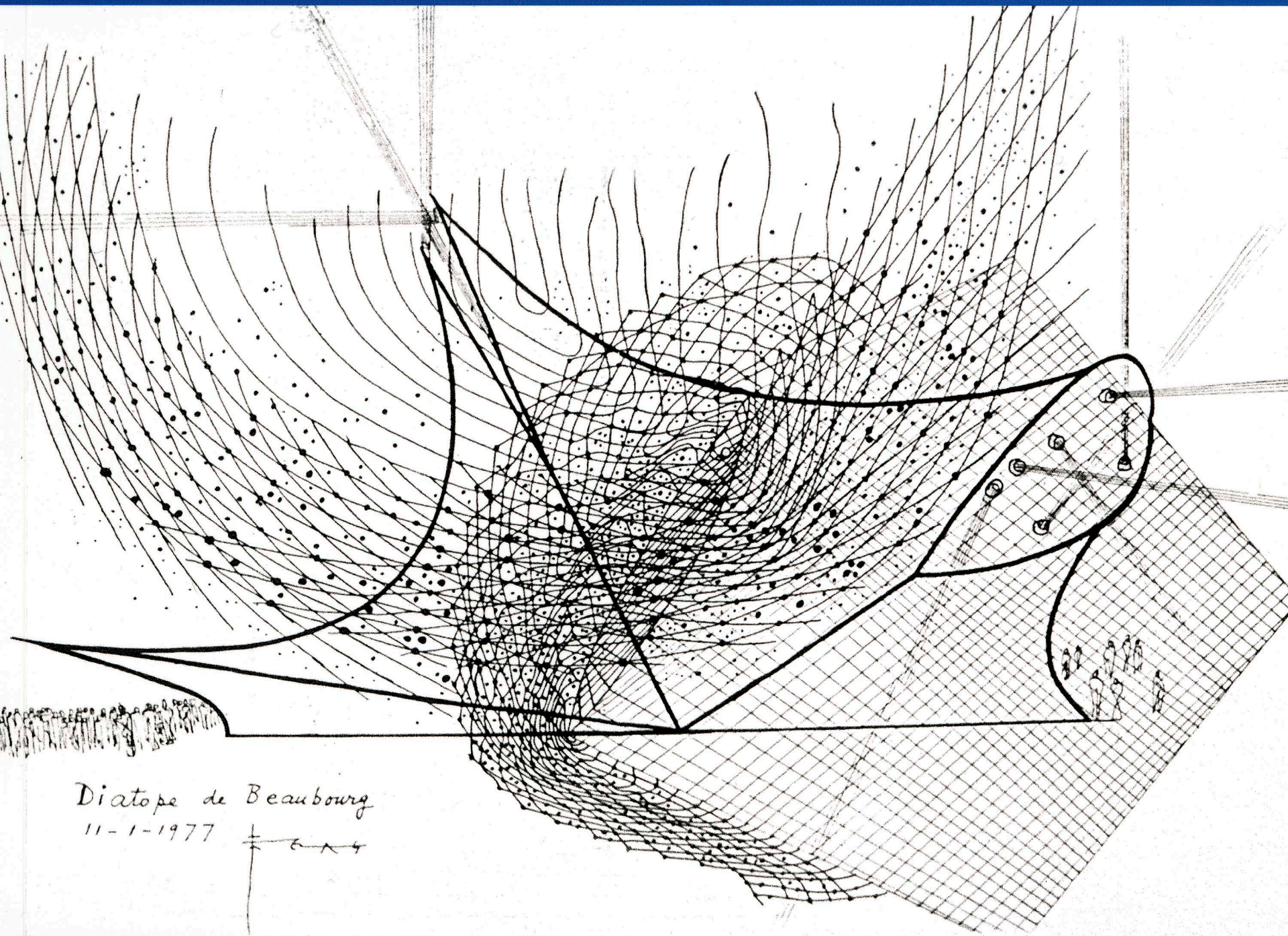


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The Architectures of Iannis Xenakis

Elizabeth Sikiaridi

Abstract

Iannis Xenakis (1922-2001), composer, architect, engineer and media artist, designed together with Le Corbusier the Philips-pavilion for the 1958 Brussels World Fair. This pavilion is an early example of ("hybrid") combined media and architectural space as it contained a *Poème Électronique*, an electronic synthesis of visual projections (conceived by Le Corbusier) and acoustic events (composed by Varèse). The pavilion's architecture with its hyperbolic-paraboloid shells had a dynamic expression. Xenakis continued this research into complex material architectural forms. He also worked on the complex ephemeral architectures of light and sound events. What is specific to Xenakis is the way he used forms in different fields and transferred them from one field to another, from engineering to music, from music to architecture and visual events. This experience of working simultaneously and applying the same (mental) structures in different fields opened him the way (partly supported by the universal computer instrument) for the practice of transferring mathematical-scientific structures into artistic production. In this context Xenakis pleads for the development of a "General Morphology", a research concerned with the understanding of form and its generation. Xenakis's 'material' architectural work is to be seen in continuity with his architectures of music and light.

