *mf* *sub. p* *molto leggiero*

Hp. *sub. p* *loco molto leggiero*

Vln. *p* *mf* *sub. p* *molto leggiero*

Ab F Db Bb

103

Ob. *pp*

Bb Cl. *pp*

Pno. *pp* *molto leggiero*

Hp. *pp*

Vln. *pp*

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

Largo  $\text{♩} = 46$

8

*très doucement*

106

Ob.

Bb Cl.

Pno.

Hp.

Vln.

*pp*

*très doucement*

*pp*

(8<sup>va</sup>)

*très doucement*

*pp*

Detailed description: This page of a musical score covers measures 106, 107, and 108. The score is for five instruments: Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), and Violin (Vln.). The key signature has three flats (B-flat, E-flat, A-flat), and the time signature is common time. The tempo is marked 'Largo' with a quarter note equal to 46 beats. A circled number '8' indicates the start of a section. The performance instructions are 'très doucement' (very softly) and 'pp' (pianissimo). The Oboe and B-flat Clarinet parts play a sustained note in measure 106, followed by a melodic line in measures 107 and 108. The Piano and Harp parts play chords in measure 106 and have rests in the following measures. The Violin part plays a sustained note in measure 106 and a melodic line in measures 107 and 108. A harp glissando is indicated in measure 107 with a dashed line and the notation '(8<sup>va</sup>)'. A harp part with vertical strokes is shown in measure 107.

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

109

Ob.

Bb Cl.

Pno.

Hp.

Vln.

D.B.

*loco*  
*très doucement*

*pp*

A D  
*très doucement*

ord.  
pizz.

*pp*

Detailed description: This page of a musical score covers measures 109, 110, and 111. The score is for six instruments: Oboe (Ob.), Bb Clarinet (Bb Cl.), Piano (Pno.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The key signature has three flats (Bb, Eb, Ab) and the time signature is 3/4. The Oboe and Bb Clarinet parts play a melodic line starting with a half rest in measure 109, followed by quarter notes in measure 110, and quarter notes with a slur in measure 111. The Piano part has a half rest in measure 109, then plays a series of chords in measure 110 marked *pp*, and continues with chords in measure 111. The Harp part has a half rest in measure 109, then plays a series of chords in measure 110 marked *très doucement* with fingerings A and D, and continues with chords in measure 111. The Violin part plays a melodic line with quarter notes in measure 109, quarter notes in measure 110, and quarter notes with a slur in measure 111. The Double Bass part has a half rest in measure 109, then plays a series of chords in measure 110, and continues with chords in measure 111 marked *pp* and *ord. pizz.*

V. The Promenade of Elements:  
"A Fascinating Study in Numbers"

*rit.*

112

Ob. *pp* *mp* *n.*

Bb Cl. *pp* *mp* *n.*

Pno. *pp*

Synth. *pppp* *p* *n.*

Hp. *pp*

Vln. *pp* *mp* *pppp*

Div. arco

D.B. *pp* *mp* *pppp*

The image shows a page of a musical score for a symphony. It features six systems of staves, each for a different instrument. The instruments are Oboe (Ob.), B-flat Clarinet (Bb Cl.), Piano (Pno.), Synthetizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.). The score is in a key with three flats (B-flat major or D-flat minor) and a 4/4 time signature. The page number 112 is written at the beginning of each system. The tempo is marked 'rit.' (ritardando). The dynamics are indicated by *pp* (pianissimo), *mp* (mezzo-piano), *p* (piano), and *pppp* (pianississimo). The notation includes various note values, rests, and slurs. The Oboe and B-flat Clarinet parts have a crescendo from *pp* to *mp* and then a decrescendo to *n.* (no sound). The Piano part has a *pp* dynamic. The Synthetizer part has a crescendo from *pppp* to *p* and then a decrescendo to *n.* The Harp part has a *pp* dynamic. The Violin part has a crescendo from *pp* to *mp* and then a decrescendo to *pppp*. The Double Bass part has a *pp* dynamic and includes the instruction 'Div. arco' (divisi arco).

## Appendix B: Music Analyses

### Analysis 1

#### Derivation of Forte Set Class 6-Z29<sup>341</sup>

#### **Analysis of Set Class Employed in “Nuclear Chain Reaction” Scene in *Our Friend the Atom* (1957) by Oliver Wallace {1,4,6,7,10,11}**

Rotations	Span Intvl (PC1 - 5)	
A: {4,6,7,10,11,1}	9	7
B: {6,7,10,11,1,4}	10	7
C: {7,10,11,1,4,6}	11	9
D: {10,11,1,4,6,7}	9	8
E: {11,1,4,6,7,10}	11	8
F: {1,4,6,7,10,11}	10	9

#### Calculation of the Normal Form, Transposed to T8

A: T8 {0,2,3,6,7,9}	7
D: T2 {0,1,3,6,8,9}	8

A is Normal Form of Set Class

---

<sup>341</sup> These analyses use the methodology for determining the normal form of a post-tonal set class, referred to here as a Forte Set Class, as described by Joseph Straus in his seminal book on Post-Tonal Music Theory. See Joseph N. Straus, *Introduction to Post-Tonal Theory*, 3rd ed. [Upper Saddle River, NJ: Pearson/Prentice Hall, 2005], 35-38 and 261-264. For the calculation of the normal form, per Straus, the set class is transposed by a value that renders its initial pitch-class as equal to 0. This aids in identifying it in a Forte Set Class chart.

