

Jacques Polieri: espacio teatral cinético

Jacques Polieri: kinetic theatre space

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Resumen: Entre la Primera y Segunda Guerra Mundial, la definición de la nueva tipología teatral fue una de las principales tareas de la vanguardia europea. En su diseño y formulación participaron poetas, dramaturgos, directores, arquitectos, pintores, actores e ingenieros de diferentes países y movimientos artísticos. A pesar de la colaboración de algunos de los principales miembros de la vanguardia como Marinetti, Moholy-Nagy, Kiesler, El Lissitzky o Gropius, ninguna de sus propuestas fueron construidas por radicalidad y carácter utópico. Fue un joven director de teatro francés, Jacques Polieri, quien se convirtió en el compilador y promotor principal de estas propuestas en la Europa de posguerra en dos números de la revista francesa *Aujourd'hui, art et architecture*. El primero de ellos, publicado en mayo de 1958, bajo el título "Cinquante ans de recherches dans le spectacle" recogía las experiencias más importantes en los ámbitos teórico, escenográfico, técnico y arquitectónico en el período de entreguerras. Polieri trabajó con diferentes arquitectos en diversos proyectos de teatros, cuya principal característica era la movilidad de todos sus elementos y componentes, tratando de conseguir una experiencia dinámica durante la representación. Esas propuestas relacionadas con el Arte Cinético, se publicaron en octubre de 1963 en un segundo número de *Aujourd'hui, art et architecture* titulado "Scénographie Nouvelle".

Palabras clave: Polieri, teatro, vanguardia, cinético.

Abstract: *Between the First and Second World War the definition of the new type of theater building was one of the main tasks of the European Avantgarde. In its design and theoretical formulation were poets, playwrights, theater directors, architects, painters, actors, engineers... from different countries and art movements. Despite the collaboration of the leading members of the Avant-garde like Marinetti, Moholy-Nagy, Kiesler, El Lissitzky, Gropius... none of these proposals were built because of their radical and utopian characteristics. It was a young French theater director, Jacques Polieri, who became the main compiler and prompter of those proposals in postwar Europe in two issues of the French journal *Aujourd'hui, art et architecture*. The first of them published in May 1958, under the title "Cinquante ans de recherches dans le spectacle" collected the most important experiences in theory, scenography, technic, and theater architecture in the interwar period. Polieri worked with different architects in several projects for theater buildings, whose main feature was the mobility of all their elements and components, trying to get a dynamic experience during the performance. Those proposals related to Kinetic Art, were published in a second issue of *Aujourd'hui, art et architecture* entitled "Scénographie Nouvelle" in October 1963.*

Keywords: Polieri, theater, avant-garde, kinetic.



Since the beginning of XX century, theatre was in a time of turmoil and under the threat of an emerging crisis. The new technical means and the identification of the existing theatres as anachronistic institutions adapted to the use of an elite minority, kept away the masses of population who showed a preference for sport competitions or cinema. The social, economic, cultural, and political changes which took place in the interwar period, led various authors to suggest cutting-edge theatre shows which could hardly fit in the theatres available at that time.

Such a situation led many architects to suggest alternatives to existing types. Despite the variety of solutions applied, a number of constant features could be noted in these spaces, as the integration of technology in design, the substitution of stratified audience by a single sloped amphitheatre and the layout of the stage in direct contact with the auditorium. These modifications were due to artistic needs, but also to aesthetic and social issues, as this architecture without class stratification was the response to the requirements of mass society and democratic trends that emerged in Europe in the twenties. Theatre architecture consciously evolved towards the Greek theatre typology, both in using amphitheatre and in the scenic layout, reintroducing orchestra and sharing a single undivided space with the audience.

Despite the interest that many of these proposals aroused in Germany, Austria, Italy or Russia, few examples could be executed and the theories and projects were silenced during the totalitarianism period in Central Europe, while many of the authors migrated or died during those years.¹ However, after WWII, democracy, welfare state, and economic, scientific and technological developments in many European countries created a favourable context that allowed the re-introduction of theatre experimentation in the twenties and thirties.

JACQUES POLIERI AND KINETIC THEATRE SPACE

The French author Jacques Polieri began his career as a theatre director after a brief stint as an actor in the early fifties.² During this period he conducted stage productions for works by Eugène Ionesco and Jean Tardieu. This period was characterized by the supremacy of abstraction, in an effort to generate a formal, rhythmic, and dynamic language.

