Architecture, Technology, and Change
Human Associations with Architecture and the Machine

Rob Kronenburg

"Replicants are like any other machine—they are either a benefit or a hazard." In this statement from Ridley Scott's 1982 film *Blade Runner,* Deckard, the assassin of androids (or android assassin), defines the relationship with the artifacts human beings make in unequivocal positive and negative terms.[1] However, in Philip Dick's book on which the film is based, *Do Androids Dream of Electric Sheep,* the character's statement is more fuzzy: "A humanoid robot is like any other machine; it can fluctuate between being a benefit or a hazard very rapidly."[2] The use of the terms "fluctuate" and "rapidly" in this quote are used by the author to reinforce the variable humanistic characteristics which machines that are intended to duplicate human beings must adopt—the machine being predictable and constant whilst humanity is unreliable and changing. This paradox lies at the heart of the fascinating relationship that people have with all the things they make, including of course, architecture.

Architecture is an artifact, a thing, and yet because of its significance to human beings we frequently assign it with human associations. This also occurs with other manufactured objects, in particular machines, which have a semblance of animation and autonomy; for example automobiles, ships, and aircraft, and to a lesser degree anything that people operate. In very special circumstances the human relationship with a machine may become especially significant.

Carolyn Grace owns and flies a wartime Supermarine Spitfire Mk IX that her husband restored before his death:

> Every time I see the Spitfire it thrills me, it's such a beautiful thing. When you climb up on the wing and slide the canopy open you get this wonderful, seasoned smell, a mixture of aviation fuel, hydraulic fluid and oiled metal. The cockpit is very narrow, and when you climb in, it sort of encases you within it. It's a very secure feeling. I've met many wartime pilots who describe that same feeling—of becoming one with the aeroplane.[3]

Usually though, when people have a relationship with a machine it is of a curiously dated kind. We believe that machines are a grade above our tools, that they are like servants, and it is hard not to believe that a servant who prevents your tasks being completed is not doing this simply to thwart your ambitions—you become angry with it, distrustful, resentful. Similarly a reliable tool/servant is rewarded with loyalty and affection. People imprint their own personalities onto the relationship and identify good performance with cooperation, inadequate performance with poor behavior. Though the relationship people have with architecture is related to this characteristic master/servant one there are significant differences.

The machine is the ultimate manifestation
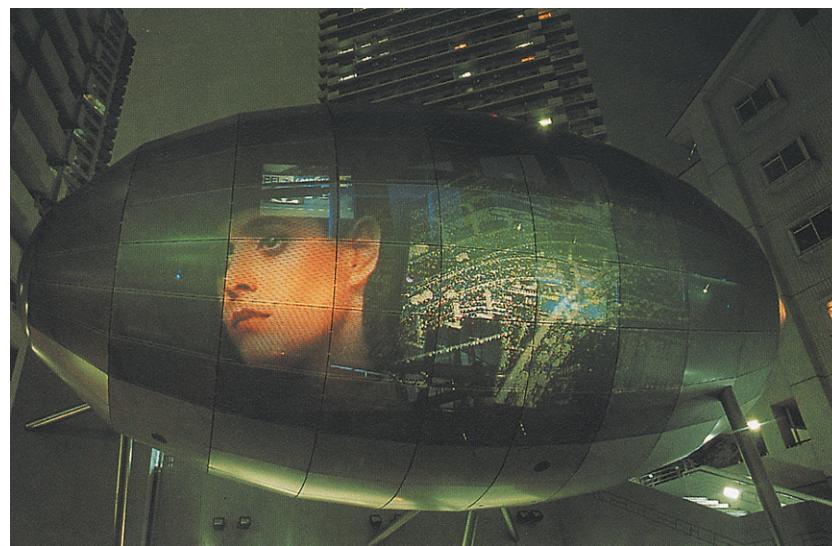
Toyo Ito, Egg of Winds, 1989. Moving images projected onto the city street—in this case the still is from Ridley Scott's film, Blade Runner. *©Toyo Ito*

of the kinetic object—it is defined as such on the basis of movement between its component parts, and though most machines are designed to operate in just one place, the most charismatic machines of the industrial age are vehicles, which operate from place *to* place. In many cases the kinetic power of machines is amplified by their ability to operate as autonomous artifacts outside the immediate control of humans and some would argue that it is at this point when Philip Dick's benefit/hazard line is most usually crossed. Architecture, it could be argued, is the ultimate manufactured manifestation of the static object—built to last, to engage the human need for permanence, stability

and continuity. Out of all human made physical artifacts the building is the longest lasting—it is how we judge the civilizations of the past not because it was their most important achievement but because it is frequently all that is left. Even so, architecture can also become a hazard—physically, when poorly constructed buildings collapse or poison their inhabitants, or socially when poorly designed places exacerbate unsuitable economic, political, or environmental conditions.