## Analysis 2

### Derivation of Forte Set Class 6-Z4

**Analysis of Set Class Employed in “The Atomic Genie”  
Scene (mm. 1-2) in *Our Friend the Atom* (1957) by Oliver  
Wallace {11,0,1,3,4,5}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {0,1,3,4,5,11}	11	5
B: {1,3,4,5,11,0}	11	10
C: {3,4,5,11,0,1}	10	9
D: {4,5,11,0,1,3}	11	9
E: {5,11,0,1,3,4}	11	10
F: {11,0,1,3,4,5}	6	5

Calculation of the Normal Form, Transposed to T1

**F: T1 {0,1,2,4,5,6}                      5**

F is Normal Form of Set Class

### Analysis 3

#### Derivation of Forte Set Class 9-10

**Analysis of Complete Set Class Employed over the course of “The Atomic Genie” Scene, (mm. 1-5, omitting the pickup bar) in *Our Friend the Atom* (1957) by Oliver Wallace {1,2,4,5,6,7,8,10,11}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {2,4,5,6,7,8,10,11,1}	11	9
B: {4,5,6,7,8,10,11,1,2}	10	9
C: {5,6,7,8,10,11,1,2,4}	11	9
D: {6,7,8,10,11,1,2,4,5}	11	10
E: {7,8,10,11,1,2,4,5,6}	11	10
F: {8,10,11,1,2,4,5,6,7}	11	10
G: {10,11,1,2,4,5,6,7,8}	10	9
H: {11,1,2,4,5,6,7,8,10}	11	9
I: {1,2,4,5,6,7,8,10,11}	10	9

#### Calculation of the Normal Form, Transposed to T8

<b>B: T8 {0,1,2,3,4,6,7,9,10}</b>	<b>9</b>
G: T2 {0,1,3,4,6,7,8,9,10}	9
I: T11 {0,1,3,4,5,6,7,9,10}	9

B is Normal Form of Set Class





## Analysis 5

### Derivation of Forte Set Class 4-23

**Analysis of Set Class Employed in “II. Democritus and the Lost Concept of *Atomos*” (m. 49 in the harp part) of *Nexus: Music for a Shadow Animation* (2019) by Patrick Gibson**  
**{10,0,5,7}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {0,5,7,10}	10	7
B: {5,7,10,0}	7	5
C: {7,10,0,5}	10	5
D: {10,0,5,7}	9	7

Calculation of the Normal Form, Transposed to T7

**B: T7 {0,2,5,7}      7**

B is Normal Form of Set Class

## Analysis 6

### Derivation of Forte Set Class 4-10

**Analysis of Set Class Employed in “II. Democritus and the Lost Concept of *Atomos*” (m. 50, in the ensemble) of *Nexus: Music for a Shadow Animation* (2019) by Patrick Gibson**  
**{1,6,3,4}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {4,6,1,3}	11	9
B: {6,1,3,4}	10	9
C: {1,3,4,6}	5	3
D: {3,4,6,1}	10	3

Calculation of the Normal Form, Transposed to T11

**C: T11 {0,2,3,5}      5**

C is Normal Form of Set Class

## Analysis 7

### Derivation of Forte Set Class 4-10

**Analysis of Set Class Employed in “II. Democritus and the Lost Concept of *Atomos*” (m. 51 in the harp part) of *Nexus: Music for a Shadow Animation* (2019) by Patrick Gibson**  
**{8,7,5,10}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {7,8,10,5}	10	3
B: {8,10,5,7}	11	9
C: {10,5,7,8}	10	9
D: {5,7,8,10}	5	3

Calculation of the Normal Form, Transposed to T7

**D: T7 {0,2,3,5}      5**

D is Normal Form of Set Class

## Analysis 8

### Derivation of Forte Set Class 5-23

**Analysis of Set Class Employed in “II. Democritus and the Lost Concept of *Atomos*” (m. 52 of the ensemble) of *Nexus: Music for a Shadow Animation* (2019) by Patrick Gibson**  
**{3,5,7,0,2}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {2,3,5,7,0}	10	5
B: {3,5,7,0,2}	11	9
C: {5,7,0,2,3}	10	9
D: {7,0,2,3,5}	10	8
E: {0,2,3,5,7}	7	5

Calculation of the Normal Form, without Transposition

**E: T0 {0,2,3,5,7}7**

E is Normal Form of Set Class

## Analysis 9

### Derivation of Quasi-Forte Set Class 4-28\*

**Analysis of Set Class Employed in *Universe of Energy* (c. 7:04-7:13) by Norman “Buddy” Baker {2,9,5,8}**

<u>Rotations</u>	<u>Span Intvl (PC1 - 5)</u>	
A: {8,9,2,5}	9	6
B: {9,2,5,8}	11	6
C: {2,5,8,9}	7	6
D: {5,8,9,2}	9	4

Calculation of the Normal Form, Transposed to T10 of Initial Pitch-Class in the Set

**C: T10 {0,3,6,7}      9**

\*This set class contains {7} instead of {9}. As a result, this set class is not truly 4-28, but resembles it in three of pitch-classes and contains the diminished triad in 4-28.

