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The advent of electronic music and its impact on the career of Edgard Varèse

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However many loudspeakers were eventually hauled into place, there was a crowd of them ... the images were 'themed' to give the spectacle distinct sections, which were mirrored in terms of light and sound ... to provide a sense of random activity in which the position of the sounds and images would be unpredictable in both time and space. Yet, underneath this apparent chaos, everything was in order.¹

Such are the words of Katharine Norman upon investigating a pivotal moment in twentieth century music: the union of architecture and sound at the 1958 World's Fair in Brussels, Belgium. This moment of structural and sonorous union occurred in the Philips Pavilion, designed by the architects Le Corbusier and Iannis Xenakis, a building built solely for the performance of Edgard Varèse's *Poèm électronique* (See Appendix A). This blending of arts "would go down in history as a defining moment in the collaboration of architecture and sound" in which "technology became invisible and amazing."² To the estimated two million people who experienced Varèse's *Poèm électronique* between May and October of 1958, a new music was present, electronic music.³

Electronic music is exactly what its name implies: music produced by means of "instructed electronic oscillations."⁴ The means of producing early electronic music included instruments such as the "Theremin," above which a player moves his or her hands with relation to two metal antennae to control the pitch and volume of the instrument, and the 'Dynamophone' or 'Telharmonium,' a 200-ton precursor to the electric organ.⁵ The advent of electronic music occurred for reasons including engineers beginning to explore the limits of what machines could do with respect to sound, coupled with composers such as Richard Wagner, Richard Strauss and

¹ Katherine Norman, *Sounding Art* (Burlington: Ashgate Publishing Company, 2004), p. 15.

² *Ibid.*, p. 7.

³ Malcom Macdonald, *Varèse: Astronomer in Sound* (London: Halstan & Co Ltd., 2003), p. 373.

⁴ Milton Babbitt, *The Collected Essays of Milton Babbitt* (Princeton: Princeton University Press, 2003), p. 70.

⁵ Hans-Joachim Braun, *Music and Technology in the Twentieth Century* (Baltimore: John Hopkins University Press, 2002), p. 11.

Claude Debussy who were breaking traditional rules of harmony and the recreation of a “new language for poetry” advocated by Hugo von Hofmannsthal.⁶

The Italian composer and concert pianist Ferruccio Busoni discussed this “new language” in 1907 in his famous essay “Outline of a New Aesthetic of Music,” in which Busoni expressed his desire to do away with program music. He believed in absolute music in that music was not about obeying laws and rules established by previous composers, but about creating new principles free from all material limitations. The limitations that Busoni was referring to were the properties of the musical instruments of the time and that composers should seek to create an “abstract sound, a technique without hindrance, an unlimited world of tones.”⁷ Busoni developed this concept in proposing that the tempered system of tonality was limiting music and outlined 113 new ‘modes’ of tonality that he claimed were of equal value to the traditional diatonic major and minor modes. These 113 new modes were developed from dividing the chromatic scale into “third-tones, quarter-tones, sixth-tones and so-on.”⁸ Busoni was a huge fan of the Dynamophone, on which intonation could be altered to play his new modes. Thus in Busoni’s “Outline of a New Aesthetic of Music,” the movement of Futurism is outlined.

While Busoni was developing his new system of tonality, other Futurists such as George Antheil and Luigi Rossolo were working on new systems of metropolitan noise, which utilized electric bells, sirens, airplane-propellers, and newly invented noise instruments in attempts to recreate scenes from city life. In such works a pedal tone may be held out to represent the vibrations of the city street, with different noises such as the hooves of horses or the acceleration of car engines above, accompanied with a crowd of voices, marked by the occasional shout, and

⁶ Malcom Macdonald, *Varèse: Astronomer in Sound* (London: Halstan & Co Ltd., 2003), p. 67.

⁷ Antony Beaumont, *Busoni the Composer* (Bloomington: Indiana University Press, 1986), pp. 90-91.

⁸ *Ibid.*, p. 68.

hanging above it all, the electric wires of the trams and rattle of railways above the city.⁹ In some cases Futurist composers blended visual art with the music in a performance, in order to illustrate the scene that the piece was about. The Futurist who some deemed as the leader, Marinetti, called for music that celebrated the frenzied life within the great cities of the time.

