Universal Service: The Cathedral of Bell

North America has always been a bold and hopeful country, especially throughout the 20th century. It trusted in its scientists to develop atomic power, put a man on the moon, and provide universal communication for all. Looking at popular science magazines from that era, every page speaks of a utopian trust in scientific discovery, which was also always coupled with the commercialisation of inventions. The *Bell Telephone Company* with its claim "one company, universal service" and its status as a communication monopolist is a prime example of this approach and the main focus of this chapter.

Architects revelled in that spirit of scientific progress and corporate power as well. They built impressive structures, using new types of concrete, steel, and glass; and most of them were convinced that their architecture would also better society as a whole. A visible expression of this utopian and commercial spirit are the buildings of three of the largest American companies in the 20th century: General Motors, IBM, and Bell. They are impressive and futuristic designs that employed the latest materials and told the onlooker that inside scientists are solving society's problems – and also that they and the company that employed them were the ones to trust.

Figure 4: IBM Thomas J. Watson Research Center, Eero Saarinen (1961)

Simon Greig's image of the research center can be found at *Wikimedia Commons* under the title "IBM Yorktown Heights".

One basis for that boldness is a specific approach to the material world. From the scientist's perspective it meant that matter could be discovered and, in the end, mastered; from the company's perspective it meant that progress was con-

trollable like a business plan; and from the architect's perspective it meant that an artistic vision could be totally realised. This is a powerful and yet dangerous approach since it neglects the inherent potential of the world around the laboratory, both of matter and of people.

Universal service and bold architecture both came to an end at the beginning of the 21st century. Bell's research campus is now a derelict monument as is the company. But the dreams of universal service and total architecture did not end. Therefore, we can learn a lot from looking at the mindset of both technology companies and their architects.

Laboratory Architecture as a Company's Vision to Shoot a Man to the Moon Every Day

The story of the *Bell Telephone Company* is one of unparallelled success as a communication monopoly, as Tim Wu tells in his book on the history of *Information Empires* in the United States (Wu 2011). For our purposes I want to retell parts of that story by looking at the company's research facilities and their development from a small shop to the corporate campus at Holmdel.

Figure 5: Bell Laboratories Murray Hill, Voorhees, Walker, Foley and Smith (1941)

A picture of the original Bell Laboratories can be found at *Wikimedia Commons*, described by the author "Blaxthos" as "Lucent Headquarters in Murray Hill", which indicates the complex process of mergers and acquisitions from *Bell* to *Alcatel Lucent* (and later to *Nokia*).

The first Bell laboratory was housed in a cramped building in the midst of New York on 463 West Street. It provided little space and forced researchers to work under provisional conditions. The building resembled a magnified version of the laboratories of the early inventors such as Thomas Edison or the radio pioneer Guglielmo Marconi. When the *Bell Telephone Company* finally decided to move out of that first building in 1941, they commissioned the architectural firm *Voorhees, Walker, Foley and Smith* to design a new research facility in rural New Jersey that would be the antithesis of the cramped space on West Street. For the first few years, the new Murray Hill campus was praised for its ample and relatively flexible space as well as its tranquil surroundings. But the research

quickly outgrew the building and the inflexibility to adapt the site to the researchers' needs posed another problem. Moreover, the company found that the laboratory campus' "conservative Colonial Revival design [...] conflicted with its modern use and mission" (Hamilton and Wilcox 2015, p. 15). However, the campus is still in use, at the time of writing this book, for the telecommunication company *Nokia* (Coupland 2014).

In 1957, the internationally acclaimed architect Eero Saarinen and his firm were asked to design a new building for a yet undeveloped site at Holmdel in New Jersey (cf. Hamilton and Wilcox 2015, p. 15). Landscaping was commissioned to the influential landscape designer Hideo Sasaki, an American of Japanese descent. Eero Saarinen – son of the famous Finnish architect Eliel Saarinen, who followed the rationalist design in the tradition of Ludwig Mies van der Rohe (cf. ibid., p. 16) – was deemed the right man for the project because he had already designed other commercial research facilities, the most prominent being IBM's Thomas Watson Research Center in Yorktown Heights, New York, and the General Motors Technical Center in downtown Detroit. The type of architecture that the executives at Bell had in mind and that Eero Saarinen was willing to deliver was that of the neo-futuristic corporate campus. This type of facility "symbolized a postwar [sic!] ideology of corporate research that emphasized basic research and took the university as the appropriate model for organizing science" (Knowles and Leslie 2001, p. 1).

With these developments, the research laboratory moved out of the city and into a secluded, tranquil environment – which was also heavily protected against any non-corporate visitors. As Knowles and Leslie point out, the corporate campus created "spatial and symbolic identity and an elaborate public stage" (ibid., p. 2) for the companies who could afford that. This architecture is not merely functional, it is a public manifesto.