C is Normal Order of Set Class.







# Rhythmic Transformations

Pre-Composition for *Nexus: Music*  
for a *Shadow Animation*,  
I. "Heat through an Atomic Eye" (Cont'd)

8  
Libson

Rhythmic Cell/Transformations  
for Transitional Theme  
(based on material @ mm. 17-18, First Staff)

*Carta* No. 27

## Appendix D: Musical Examples

Fig. 1 - George Bruns, *Man in Space*: "Tests and Observations"

### Man in Space: "Tests and Observations"

from the Disneyland Television Anthology Episode  
c. 45:18ff.

George Bruns  
Transcription by Patrick Gibson

Adagietto  
♩ = 84

"Space medicine will benefit from tests conducted..."

Flutes

Bass Flute

Violins I and II  
Doubled by  
Intermittent  
FM Frequency  
at (6)

Timpani

Bass Drum

Orchestra

pp

ppp

mf

f

6 5 6 5 6 5

8 11 8 11

6 5 6 5 6 5

sul pont.

10 1

"Tests and observations by the crew..."

©1955 The Walt Disney Company

Un poco più adagio ♩ = 68  
"...and will add to our knowledge of many sciences."

The musical score is arranged in five staves. The top staff is for Flutes, marked with *rit. un poco* and *rit.* The second staff is for Bassoon, marked *p*. The third staff is for Violin I, marked *pp*. The fourth staff is for Violin II/Violas Divisi, marked *pp*. The fifth staff is for Timpani, marked *staccato* and *mp*. A Harp part is indicated with *L.V.* and *p*. The score includes various musical notations such as slurs, accents, and dynamic markings.

**"Instrument Rocket approaching  
from three o'clock high."** [Cue continues after this bar]

13 *mf*

*mp*

13 **Horns**

**Trombones/Bass Trombone**

*sub.*  
***ff***

*mf*    *sub.*  
***p***    ***ff***    *sub.*  
***p***    ***ff***

**Fig. 2 - George Bruns: *Man and the Moon*, "Zero Gravity Motive"**

Analysis of Tomorrowland: "Man in Space  
(Zero Gravity Motive)" by George Bruns

George Bruns

**Mysterious, ominous**  
♩ = 96

Piano

1 2 10 9 5 7 3 4 1 2 10 9 5 7 3 4 1 2 10 9 5 7 3 4 1

*p*

4

Pno.

10 8 6 4 2 10 8 6 4 2

2 10 9 5 7 3 4 1 2 10 9 5 7 3 4 1 2 10 9 5 7 3 4 1 2 10 9 5 7 3 4 1

©1955 The Walt Disney Company

Fig. 3 - Oliver Wallace: *Our Friend the Atom*, "Nuclear Chain Reaction"

Our Friend the Atom: "Nuclear Chain Reaction" Scene

Oliver Wallace  
Transcribed by Patrick Gibson

Allegro ♩ = 126

"One neutron is enough to start it..."

Piano

Flutes

Xylophone, Flutes

*f*

Strings, Bb Clarinet

Presto ♩ = 152

Pno.

*ff*

Trombones (Wah Mute)

[Atomic Explosion]

Pno.

Fig. 4 - Norman "Buddy" Baker: *Universe of Energy*, "Primeval Diorama"

Universe of Energy: "Primeval Diorama"

Norman "Buddy" Baker  
Transcribed by Patrick Gibson

Adagio ♩ = 40  
c. 2:12

*pp*

Andante ♩ = 80  
c. 7:04

*pp*

*f*

**Fig. 5 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, IV. Curie's Discovery of Radium  
MM. 29-36**

The musical score is arranged in a vertical system with the following instruments and parts:

- Ob. (Oboe):** Part 3, marked *plus doucement*. The melody consists of eighth notes with a slur over the first two measures.
- B♭ Cl. (Bass Clarinet):** Part 1, marked *plus doucement*. The melody consists of eighth notes with a slur over the first two measures.
- Pno. (Piano):** Part 1, marked *plus doucement et L.V.*. The right hand has a melody of eighth notes, and the left hand has a bass line of eighth notes.
- Synth (Synthesizer):** Part 1, marked *doucement* and *mf*. The right hand has a melody of eighth notes, and the left hand is silent.
- F.M. (Foley Music):** Part 1, marked *mp* and *> mp*. The right hand has a complex rhythmic pattern of eighth notes, and the left hand has a bass line of eighth notes.
- Hp. (Harp):** Part 1, marked *plus doucement et L.V.*. The right hand has a melody of eighth notes, and the left hand has a bass line of eighth notes.
- Vln. (Violin):** Part 1, marked *mf*. The right hand has a melody of eighth notes.
- D.B. (Double Bass):** Part 1, marked *mf*. The right hand has a bass line of eighth notes, and the left hand has a bass line of eighth notes.

