

The Cinematic Visions and Dreams of Edgard Varèse

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More than is apparent in most of the existing studies, Edgard Varèse's experience with electronic composition, is closely linked to a profound reflection on the relationship between music and film, almost as if the two artistic expressions were to be considered closely linked, almost inseparable. *Déserts* (1954), albeit only in intention, *La procession de Verges* (1955) and *Poème électronique* (1959) pioneeringly investigate different ways of understanding music in relation to moving images: from the fictional work to the documentary film, and to the multimedia experience. Only recently, now immersed in the digital production world of DAWs, does the new medium – as often happens – allow us to shed new light on the “old” analogue world and enable us to fully understand the visionary force of Varèse's aesthetics and the poignancy of his way of understanding music and images. The paper retraces the compositional parabola that involved the author for the last years of his life, setting it down in the recording studios and human environments in which he found himself operating, in order to reconstruct, through the dense network of relationships between technology and thoughts, the milieu that gave rise to one of the multiple roots of film music.

Edgard Varèse was one of the key figures in 20th century music. His contributions are of paramount importance in the development of 20th century musical thought; they have been analysed in many studies (e.g. Varèse 1972; Ouellette 1973; Vivier 1973; Mâche 1985; Clayson 2002; MacDonald 2003; Meyer and Zimmermann 2006) and continue to offer fertile ground for research, not only in the strictly musical sphere, but also in music for films (Calabretto 2010). The fact that this American composer was enthralled by the moving image is well known. This is amply demonstrated by his 1940 paper, “Organised Sound for the Sound Film” (Varèse 1940), in which he outlined his aesthetics of an experimental film music in the framework of his idea of *art-science* (Risset 2004) as an audio-visual work in which sound and image coexist without hierarchies and in a co-partnership that gives rise to a new form of art.

Much of the recent criticism of the over-loud blaring of the conventional orchestra throughout the progress of the film—writes Varèse—comes from a realization—conscious or unconscious—that the emotional appeal of the music is too reminiscent of past

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experiences and does not correspond directly enough to the actions taking place on the screen. It becomes either an irritant or an opiate rather than a cooperative factor for heightening dramatic effects, or underlying meanings specifically related to the particular moment of the picture, or intensifying emotion [...]. Between this sound score and the dramatic continuity the relation must be one of intimate and interacting connection; a relationship of unity, of form and of rhythm. But this weaving together of disparate sonorous and visual elements which will make of a film a unified whole cannot be achieved by the device of an imitative repetition of the visual (Varèse 1940, 204-7).

Therefore

the sound-film and the light-film, using two distinct mediums, should not attempt identity. They should complement each other. Often the most exciting moment of a dramatic situation will be far more enhanced by an abrupt, timely suspension of all sound than by any musical outburst. The simultaneous opposition of dynamics is a more effective device and I wonder that it is so seldom used (Varèse 1940, 206).

Considering the year in which it was formulated, his avant-garde conception of film music does not seem to have particularly influenced the composers of the time, nor do the filmmakers of its time and the next generation seem to have considered his visions. The only honourable exception, perhaps, is Woody Allen's use of a fragment of *Equatorial* (1934) in *Another Woman* (1988). It is also true that the paucity and inaccessibility of Varèse's production in this field linked mainly to his electronic compositions makes it difficult to investigate this important aspect of his poetics, which must be reconstructed from fragmentary elements, aborted projects, personal notes, and unpublished materials.

FOR A CRITIQUE OF VARÈSE'S AUDIOVISUAL SOURCES

Whereas much has been done in terms of collection and cataloguing, particularly by Paul Sacher Stiftung in Basel, to date the audiovisual sources of Varèse's electronic and image-applied production are scattered in many mainly European and North American archives. The most important institutions that preserve these documents include INA, Paris, Norddeutscher Rundfunk, Hamburg, Paul Sacher Stiftung, Basel, Casa Ricordi, RAI in Milan, the Institute of Sonology of the Conservatory of The Hague, the British Library, London, Columbia University, New York, the Library of Congress, Washington D.C., the Library and Archives of Canada, Ottawa, and Stanford University, not to mention the many private archives of all those ensembles that include his music in their repertoire.

The proliferation of copies, the audio of which is sometimes also reprocessed

to the tastes of the performer, is enormous and constantly increasing. This myriad of documents is matched by discographic editions, which include: *The complete works* published by DECCA in 1998; the classic *The Varèse album* published by Columbia in 1960, commissioned by the composer himself to publish performances of his works conducted by Robert Craft; *The Varèse record* published in 1977 by Finnadar (Catalogue number SR 9018) as a reissue of the famous EMS 401 record referenced by no less than Frank Zappa (Occhiogrosso, Zappa 1989), to which the *Déserts* interpolations were added later on. This record, which became legendary thanks to mention by Zappa (hence a source of certain commercial revenue), was in turn reissued first by Cherry Red Records on vinyl, and is now also for sale in a digital version on the iTunes Store (*Complete Works of Edgard Varèse*, vol. 1). There are also many concert recordings, often made in a "homemade" bootleg manner that can be easily found and downloaded after a brief search on the internet.

