

Kees Tazelaar

# On the Threshold of Beauty

Philips and the Origins  
of Electronic Music  
in the Netherlands  
1925–1965

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# Foreword

by Daniel Teruggi

The short history of electroacoustic music contains a few unique moments that all composers, students and music lovers identify as landmarks; they have changed our perspective on this “recent” music. The Philips Pavilion at the 1958 World’s Fair in Brussels is one of them. This event brought together three of the great innovators of the twentieth century: Le Corbusier, a master of new architectural concepts; Edgard Varèse, the composer who introduced timbre as a major concept in instrumental music; and Iannis Xenakis, a composer and one of the finest thinkers on how music could be conceived in a different way.

In telling us their story, Kees Tazelaar describes forty years of the technical development and musical implications of what Dutch composers in 1956 decided to call “electronic music.” This book studies the evolution of the Philips company from its original engagement in making electrical technology and home devices through its interest in content and media to its conception of a special lab for work relating to technology’s effects on media, sound and music in its practice and creation. Tazelaar discovered that on the one hand there was strong research activity at Philips regarding the investigation of the potential of electroacoustic technology; however, to our great surprise, it was not this department that launched the Philips Pavilion project but the company’s commercial arm, which wanted a showroom for Philips technology.

Tazelaar’s story delves into the strong links between technical developments and musical concepts as well as into the complexity of relationships between composers and technicians and between composers themselves, in which musical ideals were strongly affected by rivalries and moral positions. *On the Threshold of Beauty* is a history of people – the passionate, the inventive, and those simply curious to see how technology could produce previously unheard and unseen musical and sonic environments. Researchers and technicians developed ingenious means of responding to composers’ wishes, and these new machines opened new creative vistas, which in turn pushed composers and musicians to imagine new possibilities for the expansion of technology.

Dutch composers and institutions encountered considerable difficulties in making a place for themselves within the international electroacoustic scene, mainly controlled in the 1950s by the *musique concrète* group in Paris, with Pierre Schaeffer at its head, and the *elektronische Musik* developed in the NWDR studio in Cologne, where Karheinz Stockhausen became the most prominent composer. While French and German electronic music history is well known and extensively studied, Tazelaar’s approach, rich and extremely well documented, gives us new insight into the way electronic music developed in the Low Countries and how the various actors contributed to the diffusion and dissemination of modern musical concepts.

Kees Tazelaar is a composer himself, and this probably gives him a view on sound and music that is unusual among researchers. He understands perfectly each concept, technique and tool, as well as the complexity of institutions, which always underlies human experience. He is capable of transmitting to the experienced or beginner reader the importance and complexity of this unique story in such a way that we feel part of it. He permits any reader to grasp the complexity of the technological environment before the age of computers, in a period when machines were electrical, electronic or mechanical. Today, technology is everywhere and seems simple to use; however, we often lack descriptions of how things came to be this way.

*Daniel Teruggi is the director of the Groupe de Recherches Musicales at the Institut National de l’Audiovisuel in France.*

# Introduction

The emotional impulse that moves a composer to write his scores contains the same element of poetry that incites the scientist to his discoveries. There is solidarity between scientific development and the progress of music. Throwing new light on nature, science permits music to progress – or rather to grow and change with changing times – by revealing to our senses harmonies and sensations before unfelt. On the threshold of beauty science and art collaborate.<sup>1</sup>

Edgard Varèse, 1936

When I began teaching in the analog studio at the Institute of Sonology in 1993, I also took on the responsibility for its tape archive. The Sonology archive contains master tapes of electronic music dating from 1956 onwards, and it was high time to begin preserving, restoring and digitizing the oldest tapes in particular. My work on this task resulted in a number of CD productions; the box set *Popular Electronics*, made up of electronic music from Philips Research Laboratories and coproduced with the electronic music pioneer Dick Raaijmakers, is the most extensive so far. During my long and intensive collaboration with Raaijmakers, my interest in the historical aspects of electronic music production in the Netherlands grew. Raaijmakers also proved to be in possession of a large collection of documentation on the subject, which he wished to transfer gradually to me on account of his advancing age. This material was the starting point of the research on which this book is based.