The score is divided into two systems, with the first system starting at measure 29 and the second system starting at measure 30. The key signature is one sharp (F#), and the time signature is 4/4.



Ob. *p*

B♭ Cl. *p*

Pno. *p* *avec un peu plus d'intensité*

Synth

F.M.

Hp. *gliss.* *pp*

Vln. *pp*

D.B. *pp*

33

Pno. *molto leggiero*  
L.V.  
sub.  
**mp**  
Ped.

Synth

F.M.

Vln. *molto leggiero*  
sub.  
**mp** **pp**

Detailed description: This page contains four staves of musical notation. The first staff is for Piano (Pno.), the second for Synthesizer (Synth), the third for F.M. (likely a harp or similar instrument), and the fourth for Violin (Vln.). All staves begin at measure 33. The Pno. part features a melody in the right hand and a bass line in the left hand, with a 'Ped.' (pedal) marking. The Synth part has a melodic line in the right hand and a bass line in the left hand. The F.M. part consists of a complex, rhythmic pattern in the right hand and a sustained bass line in the left hand. The Vln. part has a melodic line with dynamic markings: *molto leggiero*, *sub.*, **mp**, and **pp**. The page number 308 is centered at the bottom.

The musical score is divided into three systems, each starting at measure 35. The first system, labeled 'Pno.', consists of a grand staff with a treble clef on top and a bass clef on the bottom. Both staves contain a whole rest in each of the two measures. A horizontal line with a small upward-pointing triangle is positioned below the bass staff. The second system, labeled 'Synth', also consists of a grand staff with a treble clef on top and a bass clef on the bottom. Both staves contain a whole rest in each of the two measures. The third system, labeled 'F.M.', consists of a grand staff with a treble clef on top and a bass clef on the bottom. The treble staff contains a complex rhythmic pattern of eighth notes with stems pointing up, with a dynamic marking 'n.' at the end of the second measure. The bass staff contains a complex rhythmic pattern of eighth notes with stems pointing down, with a dynamic marking 'n.' at the end of the second measure. A horizontal line is positioned below the bass staff.

**Fig. 6 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, III. "Heat through an Atomic Eye"  
MM. 1-22**

Performance Note for Synthesizer:  
MIDI Mapped Track Fader 4 on MIDI Controller Used to Effect Dynamics  
Track Fader 4 = Volume  
Saw/Leather

III. "Heat through an Atomic Eye"

Moto perpetuo: Agitato  
♩ = 80

Patrick Gibson

The musical score is for the piece "Heat through an Atomic Eye" by Patrick Gibson, marked "Moto perpetuo: Agitato" with a tempo of 80 beats per minute. The score is in 4/4 time and features the following instruments:

- Oboe:** Enters in the third measure with a melodic line marked *mp*.
- Clarinet in Bb:** Enters in the third measure with a melodic line marked *mp*.
- Piano:** Remains silent throughout the first three measures.
- Synthesizer:** Plays a rhythmic pattern of eighth notes in the right hand, marked *p*. The left hand has a sustained bass note in the second and third measures.
- Harp:** Remains silent throughout the first three measures.
- Violin:** Remains silent throughout the first three measures.
- Double Bass:** Remains silent throughout the first three measures.

The score includes a MIDI controller mapping note for the synthesizer, indicating that Track Fader 4 is used for volume control and is mapped to a Saw/Leather sound.

Ob.

B♭ Cl.

Pno. *mf*

Synth.

pitch wheel up to pitch in next meas.

vib. vibrato with mod wheel

MIDI Mapped Volume Control Fader 4

Hp. *mp*

D.B. *mp*

Detailed description: This page of a musical score features six staves. The top two staves are for Oboe (Ob.) and B-flat Clarinet (B♭ Cl.), both playing eighth-note patterns with slurs. The Piano (Pno.) part has a melody in the right hand and accompaniment in the left hand, marked *mf*. The Synthesizer (Synth.) part has a long note with a wavy line indicating vibrato, marked *vib.*, with three performance instructions in boxes: 'pitch wheel up to pitch in next meas.', 'vibrato with mod wheel', and 'MIDI Mapped Volume Control Fader 4'. The Harp (Hp.) part has a melody in the right hand and accompaniment in the left hand, marked *mp*. The Double Bass (D.B.) part has a long note, marked *mp*. A rehearsal mark '4' is present at the beginning of each staff.

Ob.  $\textcircled{1}$   
B♭ Cl.  
Pno.  
Synth.  
Hp.  
Vln.  
D.B.