Most of the stage productions between 1953 and 1956 were executed by the Russian-born artist Yuri Pavlovich Annenkov, who had played a strong role in the Russian avant-garde theatre after the October Revolution, when his production was linked to Constructivism. Within this movement, Annenkov approaches the "Realistic Manifesto", in which the authors Naum Gabo and his brother Antoine Pevsner, suggested the study of the movement as a basis for future art:

We proclaim a new element in the visual arts: the kinetic rhythms, essential shapes of our perception of the real world.³

Annenkov left the Soviet Union in 1924 to settle in Germany and then in France. His theatre principles, clearly influenced by the kinetic manifesto by Gabo and Pevsner, suggested the use of dynamics as an element for the creation of a new theatre aesthetic, which was renamed Kaleidoscopic Theatre. Polieri picked up the principles again and even the name of the Russian manifesto in his formulation of a theatre action based on movement, lighting, chromaticism, abstract figuration, and sound rhythms, building a dynamic unity in the stage action:

The theatre of the future will be a theatre of introspection and abstraction, using every possible aspects of the performance, an orchestration of sound, light, shapes, colours,

and life. [...] One of the essential principles of Théâtre kaléidoscopique is movement. All the elements of the performance are movable.⁴

Through his link to Annenkov, Polieri got in touch with the avant-garde of Kinetic Art, which in the mid-fifties had Paris as one of its capitals, as it was the place of residence and meeting point of some of the leading exponents of artistic experimentation with movement. The principles enunciated in the "Realistic Manifesto" were picked up again as a purely aesthetic element oriented to the generation of a formal experience, without seeking the integration of technical, art and life sought by Russian Constructivism. Kinetic Art, disregarding this connotation, was formed as an experimental movement linked to scientific and technical progress, based on the generation of three-dimensional dynamic effects.

It was also in Paris, in April 1955, where one of the milestones of the kinetic avant-garde took place, the opening of the exhibition *Le Mouvement* in Galerie Denise René, curated by Pontus Hulten. The exhibition featured some of the prominent figures of the kinetic avant-garde, divided into three sections: one dedicated to the precursors, which included works by Alexander Calder and Marcel Duchamp, one dedicated to the paintings on glass by Victor Vasarely and a miscellaneous section which displayed works by Yaacov Agam, Jesús Rafael Soto, and Jean Tinguely, among others.⁵

Influenced by the experiences of Kinetic Art, Polieri began to work on the definition of a dynamic stage space, taking optical, physical, and aesthetic considerations as a starting point for the construction of a modern typology. The origin of its kinetic approach was also influenced by Nicolas Schöffer, pioneer of Cybernetic Art with the fusion of light, movement, color, sound, and

electronic technology that he originally called Spatiodynamisme.

The film technique was also inspiring to Polieri for its ability to mobilize the viewer's mind, moving the audience closer or further to action, changing their perspective, position, space, and time. The desire to build a dynamic multi-view of the performance, unique to each viewer, will lead Polieri to "mobilize" viewers, placing them on mobile platforms that will allow for the creation of a unit with dynamic performance and moving audience. This dynamic conceptual approach established a new relationship between stage and audience that could hardly fit into a space with an enclosed stage area isolated from the audience by the proscenium arch. This is what led Polieri to create kinetic theatres.

CINQUANTE ANS DE RECHERCHE DANS LE SPECTACLE

The need for a new architectural space tailored to the needs and requirements of the kinetic stage performance and able to overcome the division between stage and audience created by the proscenium arch, led Polieri to research in which Annenkov was also fundamental. The Russian artist put the French director in direct contact with the theatre experimentation, which he had known during his youth in the Soviet Union and in his trips to different European countries.

In his research process Polieri got to know the most outstanding theories and productions of the twenties and thirties, which had mostly been silenced during the totalitarianism era in Central Europe and WWII. From this moment he not only became recipient of these experiences, but also in its main promoter and diffuser in postwar Europe and did so in a special issue of the French magazine

Aujourd'hui, art et architecture, published in May 1958 under the title "Cinquante ans de recherches dans le spectacle".⁶ The magazine dedicated the first section to the compilation of the experiences of those years, based on the theories of Adolphe Appia and Edward Gordon Craig, to go into the achievements of Russian Constructivism, Bauhaus, Cubism, Dadaism... in more depth, including texts and pictures of productions of important authors as Schlemmer, Moholy-Nagy, Kandinsky, Prampolini, Kiesler, Léger, Picasso... The publications of this collection were twofold, claim and publicize the stage activity of that period and lay the basis for the future postwar theatre action. This second issue was dealt with in the second part of the publication entitled "Recherches pour une nouvelle scénique architecture", which started with a study of the different theatre typologies used throughout theatre history, and subsequently focused on the most outstanding proposals of the twenties and thirties for the definition of a new modern theatre space: the Total Theater by Walter Gropius and Erwin Piscator, the Theatre ohne Zuschauer by Rudolf Honigsfeld and Jacob Levy Moreno, the Kugeltheater by Andor Weininger, the theatre proposals of Norman Bel Geddes and Frederick Kiesler, the Teatr Meyerhold of Barkhin and Vakhtangov, the Teatro di Massa of Gaetano Ciocca and many other milestones from this period of research. Despite the variety of spatial, technical, and typological solutions presented, certain principles remained, as the layout of stage and audience in one space, the integration of the machine and the latest technological advances, the construction of a dynamic architectural space and the pursuit of a complete sensory experience.⁷

