

Space 1: Scene/Machine (1876–1933)

“What distinguishes modern architecture is surely a new sense of space and the machine aesthetic.”

REYNER BANHAM, *THEORY AND DESIGN IN THE FIRST MACHINE AGE*¹

Wagner’s Theater of the Future

Our story begins not in the age of the CPU, but on August 13, 1876, the opening day of German composer Richard Wagner’s fabled *Festspielhaus* (festival theater) and *Bühnenfestspiel* (theater festival) to which thousands of Europe’s and America’s royalty, artists, and critics made their pilgrimage to witness a spectacle of historical proportion. Descending on the small, rural town of Bayreuth in northeastern Bavaria, the audience of luminaries included Tchaikovsky, Edvard Grieg, and Mark Twain. The Viennese music critic Eduard Hanslick announced “an extraordinary musical theatrical experience and much more! This four-evening-long music drama is a remarkable development in cultural history, not to mention the construction of a special theater solely for its production and the pilgrimage of thousands of persons from half of Europe to this remote, half-forgotten little town whose name is now indelibly recorded in the history of art” (Hartford 1980, 72).

The catalyst that brought both elite and bohemian societies together in Bayreuth that summer was none other than the world premiere of Wagner’s colossal fifteen-hour opera *Der Ring des Nibelungen* (*The Ring of the Nibelung*)—the music-theater work for which the entire theater building and festival had been conceived and constructed. Beginning its composition around 1851, Wagner knew early on that *The Ring* would be the epiphany of his compositional genius; a work so vast in musical and theatrical ambition that it could not be staged in any conventional theater but required a new kind of space of illusion to cradle it. Even if Wagner was not an unknown composer for his day (the

commission for *The Ring* came from King Ludwig II of Bavaria), the development of the opera and endless pursuit to create a theater specifically designed for its presentation was to lead him through a twenty-five-year odyssey of failed attempts, exile, and even bankruptcy, until its completion in 1876.

Wagner's penning of *The Ring* emerged as a response to what the composer perceived as a deep decadence plaguing nineteenth-century culture. Torn away from its Greek origins in the festivals of Dionysus, where the stage served as the "expression of public conscience," drama itself had become severed from both its civic and sacred origins and split into discrete artistic components: rhetoric, sculpture, painting, and music. In Swiss exile after participating in an aborted 1849 revolutionary uprising in Dresden, Wagner set out in writing his theoretical counterparts to *The Ring*: "Das Kunstwerk der Zukunft" ("The Artwork of the Future," 1849) and "Oper und Drama," ("Opera and Drama," 1850/1851). In "Das Kunstwerk der Zukunft," a text that already explored the perceptual experience of the spectator in relationship to the dramatic event, the eye perceived not only the visual setting but also the inner life of the performer, while dramatic action drove the need to bring all of the arts together in a total synthesis of elements: staging, image, music, and text.

The synthesis of art forms, what Wagner labeled the *Gesamtkunstwerk* (the total artwork) was "to include all phases of art and in doing so to consume, to destroy each one, so to speak, in favor of the total purpose of them all" (Wagner 1912, 115). For the composer, reason, intellect, and a rational worldview played no role in the audience's experience of the *Gesamtkunstwerk*'s utopian synthesis. Instead, the fusion of artistic forms would communicate directly to the senses and through them, exclusively to the emotions.

Based on the Romantic notion of the artist as a conveyer of the sublime, Wagner's interest in appealing to the deepest emotions by way of a fusion of media elements is also surprisingly contemporary. In a strange way, Wagner already had command over what many contemporary creators are still trying to sort out: the design of media carefully choreographed within a specifically defined architected space to create a complete and total immersion of the spectator's senses, literally sweeping them into an emotional, hypnotic vertigo; what Wagner scholar and editor Albert Goldman so aptly called a *theater of narcosis* (Wagner 1964, 29).

We need not, however, dwell on Wagner the composer or as the theorist of the *Gesamtkunstwerk*, although obviously such a concept plays a key role in making sense of our utterly confusing, multisensory, audiovisual media society of the present. I want here to focus on Wagner as an experience architect of a machine that utilized the technologies of the time to create unprecedented control over the perceptual and affective experience of his spectators.