The scenario is complex indeed. Things are further complicated by the fact that most sound documents are jealously preserved by the archives that possess them and are not made available to scholars except in the form of digitised versions that most of the time can only be listened to through headphones. These conditions make critique impossible: not having the chance to analyse the original medium and gain access to all the information external to the signal it carries (presence of physical processing, text on the cases, enclosures, tape marks and models that enable dating, etc.) on one hand, and the impossibility of comparing the digitised signals with the software that allows their visualisation and analysis in different domains, on the other inevitably leads to interpretative fallacy. Just as there can be no philology of photocopies on which inks, stratifications, watermarks cannot be distinguished, there can be no criticism of audio sources based on copies whose specifications and parameters of the system that created them are ignored and stripped of the information that, in addition to the simple audio signal, the original document conveys (writings, attachments, dates, marks and models, etc.).¹

Another complication arises from the absence in many archives of laboratories equipped to reproduce these documents with professional systems. Unlike textual documents, the content of which is immediately appreciable to the eye, audio documents that store the electronic component of the works under investigation are mute without a technological system that allows their reproduction: in other words, a system that re-establishes synchronism with the temporal scanning of the recording process and restores the aural component to the sound events recorded. The reproduction of an audiovisual document is not one without criticalities, *sine interpretatione*, and instead one that insistently poses the problem of the influence of interfaces on the characteristics of the object observed. The comfort of an abstract, finite and discrete encoding as

¹ The problems regarding the preservation, restoration and critical edition of works fixed on analogue media have been extensively discussed in Cossetini and Orcalli (2023).

found in the world of alphabetical and musical writing that at least permits the separation of the investigation into the two spheres of signifier and signified is entirely lacking. In analogue recording, the acoustic universe is fixed in objects and traces of the sound events that in-formed them. Outside the world of the encoded "text", in the world of objects that become *simulacra* of reality, the instrument of observation and analysis that we use (in our case, audio equipment, firstly, followed by sound editing and analysis software) determines, with its characteristics, the form of the object under investigation. Different tape players, even when perfectly calibrated, will extract audio signals in slightly different manner; different software and different analysis algorithms will highlight different, sometimes even contradictory but mutually complementary (consider the indeterminacy of time/frequency) aspects of sound texture; different diffusion systems will orient our listening to different aspects of the sound. These investigations are always partial, and all of them are insufficient to respond to the complexity inherent in the world of sound recording, yet all of them are essential to "encircling" the object of investigation and providing a representation of it that we must remember is always incomplete.

Although electronic and film music lie in the domain of technical reproducibility, in our case, we are not dealing with serial productions but mainly with handcrafted objects that are often unique and do not undergo a subsequent industrial distribution process, unless they become part of a discographic project or of a soundtrack. Consider, for example, the multitrack audio formats that cannot be reproduced in the most common consumer formats: until the advent of the DVD, SACD, and Blue Ray—excluding the unfortunate season of the four-channel disc—audio formats on the commercial circuit for music and film allowed stereophonic sound diffusion at most. The spatialisation of multichannel works therefore had to be reduced, *flattened* on the frontal plane. For technical and aesthetic reasons, the phenomenology of the transmission of audio documents shows, particularly in the case of Varèse, a large number of variants resulting from both intentional and unintentional processes of copying and transformation (Cossettini 2013). The audio editing processes adopted by Varèse often feature the repetition of the same sound materials that cross the boundaries of the single work. In such a complex scenario historically established methods in philology and musicology often fail to capture the peculiarities of new audiovisual documents. It is impossible, for instance, to employ the equivalence and identity criteria used in textual bibliography studies—edition, impression, issue—in critical study, which are, if anything, more adherent to the study of discography and film production and dissemination. In the absence of general criteria for segmenting the sound continuum, the problem of collating these sources then arises. Is it possible to define an equivalence criterion for audio signal segments? The answer regards the crucial question of the conditions of possibility of the analysis of recorded music. The study of Varèse's electronic and film music must therefore necessarily go through the reconstruction of the systems that created it, intended as technological systems (study of the

equipment of the time) and human systems (study of the relationships between composer, performers, sound engineers, collaborators, directors, etc.).²

DÉSERTS

Varèse's first electronic work, *Déserts*, for 14 winds (brass and woodwinds), 5 percussion players, 1 piano, and electronic tape (1954) also marks the composer's first encounter with film music, as if the two universes were immediately closely related and indivisible. The work consists of 4 instrumental parts interspersed with 3 electronic interpolations.

It is possible to reconstruct the early genesis of the work from an unpublished document written by Ann McMillan and preserved at the Department of Special Collections of the Green Library of Stanford University (MISC 278/1).

He was at work on a piece he would call Déserts. [...] It was late in 1953, and except for minor changes, the instrumental part was completed. Fred Plaut, a friend and Columbia Records engineer, had helped record the raw material chosen for the tape part: factory sounds of cutting metal, drilling, hammering, and so on... more, including organ sounds, would be added. Now the sounds needed to be assembled on tape (McMillan [unpublished]).

