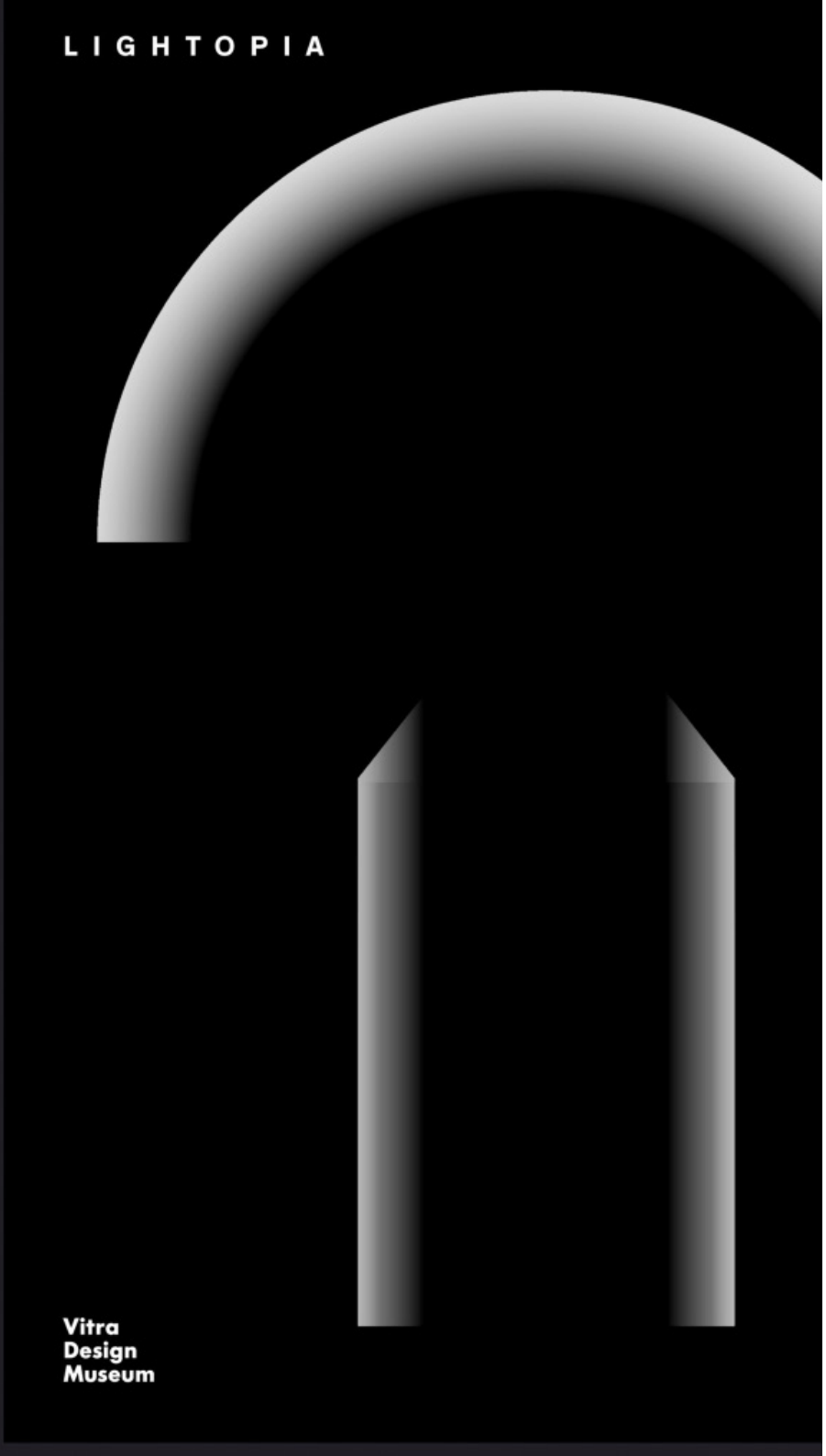


UNIVERSITY OF TECHNOLOGY, SYDNEY

THEA BREJZEK
Modulating Space:
Using Light in Staging and Set Design
/ Raumbildend: Licht als szenisches Gestaltungsmittel

2013 | *Lightopia, Vitra Design Museum*

Lightopia, Cover of Publication

This essay, commissioned by Vitra Design Museum Weil am Rhein for Volume 1 of 3, *On the Cultural History of Light* for the 2013 Vitra exhibition, *Lightopia*, traces the development from natural to artificial light as a dynamic and artistic rather than merely pragmatic medium in the design and articulation of performative space in theatre, event and urban space. The text understands light to be an active agent in the creation of an overall scenography, comprised of all material and immaterial elements that make up the space of a live event. Drawing on a wide range of significant primary texts and practice examples from antiquity to contemporary positions, the author links technological developments to changes in the understanding of the hierarchy between audience and performer, text and image, space and decoration in the history of scenography.

In line with the author's research focus on scenography, performative space and the politics of space, the positions introduced and interrogated in *Modulating Space* show performance lighting to occupy a central role in the constant rethinking of the relationship between the space of action (the stage) and the space of reception (the auditorium). The transgression of such conventionalized spatial demarcations toward undisciplined and disharmonious configurations (as in Antonin Artaud's *Theatre of Cruelty*), toward abstraction and reflection (as in Adolphe Appia's Hellerau stage) and toward mass manipulation and representation of power (as in Albert Speer's Nuremberg and Paris Light Domes) are shown as examples in their historical and cultural context.

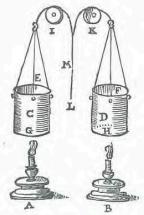
Modulating Space

Using Light in Staging and Set Design

FIG. 1
Mariusz Treliński, Boris Kudlicka, Marc Heinz, *Orfeo ed Euridice* (by Christoph Willibald Gluck), 2009, Polish National Opera, Warsaw
→ p. 57

As a support for narrative and dramaturgical structures, aesthetic experience and generating atmosphere, light plays a central role in theater and public events. Light creates spaces and is able to shape space in time. The development and use of artificial, static and mobile light, as deployed on stages and at the opening and final ceremonies of the Olympic Games, at world expos and at international light festivals, are directly linked to technological innovation and a changing way of thinking about the hierarchy and the presentation of performers, space and text FIG. 1.

In the amphitheaters of Ancient Greece around 400 BC, performance and the plot of a drama were bound to the maximum length of the day from dawn to sunset, and the only "lighting" effect was the course of the sun. The theater during the Middle Ages, however, knew no fixed stage: liturgical plays and festivals took place in market squares or in churches and light was provided by oil lamps, candles or torches. It was only with a return to ancient building traditions and the late reception of the Roman theorist Vitruvius's theory of perspective *De architectura libri decem* (Ten Books on Architecture) that architects began to think about questions of scenography to link stage decoration, perspective and light to one another. The permanent perspective stage sets in Andrea Palladio's Teatro Olympico in Vicenza (built posthumously, 1580–84) and Vincenzo Scamozzi's first freestanding Renaissance theater (1588) in Sabbioneta, a north-Italian "ideal" town, were to be illuminated so as to emphasize perspective depth. At the same time, the actual space of action for the performers was to be lit in an even fashion using light from the sides. In his multi-volume work *Tutte l'opere d'architettura*, published in 1537 and strongly influenced by Vitruvius, the Italian architect and stage designer Sebastiano Serlio (1475–1554)



Siano i due Lumi, che li hauranno ad oscurare A. B. & i Cilindri C.D.