The illusion technologies of the stage arts form a history in themselves, ranging from the Greeks' *deus ex machina*, the moving wagons of the mystery cycles of medieval times

and the mechanical birds and fountains of Byzantine court spectacles to Serlio's theatrical perspective in the mid-sixteenth century and Inigo Jones's elaborate masques for the Stuart royalty in the seventeenth century. But Wagner's *Festspielhaus* included the first full-scale use of modern technologies of lighting, acoustics, and architectural transformation specifically manipulated to create a powerful and cumulative effect on the senses that would "place you in a new relation to the play you are about to witness" (Wagner 1964, 358).

The architectural plan for the theater that would place the spectator into an unheard-of relationship with the onstage spectacle was nothing short of radical for its day (figure 1.1). Resorting to a Greek amphitheater-like arrangement for the seating configuration, Wagner first and foremost removed any trace of stage machinery that would shatter the spell of illusion. By sinking the orchestra pit below the stage and partially covering it, Wagner guaranteed that the spectator's eye would not be distracted by stray light and movement from the "mystical abyss" filled with conductor and musicians between the *theatron* and the stage. "With a dramatic representation, on the contrary, it is a matter of focusing the eye itself upon a picture; and that can be done only by leading it away from any sight of bodies lying in between, such as the technical apparatus for projecting the picture" (Wagner 1964, 365).

To further enhance the seamlessness of the effect, Wagner took an idea from his earlier collaborator on the project, the architect Gottfried Semper, in creating a second, wider proscenium frame that served to distance the stage even further from the spectators. The construction of this double proscenium created a kind of "mystical gulf" between the audience and the stage in which "the stage image was reduced to the form of a 'picture.' . . . Between him {the spectator} and the picture to be looked at there is nothing plainly visible, merely a floating atmosphere of distance, resulting from the architectural adjustment of the two proscenia; whereby the scene is removed as it were to the unapproachable world of dreams" (Wagner 1964, 366). To complete the distancing effect, Wagner plunged the entire house into almost total darkness by way of gas lighting during the performances.²

If the framing of the stage image was reduced to the equivalent of a two-dimensional screen, Wagner's precise acoustic shaping of the auditorium had the opposite effect, enveloping the spectators in a continually transforming sea of sound. Slightly fan-shaped to reduce *standing waves* and with a reverberation time of just under 1.55 seconds, both auditorium and structural interior of the building were constructed of wood, allowing the space to become an efficient receiver and diffuser of acoustic energy. Additional innovations, such as hollowing out the space beneath the ramped seating area to serve as a low-frequency *resonator* and the addition of numerous columns running along the walls to create irregularly shaped surfaces, all enabled Wagner to carefully compose and tune *The Ring* and his last work, *Parsifal*, to the exact acoustics of the *Festspielhaus* in a manner unheard of at the time.³