With these words, McMillan informs us of the beginnings of the composition of the electronic interpolations for *Déserts* and the soundtrack of the film *Around and About Joan Miró* (1955) by Thomas Bouchard (see below). McMillan, a musician and sound engineer, a student of Otto Luening, was a direct witness to the events. It was she, in fact, who worked with Varèse on the first editing of the preparatory materials. Varèse's electronics thus originated far from the professional production studios and instead at his home using an Ampex tape recorder purchased thanks to a fundraising organised by Al Copley, in which Louise Varèse, who did not want to be mentioned, also participated: "Varese wanted one of his own, the minute he saw the tape studio of Otto Luening and Vladimir Ussachevsky, which they had rigged up for their composing, in a small gray house on the edge of the Columbia University campus" (McMillan [unpublished]).

The composer's correspondence preserved at the Paul Sacher Stiftung in Basel contain a few estimates from the Ampex audio inc., a company that permits the reconstruction of the recording studio used to record the first drafts of the interpolations, later reworked and completed in Paris at Radio France's Studio d'Essai. The equipment was already at Varèse's home in New York on 22 March 1953 when the composer wrote to his friend Al Copley: "Thanks for the machine. Since the 22nd the beautiful Ampex—amplifier—power supply box—

² For more details on the methodology of musical analysis and audiovisual sources criticism, see Cossettini and Orcalli (2015).

microphone—loudspeakers are here, installed and ready to co-operate. I am eager for new technical means, anxious to give birth to new works. As soon as the score in progress is finished (and I must hurry as I have a deadline) I will plunge into new ventures".³

The material recorded with this system can be traced mainly to the noises that Varèse captured, ten years before Luigi Nono, in foundries, sawmills and other factories in Philadelphia. The lower quality of the audio, can be traced indicatively—but not definitively—mostly to the lack of drive stability of the Ampex 401A portable magnetophone which, unlike the newer models, mounted the speed control system (capstan/pinch roller) to the right of the head block.⁴ The speed was therefore regulated before the tape was read or written; any instability of the drive motor inevitably escaped control. Also significant was the response of the Altec M11 condenser microphone system with a 21B capsule, which nominally guaranteed a working frequency band of 20 Hz to 15 kHz with a signal-to-noise ratio of 48 dB.⁵

Due to the limited means at his disposal, Varèse could only record a few preparatory materials; notes and working ideas. *Déserts* was still a long way off. The opportunity came in June 1953, when Pierre Schaeffer invited Varèse to the Studio d'Essai in Paris—the cradle of *musique concrète*—for the first time, to produce an electronic work with the means made available by French radio.

*Mr Maren tells us that we may look forward to a visit from you in the not distant future, we are delighted and are prepared to give you the warmest welcome—morally at least. Materially, as you probably realize, our means are extremely limited and not in proportion to the really enormous task we have had the imprudence and the audacity to undertake, lucky, however, in being helped to a certain extent by the Radio Française.*⁶

It was only in March 1954, however, that *Déserts* was explicitly mentioned. In reply to a letter from Schaeffer proposing that he participate with *Ionisation* in an international music festival organised by the Centre de Documentation de Musique Internationale scheduled for 21-27 October 1954, Varèse wrote: "au festival d'Octobre j'aimerais, si cela vous est agréable, voir figurer au programme en premier audition: *Déserts*. L'œuvre dure 20 à 22 minutes, est écrite pour un ensemble instrumental de 20 exécutants (bois, cuivres, percussion) avec brèves interpolations (2 channels) de fragments de son

3 Letter from Varèse to Al Coplay dated 23 March 1953 preserved at Paul Sacher Stiftung in Basel. See also Wen-Chung 1966, 166.

4 See also *Ampex Series 400 operation and maintenance manual*, Ampex Electric Corporation, Redwood City, California.

5 See the manuals *Installation and operating instruction for the Altec M11 microphone systems featuring the Altec 21B miniature condenser microphone*, Altec inc., San Diego, California.

6 Letter from Pierre Schaeffer to Varèse dated 2 June 1953 conserved at Paul Sacher Stiftung, Basel.

organise. Je me permettrai à ce sujet de vous consulter et vous demander conseil.”⁷

Déserts was not ready by October and was staged on 2 December of the same year in the memorable concert-scandal in Paris forty years after the similar scandal of the premiere of Stravinsky's *Sacre du Printemps*. Nonetheless, the meeting with Schaeffer was the initial impetus for the Parisian revival of the electronic interpolations, conducted with Pierre Henry's active contribution.

At Studio d'Essai, Varèse was at the heart of the capital of concrete music. The compositional practices used are those of magnetic tape editing, filtering, modulations. More than the equipment, which was used by many other production studios⁸—and incidentally considered “extremely limited” by Schaeffer himself⁹—it is the cultural environment of the Studio, which Varèse frequented for almost two months, that influenced the acoustic-musical result most. The practice of reduced listening, the investigation of sound morphology, the Parisian workshop practices—personified by Pierre Henry—are reflected in the first version of *Déserts'* interpolations. The material is entirely of acoustic origin, be it the noise of a factory, or the recording of an organ or a percussion ensemble. Varèse reworks noises already recorded in the United States and does not introduce synthetic sounds. The Studio d'Essai with its equipment, the people who inhabited it and its aesthetic approach, left an indelible mark on the work.