FIG. 2
Nicola Sabbatini, Dimmers, 1638

emphasized for the first time the necessity of careful stage design to enhance the three-dimensionality of the stage architecture. The Baroque stage, with its wave machines and flying machines and dramatic depictions of catastrophes, featured a complex use of light with candle devices, torches and fireworks. In 1638, the Italian architect Nicola Sabbatini published the first guidebook on stage and lighting technique, *Pratica di fabricar scene e macchine ne' teatri*, with a depiction of lighting devices that could be regulated gradually—so-called "dimmers," two cylinders hanging over burning candles that could be lowered or raised by way of a mechanism. Depending on the distance of the cylinder from the candle flame, the light effect could be amplified or weakened FIG. 2.

Swabian engineer and mathematician Joseph Furttenbach (1591–1667) advanced the development of Italian lighting technology in Germany, although he continued to use the outdated ancient model of rotating side stages *(periaktoi)*. Besides investigating complex chemical mixtures for fireworks,[1] Furttenbach also experimented for the first time with mirrors that could be used as light reflectors and with metal reflectors that, used in the footlights, put an end to the bothersome blinding of the spectators by way of lights placed on the stage floor. The continuing development of reflectors and the fixation of lighting on rotatable scaffolding in the eighteenth century allowed for an increasingly differentiated use of light. Architecture and performers could now, in a first turn toward the interpretation of music and text using space, light and movement, be "staged" in a targeted and effective way. Changes in lighting not only marked the beginning and end of a performance, but also structured the performance in scenes and various moods.

LIGHT BODIES AND LIGHT SPACE

Gas lighting was initially used in foyers and auditoriums, and in 1817 it was used for the first time on the stage at London's Lyceum Theatre. The advantages of gas lighting—great light intensity and easy controllability—were countered by the increased danger of fire, as seen in the dramatic rise in the number of theater fires between 1820 and 1880. Vienna's 1881 Ringtheater fire, which resulted in the deaths of three hundred people due to a tragic chain of mistakes and misunderstandings, led to the establishment of fire code regulations specifically for theaters. The common practise of using oil lamps in the foyer and behind the stage, and gas lighting in the auditorium, was then replaced by gas lighting in the entire theater building.

The fire at Vienna's Ringtheater on Schottenring broke out just before the start of a performance of *Tales of Hoffmann* due to the release of excess gas when igniting a light box backstage. The fire quickly spread to the stage decoration

1
Furttenbach, Josef, *Halinitro-Pyrobolia. Beschreibung einer newen buchsen-meisterey, nemlichen: grundlicher Bericht, wie der Salpeter, Schwefel, Kophlen, unnd das Pulfer zu praepariren, zu probieren, auch langwirrig gut zu behalten: das Fewerwerch zur Kurtzweil und Ernst zu laboriren*, Ulm, Jonas Saur, 1627.

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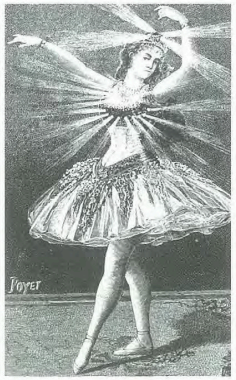

FIG. 3
Dancer with electrical costume lighting, circa 1881

and the sold-out auditorium soon caught fire. A side door open near the stage caused a strong draft that further fed the flames, and doors that only opened inwards hindered the audience who were trying to flee. The oil lamps for the emergency lighting had not been reinstalled after having been repaired. The policeman responsible, Anton Landsteiner, announced, "All clear!" upon seeing the doors to the auditorium closed, and the firemen, who arrived late on the scene, left without doing a thing. In Arthur Schnitzler's story "Komödiantinnen" from 1892, the young Fritzi lives though the experience over and over again, to the delight of the men listening to her. "It seemed," she continued, "as if the flames were nothing harmful, nothing that threatened me. I stared into the fire with interest, perhaps even enthusiasm, but certainly not with fear. Then suddenly, I felt myself being pushed, no, not pushed, lifted, and around me there was a horrifying, monstrous noise, as if everything were collapsing, and it blustered throughout the room like a storm, while a gray, dark smoke issued forth from the blaze. Unexpectedly, there was a violent push in a certain direction. It was suddenly dark, and I couldn't move. Around me, there was cursing and moaning. Yes, I screamed as well a few times, barely knowing why. And suddenly, I felt fingernails around my neck, claws: somebody was pulling at me. My collar was torn from me; my dress was simply pulled off my body."[2]

As a consequence of the Ringtheater fire, an iron safety curtain, which separated the audience from the stage and could be lowered against the danger of fire, became a legal requirement, and other fire code regulations also went into effect.

Soon after Edison's development of the electric light, the foyers and auditorium of the first theaters were outfitted with electrical lighting—first London's Savoy Theater (1883) and briefly afterwards Brünn Theater, the first to use electric lighting exclusively. Initially, lighting systems were used only to illuminate the stage. However, the development of special effects technology followed soon after. Revealing here is an article of 1883 in the *Polytechnische Journal* on the lighting effects in Gilbert & Sullivan's operetta *Iolanthe* at the Savoy Theatre, based on a lecture by Berlin engineer Paul Jordan FIG. 3: "In the theater, all the fairies in the large-scale, evening-filling fairy spectacle *Iolanthe* appear with their own electric light. Each of them carries a small, tiny swan lamp in their hair, as shown in fig. 2. The electricity is provided by a Planté secondary battery consisting of two elements that the fairies wear between their wings and their flowing hair hidden on their backs. One such secondary battery weighs 1.75 kg, to charge them an electric current of 3.2 amperes is required: their electromotoric power has 5 volts and the light from the lamps c. 1.5 amperes. The small lamps are connected to the battery with thin, flexible wires,

2
Schnitzler, Arthur, *Gesammelte Werke: Die erzählenden Schriften*, vol. 1, Frankfurt am Main, Fischer, 1961, p. 218.

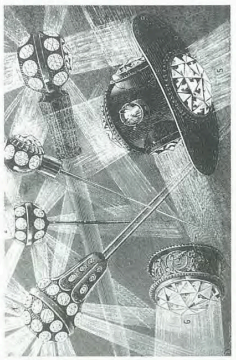

FIG. 4
Gustave Trouvé, *Bijoux Électriques*, circa 1881

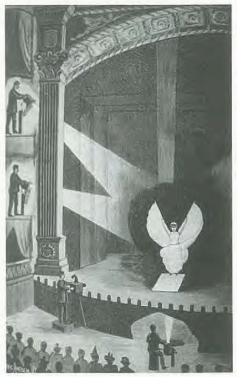

FIG. 5
Loïe Fuller, *The Skirt Dance*, 1901

and attached to their hair using a comb. The overall effect is a very nice one."[3]