7 8 4/4

$(\text{♩}=\text{♩})$   $(\text{♩}=\text{♩})$

*f* *mp* *mf*

*mp* *f* *mp* *mf*

*f* *mp*

*p* *mp* *p* *p*

*f* *mp*

*mp* *f* *mp*

spicc. ord. Div.

*f* *mp*



②  
(♩=♩)

The musical score consists of seven staves: Oboe (Ob.), Bass Clarinet (B♭ Cl.), Piano (Pno.), Synthesizer (Synth.), Harp (Hp.), Violin (Vln.), and Double Bass (D.B.).

- Ob.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *mf*. At measure 17, the dynamic changes to *ff*.
- B♭ Cl.:** Starts at measure 15 with a rest. At measure 16, it begins a melodic line with a dynamic of *f*. At measure 17, the dynamic changes to *ff*.
- Pno.:** Starts at measure 15 with a melodic line. At measure 16, it continues with a melodic line. At measure 17, it continues with a melodic line. At measure 18, it continues with a melodic line. The dynamic is *ff*.
- Synth.:** Starts at measure 15 with a melodic line. At measure 16, it continues with a melodic line. At measure 17, it continues with a melodic line. At measure 18, it continues with a melodic line. The dynamic is *f*.
- Hp.:** Starts at measure 15 with a melodic line. At measure 16, it continues with a melodic line. At measure 17, it continues with a melodic line. At measure 18, it continues with a melodic line. The dynamic is *ff*. There is a staccato instruction: "Execute staccato with L.H." and a graphic notation consisting of vertical lines above the staff.
- Vln.:** Starts at measure 15 with a melodic line. At measure 16, it continues with a melodic line. At measure 17, it continues with a melodic line. At measure 18, it continues with a melodic line. The dynamic is *f*. There is a *spicc.* instruction above the staff.
- D.B.:** Starts at measure 15 with a melodic line. At measure 16, it continues with a melodic line. At measure 17, it continues with a melodic line. At measure 18, it continues with a melodic line. The dynamic is *ff*. There is a *Div.* instruction above the staff and a *spicc.* instruction above the staff.



③ (♩=♩)

Ob. *pp* *p*

B♭ Cl. *legato e cantabile* *p*

Pno. *8va* *sub. pp*

Hp. *ord.* *sub. pp* *ord.*

Vln. *ord. solo legato e cantabile* *sub. p*

D.B. *Div. ord. pizz.* *sub. p* *arco*

Fig. 7 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos* (MM. 47-52)

33 Nexus: Music for a Shadow Animation

Ob. *pp* *sub. f*

B♭ Cl. *pp* *sub. f*

Pno.

Hp. *p* *sub. f*  
A C Eb E F Eb Bb

Vln. *ord.* *p* *sub. f*  
*Unis. (p)*

D.B. *p* *sub. f*

50 *marcato* *rit. ord.*

Ob.

B♭ Cl.

*p*

*p*

50 *marcato* *R.H. ancora marcato*

Pno.

*marcato* *legato*

50 *simile*

Hp.

F#  
C#  
Ab  
F  
A

50 *marcato* *detaché*

Vln.

*f*

*detaché*

D.B.

*marcato*  
*f*

Fig. 8 - Patrick Gibson - *Nexus: Music for a Shadow Animation*, II. Democritus and the Lost Concept of *Atomos* (MM. 53-64)

35 Nexus: Music for a Shadow Animation

Plaintively  $\text{♩} = 72$

③

Ob. *mp* *p*

B♭ Cl. *mf* *p*

Pno. *mf* *p* *8va*

Hp. *mf* *p*

Vln. *mf* *p* *legato appassionato*

D.B. *Unis.* *p*

The musical score for measures 56-58 is arranged in six staves. The time signature changes from 3/4 to 2/4 at measure 57. The instruments and their parts are as follows:

- Ob.:** Measures 56-57: *mf* (mezzo-forte), melodic line. Measure 58: Rest.
- B♭ Cl.:** Measures 56-57: Rest. Measure 58: *mp* (mezzo-piano) to *pp* (pianissimo), melodic line.
- Pno.:** Measures 56-57: *mf*, chords. Measure 58: *mf*, chords. Includes *8<sup>va</sup>* (octave) markings.
- Hp.:** Measures 56-57: *mf*, chords. Measure 58: *p* (piano), chords. Includes *L.V.* (Left Hand) and *B D* (Bass Drum) markings.
- Vln.:** Measures 56-57: *mf*, melodic line. Measure 58: *pp* (pianissimo), melodic line. Includes *doucement* (softly) and *8<sup>va</sup>* markings.
- D.B.:** Measures 56-57: *mf*, rhythmic accompaniment. Measure 58: *p*, rhythmic accompaniment.

4 *a loco*<sup>10</sup> *p* *mf* 8<sup>va</sup>

Pno.

loco

59

Hp.

(8<sup>va</sup>) L.V.

*mf* 8<sup>va</sup>

59

Vln.

(8<sup>va</sup>)

*pppp*

62 (8<sup>va</sup>) loco *p* *sub. ppp* Ab E#

Pno.