Based on the study of these proposals and on the experiences provided by Kinetic Art, Polieri begins a process of designing and making models in which mechanics act as a space configurator and

movement as the beginning of the research. He tried to find the theatre typology that he could ascribe his research to for the construction of a kinetic theatre. Through the study of the classical typologies and typologies developed in the 20s and 30s, the total theatre and theatre in the round, Polieri decided to assign the research to the two latter types which, by including the movement as the governing element of the performance, turns into Théâtre Mobile à Scènes Annulaires and Théâtre du Mouvement Total.

THÉÂTRE MOBILE À SCÈNES ANNULAIRES

In 1955 Polieri created the first of his space proposals aimed at creating a kinetic theatre through intensive use of mechanics. In this first attempt, he starts from the classic arena typology, in which a central round area is surrounded by a ring grandstand for accommodating the audience. In the twenties and thirties some proposals sought to reverse this spatial pattern, setting a sloping auditorium in the centre of the space surrounded by a ring-shaped stage. This typology involves the creation of a new relationship between stage and auditorium, trying to replace the single view focused on the stage. The origin of this typology was Apollinaire's poem Les Mamelles de Tiresias, 1916:

A circular theatre with two stages
One in the middle the other as a ring
Surrounds the audience allowing
The full unfolding of our modern art.⁸

Based on this theoretical concept, a number of authors sought in the interwar period to develop this conceptual framework in order to achieve an architectural device capable of enabling a new typology in modern theatre. In that way, proposals emerged, as the Théâtre Nunique by Pierre

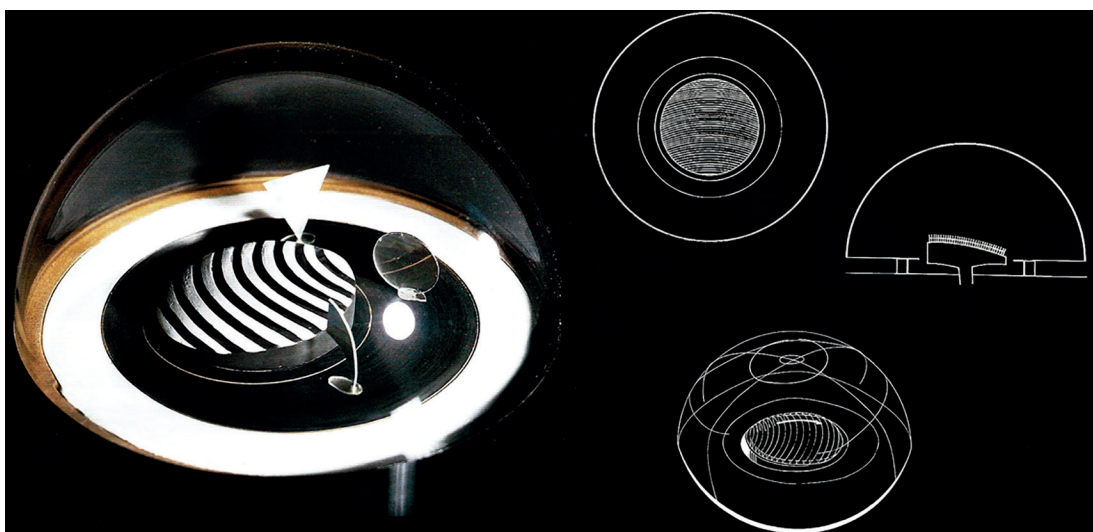


Figure 1. Jacques Polieri, Théâtre Mobile à Scènes Annulaires, 1955. BnF.

Albert-Birot, the Rundtheater by Oskar Strnad, the Teatr symultaniczny by Szymon Syrkus and Andrzej Pronaszko or the stage experiences of the Russian Nikolay Okhlopkov. Although some of these proposals provided the movement of the scenic rings for effects and changes of scenery, Polieri added to his scenery conception a mobile nature more radical and comprehensive.