From the outset, Dutch electronic music found itself in between two principal European trends: the *musique concrète* introduced by French radio in 1948 and the German *elektronische Musik* that emerged from 1951 onwards at the Cologne broadcast station. While the decisive step in *musique concrète* involved treating recorded sound as a given physical phenomenon and taking it as a starting point for experimentation and composition,<sup>2</sup> the purpose in *elektronische Musik* was to assemble sonic material from its most elementary components on the basis of compositional rules, with the help of tone generators, bringing sound into line with the organization of the other musical dimensions. In the Netherlands, there were initially no such unambiguous compositional-theoretical starting points. Although Dutch radio studios had been making electronic music on occasion since 1952, they did not yet have a purpose-built studio, as Germany and France did. The first real Dutch electronic music studio was built in 1956, not by a broadcasting company but, remarkably enough, by the acoustics department at Philips Research Laboratories.

Philips' corporate history has been extensively described in I. J. Blanken's five-volume *Geschiedenis van Philips Electronics N.V.* (History of Philips Electronics N.V.). However, Philips Research Laboratories' electronic music studio does not feature in it at all. This is not surprising, since electronic music at Philips was a byproduct of developments in the field of electroacoustics and played a marginal role in its corporate history. My research, however, reveals that Philips was of great significance for the genesis of Dutch electronic music. That genesis is the object of this study.

The book comprises three parts. The first describes the development of various aspects of electroacoustics at Philips Research Laboratories and the electronic music that arose as a result. The second part addresses the production and performance of electronic music for the Philips Pavilion at the 1958 World's Fair in Brussels. The final part deals with efforts made by organizations and composers, parallel to and after the electronic music-making at Philips, that led to permanent electronic music studios and related educational programs.

As a starting point I chose 1925, the year the engineer Roelof Vermeulen designed his first loudspeaker at Philips Research Laboratories. Its design marks the beginning of a period in which Philips expanded from a light bulb factory, began manufacturing radio tubes, and ultimately became a global force in electroacoustics. Although in fact no electronic music was produced at Philips between 1925 and 1955, many techniques developed during this period for loudspeaker technology, synthesized sound, reverberation research, recording equipment and spatial sound reproduction could be regarded as preludes to the birth of electronic music in the Netherlands. Vermeulen became the head of Philips Research Laboratories' acoustic department in 1947 and played a central role in the development of these techniques.

For Vermeulen, apart from accurately representing instruments' sound, another important requirement for reproducing music well was listeners' correct perception of the acoustic space in which those instruments were played. This applied not only to sound recordings but also to real-time "multiplication of concerts" that would enable many more listeners besides the audience at the live performance to enjoy a concert, not via a radio broadcast but in additional rooms where the music could be heard simultaneously with the live performance. After experiments at Philips, Vermeulen concluded in 1948 that this form of concert experience could be perfected to the point where it could even be preferable in some cases to attending the actual concert. At that point, listening to speakers without seeing musicians perform was not regarded as problematic. Later, though, it would regularly be cited as an objection to performances of taped electronic music in concert halls.

Roelof Vermeulen believed that besides serving Philips' business interests, his research program had a social function. With the emancipation of the working classes, traditional forms of musical performance would not be able to serve the increasingly large numbers of listeners, and electroacoustics could offer a solution. Moreover, according to Vermeulen, the working classes should be educated in music, so they would not fall prey to exclusively material desires, and electroacoustics could be deployed in this context. One of the electronic instruments used at Philips Research Laboratories in 1956 in the production of music, the electronic clavichord or Philichord, was part of an effort to develop inexpensive educational resources for domestic music-making.

This mixture of business interests and social motives also explains why the composer Henk Badings played an important role in Vermeulen's research program. Badings' traditionalist approach to the electronic medium and avowed distaste for modernism rendered him ideal for making music that presented a new sonic world but at the same time remained accessible for a general audience. The high esteem he enjoyed as a composer of symphonic music also

made him highly marketable for Philips. Vermeulen's unwavering support for Badings eventually turned the former's initially catalyzing role in Dutch electronic music into an inhibitory one, however, since Badings' musical ideas stood in diametrical opposition to developments that took place in the Dutch avant-garde.