With Varèse's life developing in such close proximity to Marinetti and others of the Futurist movement, one would think that Varèse himself would be coined a Futurist, and in fact he was. His music does seem to embody the violent, cacophonous ideas of the Futurists, but Varèse vehemently rejected this label and, in his musical sphere, rejected the Futurists as "slavishly imitating only what is superficial and most boring in ... our daily lives."¹⁰ However much Varèse personally rejected the idea of his association with the Futurists, the Futurist ideas at least were somewhat of a petri dish in which he grew his musical concepts, and his later works that incorporated visual art along with original music certainly paralleled earlier Futurist works that combined visual art with sound.

Many of Varèse's early scores were lost in a building fire in Germany or through other factors related to World War I while Varèse was in the United States. Of the first published scores, one can certainly see why some people saw him as a Futurist composer. He employs certain timbral effects that seem to come from an urban setting, such as the grumbling "lion's roar," produced by a special drum that sounds like the bowels of a city, the crescendos and decrescendos of sirens, or even the use of traditional instruments in unorthodox ways. One such example occurs in *Offrandes*, in which a certain denotation for the harp indicates that the player should "slide violently ... from the starting note to the end note (wire strings), as the arrow

⁹ Hans-Joachim Braun, *Music and Technology in the Twentieth Century* (Baltimore: John Hopkins University Press, 2002), p. 100.

¹⁰ Louise Varèse, *A Looking-Glass Diary* (New York: Norton, 1972), p. 106.

points ... allowing the strings to strike against each other, and let them vibrate” as shown below in the opening of “La croix du sud:”

Example 1



Such an effect produces a very raspy and ugly sound from the harp, a sound that could perhaps be identified with a snarling sound of a metal suitcase being dragged across a metal grate in New York City. On the other hand, the sense of urban noise can come from the entire orchestra as in *Ameriques*, in which a very low chromatic rise and fall in the strings happens three times, followed by a counter-rhythmic section in the celesta, glockenspiel, xylophone, and percussion instruments. (see Appendix B)

In such instances as discussed above, it would be easy to see how Varèse could be seen as a Futurist. Varèse actually regarded Futurist music as servile imitation of daily life,¹¹ and though both Futurists and Varèse believed in music without limits, the music of Varèse still sticks to rules. These rules are unique to Varèse and come to light the more one listens to his music, for Varèse once stated in an interview “anyone who does not make his own rules is an ass.”¹² For example, music of the Futurists generally rejected any kind of thematic structure, and thus threw away all rules with respect to conventional music theory without creating their own. Varèse on the other hand, may throw out all rules with respect to conventional music theory, but writes his

¹¹ Larry Stempel, Varèse’s “‘Awkwardness’ and the Symmetry in the ‘Frame of 12 Tones’: An Analytical Approach,” *The Musical Quarterly*, 65:2 (1979), p. 154.

¹² Malcolm Macdonald, *Varèse: Astronomer in Sound* (London: Halstan & Co Ltd., 2003), p. xi.

own, which give his music a structure, an organization required for noise to become music, that the Futurists were certainly lacking.

For example, a theme is presented a few measures from the beginning of *Ameriques* in the flute:

Example 2



According to conventional rules of music theory, the theme should be stated again exactly as it appears here, but perhaps with more instruments or in the dominant key, again somewhere in the piece. This is not the case, however. Instead, Varèse twists the theme a little as the piece progresses, as shown when the theme is presented for the second time (see Appendix C).

This time the theme is barely recognizable. In some voices the intervals seemed squashed and in others the intervals are flipped and reduced. When listening to the piece though, there is no mistaking that this is the Varésian theme. And as it continues to be manipulated and changed throughout the piece, sometimes only hinted at or half-stated, other times augmented or diminished as in a fugue, and other times so far from the original theme the listener wonders if it is still the theme. By the end of the piece it seems as if the composer or musicians or both had completely forgotten what the theme was, and were painstakingly stabbing at what it might be. References to the theme are played with accents, others very quickly as if the idea of the theme would come back only if the someone could remember it. Finally the instruments seem to come together in fortississimo organized frustration and the piece ends without any cadence or ending that would be acceptable within traditional harmonic theory. In light of Varèse's own rules,

however, if one were to set aside traditional music theory and come to the work on Varèse's own grounds he or she would find that Varèse does indeed "write his own rules" and that following Varèse in exploration of the limits of music stretches the limits of one's own mind.