Figure 6: Bell Laboratories Holmdel, Eero Saarinen (1957)

In 2007 The *Cultural Landscape Foundation* has written an article about a planned development on the site of Saarinen's Bell Laboratories building: "Bell Labs: Birthplace of the Transistor and Cell Phone at Risk". It includes historic images of the building from *Preservation New Jersey*, a nonprofit organization dedicated to preserving New Jersey's historic places.

The laboratory did not only display the modern outlook of the company to the public, it also gave "meaning and identity to [...] its occupants" (Knowles and Leslie 2001, p. 3). And that meaning took on the form of a bold statement: The telephone company wanted to position itself as the spearhead of futuristic research (cf. ibid., p. 25). In this respect it seems fitting that *Life* magazine in May 1956 called Eero Saarinen's corporate campus buildings a "Versailles of Industry" (ibid., p. 5). The fountain display at the large pond of the Holmdel site was also worthy of that description.

Eero Saarinen did not just build a corporate image. He also tried to understand what was going on in a research laboratory. "He wanted to give the researchers themselves a significant role in designing the new laboratory" (ibid., p. 20). He saw on the one hand the (windowless) office where the concentrated researcher would work without outside interferences. On the other hand he designed walkways with garden views for relaxation and a cafeteria for collegial exchange (cf. ibid., p. 25). The building thus also spoke about the type of researcher Bell employed: It was no longer the engineer who had risen up through the ranks but rather the university graduate who came from outside (cf. ibid., p. 4) and was freed from the economic pressures the company's executives and the workers at the manufacturing plants had to deal with.

Figure 7: Inside Holmdel's research laboratories

Photographer Ezra Stoller has documented the interior of Bell Laboratories in Holmdel. His images can be seen, for example, in Karrie Jacobs' 2016 article in *Architect Magazine*: "The Bargain That Revived Bell Labs".

If we look at the empty Holmdel facility today from the perspective of the historically mindful observer, we can still perceive the great promises that came with these structures. First of all, there is the steel and glass façade of the building itself with its striking windows:

From the outside, they looked like a low-brightness mirror, either blinding the viewer or dissolving into the sky and the landscape, depending on the angle. At night the glass panels disappeared entirely, revealing the stunning building within (ibid., p. 25).

Such structures promise something to the onlooker. On the one hand they stand for the massive might of the building, but on the other hand they make it seem transparent, revealing what is going on inside. Moreover, the glass at Holmdel was not simply transparent but semi-reflective, a technologically advanced material – so much so that the company supplying the glass had difficulties to produce it in quantities large enough for the building – that speaks for a technologically advanced company (cf. Hamilton and Wilcox 2015, p. 25). For the researchers working there, the windows also meant a wide view over a carefully landscaped park. The environment that Saarinen and Sasaki created spoke of peace and tranquillity but also of the complete control over nature. Historically, Saarinen's building stands for a self-assured corporate America which saw commercial research in large pastoral surroundings as the way forward, not just for companies but for society as a whole.

Magazines such as *Popular Mechanics* praised this role of technology in society. They did not just inform their readers about technological change, they also envisioned a utopian future, where technology would connect people and free them from the chores of labour. This type of science fiction often emerged from a collaboration between authors and scientists themselves. But it also had a specific corporate agenda. Popular Mechanics, for instance, pictured total control and the privatisation of space: You do not need to leave your suburban home if you can order by picture phone – supplied, of course, by the friendly monopolist Bell. And you would not encounter people who were not able to afford these technological wonders.

Figure 8: Popular Mechanics, February 1950

> Take a look at a scan on *The Internet Archive* of a 1950 *Popular Mechanics* article (issue 2, pages 112-113) by Waldemar Kaempffert: "Miracles You'll See in the Next 50 Years".

Bell Labs at Holmdel is still the model after which many large corporations build today. And the ideology behind the building still inspires CEOs and architects, even if the buildings in the Silicon Valley look different from Saarinen's plan for Holmdel. With that in mind, Jon Gertner tells the story of Bell laboratories as the forerunner of the corporate campus utopias of today:

> [B]efore the country's best minds began migrating west to California's Silicon Valley, many of them came east to New Jersey, where they worked in capacious brick-and-glass buildings located on grassy campuses where deer would graze at twilight. At the peak of its reputation in the late 1960s, Bell Labs employed about fifteen thousand people, including some twelve hundred PhDs. Its ranks included the world's most brilliant (and eccentric) men and women. In a time before Google, the Labs sufficed as the country's intellectual utopia. It was where the future, which is what we now happen to call the present, was conceived and designed (Gertner 2012, p. 10).