The original idea for *Déserts*, unsuccessfully proposed to Disney, envisioned a sound film (Mattis 1992; Scuri s.d.). As early as in the early 1950s, Varèse demonstrated to have clear autonomous aesthetic thinking, which included the potential of the relationships between sound and moving images that went far beyond the simple synchronous and asynchronous, however appropriate it was to Bouchard's documentary.

Varèse's deserts are not only geographical—endless expanses of sand, snow, barren mountains, or astronomical places—but also and above all places of the mind, the human soul, and solitude. “For this multiple conception of desert”, he writes, “visual image and sound will be used each in its unique way to communicate the beauty and the mystery of that solitude which finds such an intense, though perhaps not consciously understood, response in every human heart”.¹⁰ The moving image was therefore the device par excellence for evoking, even before representing, this multiplicity:

7 Letter from Varèse to Schaeffer dated 24 March 1954 conserved at Paul Sacher Stiftung, Basel.

8 This is well described in many texts, from the fundamental Moles (1960) to the more recent Gayou (2007).

9 Letter from Pierre Schaeffer to Varèse dated June 2nd, 1953, kept at the Paul Sacher Stiftung in Basel.

10 Undated document conserved at the Department of Special Collections in the Green Library of Stanford University (MISC 1026).

Visual images and music or, as I prefer to say, organized sound will not duplicate each other. Light and sound are different essences, eye and ear do not behave in the same way, their limitations and reactions are not the same. For the most part, light and sound will work in opposition in such a way to give maximum emotional reaction; sometimes they will join for dramatic effect and to create a feeling of unity. For example, well-timed silences might at times be the only accompaniment of visual turbulence or terror, instead of the usual procedure—the noisily imitative crescendo. Or in some calm, contemplative scene, the music might evoke quite a different event taking place far away and unrelated in mood, but which will help create, through contrast, a feeling of space and time and of universality. These contrasts achieved through the synchronization of simultaneous, unrelated elements would create a dissociation of ideas which would excite the imagination and stimulate the emotions. At other times both sound and image would join in a kind of visual and sonorous counterpoint.¹¹

Despite being a stranger to the world of cinema, Varèse intuited with great lucidity the practices of filmmaking, that orchestral, almost workshop-like work that makes it a shared and collaborative process.

For the realisation of my project the score will be written first, rehearsed and recorded on the sound track. [...] The dynamic, tension, rhythms (or better RHYTHM, element of stability) will naturally be calculated with the film as a whole in mind. The director of the photography will familiarize himself thoroughly with the score and details will be discussed before he starts his shooting expedition. From the film material he brings back, a choice will be made, a continuity extracted, in which images, sequences etc. will be used to obtain planes and volumes which will be organized and so composed as to obtain a final montage to be fitted to the already existing musical construction. The views of earth, sky water will be filmed in parts of the [American] deserts: [California (Death Valley,) New Mexico, Arizona, Utah, Alaska: sand deserts] lonely stretches of water anywhere, solitude of snow, steep deserts gorges, abandoned roads, ghost towns etc. For star galaxies, nebulae, mountains of the moon, existing photographs could be used. Cameras: 35 millimeter, black and white, infra-red, (if desirable colour,) telescopic. The whole must give a sense of timelessness, legend, Dantesque apocalyptic phantasmagoria.¹²

Nevertheless, his training as a composer still led him to conceive a hierarchy between artistic forms where music precedes the image and must constitute a complete artistic element in its own right that should also have had its own autonomy. Perhaps also for this reason, unfortunately, the project was never realised. From 1954 onwards, the electronic interpolations of *Déserts* accompanied the composer until the end of his life: he made several versions

11 Ibidem.

12 Ibidem.

in different studios (Eindhoven, Columbia-Princeton Electronic Music Centre),¹³ but for as long as Varèse lived it would remain an exclusively musical work.

LA PROCESSION DE VERGES

In 1955, Varèse composed the music for Thomas Bouchard's documentary *Around and About Joan Miró*, cited in Varèse's catalogues as *La procession de Verges*. He was in charge of the soundtrack at the same time as he began collecting audio material for the interpolations of *Déserts* (Ouellette 1973, 174). The two works are closely related, and not only in the similar, if not identical sound materials. The work is almost unknown because the director's heirs forbid its dissemination. I was able to view a copy at the Library of Congress in Washington D.C. and listen to a version of the soundtrack alone at the Library and Archive Canada in Ottawa (Fernand Ouellette Collection).

The events that led the two artists to collaborate are narrated by Diane Bouchard in her contribution *Varèse und Bouchard* (Bouchard 2006). Bouchard asked Varèse to create a soundtrack with excerpts from her works *Octandre*, *Ionisation*, *Intégrales* and *Hyperprism* for her documentary film on Fernand Léger, *Fernand Léger in America-His New Realism* (1945-46), and in 1947 to select some fragments of baroque music for the film *La Naissance d'un tableau* dedicated to Kurt Seligmann, finished in 1950; finally, in the early 1950s, original music from recorded sounds organised for the film on Miró.

In this film, the sequence set to music by Varèse is the only one in black and white and is located approximately in the middle of the film. It depicts the procession that takes place in Verges, Catalonia, on the night between Thursday and Good Friday, also known as the "dance of death". Images and music are clearly detached from everything else: the sequence is preceded by a tracking shot of the churches that inspired Miró, while the following part is devoted to his country studio; the other music is by Antonio de Cabezón, Isaac Albéniz and Enrique Granados.