In Théâtre Mobile à Scènes Annulaires mechanics allows a double rotation: the inclined grandstand and the scene can rotate together or independently, in the same direction or in opposite directions and at speeds set by the stage director. Stage action, technical devices, and movement are combined to create an alliance between aesthetics and kinetics seeking to generate new feelings in the audience. In this stage conception, Polieri suggests to activate the perception of the audience, hitherto passive in

their perception of the stage action, to promote a dynamic individual perception of the stage action, built by abstract elements disfigured by movement, light, and colour. Movement and multiple perceptions turn the viewer into an active agent in the construction and monitoring of the stage action. (Figure 1)

Polieri simply developed a conceptual design and gave it to different architects. André Wogensky set a first study in 1956, which proposed an eccentric position of the mobile platforms with regard to the outer skin of the sculpture, generating different depths in the scene and bringing the theatre proposal closer to the rhythms of films. The second study was designed by the architect Guillaume Gillet in 1958, who kept mostly to Polieri's conceptual approach, in which the movement was limited to the scenic perimeter ring. While this second

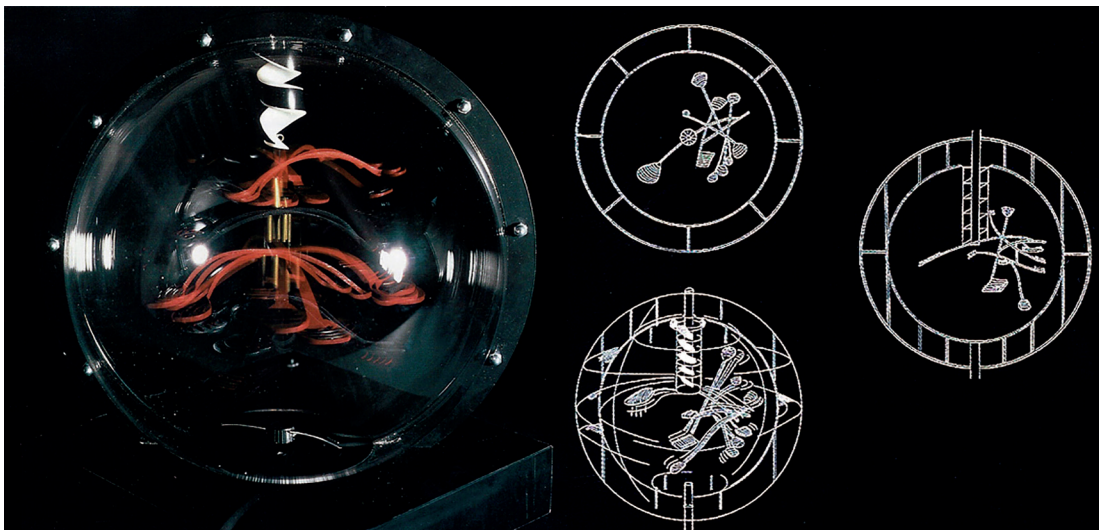


Figure 2. Jacques Polieri, Théâtre du Mouvement Total, 1957. BnF.

proposal was less ambitious, it was the origin of the staging developed by Jacques Polieri, André Bloc and Claude André Parent for the third edition of the Festival de l'art d'avant-garde, which took place in Paris in 1960.⁹ The project, conceived as a temporal montage, was installed in the American Pavilion of Porte de Versailles and consisted of a platform 30 meters in diameter in which a rotating auditorium for 300 spectators was placed. The perimeter ring, with between 5 and 10 meters and designed to house the scene, remained steady. In the performance *Rythmes et Images*, developed for this event, the sculptures of Pevsner, Colin, Brancusi, Jacobsen and Adam interacted with musical rhythms created by Edgar Varese and Pierre Volboudt so that illumination, chromatism and dynamism were combined to build Polieri's kinetic theatre action.

THÉÂTRE DU MOUVEMENT TOTAL

Later, the obstinate continuation of my accomplishments was built: unsymmetrical auditoriums, mobile auditoriums, mobile ring auditoriums... had only been the progressive succession of approaches to the original idea. The Théâtre du Mouvement Total is, in terms of scenery, perhaps the most complete picture or, at least, the closest picture to one of the possible ways of what had been the principle, the origin of the response.¹⁰

While different groups of architects were trying to shape the Théâtre Mobile à Scènes Annulaires, Jacques Polieri launched in 1957 a parallel research and, if anything, more ambitious. While in his previous stage concept movement was contained in a single level, generated by the rotation of different ring platforms, Polieri took up the challenge of

expanding this movement to the three dimensions of space, in what he called Théâtre du Mouvement Total. Inspired by a small model of a mobile by Alexander Calder and various photographs of his work, Polieri proposed a series of moving platforms suspended from a central mast, which hooked to the roof and subject to a rotating motion, would house communications and services.¹¹

