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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Boulez's Writing on Timbre

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

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

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

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

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

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

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

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

Instrumental Ideas in Le marteau sans maître

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

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

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

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[132] Arnold Whittall, *The Cambridge Introduction to Serialism*, (New York: Cambridge University Press, 2008), 176.

[133] Goldman, *The Musical Language of Pierre Boulez*, 9.

[134] James McCalla, *Twentieth-Century Chamber Music*, Second Edition, (New York: Routledge, 2003), 2 & 23 accessed November 19, 2013, *Taylor & Francis eBooks*. McCalla's analysis of *le Marteau* begins on p. 21.

[135] Pierre Boulez, *Le marteau sans maître*, (Wein: Universal Edition, 1964), p. IV-VI. Part of an English translation of this text is used as the preface to this score. A footnote on page VI explains "The text comes from the essay *Dire, jouer, chanter*, published in *La musique et ses problème: contemporains 1953-1963* (Cahiers de la Compagnie Madeleine Renaud - Jean-Louis Barrault, Julliard, Paris). *Dire, jouer, chanter* is a lecture that Boulez gave in Basle on the occasion of a concer[t] in which he conducted *Pierrot lunaire* and *Le Marteau*

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

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

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

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sans maître."

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

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

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

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

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