The sequence begins with an introduction by the narrator, who then falls silent and lets the music do the talking. [Table 1](#), next page, contains a schematic description based on the Library of Congress copy; it is an attempt to highlight the relationships between music and image that emerge upon simply viewing the film.

13 Much has been written about the different versions of the *Déserts* interpolations (see for example Ouellette 1973; MacDonald 2003; Gertich 1992 or Clayson 2002; Cossetini 2013), regrettably however, the sole certainty is that today no agreement has been reached even as regards their number. Plenty of legends indeed have circulated around an alleged "original version" whose tracks are now lost, a sort of "Holy Grail", about which a clear answer needs to be given: there is no such thing as an "original version".

TABLE 1:

COMPARISON OF THE INSTITUTIONS RAI AND TV 2 IN ITALY AND DENMARK, RESPECTIVELY.

TIMING* IMAGES		MUSIC
0' 00"	Dark streets, lit only by torches	It begins quietly with noises and gentle percussion
0' 07"	Change of frame You can see the men in the procession, the priests, coming towards the camera wearing death masks	Cantato reminiscent of Gregorian melodies.
0' 09"	Change of frame The statue of the Virgin Mary carrying a crown with candles stands at the centre of the procession	Sound developed electronically
0' 15"	Change of frame Close-up of procession	=
0' 20"	Panoramic view of procession: the front line, the middle, the rear Chained women and penitents surround and follow the statue of Our Lady.	Singing resumes.
0' 29"	=	The voice disappears and electronically processed sounds and percussion dominate
0' 32"	=	Only the percussion section continues
0' 35"	=	The percussion seems to beat out the rhythm of the procession
0' 43"	Change of frame The torches can be seen.	Electronically developed sounds and solos
0' 47"	Change of frame The procession is seen	The percussion instruments appear to continue beating out the procession
This is followed by a section with concise editing of both images and sound, without any particular correlation, correspondence, or synchronisation		
0' 59"	Change of frame Close-up of a hooded man carrying a torch	A flute can be heard
1' 05"	Change of frame Medium field view of procession	Holding flute note linking the two shots
1' 07"	Change of frame Long field view, only torch lights can be seen	A "whistle" enters almost in synchrony with the change of frame
1' 16"	Change of frame with fade to black. Soldiers in Roman-style armour can be seen around a statue of Christ	The music resumes the fade-out and continues with electronically processed sounds
1' 19"	=	The percussion reappears and this time distinctly beats the march of the soldiers
This is followed by very dark images accompanied by electronic sounds that seem independent		
1' 31"	Change of frame The image of Christ drawn on a sheet appears. Slow close-up of figure	Silence. A fade-in on soft electronically processed sounds accompanies the zoom
1' 44"	Change of frame; same subject	Percussions enter (slightly in advance of change of frame)
A more concise editing section follows. The music is flowing but unassociated		
1' 56"	The camera's view rises from the procession to the sky, creating a kind of fade to black	The voice remains alone on the black image
2' 00"	Imperceptible change of frame A face can be glimpsed looking in the car in a very dark image. The effect is very unsettling.	With an abrupt dynamic jump, the <i>ff</i> (very loud) processed noises come back in
2' 04"	Change of frame The camera view returns to the procession	Percussion (slightly in advance of video editing)
This is followed by many unconnected changes in both shots and music that nonetheless create a kind of frantic finale		
2' 39"	Fade-out	Fade-out

The music closely follows the filmic narrative, to a certain extent adapting to the descriptive conventions of musical commentary on the action, such as in the Gregorian chants, in the rhythm of the procession marked by percussion, the electronically processed sound corresponding to the supernatural and the aspiration to attain it, the silence over the figure of Christ, the sound-image mismatches that often anticipate the procession, etc. It is evident that Bouchard and Varèse worked together on the editing. Diane Bouchard writes:

Rief ich Varèse an und sagte zu ihm: "Du mußt unbedingt herkommen und dir das anschauen". Und Varèse [...] sich nicht zweimal bitten: "Ich bin gleich da". Sorgfältig spielte ich den Originalfilm [...] ab. Als es vorbei war, sagte Varèse: "Großartig. [...] Ich werde den 'organized sound' für den Soundtrack komponieren". [...] Dann sagte Varèse zu mir: "Ich brauche ein Verlaufsschema des Films, mit Angaben zu allen Szenenwechseln und genauen Timings". Als ich dies gemacht hatte, stellte sich heraus, daß die Sequenz eine Dauer von 2 Minuten und 47 Sekunden hatte. Varèses wunderbares Stück paßte perfekt zur raschen Bewegung der Bilder, zur Stimme des Priesters, der das Caligaverunt, singt, zum Seufzer, zum abrupten Ende (Bouchard 2006, 322).

Thanks to this collaboration, Varèse was introduced to the world of film editing. The experience proved to have indelible consequences on his musical thinking, as is evident in the case of the continuous revisions of *Déserts*: after the first enactment at the Club d'Essai in Paris, Varèse proceeded almost exclusively by addition, deletion and replacement of tape segments and local interventions on the volume. The analogies with film editing are obvious. The reconstruction of the technical-compositional processes of Varèse's electronic music must therefore necessarily consider in all its density the concept of "organised sound", which is not confined to composition with tape, but also embraces the experiments in cinema, musical notation, and, not least, the later architectonic-sound experience of the *Poème électronique*.

