Varèse-Le Corbusier. Scenes from a rebellious thought.
Reconstruction of the Poème Electronique

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Abstract

After the closure of the Brussels Expo, the Poème Electronique ceased to exist. Today, forty-one years later, it has come alive once more - with the use of original or philological restored components - in the reconstruction of architect and a team of musicians and researchers at CRM – Centro Ricerche Musicali in Rome.

When Louis Kalff asked Le Corbusier to design a pavilion for Philips, the Master answered: "I will not make you a pavilion, I will give you a Poème Electronique, and the bottle to contain it". This was the birth of history's first electronic multimedia event, of "electronic games, capable of moving men and women, capable of speaking to a man's or a woman's heart, as to 1,000, 10,000 or 100,000 spectators and listeners".

1. The project of the Poème Electronique

First shown at the Brussels Universal Exhibition in 1958, in an architecturally revolutionary pavilion, which fitted the performance like a second skin, "the Poème Electronique intends to show, amid anguishing turmoil, our civilization as it sets off to conquer modern times": a large fresco that synthesizes, in eight minutes, mankind's long journey, ending in an optimistic apotheosis showing a future world of joy and harmony.

Light, color, imagery, rhythm combined with music written by Edgar Varèse, "a young seventy-year-old man" personally appointed by Le Corbusier to "unleash a stream of music".

The Poème is divided in seven subsequent sequences which, without even drawing attention to themselves during the show, organize its message and concept: Genesis (from 0 to 60"), Of matter and spirit (from 61" to 120"), From darkness to dawn (from 121" to 204"), Divinities made of men (from 205" to 240"), This is how years form (from 241" to 300"), Harmony (from 301" to 360"), and To give to all (from 361" to 480")

During the last sequence, optimism, faith in tomorrow, in mankind's and contemporary civilization's possibilities, reach their apotheosis. Le Corbusier himself becomes prophet and messiah of this hope, which materializes through the use of images which represent his work: architecture, town planning, the natural taking over of the environment are the means through which mankind will reach wellbeing.

2. Varèse' musical project

In 1958 Varèse started working on his composition in the Philips provisional studio. Scientific and technological new achievements offered opportunities for space simulation (see Revue Technique Philips, volume 17, 1955/56), for movement and rotation of each sound source, for reverberation control. As regards Varèse’s music, the only thing that sound engineers knew was that he would have used electronic sounds, while, on part of the Philips, the utilization of stereophony and artificial reverberation systems was considered most important. For this reason sound reproduction equipment with three independent channels were built: listening to three different sound sources, originating from and pointing to different directions would have been an absolute novelty.

Each track pointed to a large group of loudspeakers. The control signals would have been recorded on a second tape (a multitrack); some of these signals selected the loudspeakers to be used at fixed points of the performance, while others controlled the light effects.

Fig. 1 – Plant of the Pavilion (V. Casali, ’99)
Working in the studio was not an easy task, neither for Varèse, nor for the sound engineers, problems arising from the musical terminology to be understood correctly, in order to accomplish the composer’s requirements. The composition featured sounds characterised by a great timbre richness (concrete and electronic ones) that were processed in several ways (cuts, overdubs, filtering), and finally transferred on three tracks. The loudspeakers were 350 and the rooting, controlling and synchronization of the two tapes was an extremely hard task. To allow the synchronization of sounds and lights, the electronic controls for the performing of the Poème were placed on a single desk. Each amplifier featured a maximum of 12 loudspeakers, and the switching between the loudspeakers took place through a “relais”; to avoid abrupt signal interruptions, the “relais” had an envelope function (lower than 10 Hz) in order to lessen the peaks. In order to allow the shifting and the rotation of sound, telephonic selectors were realized, to be replaced in their original position once the rotation was completed. The complex synchronization mechanism between the sounds and their distribution among the loudspeakers is notated very precisely in a performing score.

2. The reconstruction of the Poème Electronique (CRM 1999)

2.1 The Pavilion and the setting

Some of the aesthetical and theoretical perspectives more fraught with consequences of the postwar culture, in particular for musical language and the artist’s social commitment, are to be recognised in the work of Edgar Varèse.

The idea of reconstructing the Poème Electronique with the original images, lights, colours sounds and components utilized in the Philips Pavilion on the Esposizione Universale hold in Bruxelles in 1958 is due to the collaboration between the Le Corbusier scholar Valerio Casali, architect and musician, and some composers of the CRM group.

The reconstruction project had several designs, ending at last with the ultimate version, realized in the Accademia Filarmonica Romana gardens in June 1999. The reconstruction of the Poème Electronique first involved the creation of an “hyperspecialized” space for the performance. Excluding the possibility of an accurate and exact reconstruction of the original Philips Pavilion for economic and organizational reasons, the team has started again right from the beginning, studying all the requirements for a philological version of the performance.

Two concave screen facing one another delimitate the physical space of the performance. A double projection of deformed images on each concave screen is so allowed, obtaining a full immersion of the audience in an encircling and delimitating space. The two screens have been placed considering two openings, for the entrance and exit.