In contrast, an anonymous theater critic from the *London Figaro* remarked skeptically in December 1882: "The incandescent lamps worn in the hair of four of the Peris at the Savoy on the opening night did not produce the happiest effect. The light dazzled the eyes and gave rise to an uncomfortable suspicion of possible danger. For, although the wires are doubtless completely insulated, yet a fracture or a rub would imply instant death to the unhappy lady who wears the lamp. It is doubtful, after all, whether the game is worth the (incandescent) candle."[4]

The invention of such individualized electric costume accessories, called *bijoux électriques*, can be attributed to French engineer and inventor Gustave Trouvé (1839–1902) FIG. 4. For the ballet in Camille Saint-Saëns's opera *Ascanio*, Trouvé developed an electric torch with a battery (Planté batteries with lead sheets) that remained charged for twelve to fifteen minutes. This and the electric swords that Trouvé had already constructed for a duel scene in Charles Gounod's opera *Faust* (1859), which released electric sparks upon contact, were highlighted in the press of the time as especially effective stage technical innovations.

During the 1890s, the American dancer Loïe Fuller (1862–1928) used the new light and projection technologies to create individualized stage lighting, utilizing the language of light artistically in a direct engagement with the dancing female body. In her construction of ephemeral body architectures, Fuller experimented with colorful movable light, with magic lantern projections and reflecting mirrors. She painted her costumes with phosphorescent pigments to achieve a glow-in-the-dark effect and projected abstract, pathologically altered "body cells" onto the stage. Fuller worked with a team of electricians who traveled with her from performance to performance and minutely adjusted her materials for use in each appearance FIG. 5. Virtually fulfilling the Symbolist aesthetics of a dream-like interiority as described by the French poet Stéphane Mallarmé (1842–98), for whom dance represented pure poetry, in her thematic performances between 1890 and 1920 (Radium, Fire, Orchidee, Serpentine) Loïe Fuller achieved an as yet unknown fusion of the immateriality of light and the materiality of her body, which was shrouded in long, billowing silk fabric. With broad, circu-

3
Anonymous, "Die elektrische Beleuchtung des Savoy- und des Brünner Theaters," *Polytechnisches Journal* 248, 1883, pp. 241ff., available online: http://dingler.culture.hu-berlin.de/article/pj248/ar248095

4
Almaviva, "Before and Behind the Curtain," *London Figaro*, December 2, 1882, pp. 16f., accessed at http://www.savoyoperas.org.uk/iolanthe/io9.html#almaviva

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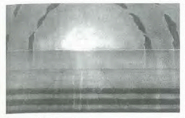

FIG. 6
Adolphe Appia, *Espaces Rhythmiques*, 1909
→ p.60

lar movements, and with the help of rods, Fuller, whose dancing body was freed from a corset in a way that was found scandalous at the time, used these flowing robes to set her audience into a delirious state. Mallarmé compared her in his writings "Crayonné au théâtre" with a "poem disengaged from the writer's tool": "À savoir que la danseuse n'est pas une femme qui danse, pour ces motifs juxtaposés qu'elle n'est pas une femme, mais une métaphore résumant un des aspects élémentaires de notre forme, glaive, coupe, fleur, etc., et qu'elle ne danse pas, suggérant, par le prodige de raccourcis ou d'élans, avec une écriture corporelle ce qu'il faudrait des paragraphes en prose dialoguée autant que descriptive, pour exprimer, dans la rédaction: poème dégagé de tout appareil du scribe."[5]

Around the turn of the century, the Symbolist aesthetic of the delirious, indefinite and interior was pursued further, while at the same time a rejection of the psychologically realistic approach to naturalism began to take hold. Against the backdrop of the programmatic articulation of the return of art to life and the unifying festival character of theater, around 1900 a movement of reform began, initiated by stage designers, directors and choreographers. They demanded the autonomization of body, stage and light vis-à-vis the authority of the text. In close collaboration with architects, new theatrical buildings and spaces were created which, influenced by Friedrich Nietzsche's philosophy of a renewal of life through art, were to suspend the strict spatial division of the spectator and the performer. At the Festspielhaus Hellerau near Dresden, built by Heinrich Tessenow between 1910 and 1912, Geneva-born stage designer Adolphe Appia laid the foundation for modern staging. In his main work *Musique et mise en scène* (1897), space and subsequently light were conceived for the first time as autonomous elements equal in importance. Appia distinguished between "distributed light" or "brightness" and "designing light,"[6] and thus emphatically rejected the traditionally dominant footlights, which he called a "strange monstrosity of our theater" and "which have the role of lighting decoration and performers from the front and from below"[7] FIG. 6.

For Appia, the stage did not live from brightness, but from the design and mutual penetration of space, light and shadow: "If light is lacking, then so is expression, and this is the case on our stages: it is possible to see, but without light. For this reason, stage decoration is only expressive during the absence of the performer. For the fictional light painted on the canvas corresponds to the painted shadow, which is equally painted upon it. But no fictional light in the world can illuminate the performer, who is a living, sculptural body. If we want to have light on our stages, we either need to sacrifice the performer or the painting: if we sacrifice the first, the drama is abolished and it becomes diorama: so it is the painting that we have to sacrifice."[8]

5
Mallarmé, Stéphane, "Crayonné au théâtre," *Divigations*, ed. Eugène Fasqueue, Paris, Bibliothèque-Charpentier, 1897, p.173.
6
Appia, Adolphe, *Die Musik und die Inszenierung*, trans. Elsa Cantacuzène, Munich, Bruckmann, 1899, p.84.
7
Ibid., p.85.
8
Ibid., pp.85f.

FIG. 7
Robert Wilson, *Götterdämmerung*, 2000, Opera House Zurich
→ p.57

In keeping with his clear rejection of painted decorations of naturalism and the portal stage of the nineteenth century, for Hellerau Appia planned a rectangular open space with a sinkable orchestra pit, the only element that he took over from his early collaboration with Richard Wagner at Bayreuth. Inspired by the founder of eurhythmics and movement theory, Émile Jacques-Dalcroze (1865–1950), which he supported by establishing a "school for eurhythmics" in the "Garden City" of Hellerau, Appia created a series of stage designs around 1909—the *Espaces Rhythmiques*—for his emerging theater that transformed the stage into a narrative space using arrangements of sculptural stage elements, light and shadow. The specially developed *Praktikablen*—cubes, rectangles, stairs and pedestal-like objects covered in canvas—served as spatial "resistance" and rhythmified the movements of the performers. The painter Alexander von Salzmann (1874–1934), a follower of Stefan George, developed a lighting system for Hellerau with up to 7,000 light bulbs spread evenly around the walls and the ceiling that could immerse the entire room in an equal light that could be controlled gradually. All surfaces of the stage were covered with a bright fabric, and the lighting system was installed behind it, including several colored light blubs. The light that was produced in this fashion in combination with tiltable ceiling spotlights supported Appia's notion of lighting as a means of expression, equal in status to the performer and the space, and was intended to perfect the Wagnerian concept of the total work of art, the *gesamtkunstwerk*.