It would be fitting to ask how Varèse went from composing music written solely for traditional acoustic instruments, to the completely electronic work *Poème électronique*. First of all one must see that Varèse was attempting to create and control sounds out of these instruments that had never before been used in composition. Furthermore, the answer lies in investigating the time when he left Europe his futurist movement associates Marinetti and Busoni and sailed to New York in December of 1915 to look for work. In New York he was "amazed that nobody knew anything about modern music," and in an effort "to welcome and reveal all noble and serious attempts of today's composers" he organized the New Symphony Orchestra in 1919.¹³ Varèse conducted the New York premiers of works by Debussy, Bartok, and Dupont, but was chastised by patrons and musicians because of the terrible reactions from the audiences to the contemporary music and was asked to change the repertoire.

Instead of changing the repertoire, Varèse resigned from the New Symphonie Orchestra. Finding companionship with other exiled composers from France such as Carlos Salzedo, he continued developing his own ideas of music without limits in his compositions *Ameriques* and *Offrandes*, and in conjunction with Salzedo in May of 1921, founded the International Composers' Guild.

The International Composers Guild, whose motto was "New Music for New Ears," was the first American organization devoted exclusively to the performance of contemporary music.

¹³ R. Allen Lott, "New Music for New Ears': The International Composers' Guild," *Journal of the American Musicological Society* 36 (1983), pp. 266-287.

The Guild would “refuse to admit any limitation” and would “deny the existence of schools, but only recognize the individual.”¹⁴ Varèse claimed that the Guild would seek forward-thinking music of the time regardless of the esteem of the composer. As a result of Varèse and the International Composers’ Guild performing contemporary works by Stravinsky, Ravel, Prokofiev, and Bartók, other music societies sprang up in Europe to revolve around contemporary music.

By the third season, the Guild was performing in the large and prestigious Aeolian Hall and had emerged as an inherent part of the New York music scene. The inquisitive New York audience foreshadowed where the Guild’s music was going, reflected in one critic’s response to a performance of Cowell’s *Ensemble*, in which two performers whirled flat pieces of wood attached to string to produce a sound. The critic enjoyed the performance but found the whirring sound from the ‘thundersticks’ was not worth the physical effort and concluded that the “same sound could have been obtained from a properly disciplined electric fan.”¹⁵ When the International Composers’ Guild disbanded in 1927, Varèse was happy to say that the other music organizations could continue what the Guild started, as he was becoming more and more preoccupied with new sounds.

Varèse was seeking these ‘new sounds’ involving electronic instruments in 1927 with René Bertrand and Harvey Fletcher, the Acoustical Director of Western Electric, and when Varèse moved back to Paris in 1928 Bertrand had invented the Dynaphone (not to be confused with the Dynamophone), a monophonic vacuum tube instrument whose pitch was controlled via a dial on the side. While in Paris, Varèse kept in contact with Fletcher’s developments at

¹⁴ “Composers For Guild to Bring New Works to Public Hearing.” *Musical America* 34 (1921), p.6.

¹⁵ R. Allen Lott, “‘New Music for New Ears’: The International Composers’ Guild,” *Journal of the American Musicological Society* 36 (1983), pp. 266-287.

Western Electric and began affiliating with the progressive film composer Arthur Hoérée, who was working with sound physically imprinted or pre-recorded on film.

Another monumental collaboration occurred in 1932 with one of the most notorious figures in French avant-garde drama: the playwright, producer, actor, and theorist Antonin Artaud. During this time Artaud was protesting the values of the predominant culture, similar to the Dadaist reaction to World War I. The principles that Artaud was attempting to bring back to French drama were strikingly similar to the principles that Varèse was trying to bring back to music: metaphysics, violence, and basic human needs juxtaposed with the forces of fate. In order to convey these concepts, Artaud was employing an array of theatrical devices including sounds, lights, and rhythmic movement.¹⁶ The two artists seemed to feed off of each other, with influences from the other's aesthetic showing in works of both. The two allegedly began collaboration on an opera named *The One All Alone* that never came to fruition, but the influences they left on each other certainly did.

Because *The One All Alone* was going to be a complete theatre performance in music, dance, and drama, Varèse's compositions after his conjunction with Artaud reflect this in nature. *Ionisation* in particular hints at originally being intended for the larger theater piece, and of course conveys Varèse's attempt at pushing the limits of timbre, for the piece includes sirens, a cow bell, a string drum (Lion's Roar), Chinese blocks, anvils, sleigh bells, and tubular bells.