However, to propose the categorizations of the kinetic machine and the static building is provocative, as something as complicated as technology—the method
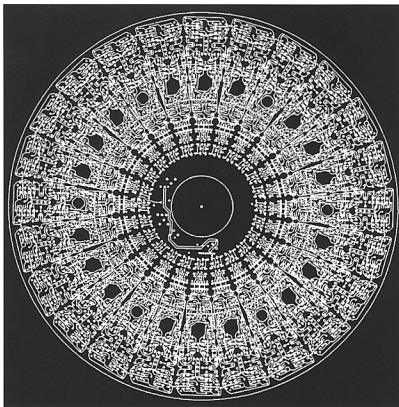
Integrated circuit design for a computer operated robot—apparently static, the movement is at an atomic scale. ©Franceschini, N., Pichon, J.M. Blanes, C., C.N.R.S. Marseille, France

by which we shape our world—cannot really be understood by such simple generalizations. The recognition of the machine as an object of moving parts is now completely outmoded in an age of solid-state electronics and smart materials where the only things that are in motion are invisible electrons and chemical compositions. And even permanent buildings contain movable elements—at the simplest level doors, windows, shutters, furniture, at a more sophisticated level the ability to change size, shape, color—in some specialized cases buildings can also be physically relocated as required.

Comprehension of the comparative relationships humans have with machines and buildings is complex. The modernists maintained that a house was a machine for dwelling in—however, this core perception of the relationship between buildings and people was fundamentally wrong. It implies that we operate a house in much the same way as we operate an appliance. Take for example the washing machine, a device invented in the nineteenth century by the North American Shakers religious group to remove the worst aspects of this largely unrewarding task in order to improve the life of their community.[4] The modern automatic washing machine carries out this same task in a family situation. We learn how to operate the machine and use it when necessary. When unused it is dormant. If it gives reliable service we are pleased with it but at the back of our minds we know that some day it will break down and then it will need attention. If we want to use it but it is broken, we are frustrated and annoyed and resign ourselves to the extra cost of having it repaired or replaced—alternatively we go to the launderette and rent someone else's machine. From this scenario it is easy to see that the human relationship with a washing machine is restricted to the basis of whether or not it is a good servant.

Our relationship with a house is different. A house is not operated, it is inhabited. There are activities related to operation, turning lights and taps on and off, opening and shutting doors and windows, but we also clean it, paint it, and furnish it. We make a fire, restock the refrigerator, water the plants—in other words we serve the house so it may fulfil our needs. These activities build up an understanding of the needs of the house and are similar to those we do for our children—feeding, dressing, bathing. In return we expect comfort and protection from inclement weather, from danger and from unwanted visitors. Also it provides a refuge, the repository for our sleeping and waking life. We have an intimate servant/master relationship in which the roles are switched around depending on the activity. This analogy of an alternating servant/master relationship operates for the other buildings associated with our lives. We may go to work in an office or a factory and we are the servants to the activity that takes place there, but these buildings also provide the venue for our friendships, the source of our income and they protect our activities from weather and danger as before.