The author argues that the scientists understood Bell laboratories more as an "institute of creative technology", where "the line between the art and science of what Bell scientists did wasn't always distinct" (ibid., p. 11), than as a facility to research commercially successful products for a telephone company. This self-description of the scientists working at Holmdel tells us about a specific spirit that must have been present during the laboratory's heydays; approaching vexing problems from new and creative angles and doing that with a seemingly limitless amount of both money and self-assurance. Technologies like the cell-phone system were indeed complex on so many levels that they would require not only the best minds but also a great amount of optimism to solve. A fitting testimony to that optimism to tackle even the largest-scale problems is the building itself. It stands in stark contrast to the tiny cramped labs in New York where "a few men in a hushed lab" (ibid., p. 237) developed the amplifier. Saarinen's big black box told the story of "large teams attacking knotty problems for years on end" (ibid., p. 237). Anthony Tyson, a researcher working at Holmdel for more than thirty years, spoke of entering the building as "entering a nurturing atmosphere" (Hamilton and Wilcox 2015, p. 23)[1].

The aspect that creativity originated in the enclosed space of the laboratory leads us to a more general assumption, namely that enclosed spaces interact with the people working there. The sociologist Maurice Halbwachs argued that "there is no collective memory which is not bound to a space". As Bernd Schäfers puts it, space is a fundamental category of social action, it is the a priori of the social, it structures our social interactions (cf. Schäfers 2014, p. 33).[2] If we

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1   The quote is taken from Hamilton and Wilcox' personal interview with Holmdel researcher Anthony Tyson.

2   While I agree with the a priori of space, I do not subscribe to the inherent notion, that it is merely a basis for something else.

consider research a social endeavour, both in the sense of researchers collaborating and in the sense of them relating to society, then the big black box at Holmdel was more than just a building, it was a cocoon that shielded academic research from the real world and its economic and its social problems. Even the nature that surrounded the building was a landscaped scene, a picture to behold rather than a wild and threatening force. At Holmdel the material of the building and the landscape corresponded to a general idea: that man is capable of controlling nature and bending the material his way.

The Architect as the Almighty Designer

Architecture participated in this bold American dream as Eero Saarinen and other corporate campus architects gave it a visible expression. One of the reasons why architecture can make statements so bold is because architects themselves see their work not as a form of applied engineering, but as art. As such, architecture expresses particular world views. Thus when talking about the corporate campus architecture, we should give prominence to the role of the architect – as they have an agenda of their own and sometimes even a greater societal or political program.

To illustrate this, I want to start not with a large structure but with a family home, albeit this house is far from simple. Frank Lloyd Wright's (FLW) Fallingwater House is not just a prime exemplar of Modern architecture, it is also a house that is integrated well into its natural surroundings. One particular part of the house shows to what lengths FLW went to respect nature: A beam bends around a tree that had been growing on site before (cf. Wiebe n.d.). This makes no sense from an engineer's perspective, in fact it introduces a structural weakness, but it shows that architects do not just solve the problems of their clients. FLW provided the wealthy Kaufmann family with housing but he solved this task in a very specific way. As a follower of Unitarianism, influenced by Ralph Waldo Emerson and Henry David Thoreau, his designs reflect a deep respect for nature (cf. Nobles 2018). It is striking that we see FLW's world view not just expressed in the Unitarian temple he built but also in the mundane architecture of non-religious buildings – not just the spectacular Fallingwater House.

Figure 9: Fallingwater (Edgar J. Kaufmann House), Frank Lloyd Wright (1938)

The detail of a beam bending around a tree at Fallingwater was uploaded to *Wikimedia Commons* by user "Daderot" under the title: "Fallingwater Detail".

Since architecture is not just problem solving it has always been part of a greater ethical debate within society and architectural critics have given a voice to the social responsibility of architects: John Ruskin chided architecture that used cheap ornaments and fake supports as deceiving the people and thus being inherently sinful – applying the theological concept of sin to architecture. Adolf Loos, himself an architect, condemned the ornamented buildings of Vienna as childish and wasteful. Loos voiced his criticisms because he acknowledged "that architects were engaged in the socio-economic enterprise of rebuilding a better world for an increasing population" (Lagueux 2004, p. 11). Bruno Taut, also an architect, suggested that an efficient architecture would improve social behaviour because "through the structure of the house" people can be moved "to a better behaviour in their mutual dealings and relationship with each other" (ibid., p. 12).

Modernist architects took this link between architecture and society very seriously. They did not just want to build for the working class, they wanted to mark a clear break with the bourgeois elitist architecture of the past. This is why not only the design of their buildings but also the materials used for their construction took on a specific meaning. The architectural historian Sigfried Giedion – who worked with Le Corbusier and introduced the International Style, or *Neues Bauen*, in Switzerland – wrote a chapter on morality and architecture in his book *Space, Time and Architecture*. He did this by praising in one part of the chapter influential modern architects, such as the predecessor of Bauhaus and inventor of the Art Nouveau, Henry Van de Velde, and praising in the other part the new building material ferroconcrete (cf. ibid., p. 13). If we look at Le Corbusier's large buildings, such as the Unité d' Habitation, we find what Giedion described: a bold statement by an architect for a no-frills architecture and the use of new materials, especially concrete structures. Both the architect's vision and the material serve the purpose of (positively) influencing, if not bettering, the lives of the building's users.