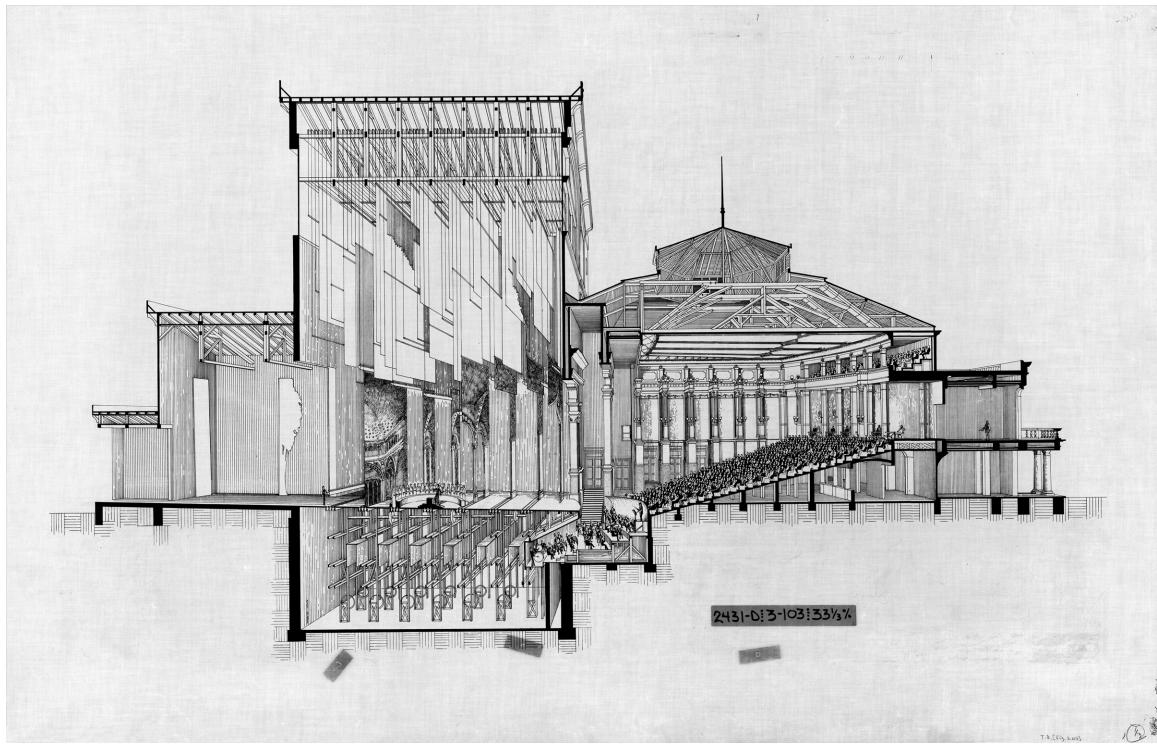


Figure 1.1 Longitudinal Perspective Drawing, Bayreuth Festival House, George Izenour Collection. Reproduced with the permission of the Special Collections Library, The Pennsylvania State University Libraries.

The overall vision of Wagner's *theater of illusion* set an important future precedent for later attempts at synthesizing architecture, drama, music, and technology in utopian spaces dedicated to the performance of singular works, including the Russian composer Aleksandr Skryabin's proposal for a cathedral in the Himalayas to exclusively house his spiritual, seven-day synesthetic music-theater work *Mysterium* (1903); Le Corbusier's, Iannis Xenakis's, and Edgard Varèse's Philips Pavilion at the 1958 Brussels World's Fair; or the custom-constructed theaters for Cirque du Soleil's Las Vegas spectacles *O* and *Kà* in the 1990s. With the shaping of space by artificial means and the construction of architecturally controlled aural and visual perception, the event of Bayreuth marked a first at the dawn of modernism that the ontology of performance was transformed not only because of its dramatic content but also by its technocratic architectural setting.

~~the individual elements into a muddling soup. Whether visual, sonic, or textual, each media element in Brecht's model maintained its independence from one another by way of a radical separation (*Trennung*).~~

~~Wagner's theory, however, presented a far greater threat to Brecht's instructive model of performance, for the very immersion of the spectator in a torrent of sensations would drastically mitigate her ability to take a critical stance to what she saw. "The process of fusion extends to the spectator, who gets thrown into the melting pot too and becomes a passive (i.e., suffering) part of the total work of art. Witchcraft of this sort must be of course fought against. Whatever is intended to produce hypnosis, is likely to induce solid intoxication, or creates fog, has got to be given up" (B. Brecht 1978, 38).~~

The Bauhaus: Preliminaries

Under the title *Kunst und Technik—eine neue Einheit* (*Art and Technology: A New Unity*), the German Bauhaus opened its first public exhibition, the Bauhaus Week, in Weimar Germany in 1923. Founded by the architect Walter Gropius as both a teaching institution and ideology, the Bauhaus was a distinctly modern phenomenon and one of the first to emphasize the conceptual and practical fusion of art and design, handicraft, and mass industrial production. Gropius's motto of "unity as diversity" focused on pragmatic, hands-on learning in which architects, sculptors, and painters would abandon their ivory-tower stance toward craftspeople and go back to the shaping of materials in the workshop.³⁴

As part of this direction, Gropius sought out master artists and craftsmen of the time such as painters Paul Klee and Wassily Kandinsky and the sculptor Oskar Schlemmer, in addition to others. The central defining characteristic of the Bauhaus approach was a one-year intensive *Vorkurs* (preliminary course), a kind of boot camp for all students involving basic questions of material form. Initially under the leadership of the Austrian designer Johannes Itten, the *Vorkurs* specialized in what we now take to be the fundamentals of basic design education: studies in materials, form, color, and composition.

In a continual spirit of transformation throughout its fourteen-year existence from 1919–1933, much of the early Bauhaus work was slanted toward more mystical directions. With its emphasis on individual artistic expression, Itten's view of art did not ultimately coincide with Gropius's pragmatic, art-technology-industry direction, and in 1923, the artist, theoretician, and educator László Moholy-Nagy took Itten's place, retooling the *Vorkurs* with a broader liberal arts approach emphasizing the intersection of art, technology, and biology.

