Le poème électronique **is generally known as the multimedia event presented in the Philips Pavilion at the Brussels World's Fair of 1958. In *From Harmony to Chaos*, the structure and genesis of the *Poème* are discussed against the background of the conceptual viewpoints of the three artists concerned: Le Corbusier, Edgard Varèse and Iannis Xenakis.**
The book also explains that, from the start, Philips had its own idea for a spectacle with colour, light and sound, which was incompatible with the plans of the "bunch of artists" that it had set out with. As a result, Le Corbusier's visual show and Xenakis's musical contribution were wrecked: it was Philips's version of *Le poème électronique* that was shown at the 1958 World's Fair. This book however is not about that performance.
From Harmony to Chaos **offers an entirely new reconstruction of *Le poème électronique* on the basis of an in-depth analysis of Le Corbusier's original scenario. Pivotal in this discussion is Le Corbusier's notion of a *synthèse des arts*, in this case the synthesis of architecture, the visual arts, film, spoken word and music.**

Jan de Heer, architect, Kees Tazelaar, composer.

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Jan de Heer
Kees Tazelaar

FROM HARMONY TO CHAOS
Le Corbusier, Varèse, Xenakis and *Le poème électronique*

1001

Jan de Heer & Kees Tazelaar

from Harmony to Chaos

Le Corbusier
Varèse
Xenakis
and

Le poème électronique

Contents

1.
Introduction

Le poème électronique is the title of a multimedia performance that took place in the Philips Pavilion during the Brussels World's Fair in 1958. The spectacular visual part was designed by the architect and painter Le Corbusier, who was also responsible for the design of the pavilion in collaboration with Iannis Xenakis. The equally spectacular musical part of the *Poème* consisted of two parts – a piece composed by Xenakis to be played on entering and leaving the pavilion and an eight-minute work by Edgard Varèse. The whole performance was set by Le Corbusier in a detailed scenario and executed entirely automatically.

The pavilion was an important factor in the performance. It did not have the traditional form of an auditorium with a stage area; instead the public was surrounded by the spectacle. The undulating walls of the structure gave the visual scene a strange extra dimension and the sound was conveyed via a huge number of loudspeakers, distributed in clusters and sound-routes along the ribs of the pavilion.

The Philips Pavilion and *Le poème électronique* are important in the work of Le Corbusier for a number of reasons. Firstly, with its striking shape, the pavilion itself stood out for its originality among all the pavilions of the different countries at the Expo; what is more, it occupies an exceptional place in Le Corbusier's *oeuvre*. More importantly however, its shape could in his view only genuinely be assessed in combination with the *Poème*. The combination of the *Poème* and the pavilion is an expression of his ideas about the *synthèse des arts*. In this case, he did not just confine this synthesis of the arts to architecture and the two visual arts; he deliberately included music and film as well. For Le Corbusier, the *Poème* was the vehicle for appreciating the unusual form of the building

and its visual entourage. With their temporary character, the pavilion and the *Poème* were intended for each other. Furthermore, the project was a more or less successful attempt at collaborating with other artists, in this case the composers Varèse and Xenakis – something that Le Corbusier had not hitherto succeeded in achieving, despite a number of previous attempts.

In Le Corbusier's post-Second World War production, the Philips Pavilion belongs in the series of the Unité d'habitation in Marseilles, the chapel in Ronchamp and the monastery of La Tourette. One can equally well see it as part of a series of projects over a longer period in which Le Corbusier presented himself as the subject of an exhibition – architect, city planner, artist and propagandist of his own ideas – the Pavillon de l'Esprit Nouveau of 1925, the Pavillon des Temps Nouveaux of 1937 and also the exhibition of his work in the Musée National d'Art in Paris in 1953. And yet despite its landmark place in his career, the Philips Pavilion is not paid much attention in *Le Corbusier Œuvre complète*, where it is dismissed with two pages, including four photos, and a single word mentioning the *Poème*.[1] The reason is fairly simple, namely that Le Corbusier felt that the *Poème* was a partial failure. After the World's Fair had finished and the pavilion was taken down, the *Poème* became a closed chapter. All he was willing to admit was that the result had only been an "approximation"[2] of what he had had in mind.

In recent years, a great interest has been taken in aspects of the project. Partly owing to his music for the *Poème*, Varèse achieved international recognition and his composition became an icon in the history of electronic music. Considerable interest and admiration has also grown over recent years about the design of the pavilion, this being in great measure Xenakis's contribution, which, like Varèse's work, took on the status of an icon, in this case for its 'liquid architecture'. Despite all the publications devoted to it, Le Corbusier's share in the project has however received very little recognition.[3] Bart Lootsma and Marc Treib have provided a description of the *Poème*, but their main concern was with the architecture of the pavilion. Sven Sterken described the design of the pavilion as part of Xenakis's work. Finally Peter Wever has compiled a large amount of interesting data about the pavilion and the *Poème* that had not hitherto been mentioned. While the first three publications largely focused on the architecture, which they discussed fairly thoroughly, *From Harmony to Chaos* concentrates on the *Poème*. The pavilion is only discussed as part of the complex of the *synthèse des arts*. What was absent in the previous publications was any perception on the part of the critics and commentators that the project was an exploration of Le Corbusier's ideas about the *synthèse des arts*; nor did they appreciate the mutual dependency between the performance of the *Poème* and the shape of the pavilion.

With the Philips Pavilion, *Le poème électronique* was a milestone in Le Corbusier's *synthèse des arts* project. It is a project that formed an important source of inspiration for architects of the 1950s and 1960s and was an example for them of the interconnection between architecture and certain works of modern art. For generations to come the Philips Pavilion, together with the chapel in Ronchamp and the Unité building in Marseilles, was an important model for architecture as sculpture.

The compositions of Varèse and Xenakis occupy an unusual position in the history of twentieth-century music. While Varèse had explored ideas about completely new musical forms throughout his life, without ever managing to achieve them in practice, Xenakis succeeded in a period of less than five years in implementing many of Varèse's utopias. What is more, this period largely coincided with the realization of the Philips Pavilion. The interest among the architects of that generation for this sort of music can therefore easily be understood.

From Harmony to Chaos consists of a number of more or less separate, substantial chapters. Although they do not need to be read in the published order, readers are recommended to do so. Chapter 3, the first substantial chapter, 'Le Corbusier's Ineffable Space: Modern Architecture and Ornament', describes the origins and limits of Le Corbusier's idea of the *synthèse des arts* and shows how the idea took on form in the design of the pavilion and the *Poème*. A central place is allocated to his article 'L'espace indicible', published in 1946. The following chapter, 'Space and Electronics in the Music of Edgard Varèse and Iannis Xenakis', describes the context in which the musical compositions of the *Poème* are to be understood. It deals with a number of conceptual notions in Varèse's work and explains their relation to the ideas of Xenakis.

The title of the next chapter, chapter 5, is 'The Origins of Le Corbusier's Scenario for *Le poème électronique*'. It follows the evolution of the project step by step. Documentation that was not easy of access has been interpreted, translated and extensively included in the text. The result is a complete picture of Le Corbusier's intentions with the *Poème*. The scenario initially evolved at the same tempo as the design of the pavilion. It was ready in May 1957, a date that roughly coincided with the driving of the first pile. The evolution of the *Poème* did not occur without any obstacles. While Xenakis was made responsible for the supervision of the construction of the pavilion, Le Corbusier took it on himself to put the finishing touches to its *Poème*. His wife however fell ill in the summer of 1957, and this prevented him from carrying out a further elaboration. Only after her death on 5 October 1957 was he able to take up the threads of the project with remarkably renewed energy, delivering the *minutage* of the *Poème* at the end of November.

Chapter 6 gives a description of the component elements of both the visual and the musical parts of the *Poème*. The pavilion, the sculptures, the *ambiances*, the *écrans* and the *tri-trous* and the musical works are discussed in turn. Their backgrounds, the development of the interior and the mutual coordination of all the parts are then reviewed.