In contrast to composers of *musique concrète* and *elektronische Musik*, Vermeulen allowed space for popular forms of electronic music. The first pieces produced at Philips, Dick Raaijmakers' "Song of the Second Moon" and "Night Train Blues," were presented to factory workers immediately after their creation via the internal radio station, the Philips Bedrijfs Omroep, or PhiBO. The arranger and bassist Tom Dissevelt continued experimenting with popular music in Vermeulen's studio in 1958 and 1959. Following the 2004 release of the *Popular Electronics* CD box set, some in the Dutch media asserted that musical genres like house and techno had their origins in the experiments in Eindhoven.<sup>3</sup>

Part 2 of this book is devoted to the electronic music made for the Philips Pavilion at the 1958 World's Fair in Brussels, the construction of which is described in detail in Marc Treib's book *Space Calculated in Seconds*. The pavilion is far and away Philips' most important contribution to worldwide electronic music history. Nevertheless, the plans for the Philips Pavilion evolved completely independently of the development of electronic music at the Research Laboratories. Furthermore, the music made for the pavilion had its own history, aims and key participants and is therefore treated as a self-contained subject in this book.

While Roelof Vermeulen's studio formed part of a research program in which even the production of popular music was intended as a scientific experiment with only scant public dissemination, the Philips Pavilion was intended as a large-scale demonstration of the professional equipment available from Philips' ELA (electroacoustics) division. The division was familiar with such demonstrations, having been in possession since 1948 of a well-equipped studio in Eindhoven in which amplifiers, microphones, recorders, loudspeaker systems, film projectors and reverberation units could be deployed. The Philips Pavilion can in fact be regarded as an on-site ELA demonstration studio. The fact that the demonstrations there eventually involved electronic music by the composers Edgard Varèse and Iannis Xenakis rather than recordings of traditional orchestral music was because the architect Le Corbusier, who had been commissioned to design the pavilion, insisted on working with Varèse.

From a compositional point of view, the music used in the ELA's popular World's Fair demonstration was ultimately much more experimental than that created at Vermeulen's Research Laboratories. In retrospect, one might think that Varèse, with his utopian ideas about spatial sound projection, would have been the ideal composer to assist in Vermeulen's research, but the latter unfortunately made no use of Varèse's seven-month presence in Eindhoven, nor was Vermeulen involved in the Philips Pavilion in any demonstrable way.

Around the same time as Philips was establishing the first Dutch studio for electronic music, Walter Maas, director of the Gaudeamus foundation for contemporary music, took steps that led to the founding of the Contactorgaan Elektronische Muziek (Electronic music contact organization), or CEM, and this is where Part 3 begins. Gaudeamus' important role in

Dutch contemporary music is well known;<sup>4</sup> CEM's has been less so. CEM's principal aim was to set up a studio where composers could be trained to make electronic music independently. Although the Philips studio was emphatically not meant for such a purpose, the corporation was represented in CEM by Roelof Vermeulen. A studio intended for composers' use opened in 1957 at the technical college in Delft.

In addition to establishing the studio, CEM rapidly began working in a more general sense to increase awareness of electronic music in the Netherlands. To this end, it was first necessary that the parties represented in CEM reach agreement as to the actual nature of electronic music; this involved the direct question of whether this was indeed the correct term, given that it seemed to refer more to German *elektronische Musik* than to French *musique concrète*. CEM did not wish to express a preference and thus considered other terms, such as "electro-*phonic music*," but eventually held to the term "electronic music," also for that in which sounds were recorded with a microphone and electronically processed.

Because today this term is more often understood as referring to electronic dance music than to music in the German tradition of Karlheinz Stockhausen and Gottfried Michael Koenig, and because the initial division between *elektronische Musik* and *musique concrète* based on theoretical principles has become obscured, the umbrella term "electroacoustic music" is often used. In this book, however, on historical grounds, I have chosen to use "electronic music" to refer to all music using electronic or electronically processed sounds.

In its early years, the CEM played an important role in staging electronic music concerts. However, by appointing the traditionalist Henk Badings and the modernist Ton de Leeuw as advisors, it condemned itself to numerous conflicts.

Vermeulen's retirement from Philips Research Laboratories in 1959 coincided with decisions to close not only the Philips studio in Eindhoven but also the studio at the technical college in Delft. A power struggle around who would host a successor studio broke out between the universities of Amsterdam and Utrecht; the conservatories in Amsterdam and The Hague also became candidates, and CEM forcefully attempted to influence the course of events.