The spherical volume would accommodate 1000 people in a joint kinetic performance with the aim of moving mobility and three-dimensional virtual reality of emission and reception of acoustic and visual data to a spatial form through the dynamism provided by mechanics. (Figure 2)

As in the Théâtre Mobile à Scènes Annulaires, the conceptual framework was given to different architects. The first study was the work of Enzo Venturelli in 1958 who suggested a spherical inner volume of 70 meters in diameter, coated with a triple skin, with platforms placed in the inter-spaces aimed to house technical and scenic elements. In the centre of the spherical space he placed a metal pillar of 8-meter diameter with a circular base, which housed the vertical communications. This pillar would rotate independently of the sphere by mechanisms displayed below the floor and over the top of the sphere. The platforms for the audience would hang from this central pillar and move independently, beyond the axis of rotation. The second version of the project was conducted in 1962 by Pierre and Etienne Vago, who proposed an evolution of the concept, eliminating the central mast and placing telescopic pillars instead, capable of moving in all directions of space. This version of the project, far more complete in terms of its operation and formalization, is the fullest realization of the Théâtre du Mouvement Total: rotation and elevation of seats, three-dimensional movement of the platforms, rotation of the inner sphere, lighting and projections on the inner skin, sounds...

FROM MECHANICS TO ELECTRONICS

Electronics would soon take over (mechanics) and offer a smoother means of management, expression and creation...¹²

The proposals developed by Polieri and his colleagues for the definition of a kinetic theatre space in the late fifties and early sixties were the subject of a second publication in *Aujourd'hui, Art et Architecture* in November 1963, entitled *Scénographie Nouvelle*.¹³ This themed issue dedicated to theatre, included specific sections related to theatre technique, as stage machinery, lighting and projections. Finally, under the title "Plans et schémas comparés des salles de conception moderne" focused on Polieri's kinetic theatre projects. The issue marked the end of a stage in which the kinetic experiences were linked to mechanics and the opening of a new stage in which movement is virtualized by using electronics. This transition was part of the evolutionary process of Kinetic Art, an artistic movement unavoidably linked to technical and scientific development. The exhibition *Mouvement 2*, organized again in the Denise René gallery in Paris in late 1964, was a clear reflection of the situation in this commemorative exhibition celebrating ten years since the first exhibition of Kinetic Art in the same gallery and expanded the number of guest artists including Josef Albers, George Rickey and Nicolas Schöffer.¹⁴ The latter, pioneer of cybernetic art through the formulation of Spatiodynamism, was one of the key influences to Jacques Polieri in the process of transformation from mechanics to electronics.

The main objective of Spatiodynamism is the constructive and dynamic integration of space in the artwork. [...] Spatiodynamism suggests to prefigure, in the theoretical level, the aesthetics and the technique of this new evolution stage, mainly synthetic, but at the

same time to create specific works to serve as starting points in this evolution and to suggest a coordination with the scientific developments.¹⁵

With his work evolving and based on these principles, Schöffer became a pioneer of Cybernetic Art, in sculptures which integrate matter, movement, light, colour, and sound, jointly interacting and reacting to changes in the environment, in works like CYSP 1, the first autonomous cybernetic sculpture presented in 1956 at the first Festival de l'art d'avant-garde.¹⁶ This sculpture interacted through the information collected by its sensors with the dance of the ballet company of Maurice Béjart making sounds and moving on the deck of the Unité d'Habitation in Marseille.

From the early sixties Polieri began a conversion process from mechanics to electronics, similar to the evolution of Schöffer's work. Virtual reality and teletransmission of modern information add to this theatre of kaleidoscopic movement leading to a new theatre type of the future, the Théâtre Gyroscopique which Polieri would not develop as a space, but use to set the general principles enabling the development of Salles à mouvements complexes, leaving the way open for future creators. This is a sum of three-dimensional movements of rotation and translation of plans and elements of different mass and materiality which, following a set of rules inspired by the laws of universal gravitation, generates a new field of research for the kinetic theatre. The future scenic space is not developed following the rules and laws of earthly motion, but responds to the new virtual environment, of which laws and limits have not been raised, the laws and limits of dynamic virtualization.