Chapter 7 and 8 describe the mutations that the original scenario underwent prior to the first public performance in May 1958. They also discuss the development of the technical aspects of the *Poème*, including both the visual and the musical elements. Most of the emphasis in these chapters is on the realization of the *Poème* from Philips's perspective. Since it last took part in an event of this kind, namely at the Paris World's Fair of 1937, the firm had developed a precise idea which it also attempted to realize at the Brussels World's Fair of 1958. Right from the start it had a preconceived notion of the way it should present itself at the Expo. Its aims, which involved making publicity for the company, offering a demonstration of high-tech multimedia and entertaining the public, conflicted sharply with the artistic aspirations of Le Corbusier, Varèse and Xenakis. As Frits Philips put it in an interview in 1998, Philips had put its faith in "a bunch of artists" in the hope that something would come of it.[4] The chapters give a detailed account of the conflict this attitude gave rise to and its implications. Finally, the

1 'Le Pavillon Philips à Bruxelles 1958', in *Le Corbusier Œuvre complète*, volume 6, 1952–57 (Zürich: Girsberger, 1957), p. 200.
2 Note, Le Corbusier, 8 February 1959, FLC J2-19-569.
3 See Bart Lootsma, 'Een ode van Philips aan de vooruitgang', *Wonen-TABK* 2 (1984), p. 10; Maarten Kloos, 'Iannis Xenakis: muziek, architectuur, ruimte', ibid., p. 18; Bart Lootsma, 'Le Poème Electronique', ibid., p. 20; Bart Lootsma, 'Poème Electronique: Le Corbusier, Xenakis, Varèse', *Le Corbusier Synthèse des arts: Aspekte des Spätwerks 1945–1965* (Berlin: Ernst, 1986), p. 111 ff.; Marc Treib, *Space Calculated in Seconds: The Philips Pavilion, Le Corbusier, Edgard Varèse* (New Jersey: Princeton University Press, 1996); Sven Sterken, 'Iannis Xenakis, ingénieur et architecte' (dissertation, Ghent University, 2003–2004); Peter Wever, *Inside Le Corbusier's Philips Pavilion: A Multimedial Space at the 1958 Brussels World's Fair* (Rotterdam: nai010, 2015).
4 Willem Hering and Hank Onrust, *Het elektronisch gedicht: Edgard Varèse in Nederland*, documentary, VPRO television (1998).

failure, at least in Le Corbusier's eyes, of the project is analysed here.

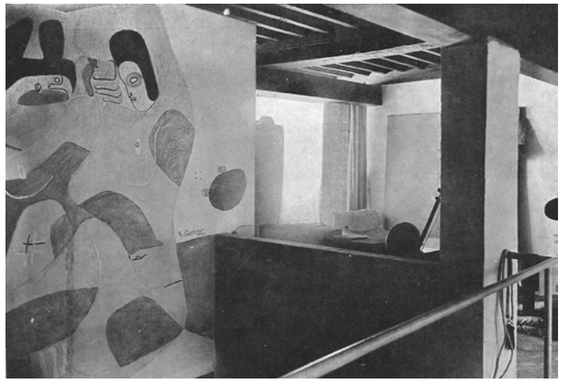
For a number of reasons the description and analysis of the visual part of the *Poème* is a complicated business. To begin with, the performance presented during the World's Fair in the Philips Pavilion in Brussels was nothing like the product Le Corbusier had had in mind. Even before Le Corbusier had written his scenario, Philips had decided that the performance should be implemented as a light show, with the result that the screenplay was subjected to piecemeal alterations and ended up seriously mutilated. In theory, Le Corbusier's original scenario could well have been realized as a Cinerama film that Philips possessed the equipment and technology to produce, but the firm decided otherwise. On the other hand, Le Corbusier introduced changes in the structure of the performance right up to the last minute to resolve his conflict with Varèse about the text to be spoken while the music was playing. In short, the version shown in the pavilion was a pragmatic compromise which Le Corbusier could not identify with. It is therefore not meaningful to view this form of the performance as Le Corbusier's ultimate product.

For this reason, it is only proper in analysing Le Corbusier's contribution to the *Poème* to refer to the original plan and not to Philips's realization. The most authentic and complete form of his scenario is that of 27 November 1957, the tabular *minutage*, or timetable.[5] It has proved possible on the basis of two versions of the *écrans* film for the *Poème* in the Eye Film Institute in Amsterdam, and a fragment from a film by Pierre Kast, to make a complete reconstruction that effectively tallies with Le Corbusier's instructions in the *minutage*. The analysis in this book is based on a close reading of this *minutage* and not on the realized version as performed in the pavilion, even if this can sometimes be quite confusing for the reader. The same is also the case with the description of the elements of the *Poème* in chapter 5, where all the changes introduced into the scenario after 27 November are as good as ignored. Where the term *Poème* is used, what is referred to is the idea of the *Poème* as contained in the original *minutage*. In part the confusion comes about because in interpreting the sequences and their images we have made use of Le Corbusier's own commentaries, early or late.

As mentioned above, Le Corbusier was disappointed with the end result. For Xenakis however the project was the start of a fruitful career. Many elements of his later work were in theory present in the *Poème* and in his design for the pavilion. For this reason, Xenakis's own evaluation of the *Poème* is reproduced as the final text.[6]

5 FLC J3-20-74-001 to 012.
6 Iannis Xenakis, 'Notes sur une geste électronique', in Jean Petit, *Le poème électronique: Le Corbusier* (Paris: Ed. Minuit, 1958), p. 266 ff.

14 Fernand Léger, 'The wall, the architect, the painter', *Functions of Painting* (London: Thames and Hudson, 1973), p. 93.
15 Le Corbusier, 'Le pavillon de L'Esprit Nouveau', *Almanach d'architecture moderne* (Paris: Crès & Cie., 1926), p. 116.
16 Le Corbusier, 'Unité', *L'Architecture d'Aujourd'hui*, special issue 4 (1948), p. 53, 55.



Deux femmes aux bains, mural in the Jean Badovici house, Vézelay, 1935–36, FLC

Le Corbusier painting *Deux femmes aux bains*, Vézelay, 1935–36, FLC

to the Renaissance. The modernists of today, he declared, were the loyal successors of this 'primitive' culture.[14] He saw a connection between these ideas and the notions of the art critic Christian Zervos and his journal *Cahiers d'Art*, which from 1926 onwards had pointed to the relevance of 'primitive' art for Modernism.

For Le Corbusier murals meant a definitive break with Purism and they gave a fresh impetus to the relation between painting and architecture. He wrote the article 'Sainte Alliance' at the same time as he and Léger were discussing their plans for the murals with Badovici. The nine murals that he went on to make between 1938 and 1962 in villa E1027, the home of the designer Eileen Gray and Jean Badovici in Cap-Martin, remain the most advanced works by Le Corbusier in this medium.

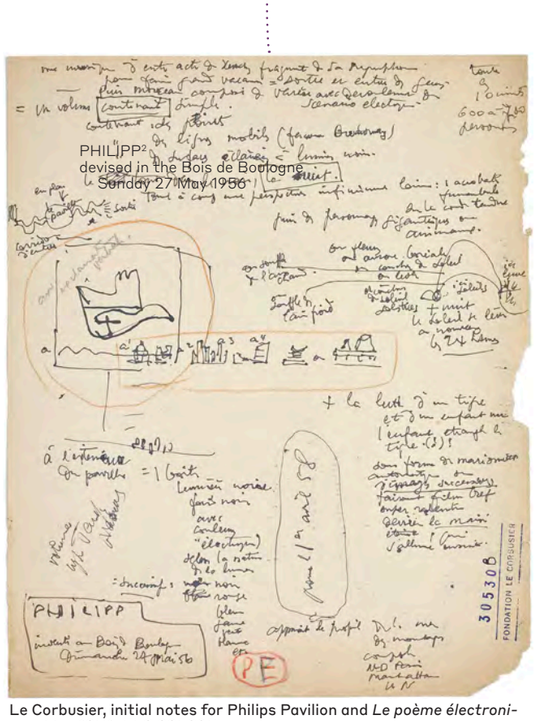
The issue of murals formed the pivotal point in the relation between his painting and his architecture. For many years, he had advocated a naked architecture without ornaments and a painting that was independent of any architectural context. Both had to be judged on their own merits. His point of view was strongly influenced by his Pre-Purist theory and practice. He wanted, he wrote, to make painting and sculpture "separate" from the wall, assuming that they were still attached.[15] Paintings should be put in frames and be moveable with regard to the structures in which they were hung. Through his work on these murals however, his views on the relation between architecture and painting changed. The art form which he had formerly so emphatically declared as being independent, would now become part of the architecture – together they could be once more thought of as a single object.