Surprisingly, the concept of the building being a machine for living in has been adopted most ruthlessly by the multi-national companies who have attempted to reduce their restaurants, hotels and shops down to a completely prescribed entity where entry into each of its outlets, no matter where it is in
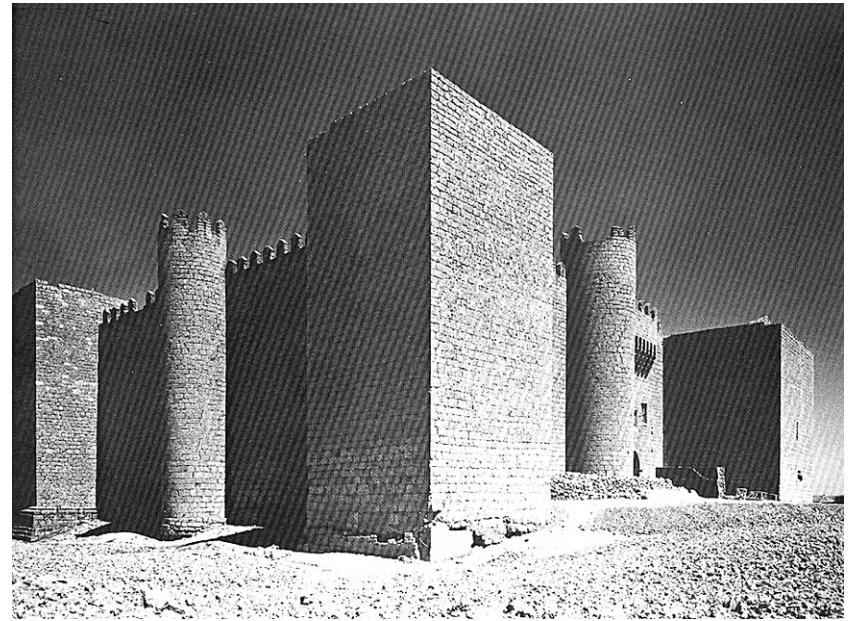

Festo "Airtecture" prototype portable active structure building—a computer controlled air-supported structure designed for relocation. ©Festo Corporate Design

Montealegre Castle, Vallodolid, Spain.

Lockheed SR-71A Blackbird—beautiful and menacing.

the world, is identical. In the case of a hamburger chain restaurant, you can go there and "operate" the system quickly and efficiently with a commensurate reward in culinary satisfaction, but would you choose to eat there all the time? You can "operate" a chain hotel room just as easily because you have been there before, but would you choose to live in one? You can stock up on basics in a chain supermarket, but is that the place to find a diverse range of local produce? This reinforces the idea that environments created on a mass-produced basis are not as much signs of increased efficiency as increased consumerism.[5]

If we accept that a house is not a machine for living, a factory or office not a machine for working, and so on, it makes it much easier to acknowledge our more deep-rooted relationship with architecture. However, though we can now see that this assertion by the modernists was wrong, their fundamental desire to come to terms with the impact of technology on home and work and on life in general was correct. Innovative technology is at the core of the increased complexity of contemporary existence and this has changed the character of building types. In fact one simple equation that does seem to hold universally true is that new technology inevitably leads to change. To try to categorize architecture by purpose or style seems almost pointless today because there is such an intermingling of function and form. Instead of the more readily defined single roles of the past it is now common for new, large scale, urban buildings to contain a mix of activities including dwelling, commerce, leisure, and community space. Innovative technology has in the past resulted in new building types—in the twentieth century amongst others we saw cinemas, motels, garages and airports emerge. In the twenty-first we have some new building types such as telephone call centers, cyber-cafes and telehotels but perhaps more challenging is the removal of building types such as some conventional retail and travel services which are set to change in the near future due to internet sales.[6]

If the types of architectural function have changed, architectural form has become equally diverse. This is partly the result of the wide range of structural systems and material options to choose from, but it is also due to an eclectic mix of design philosophies at work. This pandemonium of architecture is redolent of the age and though undoubtedly challenging, it is not necessarily something that leads to confusion in our understanding of what architecture means. It can be convincingly argued that each age has its architecture and this outpouring of ideas is commensurate with the emergence of a global civilization.