In Hellerauer Festspielhaus, which did without any set structures, stage, curtain or fixed seating, Appia and Salzmann created for the first time an immaterial architecture, in which performers, spectators, light, stage and music were to be combined in an intellectual and sensual unity. The programmatic and importance of the stage light for the Hellerau experiment were conceived by Alexander von Salzmann to the point of a synthesis of light and music: "In contrast, the spotlight has nothing to do with the imitation of sunshine: it is based on music. And only the music. And the light has to be like an instrument of the orchestra, that controls its crescendos and decrescendos exactly according to the score. A scale of light would be conceivable, so that the scale from *e* to high A is a sequence of levels of increasingly brighter white light, while from *e* colorful sounds are mixed with the white light. Complete lightlessness would be analogous to silence."[9] But Salzmann's plans to create a light-music system for Hellerau failed.

Appia's understanding of stage light as a mobile artistic medium—"the lighting will spread in space as an element of composition"[10]—finds its historical continuation in statements made by the American director, curator and stage designer, Robert Wilson FIG. 7, "Without light there is no space," and "Whenever I see Appia's drawings and designs, I feel confirmed in my work."[11] While for Appia light is an equal partner of the staging and as a living whole is always in the service of the performer, in Wilson's strictly formalized visual theater since the 1970s light itself is a performer. German actress Marianne Hoppe (1909–2002), who played the title role under Wilson's direction in 1990 in Frankfurt in Shakespeare's *King Lear*, saw Wilson as a lighting designer, not a director: "This Wilson can't fool me. I started out at the Deutsches Theater with Max Reinhardt. I know what a director is. Wilson is not a director. He's a lighting designer. A Wilson actor runs here or there only because there's a change in the lights. On a Wilson stage, light pushes the actor around. Light is important but in Shakespeare language is also important. I can speak the lines the way he wants but I don't believe Shakespeare wrote Lear to be recited by an autistic child."[12]

Indeed, Wilson's theater does refuse the psychology of characters. The performers are given a store of minimal gestures and movements fixed by the director, which, often in direct opposition to the emotional constitution of the character, are performed evenly and slowly.

American lighting designer Beverly Emmons's description of her collaboration with Robert Wilson again makes clear how much his precision in directing his performers corresponds to his lighting requirements: "What Bob does with light which is extraordinary and difficult and unusual is to separate all the elements from each other and control them independently... He wants the floor treated as a whole unit and separately painted with light. He wants the background treated as another whole, with maybe one color shaded into another... Then he wants the human figure separately etched out with light, and very often he wants the head or even nose of that figure separately lighted."[13]

In contrast to the cool perfection and formal strictness of Robert Wilson, creative teams of directors, stage designers and lighting designers among the younger generation in opera, theater and performance focus increasingly on multi-media space—light constructions in which various media techniques (moving/interactively controlled light, video projection or visual elements that are manipulable and interactive) could be combined with one another depending on the staging aesthetics and statement. An electric language of images and body language emerges: the task of the theater is no longer to communicate messages or truths, but to focus and depict reality.

SHADOW SPACES AND CATHEDRALS OF LIGHT

The history of light on the theater stage, in the interior spaces of the private and on the streets of our cities is the history of lighting and illumination, of making visible, showing and displaying spaces and bodies. But beyond the growing functionality and expressiveness of lighting devices as a tool of design, it is also a history of the increasing displacement of shadow. For the French director Antonin Artaud (1896–1948), certainly the most influential

9
von Salzmann, Alexander, "Licht Belichtung und Beleuchtung: Bemerkungen zur Beleuchtungsanlage des grossen Saals der Dalcroze-Schule," *Die Schulfeste der Bildungsanstalt Jacques-Dalcroze: Programmbuch*, ed. Bildungsanstalt Jacques-Dalcroze, printed in *Der Rhythmus: Ein Jahrbuch*, 1912, p.70.
10
Beacham, Richard C., *Adolphe Appia, Künstler und Visionär des modernen Theaters*, Berlin, Alexander, 2006, p.137.
11
Wilson, Robert, "Eine vollständige Theatersprache. Robert Wilson über Appia, Licht und Theater," in ibid., p.7.
12
Holmberg, Arthur, *The Theatre of Robert Wilson*, Cambridge, Cambridge University Press, 1996, p.138.
13
Shyer, Laurence, *Robert Wilson and His Collaborators*, New York, Theatre Communications Group, 1989, p.192.

FIG. 8
The Unilever Series: Miroslaw Balka, *How It Is*, October 10, 2009 to April 5, 2010, Turbine Hall, Tate Modern, London

theoretician of theater of the twentieth century, unsettling the shadows by way of the theater had a function of cultural critique: "Our petrified idea of the theater is connected with our petrified idea of a culture without shadows... But the true theater, because it moves and makes use of living instruments, continues to stir up shadows where life has never ceased to grope its way."[14]

Artaud's model of a Theater of Cruelty from 1932 catapulted light, sound and the stage from a traditional servile relationship to the theater text toward a non-hierarchical, chaotic and non-harmonic ensemble. The new illumination of a Theater of Cruelty demanded, in Artaud's view, new kinds of projectors and scales of color and "the effects of all kinds of luminous vibration must be investigated, along with new ways of spreading the light in waves, in sheets, in fusillades of fiery arrows."[15] The Theater of Cruelty was to be an event and overwhelm the spectators' senses. In so doing, the uncompromising disturbance of the shadows by the simultaneity of all theatrical elements was the program and the goal. In November 2009, the Polish artist Miroslaw Balka uncovered the shadows of a European past in his installation *How It Is*. At issue for him was not driving out the shadows—on the contrary. Balka congealed them to form a physically palpable darkness, recalling what the German philosopher and mathematician Edmund Husserl once called "spatial corporeality": a physical experience that brings people and things together. In the large Turbine Hall at London's Tate Modern, Balka built a container of gray steel 13 meters high and 30 meters long. The installation, accessible to visitors by way of a long, gradually inclining ramp, was covered on the inside entirely with black felt that dampened all sound. In addition, it was entirely dark. The unsettled visitor fell out of space and time and wandered about, fully disoriented, constantly trying to avoid the other visitors, who, equally helpless, walked around the seemingly endless depths of the black container or felt their way along the walls. Balka named the massive steel structure *How It Is* after the English title of the 1961 monologue novel *Comment c'est* by Irish writer Samuel Beckett, in which a man crawls, breathing heavily, through the mud, while listening to a disembodied voice that tells him the story of his life. In an analogous way, the darkness that surrounded the visitors to Balka's steel chamber was difficult, indeed unbearable, and placed them in a physically palpable liminal situation of being imprisoned, waiting for something, perhaps imminent catastrophe FIG. 8.