Inside the “hall” two barriers (cm 183 height) have been placed, in front of the screens, at a distance of 113 cm from these: the barriers, curved as the screens, house projectors, floodlights and loudspeakers; thanks to the height of the barriers, the projections start above the heads of the audience; the settings obtain by this device an “auroral” quality, the coloured lights looking like rising from below, and “evaporating” towards the higher section of the screen.

The importance of this particular effect must be stressed, mostly because Le Corbusier conceived his settings as cosmic settings, inspired by original aerial views that were altered to avoid a naturalistical perception. If the projections started from the ground level, or from any other fixed point, they will surely lose much power of suggestion: the barriers were very helpful.

The screen walls are placed inside an orthogonal structure that supports them and houses some equipping above the audience: the stars, that must light up at certain moments, the manikin (a dummy), the mathematical object (a metal tube device resembling the atomic structure). All these, are the sole three-dimensional presences inside the pavilion, together with some loudspeakers.

The screen walls have been realized in a very simple and cheap way, using a white fabric, fireproof and waterproof; the fabric has been fixed above to metal centres hanging from the structure, and down to pegs placed in the ground. The barriers are chipboard plates painted white. The structure is an aluminium trellis modular system, designed to avoid damages due to the wind during the periods in which it is not in use.

The performance has been re-established on the basis of the score of Le Corbusier, of which several versions exist, relating to different stages of elaboration. A first one, containing the succession of all “voices” in time, with an
interruption at the end of each sequence, is not ultimate. Instead, the 1958 Philips edition, shows on its cover, written in pencil by the hand of Le Corbusier, the note: \textit{partition definitive}. This score is divided into settings, with no more than one setting per page, showing on the right one the temporal succession of the “voices”, and on the left one an outline of each setting. These drawings are printed black and white, while the colours are simple backgrounds shortly described. A third score exists, owned by the Getty Center, in which the outlines are washdrawings by Le Corbusier; with the help of this material an exact reconstruction of the settings has been possible.

3 \textbf{Acoustic Space Simulation}

For the virtual reconstruction of the Pavilion acoustic space five principles of sound diffusion have been utilized:

1. localized diffusion
2. reflected diffusion
3. wide and limited frequency bands
4. delay lines
5. reverberation

The sound diffusion system has been realized through 24 pairs of loudspeakers and 24 separate amplification lines; the loudspeakers (Istituto Gramma ’98) have been designed by Michelangelo Lupone, and divided according to power, radiation angle and frequency band characteristics. Three different sound fields have been placed in the Pavilion: 8 independent channels have been assigned to each field, and the sound sources movement has been realized by the Fly30 system (1) and by a control program for the synchronization and the power calibration. The loudspeakers on the ceiling have been placed in order to obtain a sound energy concentration along the walls, while the concave shape and the sound reflecting material allowed a wave front deviation that strengthened the sound sources movement perception. The loudspeakers on the ceiling feature a spectral curve between 100 Hz and 15000Hz, and a radiation angle below 60°, obtained by wave guides. To allow on part of the audience a strong perception of the proximity of the sound sources, 8 loudspeakers pairs have been placed along the perimeter of Pavilion , 8 loudspeakers pairs at 183 cm height, with a frequency curve between 400 and 7000 Hz; on these eight diffusion channels the dynamic controls of reverberation have been placed. 8 high power loudspeakers pairs with wave guide emission oriented above have been placed behind the walls, in connection with the projection points. On this system the low frequencies energy and the wide band have been concentrated, in the moments of full dramatic tension of the \textit{Poème}.

The voices and the sounds of war destruction have been diffused through this system, fully encircling the listening area making the audience sense a great happening that moves from outside towards the inside. To obtain a more powerful definition of sound movement 8 independent delay lines have been used, while the sound sources fading away in the distance have been focused around the exit area of the Pavilion.

![Fig. 3 Internal sight of the Pavilion (V. Casali, 1999)]](image)

\textbf{Conclusions}

According to Le Corbusier, the Poème Electronique had to be a work in which the audience was placed in the centre a global performance, and, thanks to the new electronic technologies, this was finally possible. Varèse, on the other hand, was a real innovator: his contribution was not only focused on the utilization of electronic technologies for the sound production and elaboration; he, for the first time, stressed the importance of the organization of “acoustic space”, considered as a substantial element, together with other parameters, of a musical composition.

The Poème can be considered as the first example of multimedial performance, realized through electronic technologies.

The CRM’s aim was that of creating again the suggestions and the emotions originating from a complex perceptive experience, that in 1958 was a pioneering and innovative one.

The listener was really plunged in space, free to move inside the Pavilion, to follow the movements, the directions of the masses and of the sonorous objects in their shiftings, in the gorgeous landscape offered by the gardens of the Accademia Filarmonica Romana.

For the completion of the project the CRM has worked in cooperation with the Fondation Le Corbusier (Paris), the Philips International Company Archives Historiography, (Eindhoven, The Netherlands), the Embassy of France in Rome.
References