Varèse's first composition that included electronic instruments was *Ecuatorial*, which employed two Theremins (later replaced by Ondes Martenots) and organ. In employing these instruments, Varèse attempts to convey the primitive and tribal feelings associated with the text, the most popular of surviving texts from the lost Mayan civilization. Varèse does not utilize

¹⁶ Malcolm Macdonald, *Varèse: Astronomer in Sound* (London: Halstan & Co Ltd., 2003), pp. 235-236.

these electronic instruments just for the sake of having them there, but because they help push the limits of conventional music listeners' ears to arrive at a foreign people and culture never before visited. The Theremins were instruments whose timber Varèse had "long dreamed about" with a pure soprano-like tone, a range of six octaves, the ability to hold sustained notes without a breath, and to create continuous sweeping glissandos.¹⁷ Because he wanted to employ plenty of fifths and octaves in the work to give a primitive feeling, Varèse commissioned Theremin to build two instruments with higher registers solely for the performance of *Ecuatorial*.

In March of 1952 tape recording equipment was finally installed in Varèse's studio. He then began recording different factory sounds for use in the "Organized Sound" sections of *Déserts*, which is a union of *musique concrète* and ensemble composition. *Musique concrète* is the act of manipulating recorded everyday sounds in ways such as distorting them, cutting sections apart and reconnecting them, and varying them in different ways, and then changing the way they are heard by varying playback speeds and other physical adjustments so as to produce a unique sound.

For the 'interpolations' in *Déserts*, Varèse recorded sounds from various Philadelphia industrial sites: ironworks, sawmills, and factories, along with a church organ, and edited them according to the methods described in *musique concrète*. The score of *Déserts* was written to be able to stand alone, without the "interpolations" (defined in mathematics as the process of determining the value of a function between two points at which the function has prescribed values). There are only marks in the score above bar lines that say when to insert the interpolations, and it seems as if Varèse is instructing the performer to put the score on pause between two measures and play the interpolation, as if the music completely leaves all the rules

¹⁷ Ibid., p. 268.

of music behind, such as notating time, pitch, and instrument. (See Appendix D) Upon tracing the score of *Déserts* while listening to it, once the music reaches one of the interpolations, the listener is simply left in the dark to wait until the scored music begins again—certainly a feeling of helpless timelessness associated with a desert.

In 1956 the Philips Radio Corporation had already begun plans for a contribution to the World Fair to be held in Brussels in 1958. When presented with an idea of a special Philips Pavilion for a spectacular display of the possibilities of modern electronics, the Philips' commissioned architect jumped at the chance to create a building which would be the vessel for a total artwork. At once Le Corbusier demanded that they hire Varèse to write the music for it, and though the management was reluctant, Varèse was invited to write an 'Electronic Poem' for the exhibit.

Varèse had been attempting to fuse space and music for decades, and was finally given the opportunity to have music completely unlimited in a three-dimensional space. Varèse was given full access to the Philips electronic laboratory at Eindhoven and immediately began work on a completely stand-alone electronic work. Varèse had to write eight minutes of sound second-by-second but had revolutionary technology, such as filters, generators, oscillators, attack and decay and reverberation units, at his disposal for the manipulation of the recorded sounds on 3-channel magnetic tape. The raw recorded sounds that Varèse started with included pure sinusoidal tones (tones that are not affected by acoustics), bell sounds, solo and choral voices, piano, organ, percussion, and machine noise. In altering the sounds to such an extent, the work is no longer *musique concrète*, but its own "Organized Sound." Though *Poèm életronique* may sound initially like random noises thrown together, upon investigation of Varèse's scientific diagrams and graphs that show a great concern for the "precise correlation of time, dynamics,

intensity, higher or lower relative pitch, and the ‘contrapuntal combination of separate bands of sound,” one would have to conclude that such a work had as much compositional energy put into it as any work created by more traditional means.

Varèse had finally mastered the technology of his time in exploring the limits of sound. His final work, *Nocturnal*, which was finished by Chou Wen-Chung after he died, does not utilize any electronic media, but in a note mentions that he may have intended to eventually add electronic sounds to the work.¹⁸

When Milton Babbitt honored Varèse in a 1966 article, stating that “we have all profited eventually, if indirectly, from that remarkable pioneer” and that he left “his younger colleagues ... pursuing and shaping the future,”¹⁹ could Babbitt have been referring to the pop music icon Frank Zappa, who in an interview confessed he idolized the music of Varèse, and kept a signed letter by Varèse framed in his house?²⁰ Or could he have meant the incorporation of the Theremin into mainstream culture leading to its use in “Good Vibrations” by the Beach Boys?²¹ Or was he referring to Varèse’s work on electronic instruments such as the dynaphone that eventually paved the way for Robert Moog to build on his concepts in constructing his revolutionary synthesizer? From all aspects, the advent of electronic music has shaped what we see as music today because of the work of Edgard Varèse.