Miroslaw Balka's lightless container was conceived and built as a space of extreme experience, where the darkness negates the space, making it simultaneously impenetrable and inescapable as bodiless blackness. Once the exit was found, the external space seemed in comparison blindingly bright, and initially just as strange as the dark-

14
Artaud, Antonin, "Preface: The Theater and Culture," in *The Theater and Its Double*, New York, Grove, 1958, p.12.
15
Artaud, "The Theater of Cruelty (First Manifesto)," in ibid., p.95.

FIG. 9
Albert Speer, light dome at the NSDAP's Nuremberg Rally, September 8, 1936, Nuremberg

ness before. It is no accident that the online app that Tate Modern created to accompany *How It Is* included a sketch by the artist that refers to the very first "shadow narrative" in Western philosophy, Plato's allegory of the cave. Here, the prisoner, chained in an underground cave, can see on the opposite wall the shadows of objects carried by above in the wavering light of a torch. These shadows, although immaterial in nature, are part of the prisoner's reality. Once freed, the prisoner is blinded by the daylight, and neither reality nor truth can initially be recognized. Balka turned Plato's parable around: in *How It Is*, there are no longer any shadows. In the complete absence of light, all that exists is the materiality of the searching body and the fear of what might take place in the darkness, or what this might be a precursor to—the transport to Auschwitz, for example, as the Tate curators alluded to in their preface. Balka's uncompromising steel cube, whose external walls took up the steel beam structure of the Turbine Hall itself, can be read as a countermodel and spatial-sculptural reflection of the monumental light celebrations of the Nazi propaganda machine created by Albert Speer (1905–81), architect and general building inspector for the German capital and defense minister during the last years of the war. Speer's "cathedrals of light" were among the central scenographic elements of Nazi mass spectacle and demonstrations of power in public space. A broad international public is still familiar with them due to the final sequence of Leni Riefenstahl's second *Olympia* film *Fest der Schönheit* of 1938. This documentary on the 1936 Berlin Olympic Games, staged in Riefenstahl's film language which exalted Nazi ideology, ends with Albert Speer's cathedral of light, with the camera following the beams of light skyward. Speer placed the searchlights in a ring around the stadium so that the impression was created that their beams of light met centrally above the stadium at an enormous height, a visual symbol of the Third Reich's unity, power and future orientation. This symbolic significance of the cathedral of light inspired the German writer Ina Seidel to write a poem with same name, published in a volume in celebration of Hitler's fiftieth birthday in 1939. The poem's second stanza reads as follows: "Here we stand eternally united around the one / and that one is the heart of the people."[16] Speer presented other cathedrals of light at Nuremberg's Zeppelin Field for the Nazi party congresses in 1936, 1937 and 1938. The Zeppelin Field itself was created between 1933 and 1937 according to Speer's plans as a marching field for up to 10,000 people: the main and side grandstands could hold 60,000 spectators. Here, Speer experimented with arrangements of up to 150 vertically placed anti-aircraft searchlights, which, positioned around the Zeppelin Field, allowed for a monumental light architecture that reached several kilometers high FIG. 9.[17] Speer's

16
Seidel, Ina, "Lichtdom," quoted in Christian Ferber (Georg Seidel), *Die Seidels: Geschichte einer bürgerlichen Familie 1811 – 1977*, Stuttgart, Deutsche Verlags-Anstalt, 1979, pp.306f.
17
"Beside the anti-aircraft searchlights for the light cathedral, 2104 additional searchlights and lamps were necessary with a power of 703.4 KW. Since the 152 anti-aircraft searchlights already used 16 KW, the overall wattage was 3,135.4 KW, over 3 million watts" (Philipp Schmitt, "Die Beleuchtungsanlage des Zeppelinfelds auf dem Reichsparteitagsgelände zu Nürnberg," *Das Licht* 7.4 [1937], p.61, quoted in Anna Krauter, "Die Schriften Paul Scheerbarts und der Lichtdom von Albert Speer ['Das grosse Licht,'" dissertation [1997], accessed at http://archiv.ub.uni-heidelberg.de/artdok/volltexte/2004/37/)

FIG. 10
German Pavilion, World's Fair Paris 1937

light spectacles in the service of Nazi ideology created the desired sacred, solemn atmosphere that was intended to bind the Volksgemeinschaft to their Führer Adolf Hitler by way of the quasi-religious ritual of the party congress.

Speer also designed the German Pavilion at the Paris World Exhibition in 1937, for which he also created a light spectacle. For the 65-meter high tower of the pavilion, topped with a bronze imperial eagle with a swastika by sculptor Kurt Schmid-Ehmen, Speer was awarded one of the World Exhibition's two gold medals. The vertical principle of composition could best be experienced at night, when Speer had the tower illuminated with another vertically oriented cathedral of light and the imperial eagle lit from below with spotlights FIG. 10. Visible from a distance at night, the German Pavilion with its light spectacle outshone the Soviet Pavilion,[18] but was itself topped by a spectacle at the Eiffel Tower which, based on a concept by French architect André Granet, was even lit in color. In retrospect, Speer—who had been commissioned to redesign Berlin as the world capital Germania, declared in 1942—stylized himself as an apolitical "architect of light." In his memoirs, written in Spandau Prison,[19] he wrote the following about his "cathedrals of light" in Berlin, Nuremberg and Paris: "I imagine that this 'cathedral of light' was the first luminescent architecture of this type, and for me it remains not only my most beautiful architectural concept but, after its fashion, the only one which has survived the passage of time."[20]

LIGHT STAGE, LIGHT CITY

In public space, where during the 1930s Albert Speer realized ephemeral light architectures using military searchlights in the service of Nazi ideology, today, with digital light technologies and interactive projections, the city becomes a temporary stage and architecture becomes a central element in urban scenography. International light festivals such as the Internationale Lichttage Winterthur, the Frankfurt Luminale and the Australian Vivid Sydney stand in the tradition of French events called *son et lumière*, nightly shows that combine light art, city history and music. In 1952, Paul Robert, grandchild of the French magician Jean Eugène Robert-Houdin, transformed the Château de Chambord in the Loire Valley for the first time in a nightly light and sound show. Since then, the genre *son et lumière* has been considered a form of visual storytelling where colorful light and music composed especially for the event (for example, Jean Michel Jarre's Millennium Concert against the backdrop of the colorfully illuminated Egyptian Giza Pyramids on New Year's Eve 2009) emphasize the façades of historical buildings and monuments in their three-dimensionality and animate them by way of moving image projections.

18
Located directly opposite the German Pavilion, for which its architect Boris Iofan won the other gold medal.
19
Albert Speer was sentenced to twenty years in prison at the Nuremberg Trials in 1946.
20
Speer, Albert, *Inside the Third Reich: Memoirs by Albert Speer*, trans. Richard and Clara Winston, London, Macmillan, 1970, p.59.