This direction was made even more manifest by the Bauhaus's move from Weimar to a specially designed building by Gropius in the German city of Dessau in 1926. As the Bauhaus reputation was cemented in Germany and rapidly spread internationally, the emphasis on the unity of art and technology not only demonstrated a shift in the Bauhaus

pedagogical direction, but also reflected the larger transformations taking place across the European cultural landscape.

From Material to Architecture: Moholy-Nagy's Theater of Totality

Similar to El Lissitzky, the Hungarian artist, theoretician, and educator László Moholy-Nagy also saw the future of mankind dependent on scientific and technological progress and the necessary role of education as liberating the creative potential of the whole human being. Appointed to the Bauhaus in 1923 by Gropius as part of the heightened interest in Constructivism, Moholy-Nagy took over the metal shop from Paul Klee, seeking a reform of the *Vorkurs* specifically based on Constructivist principles that combined the exploration of materials with new technologically augmented forms of expression. Although he remained at the Bauhaus for only six years, Moholy-Nagy's impact as both ambassador and policy creator put an undeniable stamp on the institution.

To get a sense of Moholy-Nagy's pedagogical and artistic directions, one need only look to his major 1923 book *Von Material zu Architektur* (*From Material to Architecture*) and later republished in English as *The New Vision*, a work that functions like an encyclopedia of early-twentieth-century avant-garde creation, from Cubism, Futurism, Dadaism, Constructivism, and Surrealism to the beginnings of the so-called International Style in architecture. The book also revealed Moholy-Nagy's fascination with the aesthetic impulses provided by the mechanized world, as well as his command of its visual vocabularies.

Illustrated with a dazzling narrative of images from his own as well as his students' work combined with archival photography, Moholy-Nagy moved quickly from the structural, textural, material, and sensorial qualities inherent in materials to an exploration of volumetric forms made manifest through sculpture and concluding with kinetic explorations of light and space.

The book culminated in the exploration of space as a dynamic material through built (i.e., architectural) form. It is here that he articulated his central concept of *Raumgestaltung* (literally, the design or ordering of space)—an idea that encapsulated Moholy-Nagy's interest in the application of new materials for the exploration of kinetic form. "Space," he wrote, "is a reality of our sensory experience," both a medium of expression as well as a shapeable material (Moholy-Nagy 2001, 195). This almost Futurist-tinged, dynamic vision of space perhaps explains why the book's conclusion is preoccupied with endless images of elevator shafts, conveyer belts, smokestacks, aerial street intersection shots, and other building structures—images not only of the industrial transformations of spatiality but also the modernist visions of overlapping materials and structures in the architectonic shaping of the human environment.

The stage also provided Moholy-Nagy with a concrete example for his spatial explorations that would take place during his time with the Bauhaus and afterward as a freelance stage designer in Berlin before his exile to the United States. This transformation of static

space into dynamic space was an idea that Moholy-Nagy began to explore over several projects, one a model of a kinetic stage environment entitled *Kinetisches Konstruktives System: Bau mit Bewegungsbahnen für Spiel und Beförderung* (*Kinetic Construction System: Building with Conveyors for Play and Transportation*) (with Alfred Kemeny) and the second, a larger concept for a so-called theater of totality.

As a kinetic theater environment, Moholy-Nagy and Kemeny's *Kinetic Construction System* was envisioned as a huge, vertical cylinder in which audience and performers alike would be kept constantly in motion by a series of spiral formed conveyer belts and escalators mounted on the structure's exterior and interior (figure 1.8). With a central elevator, the performers could ascend and descend through the tube or slide from top to bottom via a fire station-like pole. Additionally, through large rings, the entire structure itself would turn in circular motion, thus providing several different simultaneously operating dynamics. While an actual scale model appears to have been built by architecture student Stefan Sebök in 1928, the intriguing aspect about Moholy-Nagy's theoretical conception was the shifting role of performer and actor enabled by the dynamic behavior of the building itself [Performative Architecture, chapter 3].

This concept of an electromechanical theater was further developed in Moholy-Nagy's article "Theater, Circus, Variety," published in 1923 in the first Bauhaus book dealing with stage work, alongside essays by Gropius, Oskar Schlemmer, and the Hungarian architect and teacher Farkas Molnár. "Theater, Circus, Variety," laid out Moholy-Nagy's own vision of a machine age *Gesamtkunstwerk*: the theater of totality (Moholy-Nagy 1961, 49). Dissimilar to Wagner's models, Moholy-Nagy's totality deemphasized the role of drama and poetry as well as the human being in favor of the mechanical—what he labeled the *mechanized eccentric*. With total stage action envisioned as a great dynamic-rhythmic process and constructed from "great clashing masses of media," Moholy-Nagy's total theater also yearned for the disintegration of the line between spectator and performer.