One way to explore our changing relationship with architecture is to examine some of the human characteristics that can be attributed to buildings, both negative and positive. Negative associations are generated most strongly through fear, for example; aggression and anonymity. A castle is an inherently aggressive piece of architecture yet beautiful in its simplicity. Its walls are austere, with carefully devised repetitive,
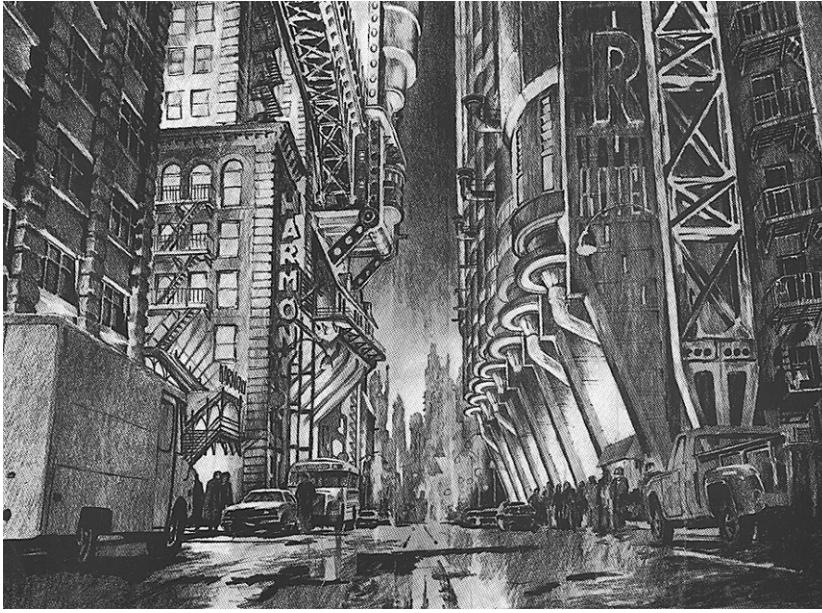
Dystopic design for Gotham's main street by Anton Furst for the 1989 film Batman. *©1989, Warner Bros. Inc.*
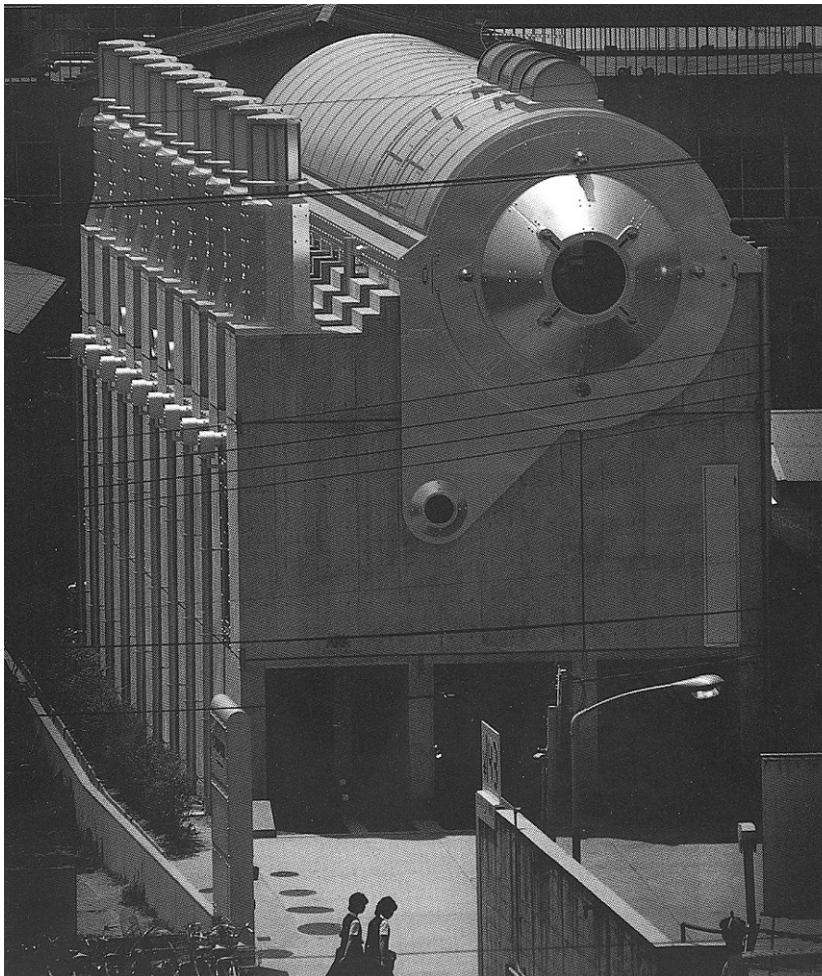
Shin Takamatsu, The Ark, Kyoto, 1981-83. ©Atsushi Nakamichi.

geometric forms. We understand its function and the purpose for which it was built, and perhaps its history also affects our response to its presence. We also appreciate that though this building was once a symbol of perhaps brutal oppression it is now ridiculously ineffectual in its original role—mobile military technology has now surpassed the purpose for which it was built. Its static presence denotes its emasculation as a weapon of war, though it still retains substance and meaning. It is a physical message from the past as with a little imagination it is not too hard to imagine what it was like to defend those walls.