Figure 10: Unité d' Habitation Firminy-Vert, Le Corbusier (1965)

> Thierry Allard has written an article on the *architecture photographer*'s blog about Le Corbusier's building, which includes not only pictures of the Firminy site, but also drawings and many details: "The Firminy workers' Unité d'habitation".

The way architects and architectural critics talk about buildings and materials points towards the notion that architecture transcends the present realities. There are three levels on which we can look into this. First of all, we can situate architects within their time and see their designs as an expression of the culture of a particular period, the zeitgeist. Architects are not isolated engineers but they participate in the current debates and express them in their work. Architecture is – according to the writer Hermann Broch, who reflected on the visibility of culture – a manifestation of how a society at a particular time in history relates to the world (cf. Hahn n.d. P. 8). Architecture shows us how a period feels:

> Who would deny the favourable look of a curved railway bridge […], the elegance of a battleship […]? Since they emerged from our time […], we see grounded in them a part of our modern sensibilities. They embody an explicitly modern design and they must reflect the sensibilities of our time just as the […] carriage adorned with golden carvings reflected those of the 18th century* (Broch in ibid.).[3]

On a second level, architecture does not just reflect the intellectual currents of its time but is also indebted to overarching values. The architect Rudolf Schwarz – a deeply religious man, who was very sceptical towards the Modernist movement and who wrote a highly acclaimed book on church architecture – has tried to answer the question of how architecture can go beyond the fashion of its time. He sees the architect's duty to search for what holds the world together at its core: "unmutilated life in its living wholeness. […] This is why it is our first duty to make room for […][life's] freedom, where it can come to itself, where it can develop the tender beauty of its primal movements and which gives it a quiet sense of security"* (Schwarz 1953 in Hahn n.d.). This

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3   Broch himself refers to the architecture theoretician Hermann Muthesius.

idea of a deeper meaning in architecture is why Schwarz opposed Bauhaus architects like Hannes Meyer, since he saw that their architecture reflected a completely different idea of what holds the world together at its core (cf. ibid., p. 14).

But there is also a third and even more fundamental level on which architecture transcends present realities and that is the nature of architecture itself: Architectural designs anticipate a future state of the world. Designing is, according to Martin Heidegger, an answer to our being "thrown into this world," "entwerfen" is our answer to "geworfen-sein."

Martin Heidegger: Designing and Building as Part of the Conditio Humana

In his seminal article, *Bauen, Wohnen, Denken* – building, dwelling, thinking – the German philosopher MARTIN HEIDEGGER looks into the semantic meaning of the words "wohnen," dwelling, and "bauen," building. He argues that we have lost the original meaning of building and dwelling as our main modes of existence as mortal humans on this earth: "The way in which you are and I am, the way, according to which we humans are on the earth, is *Buan*, dwelling. Being human means: Being on the earth as a mortal, which means: dwelling"* (Heidegger 2014, p. 101).

Figure 11: Martin Heidegger in front of his hut in Todtnauberg in the Black Forest

The photographer Digne Meller Marcovicz captured Martin Heidegger in front of his cabin in 1968. Her portfolio of images of Martin Heidegger has been published in print and can also be found on the pages of the *bpk Bildagentur*.

What is striking in Heidegger's text from the perspective of our discussion of corporate architecture is that Heidegger had a particular way (and form) of building in mind when he wrote about the essence of building. It was the small farm in the Black Forest which he referenced as a positive example and which we could understand as the antithesis to the glass and steel corporate campus.

> The essence of building is to let [someone] dwell. […] Let us think for a while
> of a farmhouse in the Black Forest, which was built two centuries ago by the

dwelling of farmers. […] It did not forget the family altar behind the communal table, it has made room in the living room for the sacred spots of the children's bed and the tree for the dead, which is what they call a coffin, and thus designed for the different generations under one roof the character of their way through time. A craft which stems from the dwelling, which still needs its tools and scaffolding as things, has built this farmhouse* (ibid., p. 109).

Heidegger's text can make us aware that architecture is not a technical service to the ideas of a client, but that architects themselves are connecting to the essence of being human through their acts of building. In more modern terms we could argue that architects connect to the needs of the client as a human being and also to the needs of the world as a whole. They thereby transcend all of the individual factors that go into each plan. Each step along this way entails a decision. Making these decisions is ultimately rooted in the freedom of the architect to anticipate a future state of the world that transcends what is already there. I would argue that architecture is a deliberately transcendental endeavour.