The actions are carried out at a long distances from each other and they can also be visualized through the telectechniques. Tilt, rotation, orbits and motions of the planetary systems are undoubtedly the same geometric structure of future scenery.¹⁷

The project Salle gyroscopique satellisée, proposed by Polieri in 1967, is a first approach to the virtualization of architectural processes involving a paradigm shift: from Kaleidoscope to Gyroscope. If motion, light, and chromaticism were combined in the kaleidoscope to create Polieri's kinetic scenery, the gyroscope is the evolution towards an element of pure movement. It is therefore a full motion utopian project consisting of "pure geometric" forms, Sphere, Cube, Icosahedron, Pyramid, and Cone, of which operation is not specifically defined by Polieri, but it is assumed that public, actors... are disregarded, resulting in a performance which could be broadcast or simply be a monument to the movement of the universe orbiting freely around the Earth. In the Théâtre Gyroscopique, virtual electronics are combined with kinetic performance spaces, as delocalized objects, located in the virtual universal space which would generate these new optical, physical, and aesthetic conditions, giving rise to the new theatre architecture of the electronic age. (figure 3)

CONCLUSION. THE END OF THE MECHANICAL AGE.

On 28 November 1968, the exhibition The Machine as Seen at the End of the Mechanical Age was inaugurated in MoMA New York curated by Pontus Hultén.¹⁸ The exhibition conceived as a retrospective compendium of the most outstanding artistic achievements devoted and inspired by the machine,

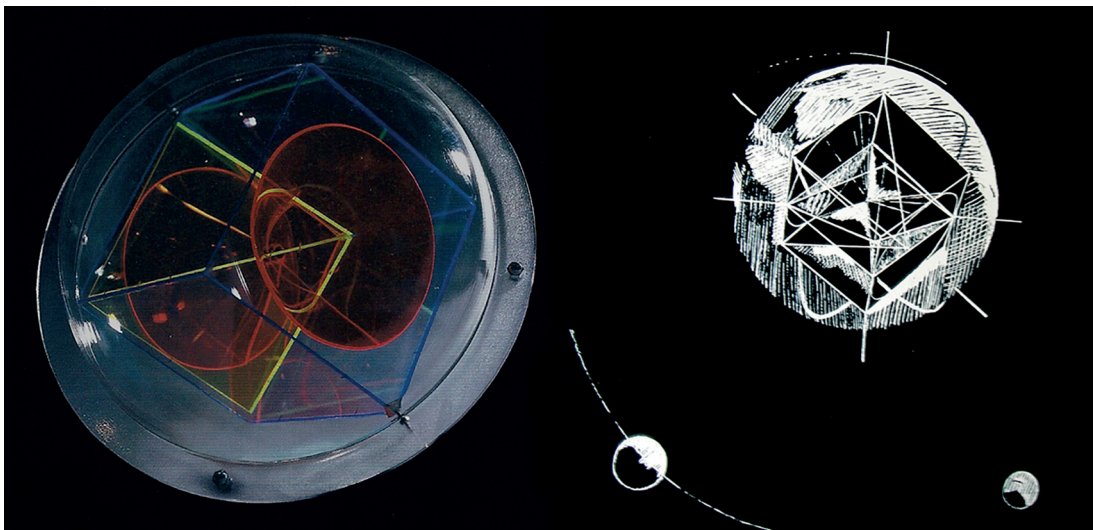


Figure 3. Jacques Polieri, Salle Gyroscopique Satellisée, 1967. BnF.

was the announcement of the end of the mechanical age and, in turn, the decline of Kinetic Art.

However, despite the evolution of Polieri's work in other fields of research, during the late sixties the opportunity to materialize his kinetic theatre concepts based on mechanics arose.¹⁹ First, in 1968, the Théâtre Mobile à Scènes Annulaires was included in the project by André Wogenscky for the Maison de la Culture in Grenoble made for the X Olympic Winter Games. The project was based on the need for a modern cultural space with flexible and versatile spaces, which should, according to the intentions of its promoter André Malraux, Minister of Culture, become the prototype of a kind of cultural facility able to involve the population in modern cultural production. André Wogenscky, author of the project, included different performance spaces: one of them with capacity for 1309 seats on the ground floor of the complex, a

film projection room with 325 seats and Polieri's mechanical theatre space with capacity for 525 seats. The conceptual premises of the French director were faithfully followed: the audience, arranged in a rotating elliptical and inclined platform, is surrounded by other circular and also rotating platform to accommodate the scene. The perimeter was delimited by a circular white screen, which would be used as background of performance and as occasional projection screen from the cabin housing the multimedia control panel positioned in the centre of the space and designed by Alain Richard. Polieri's mechanical theatre space was received with interest and represented one of the unique elements of the cultural space of Grenoble, although its use was never imposed and, during the deep alteration of the Maison de la Culture in Grenoble in 2004, under the direction of architect Antoine Stinco, Polieri's theatre space was removed. (figure 4)