In the aesthetic production of the twentieth century, there is a fascinating moment of artistic synergy. An architect, Le Corbusier, conceives an *Electronic Poem*, an electronic synthesis of visual and acoustic events, and a 'vessel containing the poem' [a pavilion] for the Philips corporation presentation at the 1958 Brussels World Fair. Le Corbusier himself works on the visual part of the *Electronic Poem*, the projections within the pavilion: a film, consisting of associative stills, representing the development of humanity, superimposed on to projections of light and colour. The composer Edgar Varèse contributes with the acoustic part, the 'spatialized' piece of music called *Poème Électronique*. Iannis Xenakis (1922-2001), who was originally trained as an engineer and was working as an architect in the office of Le Corbusier and who later was to become an internationally known composer, designs in co-authorship with Le Corbusier the 'vessel containing the poem', the shell structure of the Philips pavilion.

A temporary structure, the pavilion was demolished shortly after the closing of the World Fair and the memory of this unique creative endeavour, of this collaboration of three artistic protagonists of the past century (Le Corbusier, Varèse and Xenakis) faded. Anyway, the architecture of the pavilion itself was not the focus of Le Corbusier's attention; he considered the building mainly to be a support (a 'vessel') for the visual and acoustic projections on its interior. The architectural discourse had difficulty dealing

Keywords

Xenakis
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media art
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hybrid space