UNIVERSITY OF TECHNOLOGY, SYDNEY

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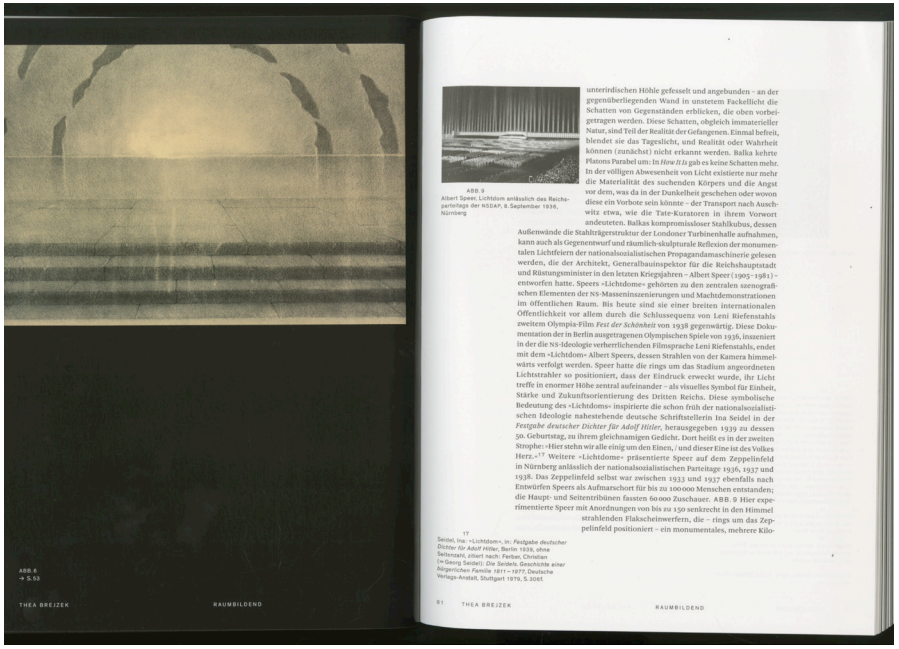

ABB. 9
Albert Speer, Lichtdom anlässlich des Reichsparteitags der NSDAP, 8. September 1938, Nürnberg

unterirdischen Höhle gefesselt und angebunden – an der gegenüberliegenden Wand in unstetem Fackellicht die Schatten von Gegenständen erblicken, die oben vorbeigetragen werden. Diese Schatten, obgleich immaterieller Natur, sind Teil der Realität der Gefangenen. Einmal befreit, blendet sie das Tageslicht, und Realität oder Wahrheit können (zunächst) nicht erkannt werden. Balka kehrte Platons Parabel um: In *How It Is* gab es keine Schatten mehr. In der völligen Abwesenheit von Licht existierte nur mehr die Materialität des suchenden Körpers und die Angst vor dem, was da in der Dunkelheit geschehen oder wovon diese ein Vorbote sein könnte – der Transport nach Auschwitz etwa, wie die Tate-Kuratoren in ihrem Vorwort andeuteten. Balkas kompromissloser Stahlkubus, dessen Außenwände die Stahlträgerstruktur der Londoner Turbinenhalle aufnahmen, kann auch als Gegenentwurf und räumlich-skulpturale Reflexion der monumentalen Lichtfeiern der nationalsozialistischen Propagandamaschinerie gelesen werden, die der Architekt, Generalbauinspektor für die Reichshauptstadt und Rüstungsminister in den letzten Kriegsjahren – Albert Speer (1905–1981) – entworfen hatte. Speers »Lichtdome« gehörten zu den zentralen szenografischen Elementen der NS-Masseninszenierungen und Machtdemonstrationen im öffentlichen Raum. Bis heute sind sie einer breiten internationalen Öffentlichkeit vor allem durch die Schlusssequenz von Leni Riefenstahls zweitem Olympia-Film *Fest der Schönheit* von 1938 gegenwärtig. Diese Dokumentation der in Berlin ausgetragenen Olympischen Spiele von 1936, inszeniert in der die NS-Ideologie verherrlichenden Filmsprache Leni Riefenstahls, endet mit dem »Lichtdom« Albert Speers, dessen Strahlen von der Kamera himmelwärts verfolgt werden. Speer hatte die rings um das Stadium angeordneten Lichtstrahler so positioniert, dass der Eindruck erweckt wurde, ihr Licht treffe in enormer Höhe zentral aufeinander – als visuelles Symbol für Einheit, Stärke und Zukunftsorientierung des Dritten Reichs. Diese symbolische Bedeutung des »Lichtdoms« inspirierte die schon früh der nationalsozialistischen Ideologie nahestehende deutsche Schriftstellerin Ina Seidel in der *Festgabe deutscher Dichter für Adolf Hitler*, herausgegeben 1939 zu dessen 50. Geburtstag, zu ihrem gleichnamigen Gedicht. Dort heißt es in der zweiten Strophe: »Hier stehn wir alle einig um den Einen,/ und dieser Eine ist des Volkes Herz.«[17] Weitere »Lichtdome« präsentierte Speer auf dem Zeppelinfeld in Nürnberg anlässlich der nationalsozialistischen Parteitage 1936, 1937 und 1938. Das Zeppelinfeld selbst war zwischen 1933 und 1937 ebenfalls nach Entwürfen Speers als Aufmarschort für bis zu 100 000 Menschen entstanden; die Haupt- und Seitentribünen fassten 60 000 Zuschauer. ABB. 9 Hier experimentierte Speer mit Anordnungen von bis zu 150 senkrecht in den Himmel strahlenden Flakscheinwerfern, die – rings um das Zeppelinfeld positioniert – ein monumentales, mehrere Kilo-

ABB. 6
→ S. 53

17
Seidel, Ina: »Lichtdom«, in: *Festgabe deutscher Dichter für Adolf Hitler*, Berlin 1939, ohne Seitenzahl, zitiert nach: Ferber, Christian (= Georg Seidel): *Die Seidels. Geschichte einer bürgerlichen Familie 1871–1977*, Deutsche Verlags-Anstalt, Stuttgart 1979, S. 306f.