Contemporary military force is sometimes secret (the ultimate indication of aggression is the hidden weapon), but when visible it is mobile, volatile, and mechanistic—the warship, the tank, the stealth bomber. It is the color of camouflaged metal, and elements of its form are clearly not structural but there for other sinister, unidentifiable purposes. Architecture that uses this language employs technology as an expression of power. The Oscar winning set design by Anton Furst for Tim Burton's 1989 *Batman* movie created a city of such buildings to represent an autocratic empire—in truth, no real commercial power would be foolish enough to so clearly state its intentions in its buildings. Architects fascinated with the power of these machines seem far more likely to transpose them into club interiors, shops, designer houses, even dental surgeries such as the Ark in Kyoto by the Japanese architect Shin Takamatsu described as a "... monstrous, primitive, and mythical machine [which] ultimately does not disclose any previous function. It is an unknown mechanism, an unidentifiable object..."[7] Interestingly, *Batman*'s designer cites Shin Takamatsu as among his influences.

Far more frightening than aggressive architecture is that which is completely anonymous, for the faceless facade can conceal anything. Anonymous architecture has found its best description in literature, in Franz Kafka's *The Trial* (1925) and *The Castle* (1926), where the societies have adopted a building style that mirrors the impenetratability of their social system. The fascist Nazi architecture of Albert Speer was designed to reduce the individual to a cog in the machine of society, vast simple forms, redolent of previous ages, but stripped down to emphasize scale and mass, to oppress the individual and deify the state. Stalinist architecture was simply big and repetitious. The image of these buildings is of solid, immovable objects, three-dimensional propaganda heralding a permanent, irreversible, authority that was nevertheless transient.

If the architecture of aggression and autocracy is ponderous and static, what is the contemporary image of an architecture that embraces freedom and possibility? Though it is relatively easy to find positive human associations for buildings: welcoming, safe, friendly, grand, stimulating—architecture that expresses the kinetic opportunity to change might best be associated with the more ambiguous characteristics of complexity and mystery. Though complexity can be confusing it can also be intriguing, and one can readily accept that once understood, comprehension and knowledge will be the reward. The visual attendant to complexity is richness, in ideas, pattern or form. Nature is full of complex patterns and forms, and the belief that unravelling the meaning of these mysterious systems will bring knowledge is largely founded in experience. In architecture, visual complexity communicates investment in time and effort. In decorated architectural forms this may be all that is initially communicated, however, it generally fuels the belief that more careful investigation is worthwhile. Constructional or structural complexity communicates a more instant message. A trussed roof has many members working together in partnership, geometry and pattern, expressive of

Japan pavilion at Expo 2000 Hanover, Shigeru Ban—a complex recyclable structure made from paper tubes, timber, steel and plastic. ©Robert Kronenburg
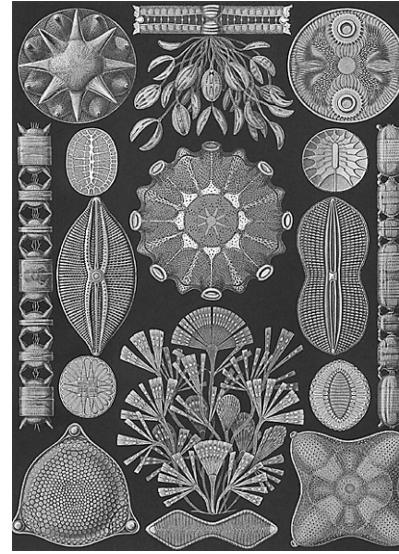
Ernst Haeckel—a print from his 1904 book Kunst-formen de Natur.

Lloyds Building, Richard Rogers Partnership. ©Robert Kronenburg

dynamic tension and compression. It is not necessary to understand the structural forces at work to appreciate the intention and the result. Advanced technology frequently makes use of complex pattern making in delivering its end result, woven fibers, circuit boards and computer chips being three examples at different sizes.

Richard Rogers's Lloyds building in London with its exuberant external detailing has been compared to the flying buttresses of a Gothic cathedral, his Inmos factory with its complex of masted, cabled elements sailing above the roof, to a harbor filled with square-rigged ships. Bringing out the usually hidden elements of structure and servicing provides these buildings with an identity, which is culturally familiar, though one that has perhaps not been associated with architecture before this. People make their own connections and identify with architecture in their own way—the expression of complexity allows them their free interpretation to do this and supports a conviction that effort has been made to create something worth identifying with. To see the "connectedness" of complex exposed building patterns implies the possibility for dismantling, for change and movement. Jean Baudrillard, the French sociologist was clearly fascinated and maybe a little rattled by Richard Rogers first major foray into this territory with partner Renzo Piano, "Beaubourg-Effect... Beaubourg-Machine...Beaubourg-*Thing*—how can we name it? The puzzle of this carcass of signs and flux, of networks and circuits...the ultimate gesture towards translation of an unnameable structure..." but comes to some conclusion about what it all means; "...this *thing* openly declares that our age will no longer be one of duration, that our only temporal mode is that of the accelerated cycle and of recycling: the time of transistors and fluid flow." [8]