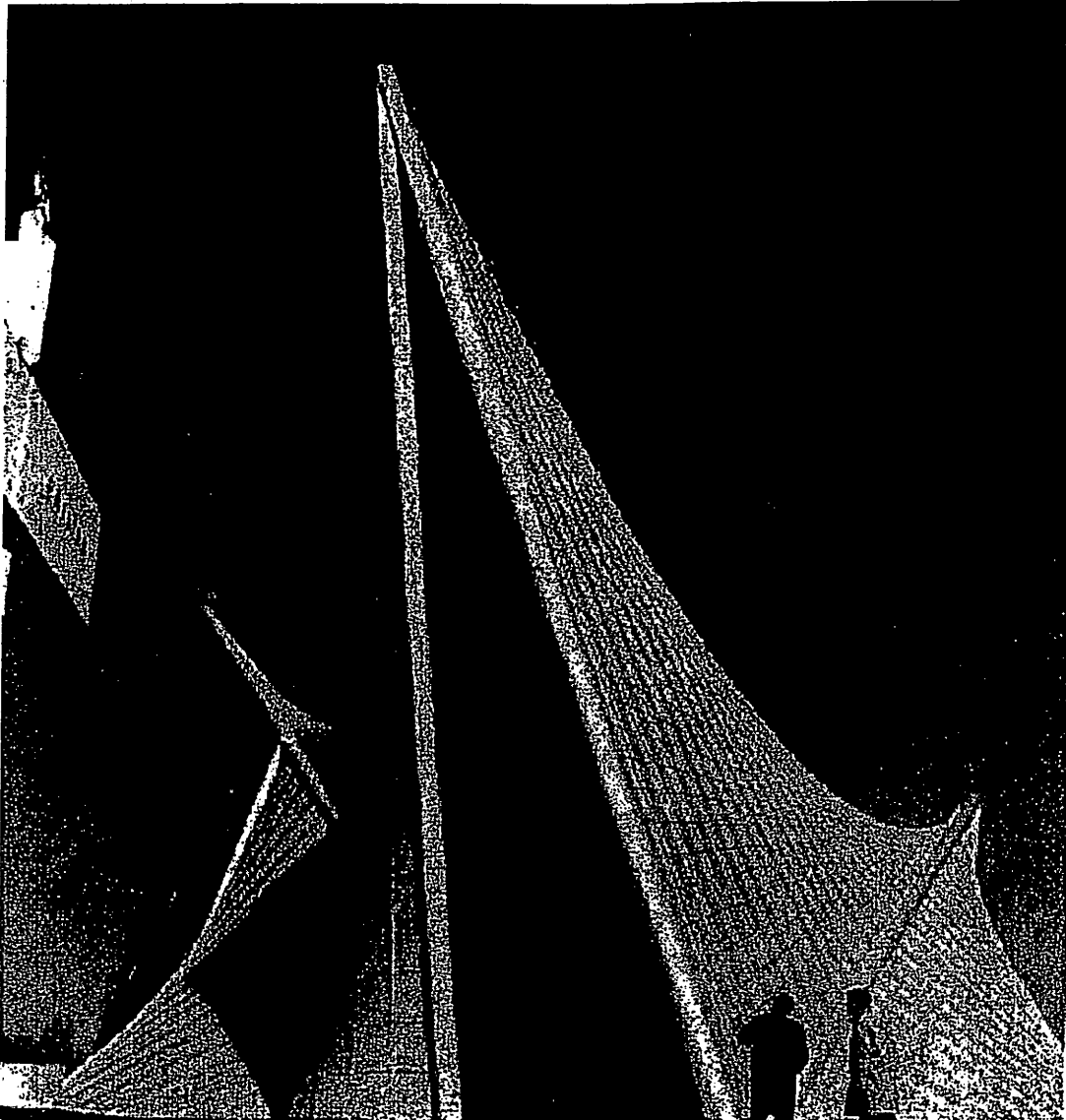
¹⁸ Chou Wen-Chung, Preface to the published study score of *Nocturnal* (New York: Colfranc Music Publishing Company, 1969), p. iii.