Moholy-Nagy was not interested only in the physical shaping of space through hard architectural materials. With a "new action of light" involving "the potential of light for sudden or blinding illumination, for flare effects, for phosphorescent effects, for bathing the auditorium in light synchronized with climaxes or with the total extinguishing of lights on the stage," as well as acoustic phenomena, media could be perceived as that which could define space and create volume (Moholy-Nagy 1961, 67). Equally incorporating the play of both material (mechanics, elevators, optical instruments, airplanes) and immaterial (light, film, and projection) apparatuses, Moholy-Nagy's vision would not only catalyze the turning of passive spectator into active participant but also create the potential for a creative transformation of the human organism.

With the stepping down of Gropius and the takeover by the devout communist Hannes Meyer, Moholy-Nagy resigned from the Bauhaus to make his living as a stage and commercial graphic designer in Berlin until 1933. In the fading twilight of the Weimar

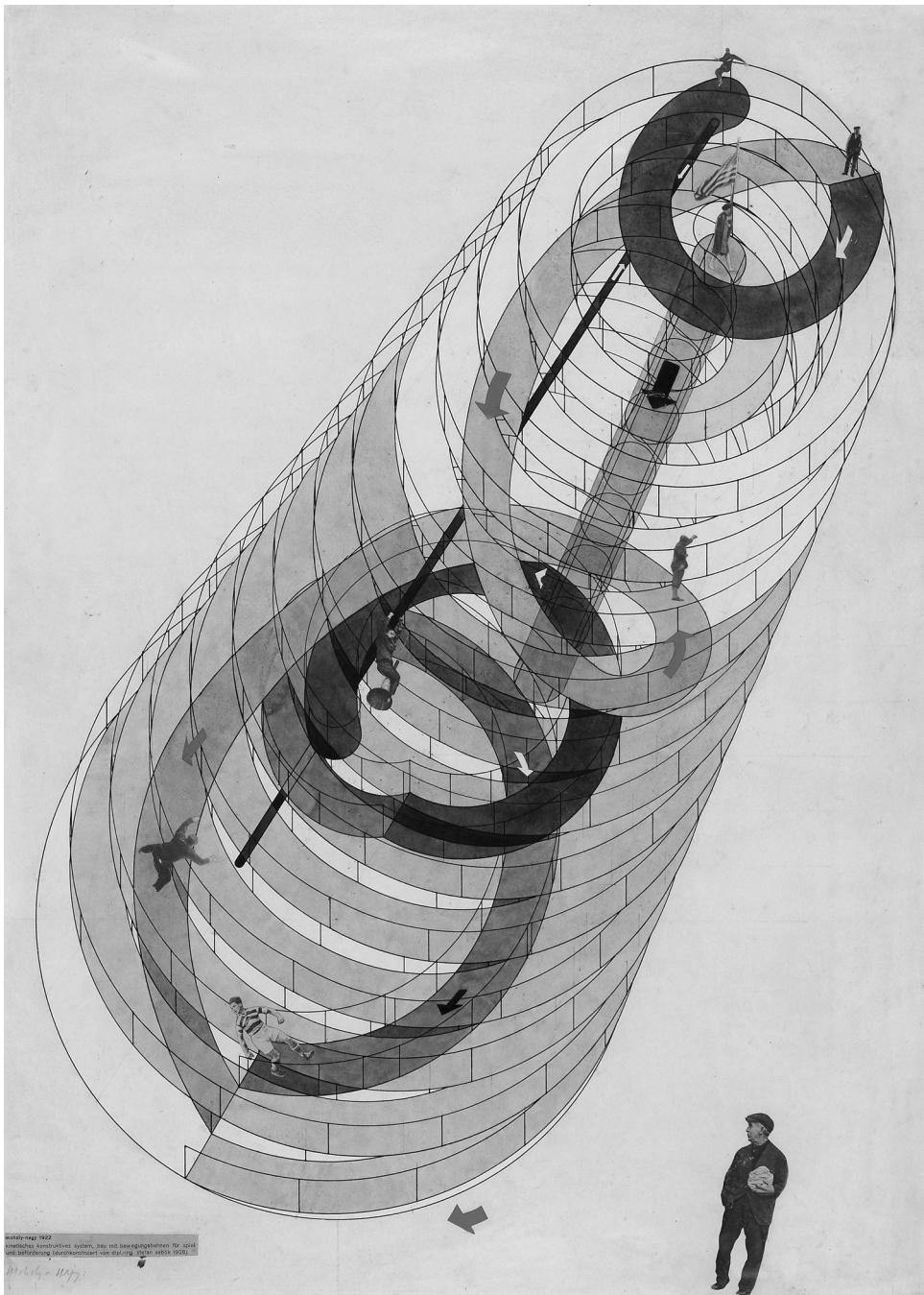


Figure 1.8 László Moholy-Nagy with Alfred Kemeny. *Kinetic Construction System: Building with Conveyors for Play and Transportation*, 1922/1928. Courtesy of the Institut für Theaterwissenschaft, Cologne.

Republic, it was in Berlin that Moholy-Nagy began to realize some of the ideas expressed in “Theater, Circus, Variety” with a series of extravagant and experimental stage designs that had been already articulated in the chapter on “Space/Architecture” in *Von Material zu Architektur* (Moholy-Nagy 2001, 215–219).

His design for a 1928 production of Jacques Offenbach’s *Tales of Hoffmann* at the Staatsoper Berlin attempted to construct a space through the use of light and shadow through a careful choreography of light against a series of translucent architectural surfaces. The scenography for Piscator’s production of *Der Kaufmann von Berlin* operated in a far more mechanical manner, deploying moving ramps, bridges, treadmills, elevator stages, and a specially shot film directed by Moholy-Nagy himself. In the hands of Piscator, all of this technical