The work of the Philips studio eventually continued at a new studio at Utrecht University, STEM. But STEM was unable to take over the training duties of the Delft studio, so CEM set up a small educational studio in the town of Bilthoven as a stopgap. At the same time, plans for a new studio complex in Amsterdam were developed further. Thus, the aforementioned tension over which institution would take the lead in furthering electronic music was still not resolved. Dick Raaijmakers, originally meant to succeed Vermeulen as director of STEM, left the theater of conflict in 1961. Two years later, in emulation of Ton Bruynèl, he and Jan Boerman founded a private studio. Despite the highly restricted resources available to composers in these private studios in comparison with STEM, the compositions that came out of them were at least as important in artistic terms.

After Raaijmakers' departure, Henk Badings took over the direction of STEM in 1962. Subsequently, STEM fell into an almost total impasse. Meanwhile, Gottfried Michael Koenig was establishing a successful internationally oriented electronic music course in Bilthoven. As a

result of the quality of this course, Koenig entered the picture as a potential director of STEM. He took over the position in 1964. From then on, Koenig's course was gradually incorporated into the pedagogical program of STEM. With Koenig's appointment in Utrecht, the Badings era of Dutch electronic music came to an end.

At least as interesting as the Dutch arena within which Koenig eventually emerged as the appropriate person to breathe new life into STEM is Koenig's own history in the field of German electronic music prior to his activities in the Netherlands. That history is treated in detail for the first time in the present volume.

Koenig's need for electronic sound material arose around 1951, when he came up with compositional ideas that were hardly or not at all realizable using traditional instruments. His repeated attempts to gain access to the necessary technical resources ultimately resulted in Herbert Eimert inviting him to work in Nordwestdeutscher Rundfunk radio's Cologne electronic music studio in 1954. This marked the beginning of a fruitful period in which Koenig realized not only his own compositions but also many works by other prominent composers.

An initially very satisfactory collaboration with Stockhausen became increasingly problematic from the beginning of the 1960s. The two men's artistic insights gradually diverged, and as a result, their technical studio requirements became increasingly distant from one another. This became especially clear when a reorganization of the Cologne studio was announced. Crucially, Koenig anticipated the role computers would come to play in electronic music production. As early as 1963, he had taken a computer course at the University of Bonn and made his first experiments in musical programming. However, it rapidly became clear that Stockhausen had no interest in working with computers and that there would be no possibility of doing so in the Cologne studio in the foreseeable future.

As soon as he saw the possibility of becoming head of STEM, Koenig began investigating opportunities for using computers to make music in the Netherlands, and one arose at the Utrecht University computing center. Computer music would become an increasingly important subject in Koenig's educational program at STEM, which was renamed the Institute of Sonology in 1967 and gained access to its own computer in 1971, drawing worldwide attention.

The composer and conservatory director Kees van Baaren was part of CEM almost from the beginning, as a representative of the Dutch Composers' Association. His interest in electronic music increased from 1957 as a result of a number of his students working in the studio at the technical college in Delft. When its closure became imminent, Van Baaren considered continuing its didactic activities at the Royal Conservatoire in The Hague, but his plan went no further. However, he picked up the thread again in 1965 after being approached by Raaijmakers. Van Baaren proposed that, instead of his students receiving private lessons at Boerman and Raaijmakers' private studio, a new electronic music studio be set up at the Royal Conservatoire. This studio, led by Raaijmakers, came into being at the end of 1966 and had a major impact on the composition department of the Royal Conservatoire.

A number of subjects cut across the tripartite structure of this book; two are spatial sound projection and the use of electronic music in film.

The spatial projection of sound is not only dealt with in the part on Vermeulen and his activities in Philips Research Laboratories' acoustics department; a perceptible line stretches from Vermeulen's first mono loudspeaker via the arduous conquest of stereophony to "ambiophony," culminating in the part on the Philips Pavilion. Concepts of spatiality reappear in Part 3 in connection with experimental theater and in focusing on the critical positions on the subject Koenig took in his first lectures in the Netherlands. Partly inspired by Stockhausen, Raaijmakers finally began integrating the spatial reproduction of sound in a compositional concept in 1963.