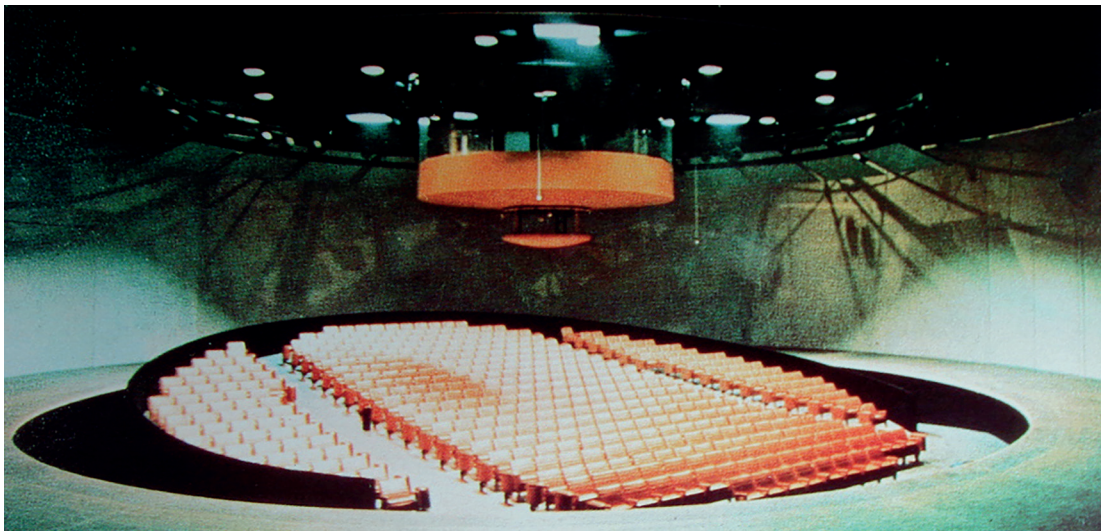


Figure 4. André Wogenscky and Jacques Polieri, Maison de la Culture de Grenoble, 1968. BnF.

The Théâtre du Mouvement Total also failed to materialize in 1970, in the World Expo in Osaka. This time Polieri collaborated with the Japanese industrial group MITSUI, for a simplified version of the project by Etienne and Pierre Vago. Accessing the lower level of the space, the audience was arranged on three platforms that operated at the pace of the projections and the music of the play *Spectacles: 50 ans de recherches*, resulting in a synchronized kinetic performance. Polieri's space construction in Osaka, despite being well received, did not meet the aspirations of the French director as the movement of the platforms was limited to the vertical plane by hydraulic devices, the telescopic scenic devices from perimeter walls were eliminated and the reduced interior space was a cylinder with a flat cover, instead of a sphere, on which sculptural acoustic elements were arranged. (figure 5)

The execution of these projects involved a retrospective look at the mechanical scenery by Jacques Polieri as in 1970 the research into mechanical movement devices in architectural space had been replaced by a movement virtualization, so that architectural space lost its importance and ceased to be the centrepiece of research.²⁰ The temporary stage productions were able, thereafter, to raise Polieri's space ambitions without having to specify a custom-built architectural space and with the resources requested by the French director.

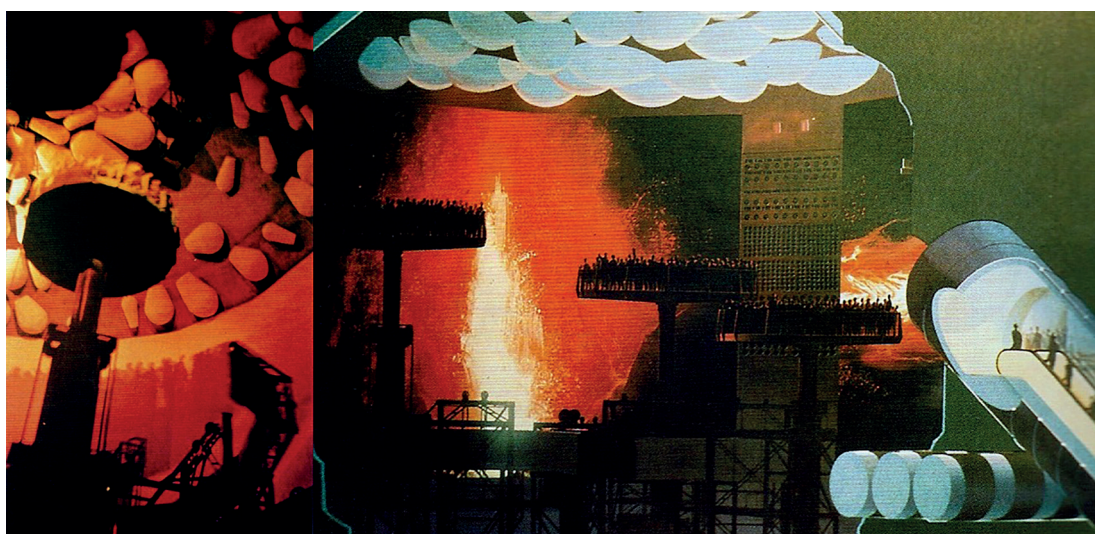


Figure 5. MITSUI and Jacques Polieri, Théâtre du Mouvement Total, Osaka World Exhibition, Japan, 1970. BnF.