paraphernalia helped demonstrate the play’s chaotic portrait of inflation-era Berlin, causing the critic Bernhard Diebold simply to state: “What an apparatus!” (Willett 1978b, 100). Although Moholy-Nagy would work in a stage context for only a short time, his ideas for the theater of totality were to be strongly influential in his subsequent artistic and commercial design work in Europe and, after his immigration after the start of World War II, the United States.

Total Theaters of the Bauhaus

Both Moholy-Nagy and the sculptor and dancer Oskar Schlemmer [The Machine Body, chapter 6] had a major impact not only on the development of new performance forms in the Bauhaus stage workshop, but also machine-based performance environments, no doubt due in part to the stage workshop’s interdisciplinary concentration, with the stage design curriculum being one of the few programs in which students from across the Bauhaus could come together in a collaborative research environment.

Picking up on themes from Moholy-Nagy, much of the Bauhaus research into total theaters derived from four specific aims: (1) the removal of the line between spectating and performing by shifting the relationship between stage and viewer, (2) the integration of mechanical and media apparatuses to create a total sensory experience, (3) the exposure of technology as part of the performance itself, and (4) the transformation of static performance space into dynamic space by way of technical means.

Farkas Molnár’s concept for a mechanically changeable environment called the *U-Theater* was a series of staging platforms that could be moved in both lateral as well as vertical directions, depending on the staging requirements of a given work. Around these platforms, a series of U-shaped rings formed the central amphitheater, with adjustable and rotating seating for 1200 audience members dispersed across the orchestra and balcony levels (figure 1.9, top left).

In the center of the auditorium, Molnár envisioned a cylindrically shaped elevator-like apparatus upon which a long platform would be connected. As the elevator would ascend and descend during performances, the performers installed on the platforms could be