Though science is on a specific quest to understand the world there is a general underlying belief that we will never, no matter how long or how hard we try, understand everything. For many of us technology also has this effect, we feel we can see the wonder of it around us but we will never be able to understand it all. Almost everyone uses computers but how they actually work is a mystery. It is like alchemy, a process with scientific trappings that leads to inexplicable, magical results. The best contemporary architecture taps into this mysterious quality, using technology in wonderful subtle ways to mirror our relationship with nature, in Heidegger's terms "to bring beauty to our relationship with the ground and the sky; to accept our movement through time and space." [9] Complex, mysterious architecture can heighten our appreciation of the achievements of human creativity, make clear the relationship it has with natural elements that are ever changing though continuous, such as the landscape, plants and light, but still be clear about use and purpose. It gives us enough to help us realise who and where we are, but holds enough back so we can continue to change and develop, and perhaps most important, retain our wonder at the world.

Beaubourg Centre, Renzo Piano and Richard Rogers. ©Robert Kronenburg

Mysterious and beautiful—circus, jewel, or a sailing ship moored on the Cambridge Fens—the Schlumberger Research Facility by Michael Hopkins. ©Robert Kronenburg

Notes

1. This essay is based on an extract from the author's book, *Spirit of the Machine: Technology as an Inspiration in Architectural Design,* to be published by John Wiley, London, in the summer of 2001.

2. Philip K. Dick, *Do Androids Dream of Electric Sheep,* New York, 1996. (First published, 1968). Dick uses these words to draw attention to the question of what makes "human-ness" at the outset of the story. Scott leaves this idea more ambiguous and explores it through the development of the replicant characters in his film.

3. "A Life in the Day of Carolyn Grace," *Sunday Times Magazine,* September 3, 2000, p. 54. It has been suggested that when people live in extreme situations their relationship with the machines that protect their existence deepens into an equal partnership where technology and humanity take on a form of symbiosis. See Rachel Armstrong (ed), "Space Architecture," *Architectural Design,* Vol. 70, No. 2, March 2000, p. 5.

4. See Herbert Schiffer, *Shaker Architecture*, Westchester, Penn. 1979.

5. See David Nye, *Electrifying America: Social Meanings of a New Technology 1880-1940,* Cambridge, Mass. ,1990. p. 238.

6. Low-cost European airline Easyjet first introduced Internet sales in 1998. Initially online reservations represented less than 1% of their total business, for the same period in 2000 it had risen to 76%. A telehotel is a building in which Internet-based companies "lodge" the hardware that facilitates their operation with access to constant maintenance and ideal environmental conditions.

7. Botand Bognar, "From Ritualistic Objects to Science Fiction Constructs: The Enigma of Shin Takamatsu's Architecture" in Paolo Polledri (Ed), *Shin Takamatsu*, Rizzoli, New York, 1993. *Batman* was made at Pinewood Studios, England by Warner Brothers in 1989 and directed by Tim Burton. Furst was assisted by Nigel Phelps. *Bladerunner* also contained another powerful distopian city, the seemingly infinite "Hades Landscape" designed by Lawrence Paull, Syd Mead, and Doug Trumbull in collaboration with the director Ridley Scott. For information on both these films see Dietrich Neumann (ed), *Film Architecture: Set Designs from Metropolis to Blade Runner,* Munich, 1999. The Ark, or Nishina Dental Clinic, in Fushimi, Kyoto was built in 1981-2.

8. Jean Baudrillard, "The Beaubourg-Effect: Implosion and Deterrence" (1977) in Neil Leach (ed), *Rethinking Architecture: A Reader in Cultural Theory,* London and New York, 1997, pp. 210–211.

9. "... 'on the earth' already means 'under the sky.' Both of these also mean 'remaining before the divinities' and include a 'belonging to men's being with one another.' By a primal oneness the four—earth and sky, divinities and mortals—belong together in one." Martin Heidegger from "Building, Dwelling, Thinking" in David Farrell Krell (ed,) *Martin Heidegger, Basic Writings*, London, 1993 (first published 1973) p. 351.