(loco)

loco

62

Hp.

(8<sup>va</sup>) loco *p*

**Appendix E: Patrick Gibson - Exposure Sheet for the Walt Disney Studios' *Our Friend the Atom* (1957), Directed by Hamilton Luske**

**Exposure Sheet for Our Friend the Atom (1957), Directed by Hamilton Luske, Written by Milt Banta, based on Our Friend the Atom [Book], by Dr. Heinz Haber and the Staff of the Walt Disney Studios**

SMPTE Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-02-13-20-00 - 01-04-03-03-79	Introduction by Walt Disney (2:13-4:03)	Starts with fade out of Nautilus capsizing/bobbing and fade-in of cover of the novel, <i>Twenty Thousand Leagues under the Sea</i> .			110-4		0	0	
01-04-03-04-00 - 01-04-15-07-79	Truck in to Heinz Haber (4:03-4:15)	Beautiful sweeping shot that crosses the Lab and trucks from wide to medium close-up on Haber, taking <i>Our Friend the Atom</i> [Book] down from book shelf and skimming through it, briefly. Directly after this shot, he turns to the audience and begins his Introduction.	Walt Disney Narration/ Introduction carries through as a Secondary Action through this segment. Ends when he looks up from the book at 01-04-15-07-79. End of Walt Disney's Narration/ Introduction.		12-4	292	12.1666666666667	0.202777777777778	4.66287500000001
01-08-31-16-00 - 01-08-39-01-79	Democritus (8:29-10:04)	Heinz Haber Narration Voice-Over, describing Democritus and his theory of <i>atomos</i> .	Held frame of Democritus holding up a handful of sand. Truck in to close-up of Democritus's Hand.		7-10	178	7.41666666666667	0.123611111111111	2.8424375
01-08-39-02-00 - 01-08-42-16-79		Speaks to his students, and explains and demonstrates his analogy between the sand and <i>atomos</i> .	Animation begins. Fingers and hand close around the lump of sand and crush it.		3-15	87	3.625	0.060416666666667	1.38928125
01-08-42-17-00 - 01-08-43-09-79			Drops sand from his left hand to his right hand.		2-17	65	2.70833333333333	0.045138888888889	1.03796875
01-08-43-10-00 - 01-08-46-07-79			Moves left hand to crush the sand to dust in his right hand.		2-22	70	2.91666666666667	0.048611111111111	1.1178125
01-08-46-08-00 - 01-08-53-01-79			Pinches the dust and holds up a grain of sand for inspection.		4-18	114	4.75	0.079166666666667	1.8204375
01-08-53-02-00 - 01-08-54-07-79			Follow-through action from previous segment: rubs fingers together on 6's, five times.		1-6	30	1.25	0.020833333333333	0.4790625
01-08-54-08-00 - 01-08-55-17-79			Drops grain of sand from fingers of his left hand to the beach, below.		1-10	34	1.41666666666667	0.023611111111111	0.542937500000001
01-08-55-18-00 - 01-09-04-07-79			Shot of Shoreline and Horizon, panning down to a sea star on the beach. 01-09-04-07-79 marks the last of the pan, with start of next frame as the beginning of a hold on sea star.		8-14	206	8.58333333333333	0.143055555555556	3.2895625
01-09-04-08-00 - 01-09-05-17-79			Hold on Sea Star		1-10	34	1.41666666666667	0.023611111111111	0.542937500000001
01-09-05-18-00 - 01-09-07-05-79		Democritus begins to build the column out of sand.	Cut to Democritus's Hand gesturing to sand column he is building. Points from bottom to top of column. Gesture from bottom to top for this duration suggests brand movements on 18's - two motions within 36 total frames.		1-12	36	1.5	0.025	0.574875



SMPTE Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-09-07-06-00 - 01-09-06-17-79			Sweeps hands up column and gathers two handfuls of sand from the sides, pausing at the top of the column and showing them to his students. Hold on handfuls of sand. This frame duration suggests the same rate of action - 18's.	Follow-through animation of sand falling down, along the sides of the column.	1-12	36	1.5	0.025	0.574875
01-09-08-18-00 - 01-09-09-19-79			Hold on Handfuls of Sand for 26 frames.		1-2	26	1.08333333333333	0.0180555555555555	0.415187499999999
01-09-09-20-00 - 01-09-11-09-79			Gesture with both hands up and over, dumping the sand onto the top of the column.	Follow-through animation of sand falling down, along the sides of the column.	1-14	38	1.58333333333333	0.0263888888888888	0.606812499999999
01-09-11-10-00 - 01-09-11-23-79			Packs sand down, palms downward. Slides hands down sides of column, straightening it out. Movement of hands downward on 2's.	Follow-through animation of sand falling down, along the sides of the column.	0-14	14	0.583333333333333	0.0097222222222222	0.2235625
01-09-12-00-00 - 01-09-12-23-79			Scoops sand form the sides of the column, as hands move upward along it, on either side. Demonstrates both handfuls of sand at top of column and packs them down on top of it. Movement on 2's. Apex of upward movement is at 01-09-12-14-00, but movement does not hold (maintains movement on 2's).	Prepares thumbs inside fist to score the sides of the column, and ultimately create the capital and the fluting of the column.	1 (24)	24	1	0.0166666666666666	0.38325
01-09-13-00-00 - 01-09-15-01-79			Lowers both hands slightly and scores the column horizontally to create its pediment, with short hold after completion of this action, starting at 01-09-13-13-00, and ending at 01-09-13-16-79 (for a total of 4 frames). At 01-09-13-17-00, continues downward motion to smooth the sides of the column. There is a short hold after completion of the smoothing action, starting at 01-09-13-23-00, and ending at 01-09-15-01-79 (1 second and two frame hold).	Sand falls down side in follow-through action, after each of the described motions at left, prior to the pauses in action.	2-2	50	2.08333333333333	0.0347222222222222	0.798437499999999
01-09-15-02-00 - 01-09-17-00-79		Further explanation.	Cut away shot to Democritus's students, listening to him (in a held shot). Almost two-second hold for Democritus's speech.		1-23	47	1.95833333333333	0.0326388888888888	0.750531249999999