¹⁹ Milton Babbitt, *The Collected Essays of Milton Babbitt* (Princeton: Princeton University Press, 2003), p. 220.

²⁰ Zappa, Frank. "Edgard Varèse: the Idol of My Youth." *Music From Other Minds*. June 1971. KALW 91.7 FM San Francisco. 2 Apr. 2007 <<http://rchr.com/mfom/zappa-Varèse.html>>.

²¹ Mark Prendergast, *The Ambient Century* (New York: Bloomsbury Publishing, 2000), p.25.

Appendix A



The Philips Pavilion, built for the showcase of Varèse's *Poème électronique* at the World Fair in 1958²²

²² "Electronic Music History." Dept. of Music, Tulane U. 3 Apr. 2007
<<http://www.tulane.edu/~park/courses/ElectronicMusicHistory/>>

Appendix B

Musical score for strings and woodwinds. The score includes parts for Violin 1 (Vlna. 1) marked *div.*, Violin 2 (Vlna. 2) marked *(div.)*, Viola (Vla.), Violoncello (Vcl.), and Contrabasso (Cb.). The tempo is marked *Agitato*. The score features complex rhythmic patterns with many sixteenth and thirty-second notes. A section of the score is marked *sempre con sordini e div.* and another section is marked *con sordini (div.)* and *non sordini*. The score ends with a double bar line and a *pp* dynamic marking.

Musical score for percussion and woodwinds. The score includes parts for Clarinet in B-flat (C.Bsn. 1), Clarinet (Cl.), Glockenspiel (Glock.), Xylophone (Xyl.), Snare Drum (Sm.), Bass Drum (S.B.), Tom-Tom (T.T.), Cymbals (Cym.), Bells (Bal.), and Metal (Met.). The score is marked with a handwritten *2:20* and a rehearsal mark *4 (J-72)*. The tempo is *Allegretto*. The score features complex rhythmic patterns with many sixteenth and thirty-second notes. A section of the score is marked *clar.* and another section is marked *dolce*. The score ends with a double bar line and a *pp* dynamic marking.

Selection from Edgard Varèse's *Ameriques* (New York: Colfranc Music Publishing Co., 1973) p. 8-9.

Appendix C

The image shows a page of a musical score for percussion instruments. The score is divided into two systems. The first system includes parts for Bass (Bans.), Contrabass (C. Bans.), F Horns (F Hrn.), Tom-toms (Toms.), Snare Drum (Timp.), Cymbal (Cym.), Bells (B.D.), and Gong (G.). The second system includes parts for Violins (Vins.) and Viola (Vla.). The score is marked with various dynamics and tempo changes. The first system begins with the tempo marking 'a tempo' and the instruction 'un peu en dehors'. The second system begins with the tempo marking 'a tempo' and the instruction 'Revenez subit. à moderato'. The score is written in 2/4 time and features complex rhythmic patterns and dynamics such as *ppp*, *pp*, *mf*, and *ppoco sf*.

Selection from Edgard Varèse's *Ameriques* (New York: Colfranc Music Publishing Co., 1973) p. 22.

Appendix D

Musical score for percussion instruments, measures 223-225. The score includes parts for Horns (Hns.), Trombones (Tbns.), Piano (Pt.), Timpani (Timp.), Snare Drum (B. dr.), and various auxiliary percussion instruments (Guero, W. dr.).

Measures 223 and 224 are marked with measure numbers. Measure 225 is marked with a tempo change to $\text{♩} = 132$ and a dynamic marking of ff . The score includes various musical notations such as accents, slurs, and dynamic markings like ff , $ten.$, and $no 2da. 8va bassa$.

Instrument parts include:

- Hns. (Horns)
- Tbns. (Trombones)
- Pt. (Piano)
- 1 Timp. (Timpani)
- 2 Timbl. (Snare Drum)
- 3 Cenc. (Cymbal)
- B. dr. (Snare Drum)
- 4 Guero (Gong)
- 5 W. dr. (Wood Drum)

Additional markings include "hard sticks" and "3" (triplets) for the Timpani part.

Selection from Edgard Varèse's *Déserts* (New York: Colfranc Music Publishing Co., 1959) p. 59.

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