POÈME ÉLECTRONIQUE

In 1958, Varèse went to the Philips research laboratories in Eindhoven to compose his *Poème électronique* in close contact with engineers and researchers. The music was part of a global multimedia experience conceived for the Philips pavilion at the Universal Exhibition in Brussels that year, which also featured the diffusion of sound within architecture designed by Le Corbusier and Iannis Xenakis accompanied by both a film conceived and shot by Philippe Agostini and Le Corbusier himself that reviewed the history of mankind and a light show (created with Louis Christiaan Kalff). This brought back into dealing with a work that involved the relationship between music and moving images in a new artistic, exhibition, and technological context. As regards the creation of the music, this was the first time he came into direct contact with synthesizers and

*There is a slight discrepancy between the duration of the sequence in the copy viewed (2'39") and the duration reported in the literature (2' 47"). In the copy preserved at the Library of Congress, no discrepancy was found. Perhaps the duration first reported by Ouellette, and taken from there, also takes the introduction of the narrator's voice into account.

pure sound generators (e.g. a siren—an instrument so dear to the composer—but here an “optic” siren for the generation of synthetic sounds). This encounter assumed paramount importance in the evolution of his compositional thinking and some of the sounds used in later versions of the interpolations may well have been first generated in Eindhoven. The versions of the interpolations of *Déserts* that the composer developed later at the Columbia-Princeton Electronic Music Center in New York, clearly demonstrate his intention to go beyond the purely concrete approach that had characterised his first version of *Déserts* and the music for *La procession de Verges*, and to study the possibilities offered by synthesis technologies.

Much has been written about the origin of this work.¹⁴ In a recent volume dedicated to Philips and to the origins of electronic music in the Netherlands (Tazelaar 2013), Kees Tazelaar goes through the stages which led to designing the project, all the way to the studio production and set-up of the work in the pavilion while also underscoring the role played by the Philips technical experts working with Varèse (Willem Tak, Simon Leo de Bruin, Jan de Bruyn, Anton Buczynski, at al.). The genesis of *Poème électronique* was complex. More specifically, the task of defining the spatialization of sound had been long and complicated because it was closely connected to the architectural framework in which it had to be completed and to the technological conditions of the day.

The first tests to assess the possibilities of sound spatialization were completed in early 1957 by Willem Tak alone, in a garage of Strijp III at Philips, set up for the occasion with loudspeakers directly on the walls; these architectural conditions were extremely different from those envisaged by Le Corbusier and Xenakis. The first ideas by Tak therefore differed greatly from what was actually implemented. For example, mention is still made of the walls, ceiling, and roof (in striking contrast with the characteristics of the facility with hyperbolic paraboloids Xenakis was designing) and of stereophonic sound; at least two pivotal elements in the final version of the work are already present, however: 1) sound moving through an exceptionally large number of loudspeakers placed along both axes—horizontal and vertical—enabled by a rotary switch, and 2) artificial echoes (see Tak 1957 quoted in Tazelaar 2013, 121-22).

In September 1957, Varèse travelled to the Netherlands. He immediately enquired about the sound diffusion conditions in the pavilion and the possibilities of spatialization. There are production notes, drawings, templates and sketches at Paul Sacher Stiftung in Basel that reveal the various ideas considered by the author in composing the movement of sound in space. Mention is made of different loudspeakers for low and high frequencies—the former built into the walls and the latter, 400 in total, placed all along the facility—of full-range loudspeakers placed in “antiphonal” position at the entrance and exit of the

14 The bibliography on the Philips pavilion and on *Poème électronique* is too extensive to be reproduced within the space of this paper. Please refer to Treib 1996; Dobson et al. 2005; Tazelaar 2013 and Izzo 2015.

pavilion, and spatial movement lines for the diffusion of the three tapes on which he was working. Tak's original project was ambitious; its technology was pioneering. In the end, the number of loudspeakers was reduced and the sound "routes" were redefined by Xenakis and physically installed in the architectonic structure only in early 1958. This meant that they were working "blindfold", without any possibility of carrying out tests on the actual operation of the spatialization lines, on the impact of their sound in real acoustic space, and on their relationships with moving images and lights. A 35mm 3-track perforated magnetic tape was used for the final sound diffusion within the architectural space. The sound was projected inside the room and amplified using an array of loudspeakers placed along the structure's walls. Once this work had been completed, a control room that included a player for the 3-track perforated magnetic tape and a 15-track system was set up to manage the control signal linked to a selective amplifier. The latter controlled arrays of loudspeakers or the rotary switch in charge of sound movement. Hence it was the control room that finally made *Poème électronique* possible by mechanically performing it inside the pavilion.