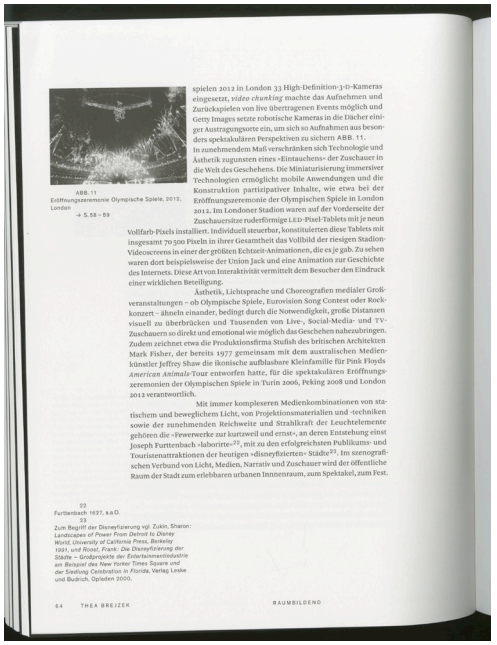

ABB. 11
Eröffnungszeremonie Olympische Spiele, 2012, London
→ S. 58 – 59

spielen 2012 in London 33 High-Definition-3-D-Kameras eingesetzt, *video chunking* machte das Aufnehmen und Zurückspielen von live übertragenen Events möglich und Getty Images setzte robotische Kameras in die Dächer einiger Austragungsorte ein, um sich so Aufnahmen aus besonders spektakulären Perspektiven zu sichern ABB. 11. In zunehmendem Maß verschränken sich Technologie und Ästhetik zugunsten eines »Eintauchens« der Zuschauer in die Welt des Geschehens. Die Miniaturisierung immersiver Technologien ermöglicht mobile Anwendungen und die Konstruktion partizipativer Inhalte, wie etwa bei der Eröffnungszeremonie der Olympischen Spiele in London 2012. Im Londoner Stadion waren auf der Vorderseite der Zuschauersitze rudelförmige LED-Pixel-Tablets mit je neun Vollfarb-Pixels installiert. Individuell steuerbar, konstituierten diese Tablets mit insgesamt 70 500 Pixeln in ihrer Gesamtheit das Vollbild der riesigen Stadion-Videoscreens in einer der größten Echtzeit-Animationen, die es je gab. Zu sehen waren dort beispielsweise der Union Jack und eine Animation zur Geschichte des Internets. Diese Art von Interaktivität vermittelt dem Besucher den Eindruck einer wirklichen Beteiligung.

Ästhetik, Lichtsprache und Choreografien medialer Großveranstaltungen – ob Olympische Spiele, Eurovision Song Contest oder Rockkonzert – ähneln einander, bedingt durch die Notwendigkeit, große Distanzen visuell zu überbrücken und Tausenden von Live-, Social-Media- und TV-Zuschauern so direkt und emotional wie möglich das Geschehen nahezubringen. Zudem zeichnet etwa die Produktionsfirma Stufish des britischen Architekten Mark Fisher, der bereits 1977 gemeinsam mit dem australischen Medienkünstler Jeffrey Shaw die ikonische aufblasbare Kleinfamilie für Pink Floyds *American Animals*-Tour entworfen hatte, für die spektakulären Eröffnungszeremonien der Olympischen Spiele in Turin 2006, Peking 2008 und London 2012 verantwortlich.

Mit immer komplexeren Medienkombinationen von statischem und beweglichem Licht, von Projektionsmaterialien und -techniken sowie der zunehmenden Reichweite und Strahlkraft der Leuchtelemente gehören die »Feuerwerke zur kurzweil und ernst«, an deren Entstehung einst Joseph Furttenbach-laborirte[22], mit zu den erfolgreichsten Publikums- und Touristenattraktionen der heutigen »disneyfizierten« Städte[23]. Im szenografischen Verbund von Licht, Medien, Narrativ und Zuschauer wird der öffentliche Raum der Stadt zum erlebbaren urbanen Innenraum, zum Spektakel, zum Fest.

22
Furttenbach 1627, a.a.O.

23
Zum Begriff der Disneyfizierung vgl. Zukin, Sharon: *Landscapes of Power From Detroit to Disney World*, University of California Press, Berkeley 1991, und Roost, Frank: *Die Disneyfizierung der Städte – Großprojekte der Entertainmentindustrie am Beispiel des New Yorker Times Square und der Siedlung Celebration in Florida*, Verlag Leske und Budrich, Opladen 2000.

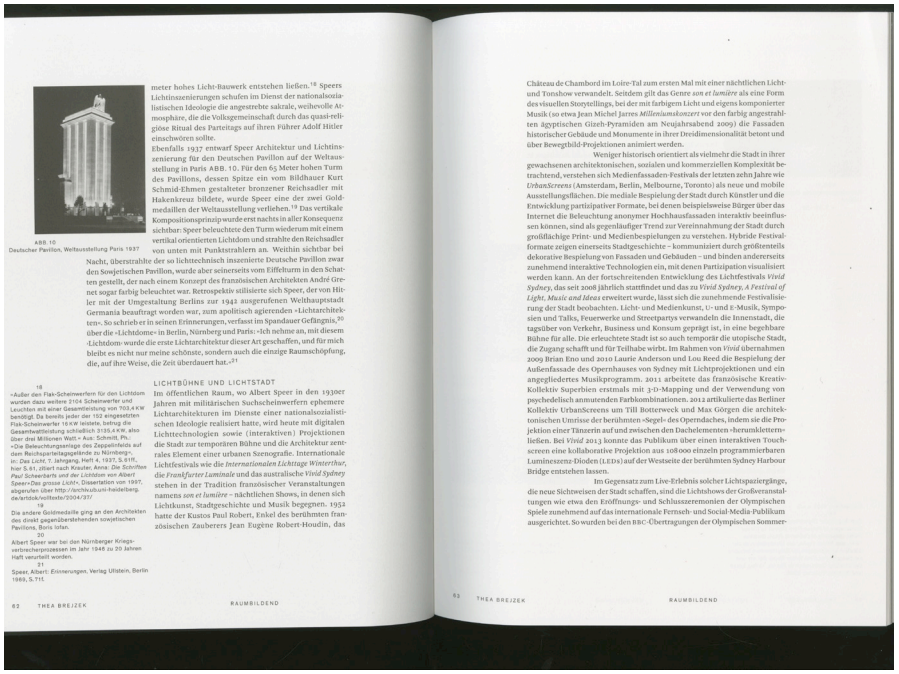

ABB. 10
Deutscher Pavillon, Weltausstellung Paris 1937

meter hohes Licht-Bauwerk entstehen ließen.[18] Speers Lichtinszenierungen schufen im Dienst der nationalsozialistischen Ideologie die angestrebte sakrale, weihevolle Atmosphäre, die die Volksgemeinschaft durch das quasi-religiöse Ritual des Parteitags auf ihren Führer Adolf Hitler einschwören sollte.