SMPT Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-09-17-01-00 - 01-09-23-16-79		Democritus continues to build the column, with greater detail (granularity).	Cut back to Democritus's hands shaping the capital of the column into a Corinthian design, and scoring of the fluting. Motion of hand, starting with thumb, begins at 01-09-17-03-00 (after a two-frame pause), and moves on 2's throughout this segment. Changes in direction of motion suggest musical phrases, and even pauses at those moments: 01-09-17-13-00; 01-09-18-11-00; 01-09-19-19-00; 01-09-19-23-00; 01-09-20-05-00 [at this point Democritus's hand comes off of the column and moves into a follow-through action - see column at right]; 01-09-20-19-00; 01-09-21-17-00; Democritus's hand comes off column again at 01-09-22-05-00 and proceeds in similar action to above with similar follow-through through 01-09-22-13-00, where hand begins to move back to column, and reaches column at 01-09-22-17-00, where motion of sand falling precedes the action of the end scoring the column.	Sand falls from the column every time Democritus touches it and makes a mark of some kind. Second follow-through action: Democritus's hand comes off of column (01-09-20-05-00) and proceeds away from column through (01-09-20-17-00).	6-17	161	6.708333333333333	0.111805555555556	2.57096875
01-09-23-17-00 - 01-09-29-00-79			Cut away shot to shoreline and horizon. Gusts of wind in the background, moving from left to right on 1's, starting at 01-09-23-18-00 and continuing through 01-09-25-17-79. At 01-09-25-17-01 begin truck and pan to upper left of screen to sun in background on 1's. This action stops at 01-09-27-00-01.	Wind continues to blow during first frame of truck and pan shot, but stops at 01-09-25-18-01. Resumes at 01-09-26-22-01 (4 frame hold). Becomes sole action in scene from 01-09-27-01-01. This action stops at 01-09-29-00-79.	5-8	128	5.333333333333333	0.088888888888888	2.044

SMPT Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-09-29-01-00 - 01-09-41-16-79		As Democritus concludes his argument, Aristotle interrupts the lesson.	Cut to Democritus concluding his assertion to his students, patiently listening on the beach, with dusk shadow in the foreground. Two frame hold before animation of Aristotle's shadow approaches from bottom right of screen at 01-09-29-03-01. This action continues to 01-09-30-00-79 without Democritus or his students noticing, moving on 2's. Aristotle's shadow stops at 01-09-30-15-79, covering out a good portion of the staged part of the screen. Starting at 01-09-30-16-01, image is held for Aristotle's voice-over, through 01-09-31-18-79. Begin pull-away shot (truck backwards) at 01-09-31-19-01, on 1's (except for the transition between 01-09-31-19-01 and 01-09-31-21-01), continuing through 01-09-34-14-79, to reveal the form of Aristotle in the right foreground (left shoulder and arm, neck and portion of his chin only). He begins to raise his left arm on 01-09-34-15-01, on 2's, through 01-09-35-23-79, with the truck continuing and the shadow of his left arm following what his left arm does. Held shot for climax of his counter-argument from 01-09-36-00-01 to 01-09-37-10-79 (1 second + 11 frame hold). His arm begins to fall back to his side at 01-09-37-11-01 and motion continues on 2's to 01-09-38-01-79. Shot is held for beginning of Haber's voice-over narration from 01-09-38-02-01 to 01-09-41-16-79.	Democritus and his followers turn to face Aristotle at the sound of his voice at 01-09-30-01-01, on 2's, through 01-09-30-09-79. Hold, looking at Aristotle, while the former's shadow continues to approach for following six frames.	12-15	303	12.625	0.210416666666667	4.83853125
01-09-41-17-01 - 01-09-47-10-79		Haber's voice-over narration with shot of Aristotle.	Cut away to shot of Aristotle in profile. Held shot for 5 seconds and 17 frames.		5-17	137	5.708333333333333	0.095138888888888	2.18771875