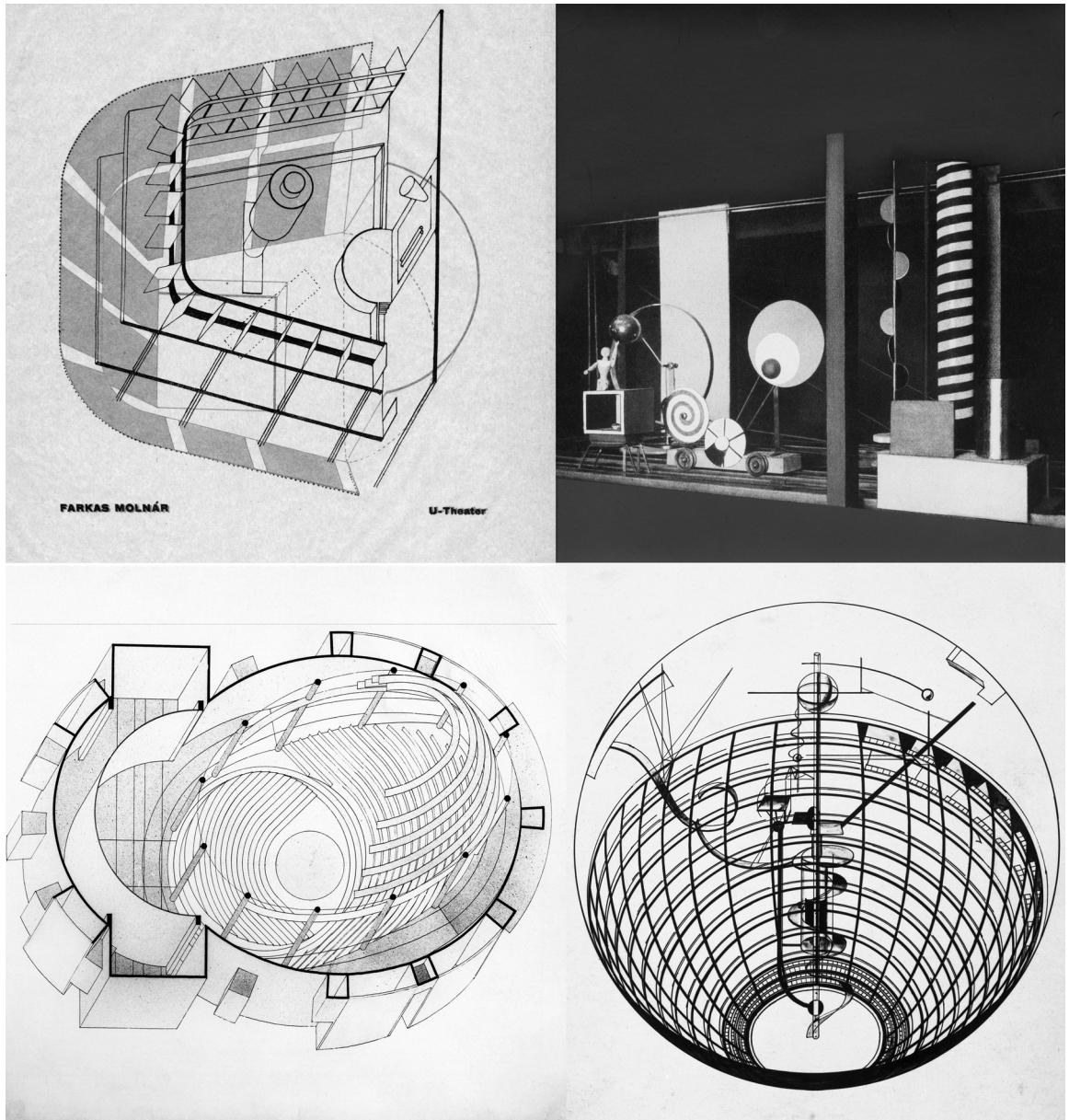


Figure 1.9 Four Bauhaus Theaters. (Clockwise from top left.) Farkas Molnár, *U-Theater*, 1925, © Bauhaus-Archiv Berlin. Heinz Loew, *Model for a Mechanical Stage*, 1927, © Bauhaus-Archiv Berlin. Walter Gropius, *Total-Theater* (designed for Erwin Piscator), 1927, © VG-Bild Kunst, Bonn. Andreas Weininger, *Spherical Theater*, © VG-Bild Kunst, Bonn.

immediately connected to the upper balconies of the theater space, which were to be positioned over the main U-shaped seating areas. “Mechanical aids for the heightening of various effects . . . machines for dispersing odors of various kinds” were also to be installed in the space, along with a series of moving, hydraulically driven drawbridges, ramps, and catwalks, all designed to link the stage with the amphitheater and thus break down the separation between viewers and event (Gropius 1961, 74).