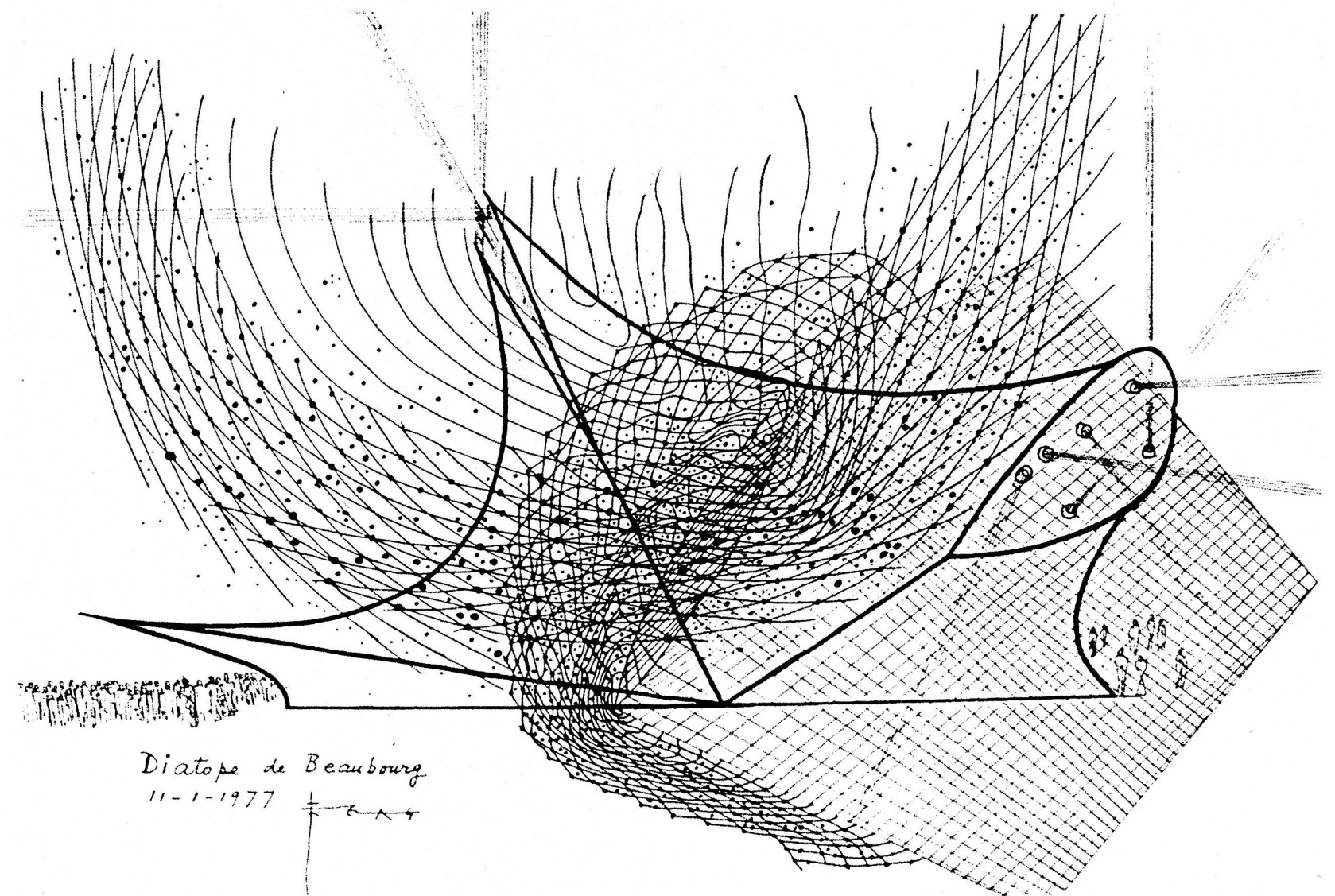


Figure 1: Xenakis's sketch of the *Diatope*, a combination of sound and light effects in a pavilion he designed himself especially for this purpose (Paris/Bonn 1978-1979).

with the media aspect, the visual and acoustic events of the *Electronic Poem*. For a long time architectural theorists also avoided researching the pavilion itself, as it was not easy to grasp nor to classify, its architectural language being a foreign body, an alien element in the context of Le Corbusier's formal categories that shaped the canons of modernist architecture.

The recent rediscovery of the pavilion and its *Electronic Poem* is closely allied to the search for references and paradigms for the expanding fields of contemporary architecture. The dynamic expression of the pavilion's architecture with its hyperbolic paraboloid and conoid shells is intriguing for contemporary architects, who are working on the expansion of the vocabulary of architectural forms into more complex, 'fluid' formations and shapes. This formal research, this integration of more complex forms, triggered by the recent developments of digital architectural design instruments (CAAD: Computer Aided Architectural Design) and construction tools (CAM: Computer Aided Manufacturing) that help control and realize three-dimensional complex structures, is still in search of its aesthetic correspondences.

As for the visual event, Le Corbusier's *Electronic Poem*, even if its heroic atmosphere, its modernistic optimism about technology and the future seems outdated, it does exert a strong fascination today. This electronic

synthesis of arts, representing the Philips corporation, a pioneer in the development of media environments (from light and sound to today's 'intelligent' networked devices and materials), is an early example of an architect's work in media space. The *Electronic Poem* and the Philips pavilion can be seen as a prototype for the expansion of architecture into combined material and media space. It can be considered an early model of the emerging 'hybrid' spaces, where the 'virtual' is projected into our tactile world, generating combinations of digital and analogue environments, where media (visual and acoustic) space is fused with material place. The Philips pavilion is an early example of an architecture of 'vessels' (containers) within the complex multilayerings of the space of (media) flows.

This electronic synthesis of arts is based on Le Corbusier's holistic approach, but is still a unique event within his architectural production. Xenakis, on the other hand, continued this research into complex architectural forms as well as into the complex ephemeral architectures of music and sound. He worked on the 'poetics of the electronic age', integrating in his creative artistic production the new electronic tools of the computer. Xenakis's work can function as a very interesting reference for the contemporary architectural discourse.

Transfers

Referring to his personal architectural design contributions in the architectural office of Le Corbusier, Xenakis points out a very specific sort of architectural member: architectural elements that capture, guide and transform light. For example, for the Convent of La Tourette, Xenakis designed the rhythmically structured facade, the *pans de verre ondulatoires* (undulatory glazed panels), and the skylights, the *Light Canons*. These 'architectures of light' evolved later in Xenakis's compositions of sound and light events: the *Polytopes*, the word (*poly-topoi*: multiplicity of places) describing the overlaying of music and light, creating various ever-changing asynchronous places, as well as in the *Diatope*, a combination of sound and light effects in a pavilion he designed himself especially for this purpose.

Xenakis's ('material') architectural production was not prolific. Still, in his architectural design work, for example, in the urban proposal for the *Ville Cosmique* (1963), the *Diatope* (Paris/Bonn 1978-79) or in his competition entry for the *Cité de la Musique* (1984) there is consistent research into three-dimensional - in the sense of volumetric - complex architectural forms. Most of these designs are based on the geometries of the hyperbolic paraboloids and conoids he had also applied in the design of the Philips pavilion.

Xenakis was familiar with ruled surfaces, with hyperbolic paraboloid and conoid forms, through his work as an engineer. What is interesting is not only the hyperbolic paraboloid form itself in its continuity and complexity but also the way Xenakis implemented this same structure in music, in architecture and in his visual events. What is specific to Xenakis is the way he used these forms in different fields, transferred from one field to another, from the field of engineering to music, from music to architecture.