SMPT Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-09-47-11-01 - 01-10-03-16-79		Column is washed away by the waves. <b>Scene End</b>	Cross-fade to shot of Column. Starts at 01-09-47-11-01 and continues through to 01-09-49-07-79. Column is worn down by the waves lapping up onto the beach 01-09-56-19-79. Setting the waves and fade to black from 01-09-56-20-01 to 01-10-02-02-79. Blackout from 01-10-02-03-01 to 01-10-03-16-79.	Secondary action of the waves in <b>five parts: 1) waves moving onto beach from lower left of screen to upper right</b> (washing past the lower half of the column), starts at 01-09-47-21-01 before the fade from held shot of Aristotle is completed. <b>2) making contact with the column</b> at 01-09-49-19-01, <b>and peaking</b> at 01-09-52-10-79, <b>3) beginning to drop arc</b> at 01-09-52-11-01, <b>receding and spreading out along the shore</b> from 01-09-52-12-01 through 01-09-55-08-79, revealing the worn-away bottom half of the column, <b>4) which begins to drop on 2's</b> at 01-09-55-09-01 through to 01-09-56-19-79 (there is a follow-through motion of the sand dropping as the column crumbles), and <b>5) water continuing action of receding</b> through to 01-09-57-18-79. Water has slight recoil shoreward from 01-09-57-19-01 to suggest movement of the tide.	16-6	390	16.25	0.2708333333333333	6.2278125
01-14-57-00-00	Amadeo Avogadro H2O Animation (15:27 - 15:49)								
01-17-03-07-00	Heat through an Atomic Eye...Power in Steam...Steam Was a Hungry Servant (17:05-19:53)			Excise Audio of Haber's Narration without Wallace's Score starting at 01-19-51-23-01 and ending at 01-20-10-04-06. Place this Sound at measure 54 (of Piano and Electronics Suite Score)					
01-20-55-21-23	Curie's Discovery of Radium (20:59-22:10)	01-21-50-08-44; beginning of radium particles escaping sample							
01-22-08-22-00	Einstein's Formula (E=MC2) ...Rutherford's Discovery of the Nucleus (22:13-25:56)								
01-25-53-22-00	How Nature Builds Her Atoms (25:57-28:00)								
01-28-11-22-00	A Fascinating Study in Numbers: The Promenade of the Elements... Uranium (28:21-30:25)								
01-33-42-18-00	The Atom Splits (34:04-35:25)								
01-35-44-10-00	The Ping Pong Balls (35:47-36:26)								
01-36-27-07-00	An Atomic Chain Reaction...The Atomic Genie (36:30-37:03)								

SMPTE Code	Scene	Description of Action	Notes	Follow-through Action	Elapsed Seconds and Frames	Elapsed Frames	Elapsed Time (Seconds)	Elapsed Time (Minutes)	Bars
01-37-01-10-00	The First Atomic Explosion (37:04-38:11)								
01-38-28-07-00	Let Me Show You What I Mean... Slowing down the Atomic Explosion (38:31-39:10)								
01-39-07-22-00	The Famous Atomic Reactor (39:11-41:09)								
01-41-05-22-00	The Atomic Genie Grants Us Three Wishes (41:09-41:30)								
01-41-27-22-00	Our First Wish Shall Be for Power (41:31-43:47)								
01-43-44-15-00	Our Second Wish Shall Be for Food and Health (43:47-47:03)								
01-43-55-05-00	Food (44:11-45:23)								
01-45-20-09-00	Health: The Tools of Atomic Medicine (45:23-47:03)								
01-47-00-01-00	And, There is Left to Us the Third and Last Wish... The Atomic Genie to Remain Forever Our Friend (47:03-48:54)								
01-47-17-22-00	The Atomic Genie Weighs in His Hands the Powers of Both Creation and Destruction [Footage of Manhattan Project] (47:21-47:37)								
01-47-35-00-60	So, Our Last Wish Will Simply Be for the Atomic Genie to Remain Forever Our Friend (47:38-47:45)		This audio is voice-over by Haber with images of Manhattan Project on-screen. May need to use audio only from this SMPTE code, as it begins in the middle of a frame.						
01-47-41-23-02	We Have Inherited a Wealth of Knowledge from the Great Thinkers of the Past. That This Heritage Would Ever Be Applied towards Destruction Was Farthest from Their Minds and Hearts... It Lies in Our Own Hands (47:45-48:54)		This audio is voice-over by Haber with images of Manhattan Project on-screen. May need to use audio only from this SMPTE code, as it begins in the middle of a frame. Images of Democritus, et al., begin at 01-47-42-10-00, and run through 01-48-01-21-79. Audio of this paragraph continues to 01-48-12-09-09. Followed immediately by an orchestra chord/hit, which is a sequence of material playing under the dialogue throughout this paragraph. Q: How can I separate voice track from orchestral background/ possible through reversing ADSR of mono track, and then playing alongside original track or does this eliminate voice over?						