The only form of painting that he permitted in his Purist architecture was architectural polychromy, painting the parts of a building in different colours. To avoid the appearance of decorative painting, he insisted that the use of polychromy should relate inseparably to the architecture, making the one a function of the other. The use of colour served to contribute to the beauty of the architectural proportions. The polychromy made it possible to arrange and correct these proportions. The most important rule he applied in the use of colour was that an entire wall had to be painted in a single plain colour, a rule that a mural would by definition violate. In short, since the experiment in Vézelay, architectural polychromy and the mural were at cross-purposes.

The murals and the polychromy of E1027 blend with each other. Le Corbusier gave these paintings a function that was related to that which had previously belonged to the polychromy. Their visual power, which he had, with Purism in mind, refrained from deploying in his use of polychromy, in order to subordinate it to the architecture, resulted in a confrontation with the architecture, which led to "ineffable perspectives".

Le Corbusier, mural, villa E1027 Cap-Martin, 1939, FLC

The interior of this villa which I enhanced with my murals was white and beautiful and could certainly have done without my talent. It has to be acknowledged however that the owner and I, as the murals developed under my brush, witnessed the birth of a miracle of space, of *ambiance coloré* [colourful ambiance] and of spiritual atmosphere. An enormous transformation.[16]


PHILIPP[2]
devised in the Bois de Boulogne
Sunday 27 May 1956

Le Corbusier, initial notes for Philips Pavilion and *Le poème électronique*, May 1956, FLC 30530B

a musical interlude by Xenakis, a fragment of his symphony
to make a lot of noise = exit and entry of people every
Then a piece composed by Varèse with development
of the electronic scenario
= a simple surrounding volume
containing: points
,, mobile lines (rail[roads] Broadway)
,, with surfaces lit with black light
everything in black, the night.
fig. 1 suddenly an infinitely distant perspective: 1 acrobat
tightrope walker
on the high wire
then gigantic figures or
animals.
flowers
northern lights
fig. 2 sunrays
at sunrise
warm wind
cold wind
fig. 3
sunrays
at solstice
the sun rises again
every
24 hours

+ the fight between a tiger
and a naked child
the child throttles the
tiger. (!)!

every
9
10 minutes
600 á 700
persons

outside
the pavilion = 1 box
black light
black background
with
"electric"
colours
according to the type
of light

volume
Temps Nouveaux
style

before 1 April 1958

in shapes of automatic
marionettes or
series of images
comprising a short film
extreme slow-motion
kept taut
extinguished, which
then ignites

= in turn: black
red
blue
yellow
green
white

then the profile appears
of the sea
of the mountains
dome
Notre-Dame Paris
Manhattan
UN

PHILIPP

devised in the Bois de Boulogne
Sunday 27 May 1956

And in pencil next to the drawing of the *Open Hand*, presumably later than the other details written in pen:

with verbal exclamation

On the reverse side we read:

Benjamin Britton Poggi and Bess

8 June 56
M Kalf
Philipp

M d'Aboville
90 Montaigne
Balsac 07.30

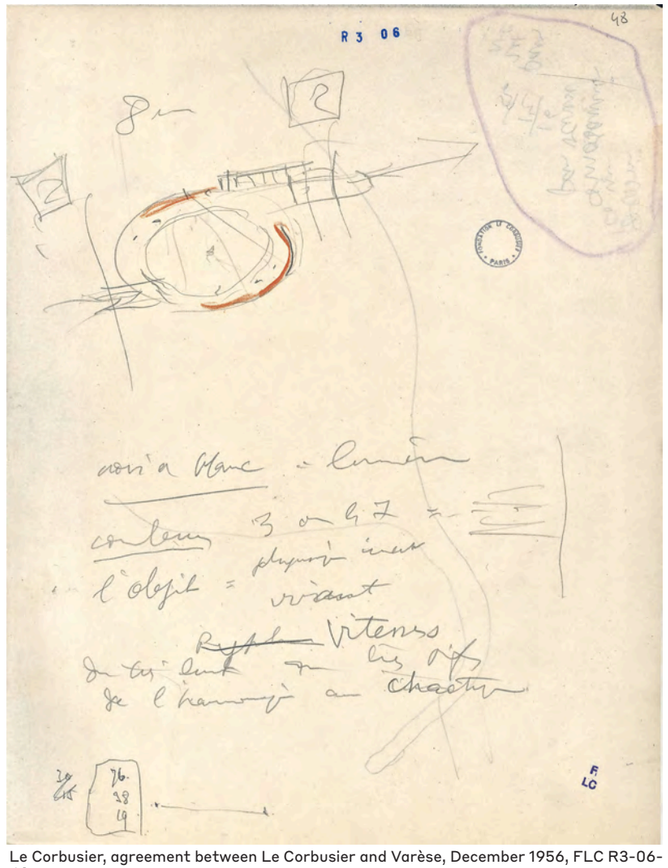
Rietweilt

2 Le Corbusier excelled in misspelling the names of people and institutions that he was dealing with, six of them in this case!
3 Letter from Kalff to Varèse, 29 November 1956, LKM.
4 FLC R3-6-48.
5 Ibid.

ground plan of the pavilion, which would later be called the "stomach", as it was intended to process large crowds of visitors. The second is the profile of a series of buildings in Paris, New York and Chandigarh that made play of the shape of the horizon. Towering above all this is the sign of the *Open Hand*. This figure is included virtually unimpaired in the final sequence of the scenario. The final figure is the diagram of the rising and setting suns. The entire structure of the *ambiances*, that is, the continuous play of colours in the pavilion, would originate in the idea underlying this figure.

The Agreement Between Edgard Varèse and Le Corbusier

Le Corbusier and Varèse had their first meeting to discuss their possible collaboration on *Le poème électronique* on 16 December 1956. Varèse had been invited by Philips to go to Paris. Le Corbusier insisted that Varèse should be given the contract for the musical part of the *Poème*, but at Philips people were not convinced of his musical talent. They had another composer in mind, namely Benjamin Britten. A requirement was stated that Varèse's contribution should



Le Corbusier, agreement between Le Corbusier and Varèse, December 1956, FLC R3-06-48

contain "symphonic elements", with the assumption that these were what the general public liked and that Varèse didn't have them in his repertoire. They wanted to put this request to him in person. In his letter inviting Varèse to take part, Kalff glossed over his bosses' doubts and wrote:

> At the end of the year a meeting must be arranged in Paris to discuss the possibilities of the scenario with you, Mr Le Corbusier and the technicians of the audio, lighting and electronic automatization in order to get a better idea of what can be realized and also to talk in more detail about your role in it.[3]

This discussion between Varèse and the staff of Philips took place on 21 December. Le Corbusier and Varèse had met up a couple of days previously. Le Corbusier's notes of this meeting have survived.[4] The first page comprises a sketch of the ground plan of the pavilion with a timetable above it of the whole performance of the *Poème*: "2 8 min 2", or a two-minute prelude, an eight-minute performance and a two-minute postlude. Below is some shorthand text:

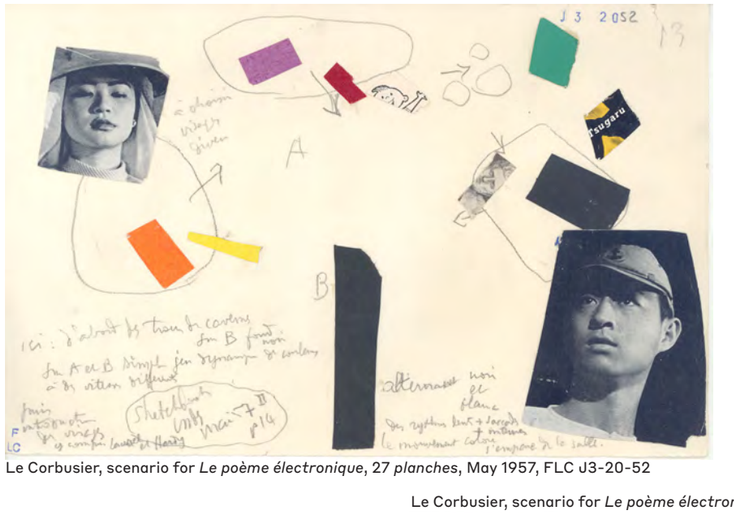
white and black = light
colour 3 or all 7 = [diagram of the rising sun]
the object = physically immobile
lively
speeds
from the most high right down to everyday living connections
from the harmonious to the chaotic[5]

not yet chosen
different
faces

here: first the holes of caves
on B background
black
On A and B simple dynamic play of colours
at different speeds
facial expression
intro or extra
including Laurel and Hardy

Sketchbook
India
mei 57 II
p. 14

alternating black
and
white
slow + jerky rhythms
+ intense
the coloured movement
becomes master of the auditorium



Le Corbusier, scenario for *Le poème électronique*, 27 *planches*, May 1957, FLC J3-20-52

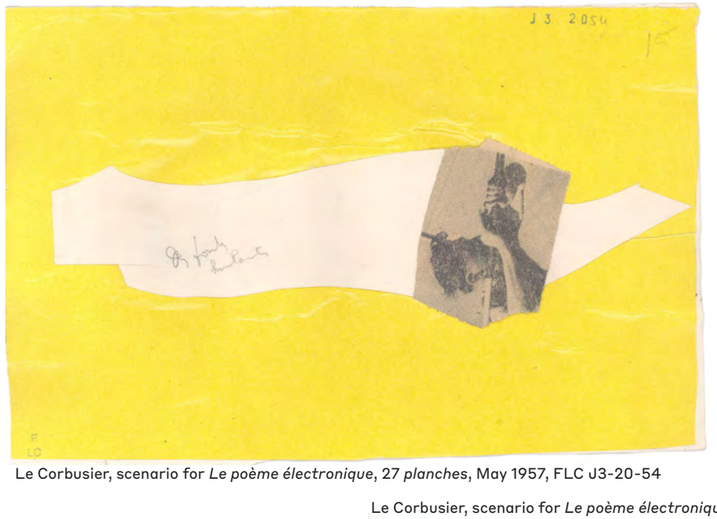
Le Corbusier, scenario for *Le poème électronique*, 27 *planches*, May 1957, FLC J3-20-53

Worms
animals snakes
grasshoppers
rhinoceros
chameleon

Jean Painlevé

civilized [?]
fights
for life and death
TV

clashing
backgrounds



Le Corbusier, scenario for *Le poème électronique*, 27 *planches*, May 1957, FLC J3-20-54

Le Corbusier, scenario for *Le poème électronique*, 27 *planches*, May 1957, FLC J3-20-55

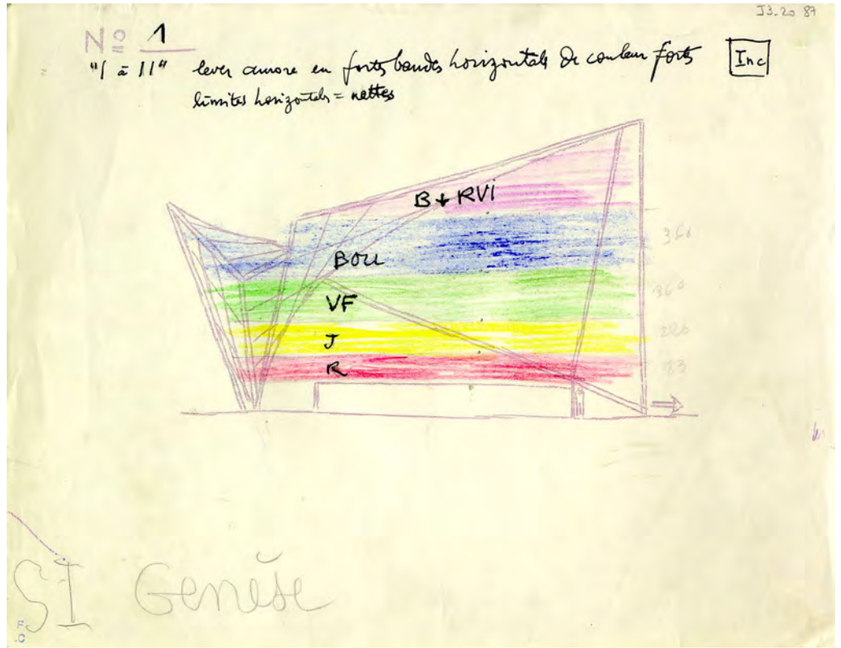
fragments

beautiful
men
women
gods

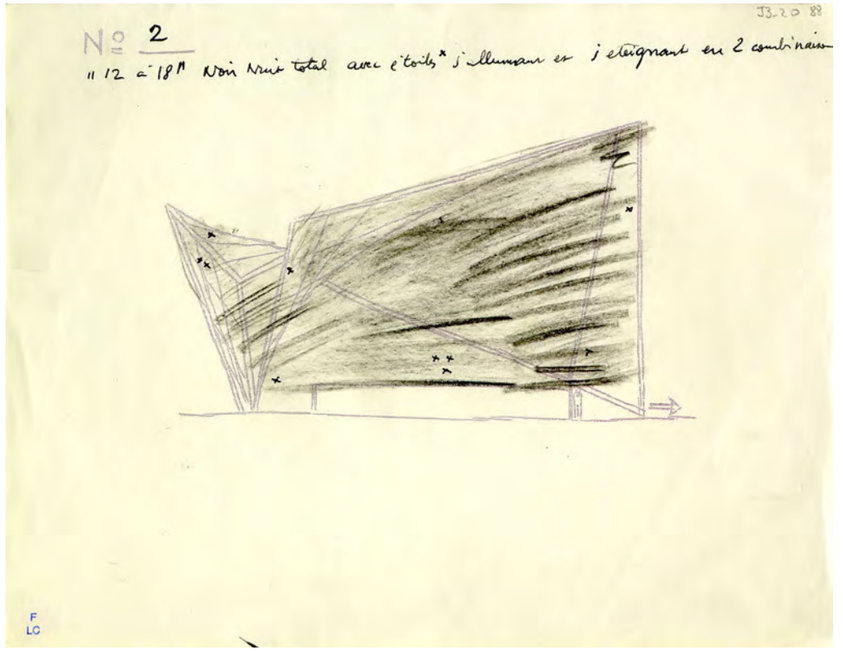
44 Letter from Le Corbusier to Kalff, 6 January 1958, LKM.