Ebenfalls 1937 entwarf Speer Architektur und Lichtinszenierung für den Deutschen Pavillon auf der Weltausstellung in Paris ABB. 10. Für den 65 Meter hohen Turm des Pavillons, dessen Spitze ein vom Bildhauer Kurt Schmid-Ehmen gestalteter bronzener Reichsadler mit Hakenkreuz bildete, wurde Speer eine der zwei Goldmedaillen der Weltausstellung verliehen.[19] Das vertikale Kompositionsprinzip wurde erst nachts in aller Konsequenz sichtbar: Speer beleuchtete den Turm wiederum mit einem vertikal orientierten Lichtdom und strahlte den Reichsadler von unten mit Punktstrahlern an. Weithin sichtbar bei Nacht, überstrahlte der so lichttechnisch inszenierte Deutsche Pavillon zwar den Sowjetischen Pavillon, wurde aber seinerseits vom Eiffelturm in den Schatten gestellt, der nach einem Konzept des französischen Architekten André Greinet sogar farbig beleuchtet war. Retrospektiv stilisierte sich Speer, der von Hitler mit der Umgestaltung Berlins zur 1941 ausgerufenen Welthauptstadt Germania beauftragt worden war, zum apolitisch agierenden »Lichtarchitekten«. So schrieb er in seinen Erinnerungen, verfasst im Spandauer Gefängnis,[20] über die »Lichtdome« in Berlin, Nürnberg und Paris: »Ich nehme an, mit diesem ›Lichtdom‹ wurde die erste Lichtarchitektur dieser Art geschaffen, und für mich bleibt es nicht nur meine schönste, sondern auch die einzige Raumschöpfung, die, auf ihre Weise, die Zeit überdauert hat.«[21]

LICHTBÜHNE UND LICHTSTADT

Im öffentlichen Raum, wo Albert Speer in den 1930er Jahren mit militärischen Suchscheinwerfern ephemere Lichtarchitekturen im Dienste einer nationalsozialistischen Ideologie realisiert hatte, wird heute mit digitalen Lichttechnologien sowie (interaktiven) Projektionen die Stadt zur temporären Bühne und die Architektur zum relevanten Element einer urbanen Szenografie. Internationale Lichtfestivals wie die *Internationalen Lichttage Winterthur*, die *Frankfurter Luminale* und das australische *Vivid Sydney* stehen in der Tradition französischer Veranstaltungen namens *son et lumière* – nächtlichen Shows, in denen sich Lichtkunst, Stadtgeschichte und Musik begegnen. 1952 hatte der Kustos Paul Robert, Enkel des berühmten französischen Zauberers Jean Eugène Robert-Houdin, das Château de Chambord im Loire-Tal zum ersten Mal mit einer nächtlichen Licht- und Tonshow verwandelt. Seitdem gilt das Genre *son et lumière* als eine Form des visuellen Storytellings, bei der mit farbigem Licht und eigens komponierter Musik (so etwa Jean Michel Jarres *Millenniumskonzert* vor den farbig angestrahlten ägyptischen Gizeh-Pyramiden am Neujahrsabend 2009) die Fassaden historischer Gebäude und Monamente in ihrer Dreidimensionalität betont und über Bewegtbild-Projektionen animiert werden.

Weniger historisch orientiert als vielmehr die Stadt in ihrer gewachsenen architektonischen, sozialen und kommerziellen Komplexität betrachtend, verstehen sich Medienfassaden-Festivals der letzten zehn Jahre wie *UrbanScreens* (Amsterdam, Berlin, Melbourne, Toronto) als neue und mobile Ausstellungsflächen. Die mediale Bespielung der Stadt durch Künstler und die Entwicklung partizipativer Formate, bei denen beispielsweise Bürger über das Internet die Beleuchtung anonymer Hochhausfassaden interaktiv beeinflussen können, sind als gegenläufiger Trend zur Vereinnahmung der Stadt durch großflächige Print- und Medienbespielungen zu verstehen. Hybride Festivalformate zeigen einerseits Stadtgeschichte – kommuniziert durch großenteils dekorative Bespielung von Fassaden und Gebäuden – und binden andererseits zunehmend interaktive Technologien ein, mit denen Partizipation visualisiert werden kann. An der fortschreitenden Entwicklung des Lichtfestivals *Vivid Sydney*, das seit 2008 jährlich stattfindet und das zu *Vivid Sydney, A Festival of Light, Music and Ideas* erweitert wurde, lässt sich die zunehmende Festivalisierung der Stadt beobachten. Licht- und Medienkunst, U- und E-Musik, Symposien und Talks, Feuerwerke und Streetpartys verwandeln die Innenstadt, die tagsüber von Verkehr, Business und Konsum geprägt ist, in eine begehbare Bühne für alle. Die erleuchtete Stadt ist so auch temporär die utopische Stadt, die Zugang schafft und für Teilhabe wirbt. Im Rahmen von *Vivid* übernahmen 2009 Brian Eno und 2010 Laurie Anderson und Lou Reed die Bespielung der Außenfassade des Opernhauses von Sydney mit Lichtprojektionen und ein angegliedertes Musikprogramm. 2011 arbeitete das französische Kreativ-Kollektiv Superbien exklusiv mit 3-D-Mapping und der Verwendung von psychedelisch anmutenden Farbkombinationen. 2012 artikulierte das Berliner Kollektiv UrbanScreens um Till Botterweck und Max Görgen die architektonischen Umrisse der berühmten »Segel« des Operndaches, indem sie die Projektion einer Tänzerin auf und zwischen den Dachelementen »herunkletterten« ließen. Bei *Vivid* 2013 konnte das Publikum über einen interaktiven Touchscreen eine kollaborative Projektion aus 108 000 einzeln programmierbaren Lumineszenz-Dioden (LEDs) auf der Westseite der berühmten Sydney Harbour Bridge entstehen lassen.

Im Gegensatz zum Live-Erlebnis solcher Lichtspaziergänge, die neue Sichtweisen der Stadt schaffen, sind die Lichtshows der Großveranstaltungen wie etwa den Eröffnungs- und Schlusszeremonien der Olympischen Spiele zunehmend auf das internationale Fernseh- und Social-Media-Publikum ausgerichtet. So wurden bei den BBC-Übertragungen der Olympischen Sommer-

18
»Außer den Flak-Scheinwerfern für den Lichtdom wurden dazu weitere 2104 Scheinwerfer und Leuchten mit einer Gesamtleistung von 703,4 KW benötigt. Da bereits jeder der 152 eingesetzten Flak-Scheinwerfer 10 KW leistete, betrug die Gesamtbestückung schließlich 3135,4 KW, also über drei Millionen Watt.« Aus: Schmitt, Ph.: »Die Beleuchtungsanlage des Zeppelinfelds auf dem Reichsparteitagsgelände zu Nürnberg«, in: *Das Licht*, 7. Jahrgang, Heft 4, 1937, S. 61ff., hier S. 61, zitiert nach: Krauter, Anna: *Die Schriften Paul Scheerbarts und der Lichtdom von Albert Speer»Das grosse Licht«*. Dissertation von 1997, abgerufen über http://archiv.uni-heidelberg.de/volltextserver/volltexte/2004/237/.

19
Die andere Goldmedaille ging an den Architekten des direkt gegenüberstehenden sowjetischen Pavillons, Boris Iofan.

20
Albert Speer war bei den Nürnberger Kriegsverbrecherprozessen im Jahr 1946 zu 20 Jahren Haft verurteilt worden.

21
Speer, Albert: Erinnerungen, Verlag Ullstein, Berlin 1969, S. 71f.

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