Student Heinz Loew produced a scale model for a completely mechanical stage without the presence of performer or audience. Composed of a structure built on three tracks and with two rotary disks, Loew’s mechanical stage set in motion a combination of three-dimensional objects, rectilinear-static forms and translucent surfaces, all mechanically controlled to achieve different compositional effects (figure 1.9, top right). More important, performance in the age of the machine had to acknowledge the presence of the technical operators, putting them on display before the public as performers—yet another nail in Wagner’s coffin.³⁵

Another equally utopian scheme was Andreas (Andor) Weininger’s plan for a massive *Kugeltheater* (*Spherical Theater*), a gigantic globe-shaped room whose aim was to create for the spectators a new relationship to space itself (figure 1.9, bottom right). By placing the audience on the inner wall of the sphere (something that seemed certain to guarantee a sense of vertigo) and transferring the normal flat plane of the stage onto a series of corkscrew-like ramps that scaled up the central, vertical axis of the globe, Weininger’s theater proposed to create a radical new set of “psychic, optical, acoustical relationships . . . new rhythms of motion to new modes of observation” (Gropius 1961, 89).

The boldest performance environment to emerge was Gropius’s own *Total-Theater*. Asked by Piscator to conceive of a new kind of completely flexible environment that would accommodate his technical visions, Gropius responded with a “great space machine”: a mechanically transformable space with seating for 2000, capable of accommodating multiple stage setups during the same performance, such as arena (audience concentrically around all sides), picture frame (i.e., proscenium), and thrust (audience on three sides). By way of gradually moving machinery, the total theater could transform the spectator/stage relationship over the course of a performance by turning the large, revolving stage 180 degrees (figure 1.9, bottom left).

In order to accommodate different geometries as well as Piscator’s relentless use of film, Gropius designed a complex projection system capable of rear-projecting onto a series of cycloramas wrapped around the space. Through a series of mobile projectors and twelve fixed rear film projectors fanned across the auditorium, Gropius’s integration of the projection apparatus directly into the space’s architecture would serve not only to “build with light and project slides and movies of abstract or figurative material to create scenic illusions which render real flats or stage props superfluous,” but also make it possible to plunge the spectator’s directly into the center of real and filmic action (Piscator 1978, 183). Unrealized due to financial reasons, Gropius’s plans would nevertheless have a major

impact on the technological transformation of performance environments into the late twentieth century.³⁶

Despite the advanced technological vision demanded of the project, Gropius made clear that technology was not just a means to “accumulate a collection of fanciful technical apparatus and gimmickry,” but rather a tool for “the most fantastic experimental creations of a stage director of the future” (Piscator 1978, 183). Similarly, Oskar Schlemmer reiterated the same sentiment of cautiousness in his writing, stating that technology should be tempered first and foremost by aesthetic concerns: “Today’s technology already has the necessary apparatus. It is a question of money—and, more important, a question as to how successfully such a technical expenditure can meet the desired effect. How long, that is, can any rotating, vibrating, whirring contrivance, together with an infinite variety of forms, colors and lights, sustain the interest of the spectator?” (Schlemmer 1961, 88).

Beyond Construction: Dadaism and Surrealism in France

As the electromechanical vision of the Constructivists overtook the Dutch-, German-, and Russian-speaking worlds in the period between the two world wars, Dadaism gradually migrated from its Zürich roots to Berlin, Barcelona, New York, Geneva, and Paris. Not particularly interested in the architectural-spatial questions that consumed people like Kiesler, Meyerhold, Lissitzky, Moholy-Nagy, or Gropius, the Dadaists still shared somewhat of a penchant for multimedia events. Indeed, the internecine battles between the French Dadaists, led by Tristan Tzara, who had left Zürich for Paris in 1919, and their antithetical successors the Surrealists, led by André Breton, resulted in one work: the “instantaneous ballet” *Relâche* (translated as *No Performance Tonight!*), which marked the closest that either movement would get to the total performance imagined by machine-age adherents.

The pinnacle of the break between Dada and Surrealism came with former Dadaist Francis Picabia’s collaboration on *Relâche* with the French composer Erik Satie. Along with other denizens of the avant-garde, including Man Ray, the young filmmaker René Claire, Duchamp, the choreographer Jean Börlin, and the director of the renowned Parisian Ballets Suédois Rolf de Maré, *Relâche* was a theatrical lashing out against the Surrealists. The result of this retaliation was a media spectacle that not only mocked the pretentiousness and inauthenticity of the Surrealist’s sudden love for a classical performance form like ballet, but would also become a landmark event in the history of avant-garde performance.

The word “*Relâche*” was used in theaters to indicate “no performance tonight.” Without a doubt, the audience that arrived for the scheduled opening on November 27, 1924, found the theater closed, with a sign hanging on the door stating none other than “*Relâche*.” This was not just another Dadaist performance but a reality, in that illness