45 FLC J3-20-86-001 to 040.

46 FLC J3-20-86-001.



Le Corbusier, coloured-in *ambiances*, January 1958, FLC J3-20-86-1



Le Corbusier, coloured-in *ambiances*, January 1958, FLC J3-20-86-2

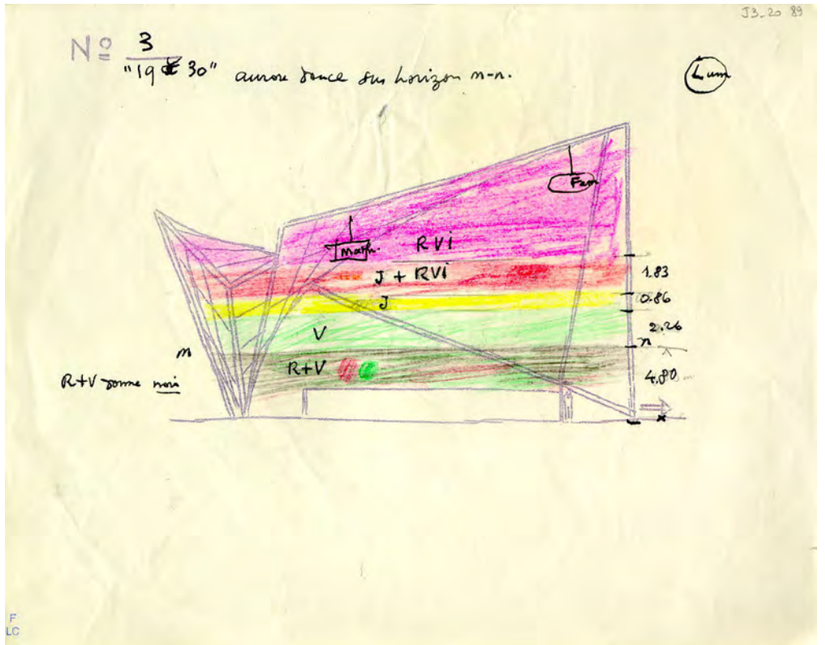
The Coloured-in *Ambiances*

With the completion on 17 December 1957 of the *minutage* and all the documents pertaining to it, Le Corbusier's work was really finished. Even though Xenakis still stated the opposite in a letter to Kalff on the day it was handed in, Le Corbusier himself declared in his letter of 6 January 1958 that the *minutage* of Petit was the definitive version, apart from a few simple alterations where required by technology.[44] In practice however that turned out otherwise. On 16 January a discussion took place in Paris about the *minutage* that Petit had circulated. Kalff had drawn up a detailed list of questions; these were dealt with systematically, resulting in considerable alterations, particularly with regard to the *ambiances*, with no less than 28 of the total of 42 being affected. These alterations were included in the coloured-in version of the *ambiances*, which, although they were not dated, must have been made after 16 January 1958.[45]

The first drawing of this list of coloured-in *ambiances* contains a key to the colours used:

R – primary red
J – primary yellow
V – pale green
B – blue (primary cobalt)
Bjour – daylight white
N – night-time black
Lum – luminescent
Inc – lightbulb [incandescent][46]
ROR – red orange
JOR – dark yellow
VF – dark green
BC – pale blue
RMA – pale mauve
JMo – mid-yellow
BOU – ultramarine
RVI – violet, pink

The coloured-in areas give a good idea of Le Corbusier's intentions. Next to them are the abbreviations from the key. The measurements of all the horizontal and vertical bands of the sun, the moon and the clouds have been taken systematically from the Modulor. In addition to the duration of the *ambiances*, the drawings also show what is to be viewed on the *écrans* and the *tri-trous* at the same time.



Le Corbusier, coloured-in *ambiances*, January 1958, FLC J3-20-86-3

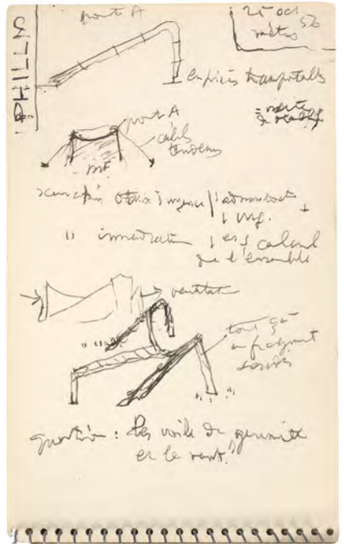
Le Corbusier, sketches for the Philips Pavilion, November 1956, FLC CA-K44-10

design over to Iannis Xenakis for further development, as he had announced in a letter to Varèse in June 1956. Xenakis went straight to work, taking the simple ground plan from Le Corbusier's initial idea as a starting point and creating a model with three asymmetrical gantries that have cables running to the periphery of the ground plan, a sort of tent. The design straddles two concepts. In the models it looks like a shell structure, an edifice constructed of ruled surfaces. One of the characteristics of shell structures is that their shell is strong and thin. Meanwhile, the drawings and attendant schematic details give the impression that the whole thing should be viewed as a tent structure of concrete tent canvas on a supporting framework of gantries.

The design sketch was presented to Kalff on 24 October 1956. Shortly afterwards Eiffel's engineering firm in Paris was asked to consult on the construction of the pavilion and carry out the preparatory work for building it. The engineers saw little more than a complicated tent structure in the design and recommended that it be adapted to that concept. Le Corbusier attempted to incorporate their advice into a couple of sketches.[8] He simplified the design, conceived of a method for prefabricating the gantries and drew a tent with 'canvas' of shotcrete supported by gantries and suspension cables, much like his original idea based on the structure of the Pavillon des Temps Nouveaux. In the sketch from 2 November 1956, Le Corbusier confirmed this standpoint: a reduction in the number of visitors to 500 and a structure made of gantries and suspension cables.

While Le Corbusier was in India

Le Corbusier, sketches for the Philips Pavilion, November 1956, FLC CA-K44-13



Le Corbusier, sketches for the Philips Pavilion, November 1956, FLC CA-K44-20

from 8 November to 14 December 1956, Xenakis worked on a second version of the design, incorporating a few of the recommendations from the Eiffel engineers. He found the majority of their suggestions unacceptable however. Time was running short though, so on 25 January 1957 Kalff took matters into his own hands. He wanted to ask other construction firms for advice and drew up a description of the project for the purpose of requesting bids.[9] The project quickly gained momentum after that and on 30 January a final meeting was held with the engineers at Eiffel.[10] A week later Kalff wrote Le Corbusier to say that he had met with Hoyte Duyster, the director of the Société de Travaux en Béton et Dragages (STraBeD), a Belgian branch of the Hollandse

8 *Le Corbusier Sketchbooks*, volume 3 1954–1957, figs. 716, 719, 720, 25 October, 2 and 6 November 1956.

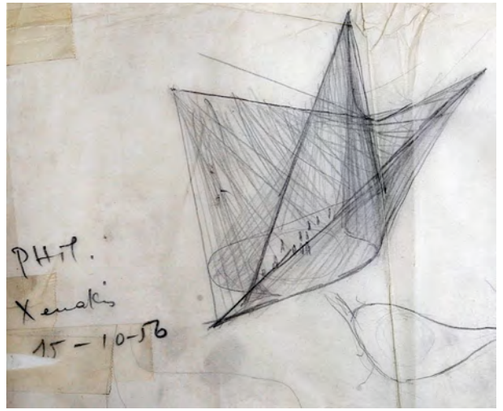
9 Kalff, 'PHILIPS PAVILJOEN – BRUSSEL 1958 – PROJECT NO. 6436', 25 January 1957, LKM.

10 FLC J2-19-222.
11 Letter from Kalff to Le Corbusier, 4 February 1957, LKM.
12 FLC 30606B; see also A. Spoorenberg, 'Voorcalculatie Wereldtentoonstelling Brussel 1958 Philips Paviljoen', 26 February 1957, LKM.