Although the Philips radios of the 1920s and 1930s achieved a high sound quality for the time, their monaural nature remained a serious limitation. Philips's position was that the reproduction of sound through a single loudspeaker offered the listener no more than a virtual hole in the wall of the space in which the music was performed. While the introduction of stereophony delivered improvements, making the locations of instruments in space perceptible and their diverse sound colors better distinguishable, for Vermeulen, something essential was still missing: the experience of the space itself. Experiments with binaural recording using artificial-head microphones and with stereophonic recording were therefore soon followed by forays into "ambiophony," in which loudspeakers reproducing stereo sound were supplemented by indirectly oriented speakers to create a "diffuse" sound. Vermeulen wished to reproduce sound in such a way that it would manifest itself naturally throughout the space around the listener. He shared this desire with the American conductor Leopold Stokowski, with whom Philips collaborated between 1946 and 1948.

The desire to accurately record and reproduce the acoustic properties of a musical performance space led to a new ambition to use electroacoustic means to influence those properties. Stereo reverberation devices developed in the 1950s for this purpose by Vermeulen were in use in numerous theaters and concert halls, such as the Teatro alla Scala in Milan, and found further application in the production and performance of electronic music. To make possible an "ambiophonic" performance, the first electronic composition realized at Philips – Henk Badings' ballet *Kain en Abel* – comprised two tracks, one projected directly through on-stage loudspeakers and the other diffusely through speakers surrounding the audience.

The audio technology used in the Philips Pavilion at the 1958 World's Fair took things a step further. The electronic music made for the pavilion was reproduced via more than three hundred loudspeakers distributed across its walls. While electronic reverberation was now used for sound effects integrated within the taped music, the sounds could be moved between speakers along various "sound routes" during performances. Such an advanced installation for the spatial projection of electronic music was unheard of at the time, and it continues to speak to the imaginations of the current generation of electronic music composers.

At the time of the Philips experiments, interest in spatialization was not limited to music. Toneelwerkgroep Test (Test theater study group), established in 1956, attempted to spatialize

theater by placing the audience around the actors and experimenting with electronic music. In a 1962 letter, the founders of the Mood Engineering Society, the predecessor of the Dutch branch of the Fluxus movement, called on local authorities to provide a new theater in which all fixed elements – stage, seats, balconies, orchestra pit – would be replaced by mobile installations and the acoustics would be variable, so that the space could adapt to the demands of a work rather than the other way around.

The aforementioned ideas about spatiality focused principally on the performative aspects of music and theater. From 1963 onwards, problems connected with the way sound travels through space motivated Raaijmakers to completely reorient his attitude towards composing electronic music. In his view, the electronic or electronically processed sounds on the tape should no longer be the sole subject matter of composition: the way those sounds manifested themselves in space after they left the speakers should also be composed.

Electronic music for film is also a common thread running through this book. Nowadays, the radiophonic work *Weekend* (1930) by the German film pioneer Walter Ruttmann (1887–1941) is regarded as a *musique concrète* composition *avant la lettre*.<sup>5</sup> In the Netherlands, Lou Lichtveld's music for Joris Ivens' 1931 film *Philips Radio* stands as an early example of the compositional application of experimental sound recordings and montage techniques. Ivens made this film about the production of Philips radios immediately after the introduction of sound in film, under the influence of Russian social realism; the industrial noises matching the images were not recorded during shooting but subsequently simulated in a French sound studio using various devices and objects.

More than twenty years later, Ivens and Lichtveld's experiment saw a sequel in the form of the electronic music for Han van Gelder's space-travel movie *The Conquered Planet*. Van Gelder used newly purchased Philips equipment at Toonder Studios; the electronic music studio at Philips Research Laboratories had not yet been established. *The Conquered Planet* was neither made nor commissioned by Philips but was subsequently purchased by the company and used to advertise its telecommunications equipment. Between 1953 and 1965, electronic music was composed by various composers for at least 23 Dutch films, many animated and most commissioned by Philips. Electronic sounds – sometimes in contrast to instrumental music – proved eminently suited to illustrate film scenes depicting industrialization, mechanization, alienation, futurism and space travel.

With the end of Philips' influence on Dutch electronic music, new dimensions became visible. Well-appointed studios and educational programs arose around 1965, and composers were able to gain access to these facilities. An extensive cultural focus on electronic music came about as a result. This book's title, *On the Threshold of Beauty*, alludes to this new situation.