It was a one-off event: after the pavilion was dismantled at the end of the exhibition, the work was disseminated exclusively through monophonic or stereophonic reductions on record or during concerts. Only recently have some reconstruction projects attempted to reintroduce the original experience by taking advantage of the virtualization potential of IT tools. Alongside a number of initiatives that might also be classified as amateurish, the VEP project achieved significant results also thanks to funding it received from Culture 2000:

The goal of the Virtual Electronic Poem (VEP) project, co-funded by the European Union through the Culture 2000 programme, has been the realization of a virtual reality (VR) environment, capable of reproducing the global experience of the Poème électronique through a philologically accurate reconstruction of the original installation and a technologically innovative VR implementation, which is effective both in the visual and the auditory domain (using stereoscopic vision and binaural/multichannel audio). Starting from the available historical sources [...], it has been possible to recreate the audiovisual show in all its components [...] and to stage it inside a computer graphics reconstruction of the Philips Pavilion. The VR installation gives the user a renowned fruition of the Poème électronique, a unique work of the 20th century culture (Lombardo, Nunnari and Valle 2010).

Thanks to work completed by the multi-disciplinary team of musicologists, cinema experts, and IT engineers assembled to restore the audio part, the video, the light games, and the modelling of acoustic and architectural space, other projects similar to VEP now provide us with a virtualization of what might have been experienced by audiences at the time. At the same time, *Poème*

électronique has enjoyed vast success as a concert piece and now, separated from its multimedia context, survives today especially as a work of pure music.¹⁵

THE MIRAGE OF NEW TECHNOLOGIES: COLUMBIA-PRINCETON ELECTRONIC MUSIC CENTER

The Dutch experience opened up a new world of sounds for Varèse with which he intended to continue experimenting, also in regard to refining the interpolations of *Déserts*. As can be seen from his wide and frequent correspondence with leading protagonists of American electronic music—not only Ussachevsky, but also Otto Luening, Milton Babbitt, Roger Sessions, Max Matthews, and John Pierce, etc.—Varèse was certainly not unaware of what was going on in his adopted homeland. Precisely in 1959, the year of Ussachevsky's letter quoted here, the Rockefeller Foundation financed the purchase of an RCA Mark II synthesiser at Columbia University intended to initiate the official activities of the Columbia-Princeton Electronic Music Centre (already operational since early 1950). Varèse hoped to take part in the research. With support from Max Matthew, who informed the composer that Columbia University offered more possibilities than Bell Laboratories¹⁶ where he had conducted some experiments in digital sound synthesis, Varèse began working at the New York studio probably in April 1960,¹⁷ assisted by Max Matthews and Newman Guttman, both of Bell Laboratories, and later by Bülent Arel, with whom he would realise the 1961-62 version of the *Déserts* interpolations.

In New York, Varèse was given the chance to use new analogue/digital technologies and new synthesis systems in an aesthetic-cultural environment that was markedly different from the one in Europe. We cannot know for sure which instruments Varèse used at the Centre, but here too the imprint of the working environment and the team assisting him is evident (Ussachevsky 1958).

There is no need to dwell at length on Max Matthew, an MIT engineer and collaborator of John Pierce. His reputation as a pioneer of synthesis and digital sound recording on computers (both of which were realised as early as 1957) requires no attempt at description.

Newman Guttman was a perception psychologist who was among the first

15 The history of the publishing process of *Poème Electronique* as part of Varèse's music catalogue (Casa Ricordi s.r.l.) go beyond the scope of this article. See the recently restored edition by Cossettini and Olto (2021).

16 See the letter Max Matthews wrote to Varèse 19 February 1960 conserved at Paul Sacher Stiftung in Basel.

17 See the correspondence between Varèse and Vladimir Ussachevsky conserved at Paul Sacher Stiftung in Basel and in the Computer Music Center archives at Columbia University in New York.

to use digital sound synthesis systems to analyse characteristic aspects of listening. Varèse held Guttman in high regard, and on 29 April 1959 he presented his experimental piece *Pitch variations*, the first one-minute composition of computer-synthesised music, to the public in a concert at New York's Village Gate.

The Turkish composer Bülent Arel had studied sound engineering with José Bernard and Willfried Garret, members of the Club d'Essai in Paris, and was one of the pioneers of "mixed" music (see for instance his *Music for String Quartet and Oscillator* of 1957); called to the Columbia-Princeton Electronic Music Center by the Rockefeller Foundation, he then founded and directed the Electronic Music Studio at Yale University.

In 1963, acting on Ussachevsky's idea, Jacques Barzun, then rector of Columbia University, asked the Kaplan Foundation for a \$1,750 grant, to be added to the \$750 already provided by the Rockefeller Foundation, for the purchase of audio equipment. They should have been used to establish a private studio in Varèse's home at 188 Sullivan Street in Greenwich Village. The letter in which, on 22 January 1963, Ussachevsky asked Barzun to intervene in support of Varèse provides not only bureaucratic and economic information, but also the last important testimony to the composer's approach to the electronic medium:

for the past three years Edgard Varèse has been one of the composers to whom the Columbia-Princeton Electronic Music Center opened its facilities. A complete revision of the tape part of his work, DESERTS, has been accomplished through a very substantial allotment of the studio and technician's time; Columbia Records brought out the new version, unfortunately neglecting to mention our contribution. Last spring Mr. Varèse decided to learn everything about our studio first-hand, how to operate every knob and switch, and to manipulate the tape recorders himself. We have accommodated him to the best of our ability. However, since last august, including a temporary problem with his health, he has been unable to come, and the work he started remains unfinished.¹⁸

Unfortunately, the collaboration did not continue. The composer passed away in early November 1965.