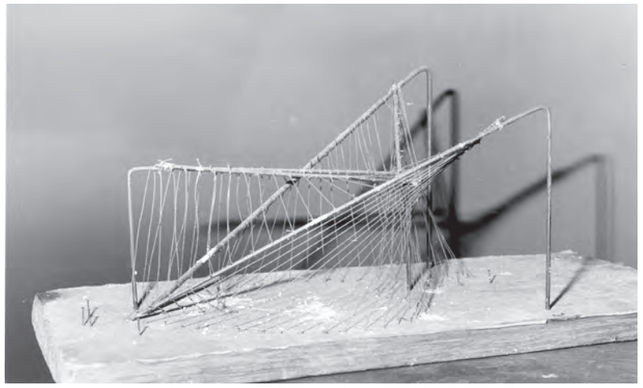
Betonmaatschappij, a company that specialized in reinforced concrete. Duyster proposed viewing the walls of the pavilion as a system of ruled surfaces and constructing the shells out of prestressed concrete.[11] Le Corbusier and Xenakis immediately approved of this plan. Before all the bids were even in from the other construction firms, Le Corbusier, Xenakis and Kalff were conferring with Duyster on 13 February in Paris about the pavilion's construction.[12]

Le Corbusier's earlier sketches for the pavilion, dating from September 1956, already contained hints of a shell structure. One sketch shows a cooling tower shape and another has the words "cone hyperbola" on it. Xenakis was the most knowledgeable person in Le Corbusier's office when it came to hyperboloid ruled surfaces. In late 1955 Le Corbusier asked him to work on the design for the cooling-tower shape of the Palace of the

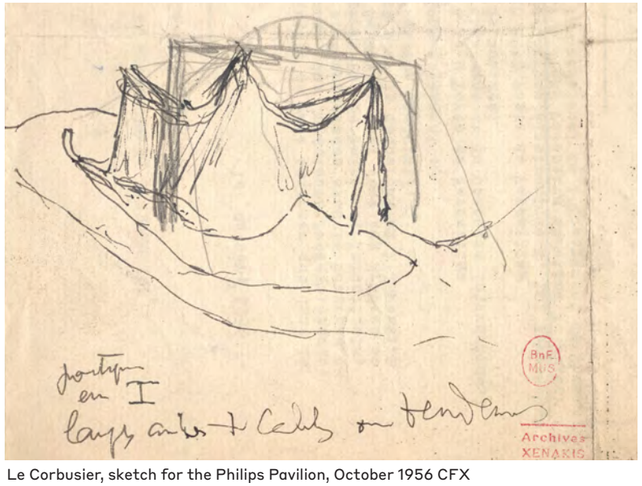
Le Corbusier, sketches for the Philips Pavilion, November 1956, FLC CA-K44-24



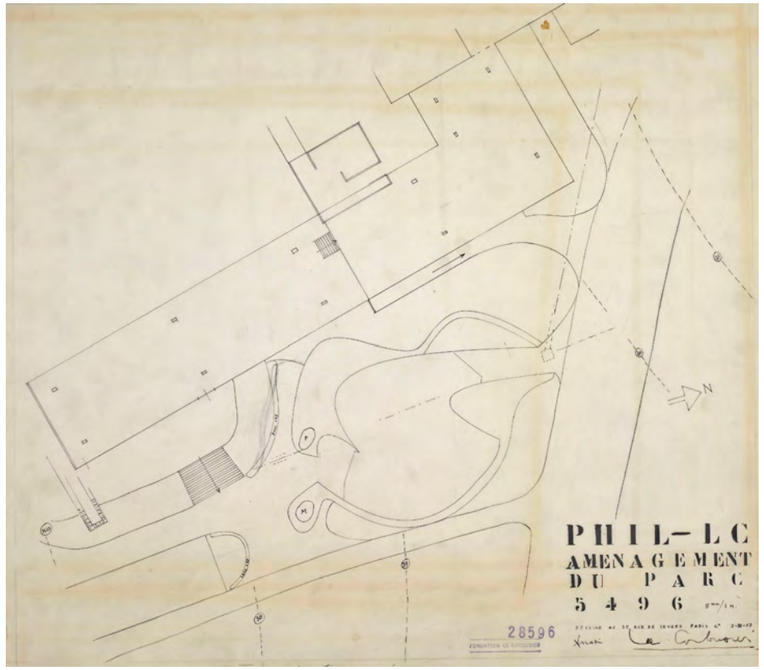
Iannis Xenakis, sketch for the Philips Pavilion, October 1956, CFX



Iannis Xenakis, model for the Philips Pavilion, October 1956, FLC L1-3-13



Le Corbusier, sketch for the Philips Pavilion, October 1956 CFX



Le Corbusier, Xenakis, site plan with sculpture locations around Philips Pavilion, April 1957, FLC 28596

as the report of Kalff's visit to Pevsner testifies. It was composed of ruled surfaces just like the pavilion and they thought a 3.80 metre-high statue would fit perfectly next to the pavilion. A plaster cast would be installed there; a bronze version would be sent to Eindhoven after the pavilion was demolished. In the project estimates from June 1957 Philips's financial planner questioned whether the high expenses for the Pevsner sculpture were justified given the state of the budget,[32] and it was accordingly scrapped in October 1957. The report from the meeting of 15 November reveals that even though that sculpture had been definitively abandoned, Le Corbusier still insisted on having a mathematical sculpture at the entrance to the pavilion but then that it should be one of his own.[33]

The drawing from 19 June 1957 for the site around the pavilion shows not two, but three sculptures.[34] But the layout had changed. As mentioned above, the entrance and exit for the pavilion had been switched, so that the sculptures that would have originally graced the entrance now needed to be moved elsewhere. The Pevsner sculpture had been planned for a water feature situated where the mathematical sculpture would end up and the mathematical sculpture stood next to the planned pool. There was also a sculpture at the entrance labelled as "fragment de la construction du pavillon avec inscriptions", sketches of which were made. This was later executed as a simple stele with an inscription which was designed by Philips at Le Corbusier's suggestion.[35]

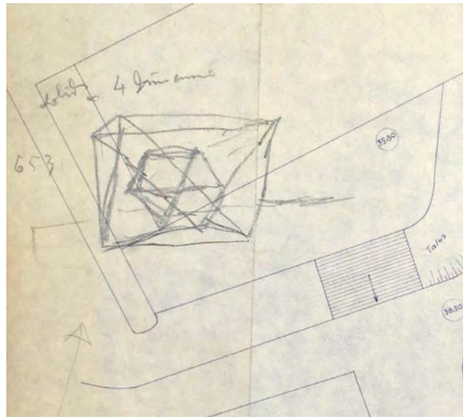
Another copy of the drawing of the site layout has three sketches in the left-hand margin, the bottom of which is dated 16 January 58.[36] These are sketches for the sculptures. The top one, never realized, is of a mountain; the middle one is the model for the mathematical sculpture, where Le Corbusier has noted "solid in 4 dimensions"; and the bottom is a sketch for the placement of the mountain sculpture in the pool. Le Corbusier made final sketches for the mathematical sculpture on 20 and 25 February 1958, which was further refined by Xenakis on 3 March.[37]

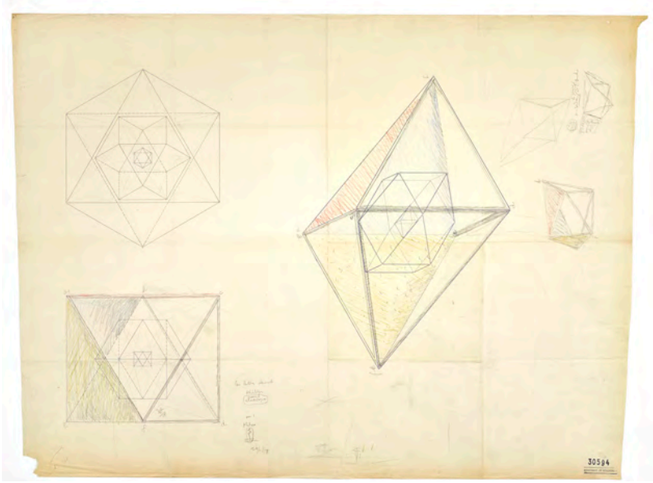
The ultimate placement of the sculpture was somewhat curious. It was not attached to the building, but stood on its own in the pool near the entrance. The pedestal holding it was a direct extension of the sculpture itself, so that in essence the water element was the pedestal. On closer inspection, it is almost as if the entire pavilion is situated in that same pool. The entire building had been placed on a pedestal by Le Corbusier and had the same plastic function as the sculpture.