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² Jacques Polieri, Toulouse 1928 – Paris 2011.

³ GABO, N. and A. Pevsner, *Realistic manifesto*. In A. GONZÁLEZ GARCÍA, ed. *Escritos de Arte de Vanguardia 1900/1945*. Madrid: Editorial Turner, 1979, p. 270.

⁴ POLIERI, J. *Le Théâtre Kaleidoscopique*. La Revue Théâtrale, 1955, 30, 25.

⁵ BRETT, G. et al. *Campos de Fuerzas*. Un ensayo sobre lo cinético. Barcelona: Actar, 2000, p. 193.

⁶ POLIERI, J. *50 ans de recherches dans le spectacle*. Aujourd'hui, art et architecture, 1958, 5 republished as POLIERI, J. *50 ans de recherches dans le spectacle*. Paris: Biro éditeur, 2006.

⁷ More information on these and other avant-garde projects on ROCHER, Y., *Théâtres en utopie*, Paris: 2014; KONEFFKE, S., *Theater-Raum*. Visionen und Projekte von Theaterleuten und Architekten zum Anderen Aufführungsort, 1900-1980, Berlin: Reimer, 1999 and KERSTING, H (ed.), *Raumkonzepte: Konstruktivistische Tendenzen in Bühnen- und Bildkunst, 1910-1930*, Frankfurt: Städtische Galerie im Städelschen Kunstinstitut, 1986.

⁸ APOLLINAIRE, G. *Les Mamelles de Tiresias*. In A. ARONSON, *Theatres of the future*. Theatre Journal, 1981, 4.

⁹ The three editions of Festivals of l'art d'avant-garde held between 1956 and 1960 in Nantes and Paris, organized and promoted by Le Corbusier, the writer Michel Ragon and Jacques Polieri, were conceived as multidisciplinary samples trying to bring art to the forefront of society.

¹⁰ POLIERI, J. *De la mécanique à l'electronique*. In M. CORVIN et al. Polieri, créateur d'une scénographie moderne. Paris: Bibliothèque Nationale de France, 2002, p.10.

¹¹ J. Polieri quoted in SALTER, C. *Entangled*. Technology and the transformation of performance. Cambridge: The MIT Press, pp. 54, 360.

¹² POLIERI, J. *De la mécanique à l'electronique*, op. cit., p.10.

¹³ POLIERI, J. et al. *Scénographie Nouvelle*. Au jourd'hui, Art et Architecture, 1963, 11.

¹⁴ BRETT, G. et al. *Campos de Fuerzas*, op. cit. p. 210.

¹⁵ SCHÖFFER, N. *Qu'est-ce le spatiodynamisme?* In J. BALLADUR et al. *Les visionnaires de l'architecture*. Paris: Robert Laffont, 1965, pp. 11-15.

¹⁶ *After Spatiodynamism*, Schaffer formulated Luminodynamism in 1957, Chronodynamism in 1959 and Spatiodynamic Architecture in works like *Tour Spatio-Dynamique et Cibernétique in 1955* or *the Théâtre Spatio-Dynamique in 1957*, which operation and generating principles were very similar to those made by Polieri in his kinetic theatre spaces.

¹⁷ POLIERI, J. *Salles à mouvements complexes*. In J. POLIERI, *Scénographie Nouvelle*, op. cit. p. 191.

¹⁸ PONTUS HULTÉN, K. G. *The machine as seen at the end of the mechanical age*. New York: MoMA, 1968.

¹⁹ In 1962 Polieri, Parent and Bloc tried to build the project for a cultural complex in Dakar, the Théâtre Transformable Automatique. It was a fragmented project in two volumes connected by a system of communications and services in which the volume of the theatre like a meteorite stands out. The theatre was arranged as an intermediate device between the Mobile Theatre with circular scene and the Theatre of Total Movement.

²⁰ Since the late 60s the teletransmissions, projections, lighting and chromatic effects take the dynamic component of theatre montages as Le Free Mallarmé, *sémiographie d'une partition in 1967* or in plays as *Rue des Loisirs* for the Munich Olympics in 1972, a virtual street bounded by screens on which electronic, planetary and teletransmission images are projected between different locations.

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