CONCLUSION

The technical limitations of the time played an important role in Varèsian thinking in relation to film music. If in the original idea of *Déserts* and the music for Bouchard's film the relationship between sound and image is tight, calculated in individual details and editing points, in *Poème électronique*, music and film follow two almost impermeable parallel paths, united only by the aesthetic idea

18 Letter from Ussachevsky to Barzun dated 22 January 1963 conserved in the Computer Music Center archives at Columbia University.

behind the multimedia experience. *Poème électronique* closes Varèse's brief and tormented parable with moving images. From the little that remains to us, however, we can draw some considerations.

It is well worth noting that the two compositions that were made for film or multimedia work do not vaunt a tradition characterised by versions or variants (if we exclude the concert version of *Poème électronique*), whereas for *Déserts*, which remains only musical, rewriting continued uninterrupted: the only "static" version of the work is, in fact, the audiovisual version created many years later by Bill Viola (1994), who in a new authorial choice chose one of the many versions of the electronic interpolations (the 1954 version) and "froze" it in his multimedia work, with the sensitivity of also providing a "live" version that leaves wide interpretative margins open to the orchestral conductor's discretion (Albert 2021).

As is often the case in the history of media, there was a natural tendency to accept a new medium with excessive enthusiasm even in the 1950s. Electronic equipment had encouraged an idea already present in the New Music debate raging during the period that facilitated its implementation: the utopia of the perfect structure, frozen once and for all within the physical space of magnetic tape: no need for a performer to implement the musical concept at some later stage and turn it into "music", no disconnection between creation and practice, no coding and decoding, and most of all, the possibility of fixing events and defeating time forever. In the early days of electronic music, magnetic tape was seen as a ploy to capture musical creation directly as it becomes music, thus eluding the entropic process of performance tradition. Something changed in the course of that journey, however, and the initial enthusiasm regarding the crystallising of "perfect" musical structures dwindled: the static fixing of the composition concept probably led to creating work that was already "mummified" from the start, detached from time because it denied the music the possibility of re-contextualising itself through the live action of the performer.

The succession of *Déserts'* realisations is the mark of a practice that cannot be ascribed to the aesthetics of the "open work", since the indefinite variety of realisations does not result from the interventions of the audience or other composers, as is the case, for instance, in Henri Pousseur's *Scambi*, but from a repeated action of the author on the tape. In *Déserts*, Varèse does not abandon the fullness of the authorial figure; on the contrary, he reaffirms it through the different realizations of a work that may be defined as "in motion". If electronics allows the insertion of a new voice, which, however, does not enjoy the immediate variability of live music, nevertheless the electronic medium allows action on the communicative process. Through electronics, Varèse fixes the interpretation of the work, i.e. the sound itself. But once recorded on tape in the manner permitted by the technology of the time, the sound cannot be instantly modified. If therefore the composer also wants to be an interpreter, to renew the act of interpretation with each performance, he or she must resort to studio manipulation, cutting, copying, mixing, and producing new recordings. This is the Varèse way to electronics: to reaffirm, even in the context of new media

context, that the ultimate reason for music, its essence, consists in being able to be recreated through interpretation.

The study of Varèse's electronic production shows us how this great composer could successfully survive the utopia of crystallising musical action. Varèse seems to be continuously restating that even in the case of electronic music, Busoni's concept of the ideal identity of composition = performance = interpretation (Busoni 1910) still applies, an idea that thereafter will be rediscovered in live multimedia performances and visual art. In mixed music that combines a live component with a component fixed on an audio or audiovisual support, the gap becomes enormous: an ever-renewed performance of the instrumental part is confronted with static electronics, condemned to the obsolescence not only of its supports, but also of its acoustic sensibilities in relation to an ever-evolving audio technology. And this is also particularly evident in the projections of Viola's film with the live soundtrack.

At a time when electronic music was at best relegated to the introduction of alienating effects in an *ante litteram* sound design (think for instance of the theremin in Alfred Hitchcock's *Spellbound* 1945) or in science fiction films (the soundtrack to *The Forbidden Planet* 1956 composed by Louis and Bebe Barron being of paramount importance and initiating a style), Varèse saw original and pioneering ways forward that film music composers began to understand and fully embrace only years later. Laden with the burden of the symphonic and operatic tradition whose stylistic features they slavishly reproduced in film music, traditional composers of music for films were slow to understand a very simple, almost banal aesthetic concept, seen today after more than fifty years: a new form of art demanded a new form of music. Varèse, in fact, as Calabretto states, invited others to "abandon traditional musical commentary and elevate sound to an element of primary importance in the setting up of the cinematographic soundtrack" (Calabretto 2010, 219). The solution necessarily needed to be found in the new technologies of electronic music and their affinities with film editing technologies, a fact that is evident today in digital audiovisual editing in the integration and standardisation of practices in DAWs, but which few composers, even the big names in electronic music, realised at the time. At the level of aesthetics, this means conceiving a univocal art form in which the spheres of music and film are fully permeable, as if there were no aesthetic boundary between sound and image.

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