The two statues up in the two highest peaks of the pavilion also lacked pedestals of their own. They floated freely, dangling high up in the

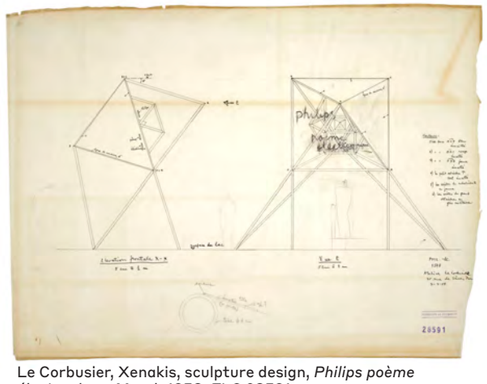
Le Corbusier, sculpture design for entrance to Philips Pavilion, June 1957, FLC 30612C

32 Z. Naber, 'Calculatie Wereldtentoonstelling Brussel 1958', p. 2, 11 June 1957, LKM.
33 Kalff, 'Reisrapport ir. L.C. Kalff naar Parijs op 15/11/1957 waar hij de HH Le Corbusier, J. Petit en Agostini moest ontmoeten', p. 2, 15 November 1957, LKM.
34 FLC 28598A.
35 Letter from Xenakis to Kalff, 17 March 1958, LKM.
36 FLC 28598B.
37 Respectively FLC 30594, 30622 and 28591.

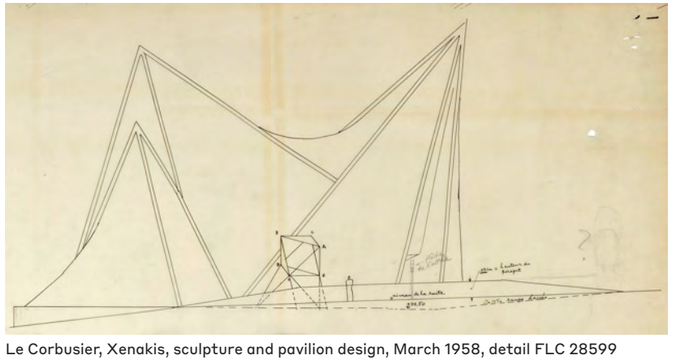

Le Corbusier, sketch *Solide en 4 dimensions*, January 1958, detail FLC 28598B



Le Corbusier, sculpture design, February 1958, FLC 30594



Le Corbusier, Xenakis, sculpture design, *Philips poème électronique*, March 1958, FLC 28591


Le Corbusier, Xenakis, sculpture and pavilion design, March 1958, detail FLC 28599


Philips, stelæ at entrance to Philips Pavilion, 20 May 1958, Philips Brussels


Le Corbusier, sculpture and pavilion, 1958, photo by Lucien Hervé, FLC


Le Corbusier, sculpture and pavilion, 1958, photo by Lucien Hervé, FLC

Comparison of Le Corbusier's first *planches* with the authors' reconstruction of the first *ambiances*

51 Letter from Kalff to Le Corbusier, 19 October 1956, LKM.
52 Letter from Le Corbusier to Varèse, 24 October 1956, FLC R3-6-37.
53 FLC J2-19-362.

the space would be flooded in bright white light. This was followed by another alternating interplay of light and dark and rhythmic staging of colours. Le Corbusier retained the notion of a horizon for almost all of the *planches* and that is partly what kept alive the relationship to this heavenly event. This motif was reinforced by the passing of the stars, the clouds, the sun and the moon.

The proposed colour scheme from the first twelve *planches* was largely adopted in the *ambiances* of the first two sequences of the *Poème*. These are the *ambiances* with the strongest narrative element: the break of day as a cosmic phenomenon, the waking of the world. The *ambiances* that follow provide for a diversity of solid colours. The variation in plain colours is only deviated from at two points. Sequence III repeats the complicated pattern of colour bands from the initial sequences and completes it with a kaleidoscopic figure, a rotating colour spectrum at the break of white and black. Then, in the final *ambiance* of the *Poème*, the colour spectacle concludes with the same horizontal colour pattern it started with, now not as dawn but as a sign of approaching nightfall.

The Films for the *Écrans* and the *Tri-trous*

Film

It took a long time for the elements of the *Poème's* visual components to crystallize. In fact the process was only fully completed with the tabular *minutage* created in late November 1957. Early on Le Corbusier had provided a breakdown according to theme in terms of light-colour / sound-rhythm / volume-surface-line, or else colour / sound / images. It was only later that this delineation according to theme was converted into the procedures for colour and sound projection, namely the *ambiances*, *écrans* and *tri-trous*. The script with the 27 *planches* from May 1957 contained everything that would later become the *ambiances*, *écrans* or *tri-trous*, though still in a single, undivided image.

The fact that the *Poème* would include film at all was by no means obvious in the beginning, but rather an idea that gradually took hold. While the initial sketches for the pavilion do depict projectors, one can only guess whether they were meant for film or something else. Nor do the earliest sketches for the scenario provide any clarification; they mention rhythm and movement but say nothing about how this is to be accomplished.

On 5 October 1956 Le Corbusier met with Kalff to discuss the contracts for the pavilion and the *Poème*. He told Kalff about his plans at that meeting, whereupon Kalff subsequently wrote, "If we understand you correctly, you would like to include a certain number of colour film projections in your exhibition."[51] Because the agreement regarding the contract with Philips concerned Varèse as well, Le Corbusier brought him up to speed shortly afterwards. He wrote to Varèse to say that to execute his ideas he would need projectors for moving and stationary images, equipment for light and colour projection and equipment for electronic music.[52]

The report of a meeting in February 1957 on equipping the pavilion reveals that a variety of projection techniques were on offer and a distinction was still being made between "film projections" and "still projections" with separate equipment for each.[53] Colour would be projected onto the walls from a central fixture, with the film projected onto two large screens from two projector booths facing one another. A month later, a second meeting was held on the same topic. Kalff reported that much of the

continuity of the images (the skulls that are so suggestive). This is not meant to be a documentary film.[86]

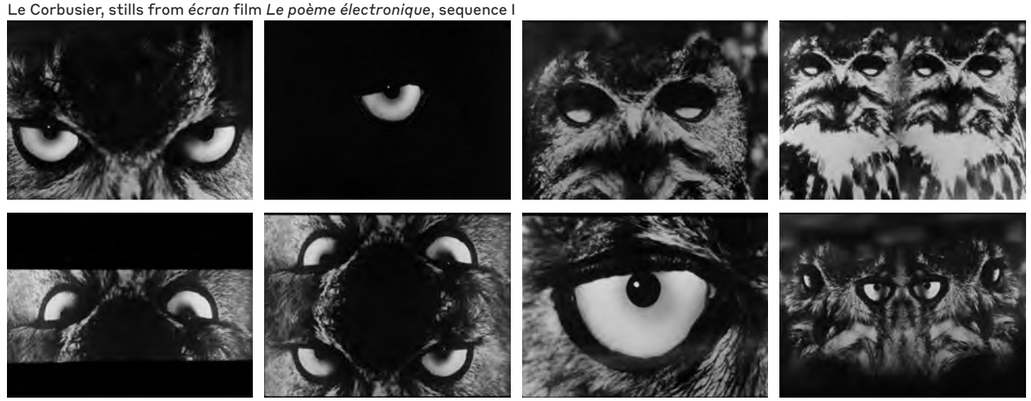
His intent was thus twofold: to unpack the images and give them individual space, while also definitely mixing the meaning of one particular series with that of another.

There is a good example of this mix of image series in sequence III. It comprises three blocks, each separated by a hole of several seconds during which no images appear. The first block of twenty-five seconds is filled with an unusual progression of four sets of eyes: first a series of owl eyes, then a turkey's head, followed by a woman's eye and finally a cicada's head.

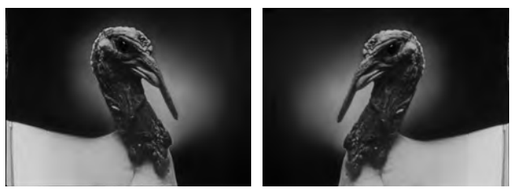
In the notes to the definitive *minutage*, Le Corbusier wrote: "The point is to impart a sense of unease with all of the eyes that are repeated during this *ambiance*."[87] We can see how the series are built as a simple formal manipulation of one and the same form. In this progression, the most remarkable interposition is that of the woman's eyes; in the first instance because all the other eyes and heads were those of animals, and in the second because the eyes are described in the *minutage* as "Œil de femme OSRAM".[88] OSRAM is a German lightbulb manufacturer and at that time competitor of Philips. The eyes in question were those of the woman in one of the company's advertising posters from the mid-1950s. The eye of the OSRAM woman was intended primarily to make Philips uneasy, since the competitor was lodging itself into the heart of the company's own advertising message – all done with a knowing wink, of course. Within the structure of the *Poème*, moreover, the eye echoes the gaze of the woman waking up and panicking from the first sequence. Another interesting point is that both the eye of the OSRAM woman and the image of the waking woman are derived from advertisements.

The next two blocks of sequence III consist of sets of gods of war,[89] skeleton hands, concentration camps, children's toys and idols, sometimes mixed with objects from Le Corbusier's private collection. During the first block, together with the series of eyes, we also see the colours from the *ambiances* and the images on the écrans echoed in the *tri-trous*. In the second block, the *tri-trous* refer back to the owl eyes shown earlier. Once the skeleton hands appear on the *écrans*, that theme is intensified on the *tri-trous* by showing a series of skeleton hands there as well. What exactly this compilation of images is intended to convey is unclear. Some nuances are explained by the comments added and verbal descriptions of the images, but where this is not the case, all that remains is a vague indication of an atmosphere. Even the title of this sequence, 'Des profondeurs à l'aube' (from deepnesses to dawn) is hardly illuminating.

Le Corbusier, stills from *écran* film *Le poème électronique*, sequence I



etc.



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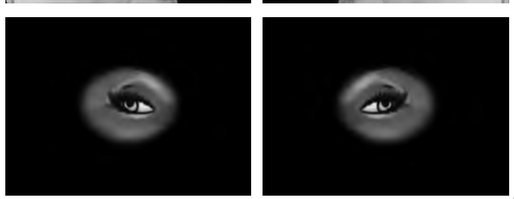
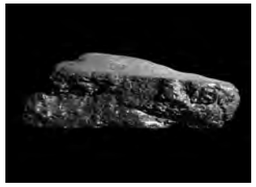


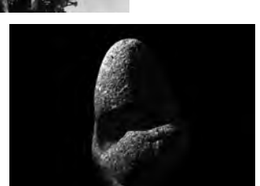
etc.

and finally etc.

Le Corbusier, gods of war in Danièle Pauly, *Le Corbusier et le dessin*, p. 55

Œuil femme OSRAM, Poster for OSRAM lightbulbs, ca. 1955



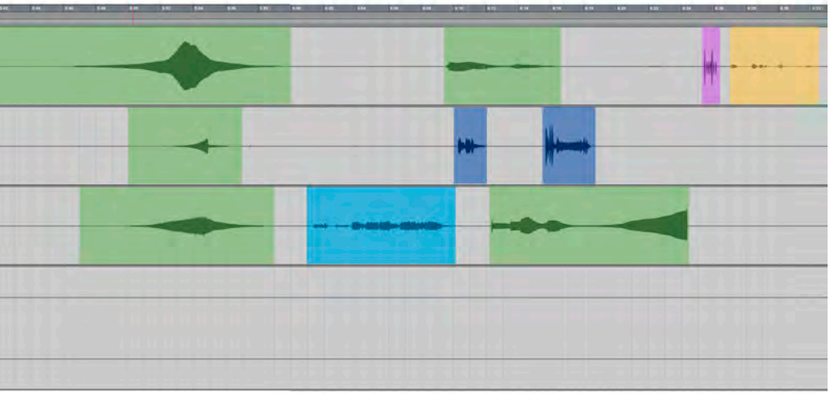


Le Corbusier, stills from *écran* film *Le poème électronique*, sequence III gods of war, intercut with objects from Le Corbusier's private collection

86 Le Corbusier, 'Minutage définitif des ambiances et images', 2 March 1958, p. 31. GRI.
87 Ibid., p. 45.
88 FLC J3-20-77.
89 The gods of war were exhibited in the Musée de l'homme. Le Corbusier had drawn pictures of three of the four that he used in the *Poème* as early as 1908–09; see FLC design 6338. Christopher Pearson noted the text that accompanied the drawing of Glélé: "King Glélé is depicted here as a lion in commemoration of his words: 'I am the lion cub who will sow terror everywhere once his teeth have grown!'" Christopher E.M. Pearson, 'Integration of art and architecture in the work of Le Corbusier', p. 186, note 116.

The soft mix of oscillator tones (green) starts off section 6 (5'41" to 6'33"), as well. After five seconds, this mix of oscillator tones starts to swell, whereupon more oscillator tone mixes appear on adjacent tracks that also swell. Together they form a complex chord that reaches a climax at about 5'54" and then dies out. We saw a similar chord formation referencing *Déserts* earlier, in section 4a, although unlike here in section 6, the notes start and stop abruptly in that progression. This is followed by another rhythmic structure built of processed percussion sounds (light blue) that shares similarities with one of the ingredients of the texture in section 5c. Immediately after that, another chord series comprised of oscillator tones (green) develops, this time in dialogue with unprocessed percussion sounds (dark blue). The final chord rises to a crescendo and then halts abruptly, recalling the crescendo of the inverted piano sound at the end of section 4a. This reference is immediately followed by yet another: a series of electronic pulses (purple) and oscillator tones (orange) like the ones that appear in sections 1, 2b, 4a and 4b. All of this clearly announces the approach of the concluding section of the *Poème*.

Section 6



Section 7a

Section 7b

Section 8

Section 7a (6'33" to 7'07") starts with the noise of a jet flying overhead (brown), which fades into a mix of percussion sounds and machine noise (dark blue). This is followed by what might be the most dramatic passage in the music for the *Poème*: the soprano solo from *Étude pour espace* (red). The soprano is first heard in the distance, with the addition of reverberation; then, it comes closer as the reverberation is removed, before disappearing again into the distance when the reverberation is added back in. The soprano solo then fades into a choral fragment from the *Étude* (yellow).

Section 7b (7'07" to 7'29") is the prelude to the finale. Two very aggressive, short bursts of metallic noises (brown) are instantly followed by a brief percussion motif that repeats two more times (dark blue). After the first sound of percussion, the metallic sound repeats three times (brown), now in even shorter bursts, with the middle sound modulated lower than the first and the third. After that, we hear for the first time the sounds of a pipe organ (purple), which have been cut together to form a similar rhythmic, repeating motif with slight variations. The rhythmic pulses (light blue) then join in again, around the final notes of the organ motif, followed by a new organ chord.

Section 8 (7'29" to 8') is the coda and ultimately the only section in which Varèse abandons the transparency so characteristic of the *Poème*. In the final 30 seconds, the listener is treated to a tremendous excess of simultaneous sounds – a résumé of all that has come before and then at a deafening volume. This section starts with the rising oscillator glissando (orange) from the end of section 1 and the beginning of section 2b, repeated twice. This repeating tone forms the onset of the coda to the *Poème* and thus, unlike in section 1, serves as an introduction to a passage instead of a conclusion. Emanating from the repeating glissando, we hear the jet engine (brown) once again, quickly accompanied by a repetition of the opening sounds of the texture in section 5c (dark blue), joined by more sliding oscillator tones (yellow), pulses (light blue) and a series of ever-louder explosions (red). The six explosions sound like the explosion from the turning point at 4'40", while also recalling, in number, the six bell tones that opened the *Poème*. After the final explosion, the oscillator tones stabilize at a high, piercing frequency (green) and suddenly stop at 8'.